N-CFSAC

Supporting Documentation Package 3

April 09-11, 2024

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Task Statement # 20-24

Committee make recommendations on processes to review and implement commercial fishing vessel mariner fitness-for-duty for service onboard CFVs of less than 200 GT fitness for duty and service should include an assessment of overall health and physical fitness and contain provisions for the elimination drug and alcohol usage and management of fatigue.

Task Statement # 21-24

Committee develop guidance and make recommendations on fatigue limiting strategies as well as work/rest hour logging requirements.

Task Statement # 22-24

Committee analyze fatigue and sleep deprivation impacts with the commercial fishing industry and make recommendations to the USCG.

United States Coast Guard

REPORT OF INVESTIGATION
INTO THE
COMMERCIAL FISHING VESSEL (CFV)

COASTAL REIGN

Capsizing & Loss of Life

20 February 2021 16:37:00 PST

MISLE Activity Number: 7145693
MISLE Case Number: 1250976

Note: This marine casualty investigation was conducted pursuant to 46 USC § 6301. As such, and in accordance with 46 USC § 6308, no part of this report, including the findings of fact, opinions, recommendations, deliberations, or conclusions, shall be admissible as evidence or subject to discovery in any civil or administrative proceeding, other than an administrative proceeding initiated by the United States

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Commandant
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16732/IIA#7145693
23 May 2022

THE CAPSIZING AND LOSS OF LIFE ON THE COMMERCIAL FISHING VESSEL COASTAL REIGN NEAR GARIBALDI, OR ON FEBRUARY 20, 2021

ACTION BY THE COMMANDANT

The record and the report of the investigation convened for the subject casualty have been reviewed. The record and the report, including the findings of fact, analysis, and conclusions are approved. The investigation's safety recommendations remain under review. The Commandant's response to the recommendations and any resulting actions will be documented separately. This marine casualty investigation is closed.

[redacted]

[redacted]. D. NEUBAUER
Captain, U.S. Coast Guard
Chief, Office of Investigations & Casualty Analysis (CG-INV)

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16732

26 FEB 2021

MEMORANDUM

From: Anthony J. Vogt, RADM [redacted] CAPT
CGD THIRTEEN (d)

To: Christopher F. Coutu, CAPT
CGD SEVENTEEN (dl)

Subj: DISTRICT FORMAL MARINE CASUALTY INVESTIGATION CONCERNING THE F/V COASTAL REIGN

1. Pursuant to the authority contained in Title 46, United States Code (U.S.C.), Section 6301 and the regulations promulgated thereunder, you are to convene a formal investigation for the marine casualty of the F/V COASTAL REIGN (O.N. 1094725) that occurred on 20FEB21. In conducting your investigation, you shall follow, as closely as possible, to the policy guidance and operational procedures for the Coast Guard Marine Investigations Program, as found in the Marine Safety Manual, Volume V, COMDTINST M16000.10A.

2. Due to the scope and complexity of the investigation, I have assigned the following persons to assist you with your investigation. For purposes of this investigation, the below persons are all designated as investigating officers as defined under 46 C.F.R. § 4.03-30, and therefore, shall enjoy the powers outlined in 46 C.F.R. § 4.07-5.:

- LT [redacted], Assistant Investigating Officer
- LT [redacted] Recorder
- LT [redacted] Legal Counsel
- Mr. [redacted] Technical Advisor

3. Upon completion of the investigation, you will issue a Report of Investigation (ROI) to me with the collected evidence, the established facts, conclusions and recommendations. Conclusions and recommendations concerning commendatory actions or misconduct that would warrant further inquiry shall be referred to me, by separate correspondence for consideration and action as appropriate. A summary of significant events shall be transmitted routinely to CGD THIRTEEN (dp) while the investigation is in formal session.

4. You will complete and submit your investigative report to me by 26 AUG 2021. If this deadline cannot be met, you shall submit a written explanation for the delay and the expected

completion date. You are highly encouraged to submit any interim recommendations intended to prevent similar casualties, if appropriate, at any point in your investigation.

5. CGD THIRTEEN will provide funding support and MSU Portland will provide administrative assistance to the Investigation.

6. CGD THIRTEEN will furnish such funding and technical assistance as may be required by the Investigation when deemed appropriate and within the requirements for the scope of the investigation. Your point of contact for funding and technical assistance is CDR Hsingyen Fu, CGD THIRTEEN (dpi).

#

Copy: CG-INV
PACAREA (PAC-54)
INCOE
CG Sector Columbia River
CG Station Tillamook Bay

U.S. Department of Homeland Security
United States Coast Guard

Commander
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16711
29 APR 2022

MEMORAND[redacted]

From: Melvin [redacted] Bouboulis
CGD TH[redacted]TEEN (d)

To: COMDT (CG-INV)

Subj: ENDORSEMENT OF SAFETY RECOMMENDATIONS REGARDING THE SINKING OF THE F/V COASTAL REIGN (O.N. 1094725)

Ref: (a) Title 46 United States Code Chapter 63
(b) Title 46 Code of Federal Regulations Subpart 4.07
(c) Marine Safety Manual, Volume V, Part A, Ch. 6.B.4
(d) D13 memo, Convening Order dated 26 Feb 2021

1. Pursuant to references (a) through (c), a formal marine casualty investigation was convened into the casualty as detailed in reference (d). The investigation and corresponding MISLE Activity 7145693 are forwarded for final action. The Thirteenth District requests that CG-INV review and release the ROI ahead of the Commandant's issuance of a Final Action Memo. The investigation confirms that the sinking of the F/V COASTAL REIGN was a preventable accident. The vessel and two crewmembers were lost on the south jetty tip at the entrance to Tillamook Bay, OR. This investigation revealed various factors that lead to the casualty to include: the vessel operator's decision to attempt a crossing of an inherently dangerous bar, crewmember's sleep deprivation, the vessel operator's suspected use of [redacted] and the submerged south jetty at the entrance of the Tillamook Bay bar entrance. I approve the findings in the Report of Investigation and recommend that the Investigation be closed.

2. Safety Recommendations:

   a. **Safety Recommendation #1 (9.1.1): Require Merchant Mariner Credentialing (MMC) for Commercial Fishing Vessel (CFV) operators less than 200GT.** Concur. I recommend Commandant obtain legislative authority to require CFV operators less than 200GT hold a valid Coast Guard MMC.

   b. **Safety Recommendation #2 (9.1.2): Engagement with the Commercial Fishing Safety Advisory Committee (CFSAC) to address safety for Commercial Fishing Vessels.** Concur. I recommend that the Commandant work with the CFSAC to improve safety on commercial fishing vessels less than 200 GT and enact the provisions in the Coast Guard Authorization Act of 2010 regarding the certification of CFV operator competency.

c. **Safety Recommendation #3 (9.1.3): Maintenance of mariner competency, including local knowledge.** Do Not Concur. While this casualty highlights a concern with regards to mariners transiting unfamiliar ports during challenging conditions, I believe that if a mariner possesses a valid MMC, then he/she possesses sufficient skill to evaluate the risks associated with a transit. I am also concerned that the recommended framework will unduly burden commercial fishing vessel examiners to correctly determine mariners' local knowledge prior to an inbound transit.

d. **Safety Recommendation #4 (9.1.4): Review and implement findings from Fishing Vessel Safety Task Force Report of March 1999.** Concur. I recommend the Commandant review and consider implementing those recommendations, specifically requirements for enrollment in drug testing programs, conducting and logging safety drills, and equipment maintenance and dry dock exams to ensure hull and watertight compartment integrity.

e. **Safety Recommendation #5 (9.1.5): Implement medical fitness requirements and mandatory rest schedule for crew onboard Commercial Fishing Vessels of less than 200 GT.** Concur. I recommend that the Commandant implement a process to evaluate the overall health and fitness of crew onboard commercial fishing vessels of less than 200 GT. Evaluations should be made on potential drug use and to address crew rest, work hours and fatigue.

f. **Safety Recommendation #6 (9.1.6): Hazardous bar restriction announcement for Tillamook Bay submerged south jetty.** Concur. I have directed my Incident Management Branch (drm) to implement the recommended verbiage into their broadcast notice to mariners to heighten awareness regarding the submerged portion of the south jetty to mariners who may not be aware.

3. Administrative Recommendations:

a. **Administrative Recommendation #1 (9.2.1): Referral of alleged violations of 18 U.S.C. 1115 to the District of Oregon.** Do Not Concur. However, if the State of Oregon is interested in pursuing criminal charges regarding the capsizing of the COASTAL REIGN, D13 will provide documents IAW all applicable laws and regulations. Additionally, D13 may offer assistance to the State of Oregon where relevant under 14 U.S.C. § 701.

b. I concur with all other administrative recommendations and have directed my staff to provide appropriate recognition to the parties that assisted with the COASTAL REIGN response and investigation.

#

Copy: COMDT (CG-CVC-3)
CG PACAREA (PAC-54)
CG SECTOR COLUMBIA RIVER
CG SECTOR PUGET SOUND

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List of Acronyms

AIS	Automatic Identification System, a vessel tracking system to enhance the safety of navigation
AIO	Assistant Investigating Officer
AMSEA	Alaska Marine Safety Education Association
ATON	Aids to Navigation
BNM	Broadcast Notice to Mariners via marine radio
BOSN	Boatswain, CG Chief Warrant Officer
CDC	Center for Disease Control
CFR	Code of Federal Regulations
CFSAC	Commercial Fishing Safety Advisory Committee
CFV	Commercial Fishing Vessel
CG	Coast Guard
CG STA	Coast Guard Station
CO	Commanding Officer
COMDT	Commandant of the Coast Guard
COMDTINST	Commandant Instruction, CG Communications outlining policy and direction
COTP	Captain of the Port
D13	Coast Guard Thirteenth District, comprising Washington, Oregon, Idaho and Montana
EPIRB	Emergency Position Indicating Radio Beacon
F/V	Fishing Vessel
GRT	Gross Ton (Gross Registered Tons)
HP	Horsepower
IMO	International Maritime Organization
LIO	Lead Investigating Officer
LLNR	Light List Number
LNM	Local Notice to Mariners, published weekly
LT	Light (ATON)
LUC	Latent Unsafe Condition, determined by an assessment of the facts and then analysis
MISLE	Marine Information for Safety and Law Enforcement, a Coast Guard database for tracking vessel related activities
MLB	Motor Life Boat, MLB 47266
MMC	Merchant Mariner Credential, a document issued by the CG to commercial mariners
MRO	Medical Review Officer
MSIB	Marine Safety Information Bulletin
NAIS	National Automated Identification System, a Coast Guard capability for tracking vessels equipped with AIS equipment
NAVCEN	Coast Guard Navigation Center
NIOSH	National Institute of Occupational Health and Safety
NM	Nautical mile
NOAA	National Oceanic and Atmospheric Administration
NPFVOA	North Pacific Fishing Vessel Owners' Association
NTSB	National Transportation Safety Board
NWS	National Weather Service

O.N.	Official Number
OCMI	Officer in Charge, Marine Inspection
ODFW	Oregon Department of Fish and Wildlife
OIC	Officer in Charge
OR	Oregon
PAWSA	Port and Waterway Safety Assessment
PFD	Personal Floatation Device
PII	Parties-in-Interest, people or organizations who have a statutory right or interest in the accident investigation.
PSDA	Probability of Survival Decision Aid, planning tool for search and rescue
PST	Pacific Standard Time; is 8 hours behind Coordinated Universal Time which is used on radio logs. The time offset from UTC can be written as -08:00.
RNA	Regulated Navigation Area
ROI	Report of Investigation
SAR	Search and Rescue
SECTOR	A Coast Guard operational unit that oversees a geographic segment of the maritime domain in the United States. E.g. Sector Columbia River
SLNM	Special Local Notice to Mariners, a Coast Guard publication
TOX	Toxicology
USC	United States Code
UMIB	Urgent Marine Information Broadcast
UPV	Uninspected Passenger Vessel
USC	United States Code
USCG	United States Coast Guard
USACE	United States Army Corps of Engineers
VHF	Very High Frequency; Marine Band Radio, typically found on vessels
VMS	Vessel Movement System; NOAA Voluntary Fishing Vessel Tracking System
WAMS	Waterways Analysis and Management System, a tool used by the Coast Guard to plan and implement ATON on federally designated navigable waterways

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CAPSIZING OF THE COMMERCIAL FISHING VESSEL COASTAL REIGN, O.N. 1094725, IN THE VICINITY OF THE TILLAMOOK BAY BAR, WITH THE LOSS OF TWO LIVES, ON FEBRUARY 20, 2021

EXECUTIVE SUMMARY

On February 20, 2021, at approximately 1637 Pacific Standard Time, the 38-foot, 16 gross ton, commercial fishing vessel (CFV) COASTAL REIGN (O.N. 1094725) attempted to cross the Tillamook Bay Bar through the southern entrance (locally known as the "South Hole") near Garibaldi, OR.

The crew of the CFV COASTAL REIGN was composed of an owner/operator, a co-operator, and two deckhands. At the time of the attempted crossing, the vessel was loaded with approximately 3,500 to 4,000 pounds of Dungeness crab. On scene weather was reported as five-knot winds from the south and 8 nautical miles of visibility. The Tillamook Bay Bar report stated that the wave height was 4 to 6 feet between the tips of the jetties. In the North entrance, locally called the "North Hole," as well as the "middle grounds," waves were 6 to 8 feet with occasional 8 to 10 feet breaks, while 8 to 10 feet waves were reported in the "South Hole" entrance. Due to the hazardous conditions, Coast Guard Station Tillamook Bay restricted the bar to all recreational and uninspected commercial passenger vessels. Commercial fishing vessels, and other commercial traffic, had the option to enter the harbor, though the Station issued caution.

On its attempt to cross the Tillamook Bay Bar, the CFV COASTAL REIGN was not well-situated in the "South Hole" and in a location other than where other local fishermen recommended. The CFV COASTAL REIGN had transited east of the recommended "South Hole" line, finding themselves over the submerged portion of the South Jetty. All four crewmembers were inside the pilothouse. The CFV COASTAL REIGN took three progressively larger waves from the port side. The third and final wave estimated to be a 12-13 foot breaking wave, broadsided the CFV COASTAL REIGN. The vessel rolled hard to starboard and capsized. The pilothouse quickly filled with water. The two deckhands who were wearing Type I lifejackets found their way into the engine room compartment through a hatch in the deck of the pilothouse that had opened when the vessel rolled. The owner/operator and co-operator were not wearing lifejackets at the time the vessel capsized. The CFV COASTAL REIGN came to rest on the visible end of the South Jetty. Both deckhands, who were initially trapped in the engine room, were able to exit the vessel. One deckhand was able to climb onto the rocks of the South Jetty and was recovered by a Coast Guard helicopter from Sector Columbia River. The other deckhand was washed off the rocks of the South Jetty and could not make it back to shore. He was recovered by a Coast Guard 47-foot rescue lifeboat from Station Tillamook Bay in the water near the overturned CFV COASTAL REIGN.

When the CFV COASTAL REIGN capsized, and as the pilothouse filled with water, the owner/operator was able to free himself from the pilothouse. When he surfaced outside the vessel, he located a bundle of crab buoys and was able to grab ahold to remain afloat. He was able to save himself by swimming away from the CFV COASTAL REIGN; remaining in the water south of the South Jetty. He was rescued by a second 47-foot rescue boat from Station Tillamook Bay. The co-operator was the last crewmember to be recovered. He was located in the water near the Tillamook Bay tower.

Both deckhands, along with the owner/operator, were taken to Adventist Health Hospital in Tillamook, OR, for treatment. The owner/operator was released that evening and one deckhand was released the following day. Mr. Zappone, the other deckhand, was first taken to Adventist Health Hospital, but shortly after arrival, he was flown to Oregon Health and Science University (OHSU) Hospital in Portland, OR, where he was pronounced dead. Mr. Todd Chase, the co-operator, was deceased when he was recovered from the water.

Through its investigation, the Coast Guard determined the initiating event was caused by the navigational decisions made by Mr. [redacted] while serving as the operator of the CFV COASTAL REIGN. Subsequent events leading to the casualty include the three large waves that struck the port side of the vessel as it transited over the submerged portion of the South Jetty of the Tillamook Bay bar. Other subsequent events include the capsizing of the CFV COASTAL REIGN, followed by the pilothouse flooding and all four persons entering the water. The final events include the injuries sustained by the surviving deckhand, the injuries and death of Mr. Zappone, and the death of Mr. Chase as a result of drowning. Causal factors contributing to the casualty were: 1) the owner/operator's operation of the vessel over the submerged portion of the South Jetty, 2) the owner/operator's [redacted] prior to operating the vessel through a dangerous evolution; 3) lack of sufficient rest; 4) the inherently dangerous nature of crossing the Tillamook Bay bar; and 5) the owner/operator's overconfidence in his abilities to safely transit the Tillamook Bay bar while under broadcasted hazardous conditions.

U.S. Department of
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16732
19 April 2022

CAPSIZING OF THE COMMERCIAL FISHING VESSEL COASTAL REIGN, O.N. 1094725, IN THE VICINITY OF THE TILLAMOOK BAY BAR, WITH THE LOSS OF TWO LIVES, ON FEBRUARY 20, 2021

INVESTIGATING OFFICER'S REPORT

1. Preliminary Statement

1.1 This marine casualty investigation was conducted, and this report was submitted, in accordance with 46 Code of Federal Regulations (CFR) § 4.09, under the authority of 46 United States Code (USC) chapter 63. Pursuant to chapter 46 USC § 6308, no part of a report of a marine casualty investigation, including findings of fact, opinions, recommendations, deliberations, or conclusions shall be admissible as evidence or subject to discovery in any civil or administrative proceedings, other than an administrative proceeding initiated by the United States.

1.2 On February 26, 2021, the Thirteenth District (D13) Commander issued Enclosure 1, a Convening Order directing a formal investigation into the February 20, 2021, capsizing of the F/V COASTAL REIGN, and the loss of life of two of the four crewmembers.

1.3 The following personnel participated in the investigation: Lead Investigating Officer (LIO) – CAPT Christopher Coutu, District 17; Assistant Investigating Officer (AIO) – LT [redacted], Marine Safety Unit (MSU) Portland; Legal Counsel – LT [redacted], District 13; Recorder – LT [redacted], District 13 Prevention; and Technical Advisor – Mr. [redacted], MSU Portland waterways.

1.4 The LIO designated the F/V COASTAL REIGN'S owner, Mr. [redacted], as a Party-In-Interest (PII). He was represented by Mr. [redacted], from the Seattle law firm of LeGros, Buchanan, and Paul. No other parties were designated in accordance with 46 CFR § 4.03-10.

1.5 The Coast Guard was the lead agency for all evidence collected during this investigation. However, Oregon State Park officials collected CFV COASTAL REIGN wreckage material found along the Tillamook Bay beaches. The material was stored at the State Park Maintenance facility. The investigation team photographed the evidence and released it to the state deeming the material not relevant to determining the cause of the casualty.

1.6 The Coast Guard inquired with the National Transportation Safety Board to determine whether that agency would participate in the investigation. Due to high volume and COVID-19 restrictions and limitations, on March 17, 2021, the NTSB declined.

1.7 During the week of March 15, 2021, the team traveled to Tillamook, OR, to view the site of the casualty, collect evidence, and conduct informal interviews. While the team had an interview scheduled with the owner/operator of the CFV COASTAL REIGN, the LIO decided to reschedule the interview to a later date. Instead of continuing with the investigation, the LIO recommended that the Thirteenth Coast Guard District consider referring the matter to the United States Attorney for the District of Oregon for review. The Thirteenth District's Staff Judge Advocate discussed and shared the case with the United States Attorney for the District of Oregon to consider the case and its evidence, but no formal referral request was made. In the fall of 2021, after thoroughly reviewing the case, the U.S Attorney's office determined the evidence did not support a federal prosecution.

1.8 In December 2021, D13 directed the team to complete a Marine Casualty Report, but not to conduct a formal public hearing, opting for a quicker report production, along with a public presentation of the findings sometime in the summer of 2022.

1.9 This marine casualty report is focused on the cause of the capsizing of the CFV COASTAL REIGN with attention paid to the vessel, the environment (including the Coast Guard's navigational assistance role in the area as well as the Army Corps of Engineers' jetty system), along with the people involved in the incident. The team did not focus on the Dungeness crab fishery or other matters not directly related to the capsizing of the vessel.

1.10 While the Coast Guard's subsequent search and rescue (SAR) evolution is not relevant to the cause of the casualties, the team has included a section regarding the SAR timeline response for the benefit of the next-of-kin of the deceased crewmembers.

1.11 Since a formal hearing was not conducted where the public would have heard the testimony of witnesses, interview summaries of percipient witnesses are provided.

1.12 A list of Exhibits to this report may be found in Enclosure 2. The Exhibits are stored electronically in the Coast Guard Homeport database within the CFV COASTAL REIGN Investigation site within a folder entitled "ROI Evidence Exhibits." It is the intent of the investigation team to ensure the Exhibits identified in Enclosure 2 are hyperlinked to electronically stored files.

1.13 All times used in this report are approximate and listed in local Pacific Standard Time.

2 Vessel Involved in the Incident

Photograph of COASTAL REIGN underway near Tillamook Bay Bar, Garibaldi, OR, February 20, 2021

2.1 Vessel Particulars

Official Name:	COASTAL REIGN
Identification Number:	1094725
Flag:	U.S.
Vessel Class/Type/Sub-Type	Fishing Vessel/Fish Catching Vessel/Pot/Trap
Build Year:	2000
Gross Tonnage:	16
Length:	38 feet

Beam/Width:	15 feet
Draft/Depth:	4.3 feet
Main/Primary Propulsion:	300HP, single screw propulsion
Owner:	[redacted] - Hammond, OR
Operator:	[redacted] - Hammond, OR

3 Deceased, Missing, and/or Injured Persons

Relationship to Vessel	Sex	Age	Status
Mr. Todd Chase, Secondary Operator	Male	51	Deceased
Mr. Zachary Zappone, Deckhand	Male	41	Deceased
Mr. [redacted], Deckhand	Male	[redacted]	Injured

4 Findings of Fact

4.1 The Incident:

4.1.1 On February 20, 2021 at 6:45 a.m., Coast Guard Station Tillamook Bay personnel conducted their first light bar report and observed hazardous surf conditions at the Tillamook Bay bar entrance. As a result, the station imposed a bar restriction restricting the bar to recreational vessels and uninspected passenger vessels (UPVs) less than 40 feet in length. This restriction remained in place throughout the day until 4:30 p.m. when Station Tillamook Bay restricted the bar to all recreational vessels and UPVs.

4.1.1.1 At 4:10 p.m., the Coast Guard Tower Watchstander radioed the CFV COASTAL REIGN, then positioning herself near the South Hole, seeking the number of persons on board. The Coast Guard informed the CFV COASTAL REIGN that they would be standing by ready to assist on Channel 16 and 22A.

4.1.1.2 CFV COASTAL REIGN acknowledged.

4.1.2 At 4:25 p.m. the CFV LADY LEE crossed the Tillamook Bay Bar through the South Hole. The CFV COASTAL REIGN and CFV PETRA MARIE were still south of the jetty at this time, watching wave sets as they watched the CFV LADY LEE make her crossing. Both the CFV LADY LEE and the CFV PETRA MARIE had been speaking with the CFV COASTAL REIGN (Mr. Chase) throughout the day. Earlier in the day, the owner/operator of the CFV PETRA MARIE offered to cross the bar ahead of the CFV COASTAL REIGN to allow the CFV COASTAL REIGN to see a safe track line across the bar. However, once at the South Hole, the CFV COASTAL REIGN did not wait to make arrangements with the CFV PETRA MARIE prior to their attempt.

4.1.3 Once the CFV LADY LEE crossed the Tillamook Bay bar, it drifted, waiting between the North and South Jetties to watch the CFV COASTAL REIGN make its crossing.

4.1.4 At 4:30 p.m, due to worsening bar conditions, the Coast Guard updated its bar restriction, restricting the bar to all recreational vessels and all UPVs.

4.1.4.1 At 4:30 p.m., the Coast Guard issued the following Sécurité report:

CG Station: "Sécurité, sécurité, sécurité, hello all stations. This is Coast Guard Station Tillamook Bay. At 4:30 p.m., the Coast Guard observed the following conditions on the Tillamook Bay bar. Between the tips, 4-6 feet, North Hole and Middle Grounds, 6-8 feet with occasional 8-10 foot breaks. South Hole, 8-10 feet. Winds, 5 knots from the south. Visibility is 8 nautical miles. The Tillamook Bay bar is currently restricted to all Recreational and all Uninspected Passenger Vessels at the tower due to hazardous conditions. Break." [Emphasis added]

CG Station: "Vessel operators are encouraged to have everyone wear lifejackets. Inspected small passenger vessels are also reminded of emergency preparation and safety requirements including the provision to require passengers to wear lifejackets when possible hazardous conditions exist. All vessel operators are reminded that they are ultimately responsible for the safe operation and navigation of their vessel at all times. This is Coast Guard Station Tillamook Bay, standing by on channel 16, out." [Emphasis added]

4.1.5 After those messages, at or about 4:34 p.m., the CFV COASTAL REIGN started their transit across the bar. The two deckhands on board were both wearing Type I personal floatation devices. The operator of the CFV COASTAL REIGN, and co-operator, Mr. Chase, were not wearing any floatation device.

4.1.6 The owner/operator of the CFV COASTAL REIGN was operating the vessel for the bar crossing evolution. He started his transit approximately 600 feet east of the South Hole. Instead of following the track-line made by the CFV LADY LEE, it transited too far east and over the top of the submerged portion of the South Jetty.

4.1.7 The Tillamook Bay Watchtower was manned by a Coast Guard watchstander, and he observed the vessel take a series of three waves from the port side. The third wave was a plunging wave that struck the vessel beam-to, capsizing it at 4:37 p.m. trapping all four crewmembers in the pilothouse.

4.1.8 According to both surviving members of the crew, within moments after capsizing, the pilothouse filled with water. The owner/operator was able to swim through a broken side window and surfaced. After locating a bundle of crab buoys to keep afloat, he swam away from the capsized vessel. Both deckhands were able to escape into the engine room from the hatch door that had opened once the vessel capsized.

4.1.9 The CFV COASTAL REIGN, now capsized, drifted onto the exposed tip of the South Jetty. Once the vessel was up against the rocks, the deckhands made their attempt to escape the vessel and maneuver themselves onto the rocks.

4.1.10 At 4:44 p.m., Coast Guard Station Tillamook Bay launched 47-foot motor lifeboat (MLB I). At 4:56 p.m., Coast Guard Station Tillamook Bay launched a second 47-foot motor lifeboat (MLB II). At 5:00 p.m., Sector Columbia River launched a rescue helicopter.

4.1.11 At 5:04 p.m., MLB I recovered the owner/operator from the water in the surf south of the South Jetty. He was suffering from minor hypothermia, had sustained minor injuries, and was responsive upon recovery from the water. He was transported to the hospital for observation and was released the same evening.

4.1.12 At 5:06 p.m., MLB II recovered Mr. Zappone from the water just north of the South Jetty near the tip of its visible portion. He was unconscious and unresponsive. The MLB II boat crew performed CPR, which was continued by EMS shore side. Mr. Zappone never regained consciousness and was later pronounced dead at the hospital.

4.1.13 At 5:23 p.m., the Coast Guard helicopter arrived on-scene and at 5:25 p.m., the surviving deckhand was hoisted from the end of the visible portion of the South Jetty by the helicopter crew. He was taken to the hospital for treatment for hypothermia, and other minor injuries. He was held overnight and released the next morning.

4.1.14 At 5:59 p.m., Mr. Chase was retrieved from the water. There were no signs of life at that time.

4.1.15 Post-casualty drug testing revealed [redacted]

4.1.16 Post-casualty sleep and rest analysis revealed the crew of the CFV COASTAL REIGN was operating on very few hours of sleep from the previous two days prior to crossing the Tillamook Bay bar.

4.1.17 A post-casualty interview revealed that the owner/operator of the CFV COASTAL REIGN along with the deckhands were [redacted] approximately 30 minutes prior to the vessel making its attempt to cross the bar.

4.2 Video of COASTAL REIGN capsizing. (Press the “Ctrl” button and double click photo)

This hyperlinked photo will take the online reader to a composite movie with sound.

4.2.1 The Coast Guard’s Search and Rescue Efforts (MISLE Log)

4.2.1 At 0645, Station Tillamook Bay provided the First Light Bar Report. It issued its broadcast of the bar conditions as part of its mission conducted throughout the day at (0647, 0752, 0852, 1023, 1128, 1228, 1330, 1412, 1634). Since the initial Bar Report, Station Tillamook Bay had restricted recreational vessels and UPVs 40-foot or less from entering the bar area.

4.2.2 At 1012, Station Tillamook Bay updated its Bar Report to include worsening weather conditions (wave height increased from 4-6 feet to 6-8 feet, and visibility reduced from 6nm to 3nm)

4.2.3 At 1410, the Bar Report was updated to include increased visibility to 8nm. No change to wave height.

4.2.4 At 1630, the Bar Report was updated, to include a report of reduced wave height 4-6 feet at the tips of the jetty. The Station restricted traffic to all recreational and all uninspected passenger vessels.

4.2.5 At 1637, the CFV COASTAL REIGN capsized, spotted by Coast Guard Station Tillamook Bay Tower Watchstander.

4.2.6 At 1640, one person in the water was spotted by the Watchtower. The person in the water was floating towards the South Jjetty.

4.2.7 At 1643, one person in the water was spotted by the tower past the South Jetty in the surf zone.

4.2.8 At 1644, the MLB I was underway with three Coast Guard crew members.

4.2.9 At 1646, the Tillamook Fire Department Chief and Rescue Unit (five crew) arrived on scene at the North Jetty. The Rescue unit attempted rescue from the jetty, unsuccessfully.

4.2.10 At 1656, MLB II was underway with four crew members.

4.2.11 At 1706, MLB II recovered Zach Zappone unconscious and deceased just north of the South Jetty. Mr. Zappone was wearing a life jacket when he was recovered.

4.2.12 At 1709, MLB I recovered [redacted], owner/operator, just south of the South Jetty with minor injuries holding onto a cluster of crab buoys. Mr. [redacted] was not wearing a lifejacket when he was recovered.

4.2.13 At 1709, MLB I started CPR on Zach Zappone.

4.2.14 At 1711, MLB II requested helicopter assistance to recover person (surviving deckhand) on South Jetty

4.2.15 At 1720, Tillamook Fire Department EMS arrived at USCG Station Tillamook Bay.

4.2.16 At 1723, the USCG Helicopter 6026 arrived on scene.

4.2.17 At 1725, USCG Helicopter 6026 recovered Mr. [redacted] from the tip of the South Jetty with minor injuries to include dislocated shoulder. Survivor was wearing a lifejacket when he was recovered.

4.2.18 At 1754, MLB I recovered Mr. Todd Chase from the water just south of the north shoreline with multiple injuries including a laceration on his face. Mr. Chase was unconscious and deceased when he was recovered. He was not wearing a lifejacket.

4.2.19 At 1940, Station Tillamook Bay radio guard passed to Sector Columbia River.

4.2.20 Other agencies that responded to the casualty: Tillamook County Sheriff (4 units), Rockaway Beach Police (1 unit), Garibaldi Fire Department (5 units).

4.3 The Vessel

4.3.1 The investigation team discovered no mechanical defects with the CFV COASTAL REIGN. While the entire craft was lost, statements from the owner/operator revealed no remarkable issues. All electrical and navigational systems were working along with all mechanical and engine systems.

4.3.2 Post casualty photos of the hull revealed no visible defect or holes to indicate a grounding. The rudder of the vessel was standard, though small, and unable to effect quick turns in rougher water.

Photo of the COASTAL REIGN capsized at the end of the submerged South Jetty. 20 Feb 2021

4.3.3 The CFV LADY LEE crossed the Tillamook Bay Bar just prior to the CFV COASTAL REIGN's attempt. The CFV PETRA MARIE crossed the Tillamook Bay Bar just after the CFV COASTAL REIGN's attempt. All three vessels had similar characteristics:

	Length (feet)	Breadth (feet)	Depth (feet)	GRT	HP	Hull Material	Year Built
CFV COASTAL REIGN	38	15	4.3	16	300	aluminum	2000
CFV LADY LEE	40	13.7	6	22	440	aluminum	1988
CFV PETRA MARIE	37.1	13.9	6.5	28	165	steel	1964

PETRA MARIE moored at the Garibaldi Marina. Date unknown.

LADY LEE moored at the Garibaldi Marina. Date unknown.

4.4 The People

4.4.1 Owner/operator of the CFV LADY LEE (Mr. [redacted])

4.4.1.1 Mr. [redacted] captains the CFV LADY LEE (O.N. 927181) out of Garibaldi, OR. He has fished out of Garibaldi, OR, crossing the Tillamook Bay Bar since 1985 and may have the most Tillamook Bay Bar crossings in the area. He also serves as the Vice President for the Port Commission.

4.4.1.2 On February 20, 2021, he left port to fish. Upon his return, he watched the breaks at the North Hole for approximately two hours before deciding that the South Hole would be the preferred approach. He stated that he rarely uses the North Hole approach and only does so when the swells are small, even though it is the preferred approach designated by the Coast Guard. He felt comfortable crossing the bar that day, as he described the conditions were "not that bad."

4.4.1.3 After shifting his approach to the South Hole, he watched the wave sets for approximately 30 minutes before crossing. He stated that he prefers to navigate the LADY LEE over the bar from the flying bridge where visibility is better. He also requires his crew to accompany him on the flying bridge and requires them to wear lifejackets, in case the vessel were to capsize. He stated that having his crew outside of the pilot house prevents anyone from being trapped.

4.4.1.4 On February 20, 2021, the CFV LADY LEE, CFV COASTAL REIGN and CFV PETRA MARIE were all in the South Hole lined up to cross the bar. The CFV LADY LEE went first at about 4:25 p.m. and successfully crossed. Once through, he stopped and drifted, awaiting the CFV COASTAL REIGN which was just outside of the surf zone. [redacted] stated that he was worried about the CFV COASTAL REIGN making the crossing and wanted to wait for the vessel to cross before heading home. He noticed that the CFV COASTAL REIGN was about 500 feet east of the South Hole (closer towards the shore and the submerged Southern Jetty). He stated that <u>the CFV COASTAL REIGN never reset their position prior to beginning their attempt despite being shifted out of the South Hole and closer to the South Jetty</u>. [Emphasis added]

4.4.1.5 Mr. [redacted] provided the investigation team access to his vessel and used his chart plotter to describe the trackline of the CFV LADY LEE as well as the location of the CFV COASTAL REIGN prior to making its attempt to cross.

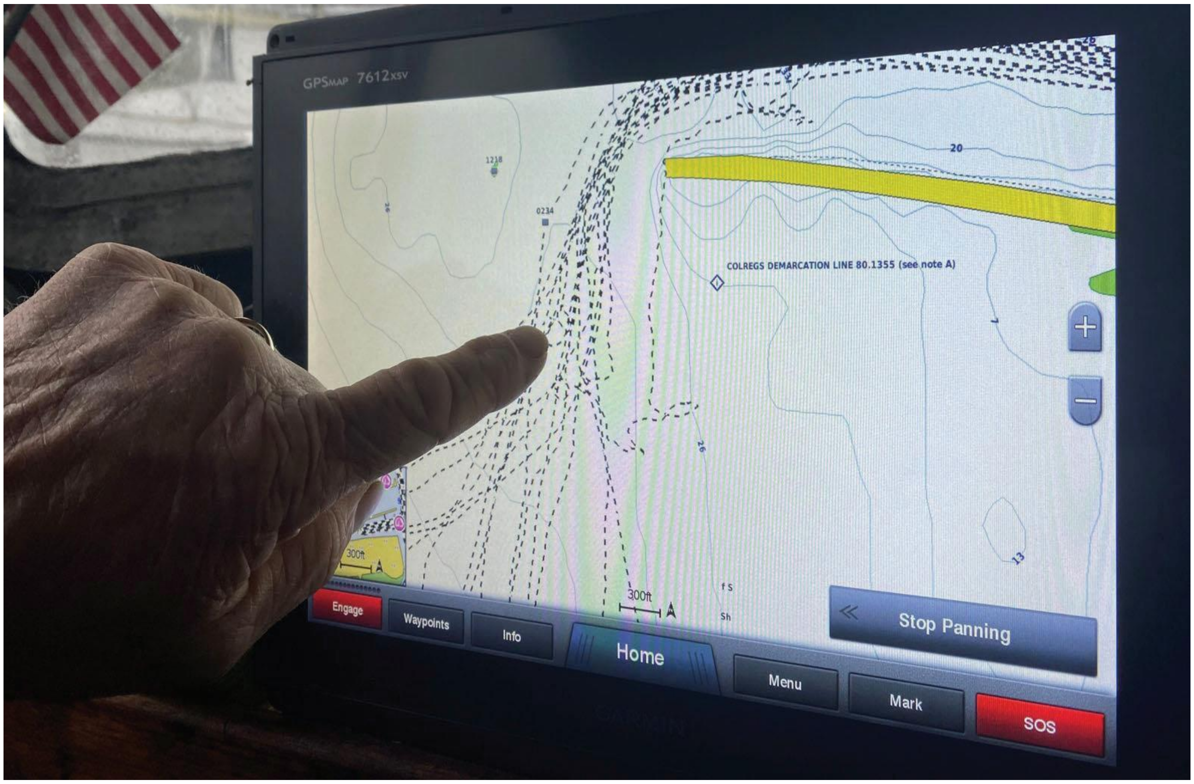
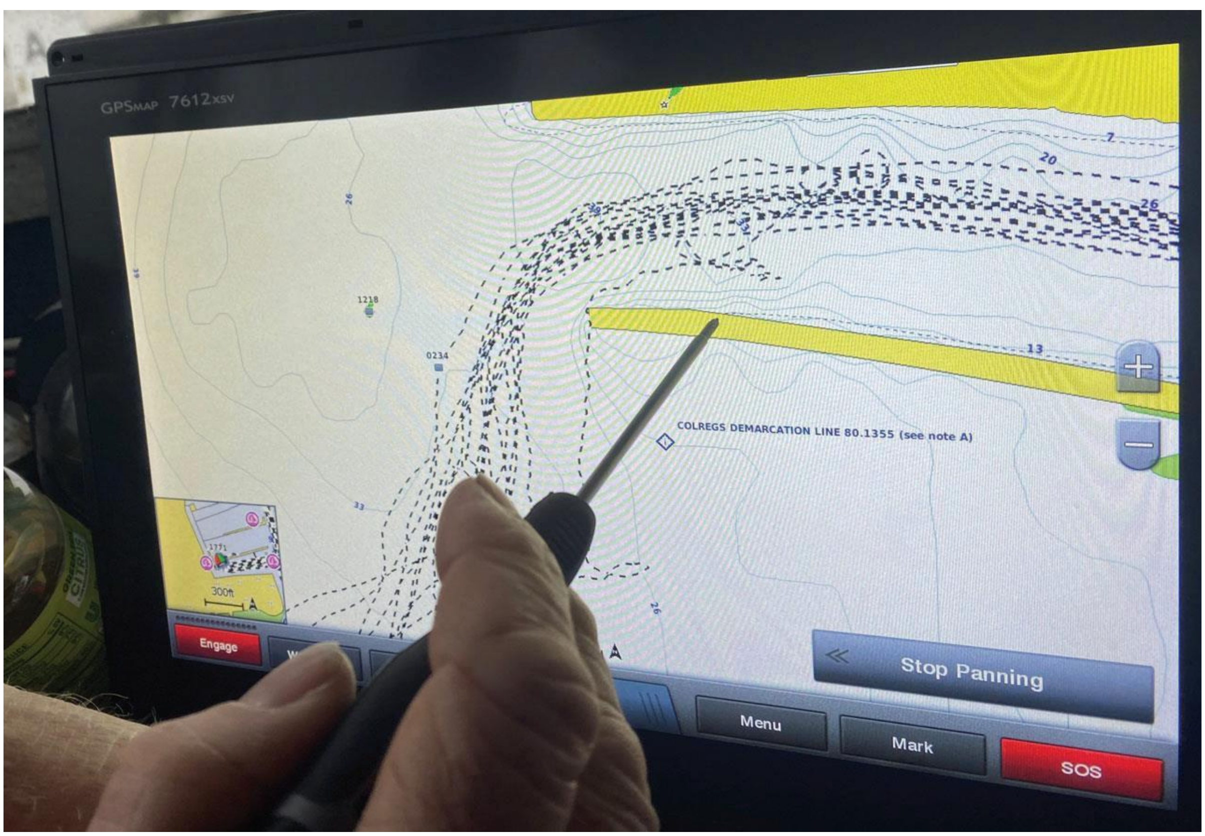


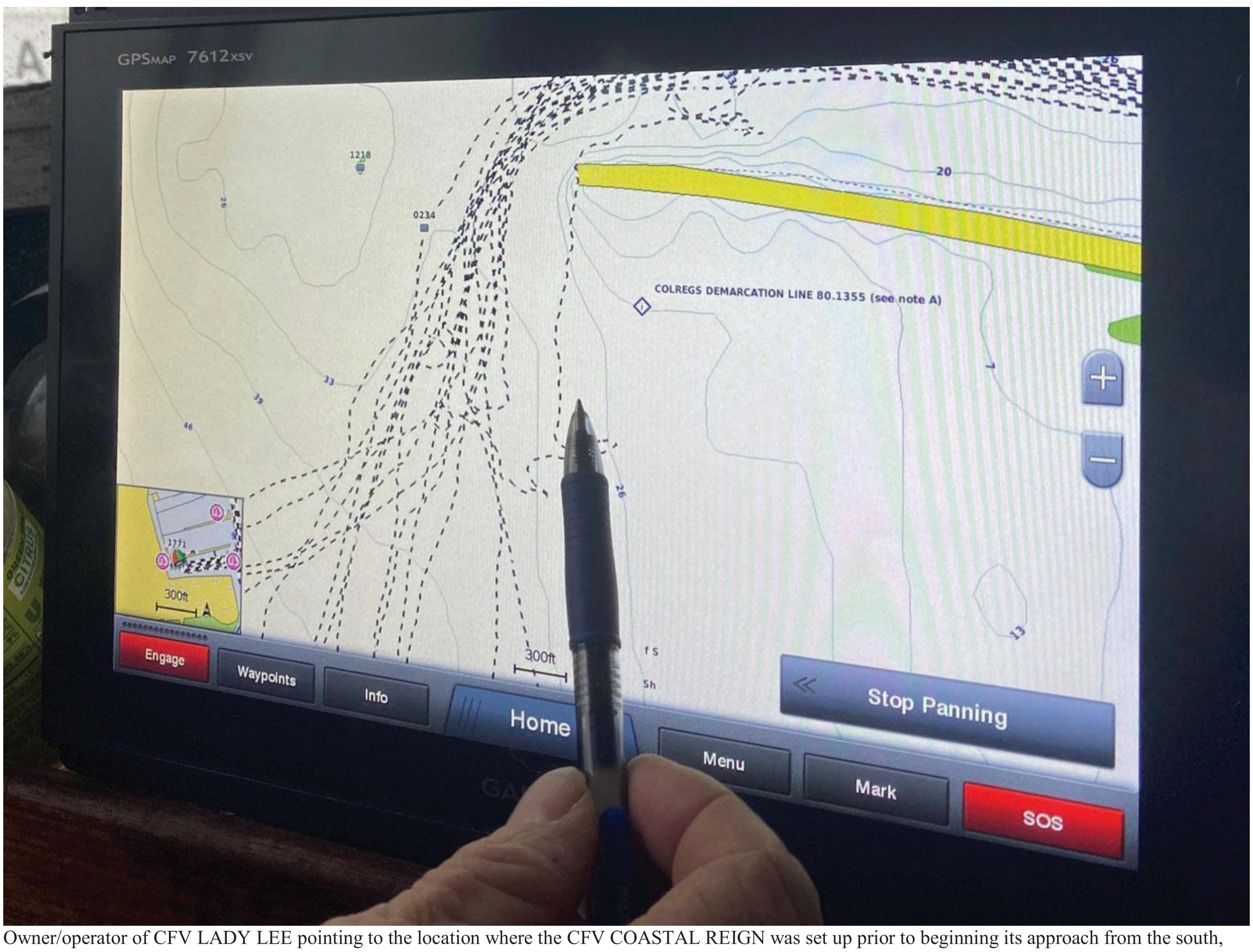
Photo of the CFV LADY LEE track lines through the South Hole. Note: chart shows full extent of the south jetty to the 'as built' length. The submerged area of the jetty colored solid as if fully configured. The electronic chart with the full length of the jetty highlighted would ensure that vessels maintain a safe distance from the submerged portion of the structure. Here, [redacted] is pointing to the exact location where the CFV LADY LEE set up for its approach.



The approximate end of the submerged jetty, showing that the electronic chart portrays an image of the as-built jetty.

4.4.1.6 When viewing the CFV COASTAL REIGN's transit, Mr. [redacted] knew, due to the wave action, (in that the waves were "standing up" quickly in the area of the submerged jetty), that the CFV COASTAL REIGN attempted its bar crossing over the submerged south jetty. In his opinion, the unpredictable waves caused by the submerged jetty are what caused the vessel to capsize. [Emphasis added]

4.4.1.7 Despite its poor starting point to the south of the jetty, the CFV COASTAL REIGN appeared to have chosen a good wave set in which to cross. However, unpredictable waves 'jump up' at the submerged jetty because it is so shallow. He was unable to contact the CFV COASTAL REIGN via radio to make them aware of their position as he did not have a radio on the flying bridge. However, he could hear his radio below and the CFV PETRA MARIE stating to the CFV COASTAL REIGN that, "You're in too far! You're in too far! Turn out, turn out, turn out!"



Owner/operator of CFV LADY LEE pointing to the location where the CFV COASTAL REIGN was set up prior to beginning its approach from the south, approximately 600 feet east of the CFV LADY LEE's starting position.

4.4.1.8 He knew Mr. Chase from fishing in Garibaldi. The two men had been in communication during the course of the day on February 20, 2021, earlier in the day and then again right before the CFV COASTAL REIGN attempted to cross. He discussed that the CFV LADY LEE would be using the South Hole approach after he decided the North Hole was not in a crossing condition. He stated that Mr. [redacted], the owner/operator of the CFV COASTAL REIGN, mostly operated in Garibaldi during the summer months, and that he had not seen him yet that winter.

4.4.1.9 When navigating the Tillamook Bay bar, [redacted] relies mostly on seaman's eye and local knowledge but also stated that his vessel is outfitted with a rudder that allows for quick turning, which is helpful when crabbing, to quickly get around the pots/lines but also helpful to correct course quickly when crossing the bar. [Emphasis added]

4.4.1.10 He estimated that the wave that capsized the CFV COASTAL REIGN was about 12 feet high. Prior to that final wave, the CFV COASTAL REIGN was hit by two others on the port side. It was able to navigate over the first wave, which turned the vessel to starboard a few degrees. The CFV COASTAL REIGN then turned to port and north in order to correct its position. He could see black smoke come out of the stacks as the engines increased in speed. The CFV COASTAL REIGN did not turn into the second wave and took it broadside. He thought the vessel would go over on the second wave, but the vessel recovered. The third and final wave was estimated to be about a 12-foot breaking wave that hit the CFV COASTAL REIGN broadside and capsized it. Each time the vessel was struck by a wave, the vessel was moved further east and further over the submerged jetty. After watching a video recorded from shore of the incident, (the same video imbedded in this report), he believes that after the first two waves, the vessel was attempting to turn into the third wave but wasn't able to complete the turn fast enough.

4.4.1.11 His experienced opinion is that if the COASTAL REIGN would have been in a better position, northwest of their starting location, which would have put them in the South Hole, (and not in position to transit over the submerged jetty) they would have successfully crossed the bar. [Emphasis added]

4.4.1.12 As the Vice President of the Port Commission, Mr. [redacted] is very aware of the ongoing changes and dangers of the bar. In 2019, the Thirteenth Coast Guard District conducted a Waterways Analysis and Management System (WAMS) study of the Tillamook Bay bar to determine the safest approach and the possibility of repositioning the channel marking buoy. As a result, the Coast Guard moved the buoy from the South Hole, to the North Hole, and designated the North Hole as the best approach. He stated that the local fisherman were not aware of the meetings leading up to the buoy relocation and were not involved in the decision making. He believes that had the local community known of the plan to move the buoy, he thinks most would have been opposed. He stated that when the buoy was in the South Hole, it was heavily relied upon as a reference point to begin the bar crossing and also as to the safe distance from the submerged South Jetty. He stated that mariners would also use the buoy to determine incoming wave sets and height based on the rise and fall of the buoy itself. [Emphasis added]

4.4.1.13 He stated that the current location of the buoy, (see the chartlet on page 27), marking the North Hole, is too far north on the bar to use as a reference point when using the South Hole approach. Regardless, he rarely uses the North Hole approach. For South Hole approaches, he has the former location of the buoy marked on his GPS (as seen in the photo above), and continues to use that as a reference for his bar crossings. However, a buoy in location would help him and other mariners judge wave height as the buoy rises and falls with each developing set.

4.4.1.14 He stated that a buoy placed in the vicinity of the old South Hole buoy, to be used as a visual reference when entering from the south, would be helpful. He stated that mariners aren't always able to look at the GPS plotter when navigating over the bar, and it is helpful to have an object to see on the water.

4.4.2 Owner/operator of the PETRA MARIE

4.4.2.1 The owner/operator of the CFV PETRA MARIE, Mr. [redacted], was a witness to the casualty. An experienced operator and fisherman, he has been operating fishing and crabbing vessels out of Garibaldi, OR, for approximately 12 years. Like the CFV LADY LEE and the CFV COASTAL REIGN, he was a Dungeness crab fisherman. He stated that commercial crabbers typically work long hours at the beginning of the season as they typically get 60-70% of their catch in the first couple of weeks. Though not a derby style fishery, the Dungeness crab fishery is a first-come, first-served industry.

4.4.2.2 The CFV PETRA MARIE does not have a flying bridge, and only one operating station within the pilot house. He stated that he didn't typically wear a life jacket when crossing the bar, but frequently made his crew wear them when conditions were less than fair. From his operating station he is able to easily reference his chart plotter and his radio. He uses his chart plotter to ensure he is in position to begin his approach across the Tillamook Bay bar.

4.4.2.3 He stated that when the buoy was moved from the south to the north, the north approach made for a good crossing on most days and that was the approach that he typically used. Over the next couple years following the buoy repositioning, the north approach became shallower and is now too shallow to cross when the weather is poor. He said that he did use the North Hole on calm days, but used the South Hole more often. On the day of the incident, the CFV PETRA MARIE watched the conditions at the North Hole before deciding that the South Hole was the safer approach. It is his practice to get to the bar about an hour before high tide so that he can sit and time the wave sets to ensure he can cross successfully.

4.4.2.4 He stated that the bar changes every year following winter storms. Like the CFV LADY LEE, he has the location of the former buoy in the South Hole where the buoy had previously been marked on his chart plotter. He uses that as his main reference point to position his vessel to begin his approach over the bar. Additionally, he uses the time before crabbing season to prepare his vessels and frequently drives to different locations to watch the breaks on the bar in all types of weather. He states that this is how he learns what has changed in the last year to determine where the safest approaches are during bad weather.

4.4.2.5 He and Mr. Chase met approximately two years ago when Mr. Chase was frequently fishing out of Garibaldi. They became friends and spoke frequently. On the day of the incident, Mr. Chase and Mr. [redacted] had been communicating throughout the day. Mr. Chase was worried about crossing the Tillamook Bay Bar. Mr. Chase had asked him earlier in the day if vessels ever crossed the bar together. Mr. [redacted] replied that he didn't typically like to do that since it was such a small area. But, if the CFV COASTAL REIGN felt uncomfortable, the CFV PETRA MARIE could cross first while the CFV COASTAL REIGN watched their track line. When the PETRA MARIE arrived at the South Hole, the CFV COASTAL REIGN was already in position to cross and was watching the wave sets.

4.4.2.6 The CFV COASTAL REIGN started its approach without waiting for the CFV PETRA MARIE. The CFV PETRA MARIE did not contact the CFV COASTAL REIGN so as not to distract the operator. He stated that as the CFV COASTAL REIGN began their approach, they appeared to be in a good position starting position. However, the CFV COASTAL REIGN steered east towards the submerged jetty. He could see the sea foam from where the previous set of waves had broken on the submerged portion of the jetty. The CFV COASTAL REIGN transited over the top of the foam. He called over the radio to let the CFV COASTAL REIGN know that they were too close to the jetty. The CFV COASTAL REIGN did not respond. Right after the radio call, it appeared that the CFV COASTAL REIGN turned north/northwest and was hit broadside by a large wave. The vessel then appeared to turn slightly to port and was hit by another larger wave that capsized the vessel.

4.4.2.7 After showing Mr. [redacted] the video of the CFV COASTAL REIGN capsizing, he stated that the wave set that the CFV COASTAL REIGN chose, looked good, but that the vessel turned too soon and transited over the submerged South Jetty.

4.4.2.8 When asked how a mariner can identify the submerged South Jetty, he stated that it is charted on the chart plotter, and it can also be determined by the wave action. He stated that the waves "stand straight up" at the start of the submerged jetty. He added, "[e]ven when there is not a large swell, the waves still stand straight up when they hit the end of the submerged jetty." [Emphasis added]

4.4.2.9 He stated that it would help if the tip of the submerged jetty were marked visually or if a buoy could be put back in the location from where it was moved a few years ago as it marked the South Hole as it could be used as a reference point to help vessels avoid getting too close to the submerged jetty.

4.4.2.10 In his conversations with Mr. Chase on the day of the incident, he learned the crew of the CFV COASTAL REIGN had not gotten much rest in the past couple days due to the opening of crab season.

4.4.3 Owner/Operator of the CFV COASTAL REIGN (Mr. [redacted])

4.4.3.1 The Coast Guard interviewed the Mr. [redacted] on February 21, 2021, one day after the incident, at his home in Hammond, OR. He stated that he purchased the CFV COASTAL REIGN in 2011. While a survey had been completed on the vessel, he could not produce it at the time of the interview and he could not recall when exactly it was completed. He did recall that the survey identified no major issues with the vessel and he described the boat as being in good condition with all systems fully operational. The value of the vessel was between $220,000 and $250,000.

4.4.3.2 He was the sole owner of the vessel and it was not insured.[1] He did not have contracts with his crew, though the terms of employment of the crew were based on a percentage of the catch for each of the crew members.

4.4.3.3 February 13, 2021, was "dump day" for the start of the 2021 Dungeness crab season for northern Oregon and Washington. "Dump day" was the day commercial crabbers could set their

[1] The investigation team learned that the CFV COASTAL REIGN had moorage in the Warrenton, OR, Marina until June 30, 2020, when his annual moorage was not renewed. It is the Marina's policy that customers are required to provide current insurance, registration, and payment in full for the annual moorage to be renewed. Without meeting the Yearly Moorage Agreement Requirements, CFV COASTAL REIGN would have been charged a daily rate for being moored. Since the marina did not renew his annual moorage, it did not collect a current copy of his insurance. The marina was unaware that Mr. [redacted] had canceled his vessel insurance until after the vessel's casualty.

crab pots in advance of the official opening on February 16, 2021. The CFV COASTAL REIGN made its first trip on February 13, set the pots, and then retrieved them on February 16 and 17 for the second trip. The crabs caught on that trip were sold in Warrenton, OR. After off-loading his catch, he went home and got six to eight hours of sleep.

4.4.3.4 The next day, February 18, the crew met at the boat around 5:45 a.m. to load bait and then depart Warrenton. For this trip, the crew consisted of Mr. [redacted], a co-operator (Mr. Chase), and two deckhands (Mr. [redacted] and Mr. Zappone). Mr. Chase was hired as he was an experienced operator.

4.4.3.5 [redacted] stated that he discussed emergency procedures prior to the vessel getting underway and that he typically reviews emergency procedures before each trip. He discussed how to operate the radio and the vessel in an emergency. He did not train with or inspect the immersion suits as often as he should have. "Every once in a while," he would pull them out from storage on the boat. He was unsure if the new deckhand, Mr. [redacted], had ever donned an immersion suit.

4.4.3.6 During the trip, Mr. Chase and Mr. [redacted] discussed the price of crab. They had learned that Garibaldi was paying \$6.50 a pound, \$2.50 more than the price for crab in Warrenton. They discussed how much crab it would take to make the longer trip south worthwhile. Complicating the decision was the worsening weather. He was aware of the hazardous nature of the Tillamook Bay Bar and described the area as a "hell hole." He stated that he had been across the bar over 100 times during the last ten years but had not gone over that winter.

4.4.3.7 He made the decision that they would travel to Garibaldi to offload their catch, <u>then remain in port for a couple of days to wait for the expected bad weather to pass</u>. The transit time from where they were crabbing off Fort Stevens, OR, to the Tillamook Bay Bar was four hours. On the way south, they set their crab pots between Silver Point and Castle Rock. After setting the gear, he cleaned the deck and rested in anticipation of crossing the bar. He believes he slept for a couple of hours. Mr. Chase operated the CFV COASTAL REIGN during the transit south. [Emphasis added]

4.4.3.8 Sometime between Manzanita and Twin Rocks, he ended his nap. He re-circulated the water in the No.1 crab hold to keep the crab fresh. He then switched the fuel tanks from which the engine drew fuel. The fuel tanks were located on the aft portion of the vessel on either side of the lazzarete, port and starboard. Fuel had only been drawn from the port tank during the first trip and for a part of the second trip. He switched the fuel tanks as he wanted to ensure that there would be no interruption in fuel flow while crossing the bar.

4.4.3.9 He estimated that there were 3,500 – 4,000 pounds of crab in the No.1 fish hold. This was the forward fish hold and it was filled with water to keep the crab fresh. The aft fish hold was empty with no water. On the aft section of the vessel is the lazzarete. Each tank on either side of the lazzarete was 450 gallons. Both tanks were filled before they had started their first trip on February 13. The first trip was about two days on the water. Some of the fuel from the port tank was transferred the generator day tank. The day tank holds about 90 gallons and Mr. [redacted] claimed the vessel burned around 100 gallons of fuel each day. He stated that the starboard fuel tank was full for the crossing and there would have been 100 gallons or less in the port tank.

4.4.3.10 At the time of the crossing, the deck was mostly cleared. It held a couple of fish totes that were empty along with a handful of unset, but secured, crab pots. On top of the cabin were miscellaneous totes, poles and line along with a bundle of buoys.

4.4.3.11 During the transit towards the Tillamook Bay Bar, Mr. Chase had been in constant communication via cell phone with both the CFV PETRA MARIE and CFV LADY LEE. Mr. [redacted] and Mr. Chase knew that the conditions at the Tillamook Bay Bar were changing on a daily basis so they sought input from experienced operators.

4.4.3.12 At the Tillamook Bay Bar, [redacted] stated that he took over control of the vessel. Initially, he first approached the North Hole to observe conditions. The waves were breaking significantly and the CFV LADY LEE recommended going to the South Hole.[2] [redacted] stated that he had used the South Hole approach last year, so the area was not unfamiliar to him.

4.4.3.13 He navigated the CFV COASTAL REIGN south, transiting west of the bar. He then set up for an approach in the South Hole. He stated that the CFV COASTAL REIGN sat and watched the South Hole conditions for approximately 30 minutes, watching the way the waves were breaking and watching the timing of the waves. <u>He watched the CFV LADY LEE cross the bar and then he believed that he moved the CFV COASTAL REIGN into the same position as the CFV LADY LEE prior to their entry</u>. [Emphasis added]

4.4.3.14 He was sitting in his chair at the controls on the starboard side of the cabin. Mr. Chase was standing on the port side forward in the cabin. One deckhand was the lookout on the port side aft in the cabin while the other deckhand was sitting on the bench on the starboard aft side of the cabin behind the pilot's chair.

4.4.3.15 Prior to starting their approach, Mr. Chase instructed the deckhands to put on their lifejackets. Mr. [redacted] and Mr. Chase did not don lifejackets, but the jackets were at the ready on the bench near the seated deckhand.

4.4.3.16 He stated that visibility was crystal clear, good daylight, and he had a 32-inch monitor in the cabin with the plotter zoomed into the area. The plotter was on the starboard side of the cabin, visible from the operating position. He stated he would occasionally glance over to ensure they were in the "correct" position. Most of his attention was outside the vessel to watch the waves. He also used the depth sounder to check the depth. He stated that he had crossed the bar in worse conditions in previous years.

4.4.3.17 When they started their approach, the depth sounder read 5.4 fathoms, approximately 33 feet. He believed that they were following the same track line as the CFV LADY LEE and were west of the submerged South Jetty. Mr. Chase announced the presence of waves as they pushed forward. Two waves hit the vessel and each pushed the vessel east, towards the jetty. He did not feel that these first two waves were very big, but did set the vessel further east.

4.4.3.18 While pressing further, he heard one of the crew say, "oh shit!" which caused him to look to port. There, he saw a wall of water seemingly out of nowhere. He put the CFV COASTAL

[2] According to the Coast Guard Watchtower, the CFV COASTAL REIGN made several attempts to enter into the north hole but abandoned the effort and transited to the south hole.

REIGN hard over to port. The vessel was broadside to the wave. The wall of water lifted the vessel and rolled it toward starboard capsizing the vessel.

4.4.3.19 He felt the water come into the vessel from the port side and fill the cabin. Both of the side windows had been locked for the crossing. The front windows were one half inch thick. The side windows were much weaker windows and must have broken. Unable to see due to the water, he attempted to find the side and at the same time trying to find the crew. He reached out and felt the outside railing of the vessel. Grabbing the rail, he pulled and kicked his way out of the vessel. He emerged out of the water and immediately saw a bundle of buoys. He grabbed ahold of the buoys for buoyancy. He watched the vessel for a moment as it surged in the surf and saw no other crewmembers. At that point, he made the decision to head towards the beach to get out of the water.

4.4.3.20 At some point later, he saw the Coast Guard vessel and crew who pulled him from the water. It is his opinion that he would not have been able to get out of the cabin if he was wearing a lifejacket. When asked what could have been done differently, he stated that the only thing that could have been done differently would have been to not attempt to cross the bar at that time.

4.4.3.21 Mr. [redacted] was not tested for alcohol within the requisite period of time after the incident, but was able to get his drug test completed. He admitted during his first interview that his drug test was probably going to come back [redacted] He did not have any additional information [redacted] Mr. [redacted] believed [redacted] crossing the Tillamook Bay Bar.[3]

4.4.3.21.1 Drug Test Results - Mr. [redacted] provided a urine sample for a post-accident drug screening at 5:15 p.m. on February 21, 2021. This met the 32-hour time requirement for testing as set forth in the regulations. [redacted]

4.4.4 Surviving Deckhand

4.4.4.1 The Coast Guard preliminary investigation officer interviewed Mr. [redacted], the deckhand, on February 21, 2021, a day after the casualty. Mr. [redacted] was again interviewed on March 17, 2021, by the investigation team.

4.4.4.2 His father was a commercial fisherman and while in high school, he regularly went gill netting with him. He surfed recreationally and was very comfortable on the water. The job on the CFV COASTAL REIGN was his first commercial fishing job. In December of 2020, he started work on the CFV COASTAL REIGN, maintaining the fishing gear and preparing for the crab season. Starting February 13, 2021, he began crabbing with the vessel, operating out of Warrenton, OR.

4.4.4.3 He took three trips with the CFV COASTAL REIGN. He transited with the vessel on February 13, 2021, to set the crab pots on "dump day." Then, transited with the vessel on February 16 and 17 to haul and sell the catch from the first day of the season. The third and final trip began

[3] Despite further inquiry, the Coast Guard has no additional information as to the nature of "the pill."

on February 18, 2021, where they hauled their catch, set the traps, and transited to Tillamook in order sell.

4.4.4.4 He stated that prior to getting underway for the first time on February 13, 2021, the Mr. [redacted] discussed the life raft, emergency radio operations, lifejackets, and basic emergency vessel operations. When Mr. Chase came onboard on February 18, 2021, the owner/operator reviewed the safety procedures once again.

4.4.4.5 He stated that the last trip aboard the CFV COASTAL REIGN departed Warrenton at about 0500 on February 18, 2021. The crew consisted of himself, another deckhand, the Mr. [redacted], and Mr. Chase, the co-operator. He stated that the crew got along very well together. Mr. Chase operated the vessel while conducting crabbing operations and Mr. [redacted] worked the deck with the two deckhands.

4.4.4.6 On February 20, 2021, the CFV COASTAL REIGN headed south to Tillamook Bay to sell their catch. The first hold was almost full, and according to Mr. [redacted], they had approximately 5,200 to 5,600 pounds of crab in it. The second hold did not have any catch and he could not recall if it was filled with water or empty. He understood that the trip to Tillamook was made to sell the crab for $2 or so more per pound in Tillamook than in Warrenton.

4.4.4.7 When the CFV COASTAL REIGN arrived at the Tillamook Bay Bar, it was rough and everyone onboard appeared increasingly nervous. He described the mood of the crew as “scared.” He recalls the Coast Guard reaching out to the CFV COASTAL REIGN on VHF radio to request to know how many people were onboard. <u>He recalls the Coast Guard also stating that lifejackets were strongly recommended</u>. [Emphasis added]

4.4.4.8 He stated that the vessel was operated by Mr. Chase as it navigated towards the North Hole of the Tillamook Bay Bar. After an unknown amount of time watching the bar from the North Hole, Mr. Chase continued south towards the South Hole.[4] The vessel waited outside of the bar in the South Hole for approximately 30 minutes. They watched the wave sets and timed them looking for the best opportunity to make an approach. Given the sea state, the crew became increasingly worried. Mr. Chase ordered the deckhands to put on their lifejackets.

4.4.4.9 At or about the same time, [redacted] locked down (or ‘dogged’) the pilot house door to keep it from slamming in the rough seas and to prevent the glass from breaking. Mr. Chase immediately opened all dogs, except for one. He opened them so that in the event of an emergency they could more easily escape the pilot house. He recalled that he and Mr. Zappone had trouble buckling the life jackets as designed, so Mr. Chase secured them for each deckhand. He stated that he was so nervous about the bar crossing that he planned to have a friend pick him up in Garibaldi so that he would not have to cross the bar again on the return to Warrenton on the CFV COASTAL REIGN.

4.4.4.10 At some point while the vessel was waiting in the South Hole, [redacted] assumed control of the vessel from Mr. Chase. Mr. Chase then recommended that they move the vessel to deeper water and continue to time the wave sets from there. Mr. [redacted] did not move the vessel as Mr. Chase had suggested. It was around this time that the CFV LADY LEE successfully crossed

[4] The operator of the vessel from the North Hole to the south hole is different between the deckhand and the owner/operator’s accounts. They do not differ when discussing the operator at the time of the south hole approach.

the Tillamook Bay Bar from the South Hole. Soon after, the owner/operator attempted his approach. He recalls that he could see the rocks of the south jetty 30-40 feet to the right of the vessel seconds before the vessel capsized. [Emphasis added]

4.4.4.11 He and Mr. Zappone were the only two crewmembers wearing lifejackets at the time the vessel capsized. The cabin filled with water. He attempted to find the door to escape but his ability to move and attempt to locate the door were hindered by his lifejacket that kept pushing him upwards. The engine room hatch, which was located on the deck of the cabin, opened once the vessel capsized. He felt air in the engine room and was able to climb into that compartment. He was sitting in the engine room with his legs hanging into the cabin when felt Mr. Zappone grab his leg. He reached down and pulled him into the engine room. He was able to use his cell phone for light.

4.4.4.12 Mr. Zappone had blood on his head and had lost his glasses. The deckhand stated that he was in a state of panic, but that Mr. Zappone was calm and collected. They both spotted Mr. Chase in the cabin face down in the water, completely limp, wrapped up in line. They reached down into the cabin and attempted to grab him but were unable to reach.

4.4.4.13 The waves pushed the capsized vessel towards the South Jetty and it was resting upon the rocks. The engine room began to fill with water and he believed that it would fill completely. Convinced he would drown, he decided to get out of the vessel. Meanwhile, Mr. Zappone wanted to stay inside the engine room and wait for the Coast Guard to rescue them.

4.4.4.14 He spotted a hole that was just large enough for the two to crawl out of the engine room. He doesn't know if it was a hole in the hull or if it was the open engine room hatch cover. Although he escaped from the inside the vessel, he does not know exactly how except that he does recall seeing the rocks and waves surging into them. He timed the wave sets and convinced Mr. Zappone to exit the engine room with him. He exited the vessel first but once out of the vessel, he saw Mr. Zappone on the rocks about six feet higher than he was. He was then hit by a wave and smashed to the rocks which dislocated his right shoulder. He was able to wedge himself between two rocks to secure himself in place as the waves continued to crash against the jetty. He stayed there until the Coast Guard helicopter rescued him.

4.4.4.15 Mr. [redacted] injuries were as follows: sliced finger on the right hand which required stitches, dislocated right shoulder, and various scratches and bruises.

4.4.4.15.1 Drug Test Results - He provided a urine sample for a post-accident drug screening at 1:20 p.m. on March 2, 2021. This exceeded the 32-hour time requirement for testing as set forth in the regulations. [redacted]. The screening cut-off for a [redacted]

4.4.4.15.2 Sleep Schedule - After departing Warrenton on the February 18, the crew did not sleep again until they slept from 0400 to 0630 on February 19. He did not sleep again until he arrived at the hospital on the evening of February 20, 2021, after the capsizing of the vessel and his recovery by the Coast Guard. He states that the crew was working constantly. Every so often, in between strings of crab pots, they would have 10 minutes or so to eat or change clothes before working the next string of pots. He was tired during the work schedule, but they all were focused on work which kept them up and active.

4.4.4.15.3 Drug Use on Board the Vessel - During his initial interview on February 21, 2021, he stated that he did not use any drugs while onboard the CFV COASTAL REIGN and he had no suspicion of anyone using drugs onboard the vessel at any time. However, after the close of the first interview, he contacted [redacted] and [redacted] to [redacted] throughout the entire fishing trip along with other members of the crew.

4.4.4.15.3.1 During the interview on March 17, 2021, he stated that he, Mr. [redacted], and Mr. Zappone, [redacted] routinely while underway. Mr. Chase was against the use of drugs onboard the vessel, so [redacted] of [redacted] from him. Mr. Zappone brought the [redacted] on board in both a glass jar and a zip lock bag. Mr. Zaponne kept the material in his backpack.

4.4.4.15.3.2 While the vessel set pots during the February 13, 2021, trip, the crew onboard was Mr. [redacted], Mr. Zappone and Mr. [redacted]. Mr. Chase was not onboard the vessel for that initial trip. Mr. [redacted] stated that the [redacted] frequently in the pilot house and on the deck while crabbing. However, when Mr. Chase was onboard, the crew would [redacted] by going out on the aft deck to [redacted]

4.4.4.15.3.3 [redacted] stated that he, Mr. Zappone, and Mr. [redacted] rotated on the aft deck for the entire transit towards Garibaldi, each taking [redacted] He stated that the three of them [redacted] before attempting to cross the Tillamook Bay Bar. [redacted] hat day and that his senses were [redacted]

4.4.4.15.3.4 In his experience as [redacted] he stated that a [redacted] normally makes a person second-[redacted]d that Mr. [redacted] appeared to be [redacted] or [redacted] nd was frequently second-guessing himself when deciding when to cross the Tillamook Bay Bar. When asked how the [redacted] made him feel at the time of the crossing, he stating that he was [redacted] at the time of the crossing.

4.4.4.15.3.5 Mr. [redacted] stated that he was confident that Mr. [redacted] and Mr. Zappone had [redacted] as he had in the 30 minutes prior to crossing the bar. This account is consistent with the correction to his original interview and the [redacted].

4.5 [redacted] ound and Tested Post-Casualty

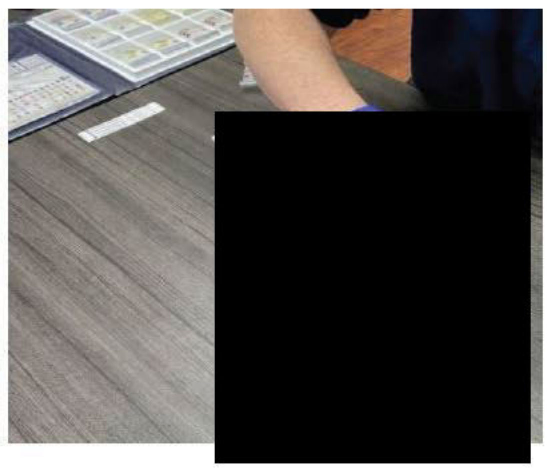
4.5.1 On February 23, 2021, the Park Manager from the Cape Lookout State Park recovered debris from the CFV COASTAL REIGN wreckage on the beach south of the South Jetty. Included in the wreckage was a backpack containing a zip-lock bag and a glass jar containing what appeared to be [redacted]

4.5.2 On March 15, 2021, U.S. Coast Guard Station Portland tested the material using their Nik Kit. Tests on the contents of the glass jar revealed a [redacted] Tests on the zip-lock bag were inconclusive. However, based on the contents, characteristics, appearance and smell, and the Boarding Officer's training, experience and judgment, it is believed by the Station personnel conducting the test that the contents [redacted] The Boarding Officer believed that the amount of moisture mixed in with the potent leafy green substance within the zip-lock bag led the test result on the contents of the zip lock to be inconclusive.

4.5.3 Mr. Zach Zappone's next of kin confirmed that the backpack belonged to Mr. Zaponne. Mr. [redacted] description of where and how the [redacted] was stored on board the CFV COASTAL REIGN is confirmed by the evidence of the plastic bag and glass jar. The full Nik Kit test and procedure report from Coast Guard Station Portland may be found on Homeport in the exhibits folder.

Left: Backpack found on the beach with the CFV COASTAL REIGN wreckage. Confirmed to be Mr. Zach Zappone's property. Note: plastic bag and glass jar containing green leafy organic material.

Below left and below right: Station personnel retrieve a sample from the plastic bag and glass jar described by Mr. [redacted].



4.6 Owner/Operator Follow-up Interview, March 4, 2021

4.6.1 On March 2, 2021, the AIO with assistance from local law enforcement, served a subpoena on Mr. [redacted] requiring him to appear before the investigation team for an interview. The subpoena required [redacted] to appear at Sector Columbia River in Astoria, OR, on March 4, 2021. His attorney, Mr. [redacted], sought immunity from any prosecution prior to any statements his client would give at the interview. Coast Guard District Thirteen was presented with that option and declined. The team proceeded with the interview and asked the following questions in order to allow the owner/operator to provide further detail and explain the casualty given the evidence the investigation team had collected. The investigation team asked the following questions to which Mr. [redacted] asserted his Constitutional right against self-incrimination provided by the 5th Amendment.

1. Why wasn't Todd (Mr. Chase) driving when you crossed the bar?
2. Did Todd (Mr. Chase) ask you to drive the boat?

3. During your initial interview with Mr. [redacted], you stated that you looked at the North Hole as a possible way to get in, correct?
4. "You made, according to the CG, several attempts going into the North Hole…."
   Mr. [redacted]: Anything about the navigation of the vessel, crossing the bar, my advice will be to assert the Fifth Amendment privilege."
5. What was the agreement for determining who was going to drive the boat across the bar?
6. Who had more experience crossing the Tillamook Bay Bar, you or Mr. Chase?
7. Why did you take control over the vessel (at the South Hole)?
8. The jetty system for the South Jetty is charted well beyond what is visible, did you notice that?
9. On the day in question, were you following any track lines?
10. Do you have any buoys saved on your plotter?
11. There was no buoy in the south hole, was that a concern of yours prior to entering that hole?
12. Why did you not wait for the CFV PETRA MARIE to contact you prior to attempting the crossing?
13. Generally, when you cross the Tillamook Bay Bar, what are your procedures to ensure a safe crossing?
14. The Coast Guard recommends a safety checklist prior to crossing and hazardous bars. Do you use any checklists to cross the bars?
15. Is there a process that you go through prior to crossing the bar to ensure that it will be a safe crossing?
16. Are you aware that the Coast Guard offers, and is available to do standbys, where the Coast Guard will send a vessel out if there is a hazardous condition on the bar?
17. Are you aware that the Coast Guard will provide an escort or discuss the crossing of the bar?
18. On the day in question, did you ask the Coast Guard for a standby?
19. What was your thought process and why did you not contact Station Tillamook Bay for an escort?
20. Discuss the process you went through in determining which route to take to cross the Tillamook Bay Bar that day.
21. Are you aware that the end of the southern jetty is submerged?
22. What if anything do you know about Mr. Zappone's [redacted]use aboard the CFV COASTAL REIGN?
23. Were you aware that Mr. Zappone had [redacted] on your boat?
24. The Coast Guard recovered a backpack that was identified to be Mr. Zappone's. In the backpack were [redacted] material and a jar of [redacted] We identified that the materials were stored openly on the CFV COASTAL REIGN. Did you see this material onboard the vessel?
25. Did you have a drug use policy onboard the CFV COASTAL REIGN?
26. From other interviews, there was mention [redacted]onboard. When was the last time you recall any use of [redacted]nboard the vessel?
27. Do you recall Mr. [redacted] using [redacted] onboard?
28. Do you recall Zachary Zappone using [redacted] onboard?
29. Do you recall if you used [redacted] onboard?
30. Do you recall if Todd Chase used [redacted] onboard?

31. Mr. [redacted] states that both you and he were [redacted] about 30 mins prior to crossing the bar. Is that true?
32. Are you aware of how [redacted] affects an individual?
33. Can you tell me if anybody onboard the vessel at the time of the crossing, to your knowledge, was under the influence of [redacted]

Without answers to the questions above, the investigation team must draw its conclusions from the other evidence collected during the investigation.

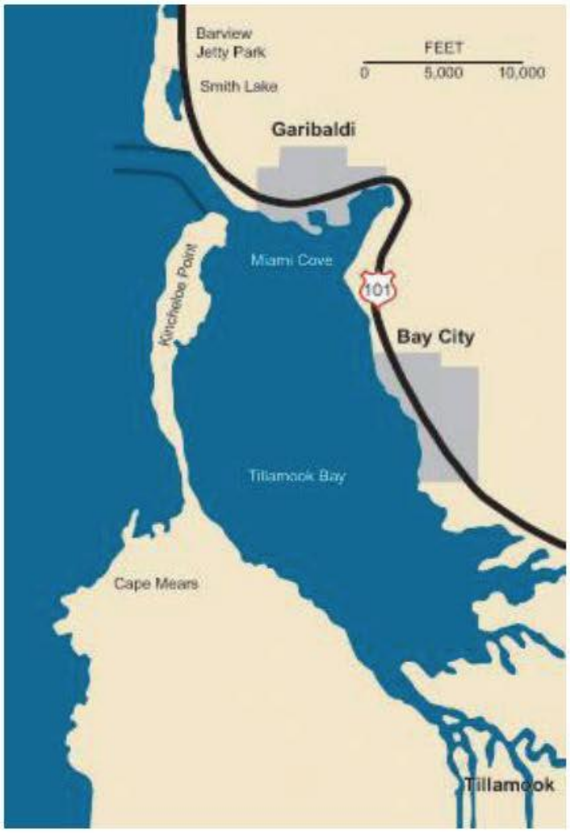
4.7 The Tillamook Bay Entrance

4.7.1 Tillamook Jetty System

4.7.1.1 Tillamook Bay is on the Oregon coast, 50 miles south of the Columbia River. Chart 18558 covers the area. The United States Army Corps of Engineers (the "USACE") owns and maintains two jetties at Tillamook Bay's entrance. The North Jetty was constructed first in 1914 with South Jetty construction beginning decades later in 1969. The USACE has made repairs to both jetties due to persistent damage from wave action continually smashing against them.

4.7.1.2 In 1931, the North Jetty was reconstructed and extended it to its full, authorized 5,700-foot length. In 2004, the USACE constructed a revetment to help prevent shoreline erosion and protect the vulnerable North Jetty root. USACE contractors rebuilt the North Jetty head in 2010, stabilizing the jetty at 5,213 feet. The repaired head is broader, higher and more substantial to withstand the powerful waves.

4.7.1.3 The South Jetty construction was authorized in 1965 with completion of the first segment in 1971. The USACE completed the second segment in 1974 and the third and final segment in 1979. The 1,500-foot third segment brought the South Jetty to its full authorized length of 7,094 feet.



USACE Map of Area:
https://www.nwp.usace.army.mil/Portals/24/images/coast/Garibaldi%20Bay.jpg?ver=2018-12-31-122806-830

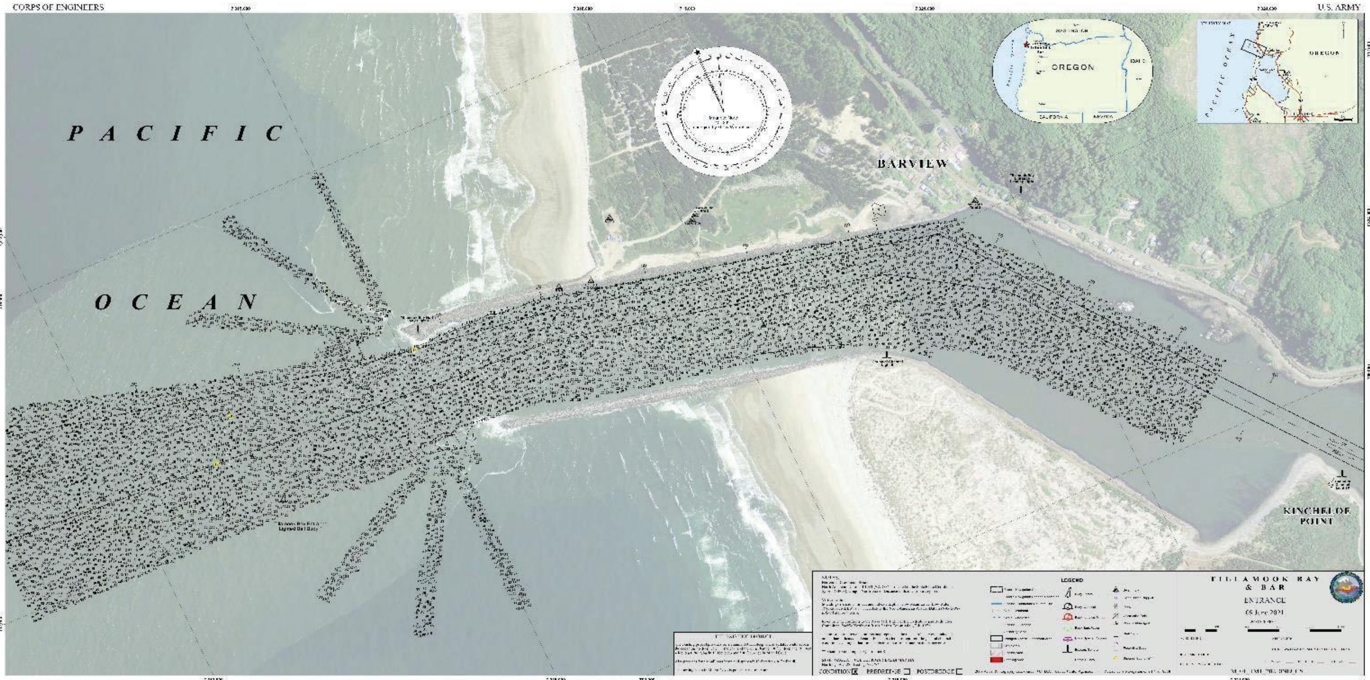
4.7.1.4 The map to the left provides a view of the jetty project area. The North and South Jetties are seen as dark gray lines in the upper left quadrant of the illustration. The North Jetty is well connected to the shore, while the South Jetty extends northwesterly from the tip of Kincheloe Point. The project description states that the channel over the Tillamook Bay Bar is 5,000 feet long, 18 feet deep, and has no prescribed width. The North Jetty is 5,213 feet long, while the South Jetty is 7,094 feet long.

4.7.1.5 Since its construction, both jetties have receded due to the Pacific Ocean environment. The USACE has focused on the rehabilitation of the North Jetty and a 2020 rehabilitation project capped it at its current length of 5,213 feet. USACE contractors placed more than 1,000 stones weighing 25-50 tons each on an existing relic stone base, creating a new cap.

4.7.1.6 The South Jetty has continued to erode and has receded significantly. The USACE has annually sought project funds to rehabilitate the South Jetty without success. Additionally, the Port of Garibaldi has been an outstanding and persistent advocate for the South Jetty rehabilitation project. At the time of the casualty, however, no South Jetty rehabilitation work had been completed by the USACE.

4.7.1.7 An overview photo, below, from June 2019, shows the Tillamook Channel and Bar area along with the North and South Jetties. Detailed depth data of the area shows the extent of South Jetty's recession as no depths are identified over the submerged area of the jetty extending past the visible rocks of the structure. On this map, the area extending west of the visible portion of South Jetty measures approximately 600 feet. However, a USACE study in 2021 officially measured the submerged area as 1100 feet, a 41-foot increase since their last official study in 2014.

4.7.1.8 The Tillamook jetty system project was proposed in such a way to have near-even jetty tips that would cause the inflow and outflow of water to serve as a means of pushing sediment from Tillamook Bay out to sea, thereby creating and maintaining a channel through the bar. The uneven jetty system has created persistent and often unpredictable shoaling. The USACE does not have a dredging program for the Tillamook entrance. According to the USACE, the Tillamook entrance is already self-dredging and has been since construction.



ACOE Aerial photo of area above, with current depth data, June 2019.

4.7.2 Tillamook Entrance Buoys

4.7.2.1 The Tillamook Bay Bar is divided into three distinct approaches as can be seen in the photo above and the chartlet below. The approaches are locally identified as the "North Hole," the "South Hole," and the "Middle Grounds." The Tillamook Bay Channel lies just south of the North Jetty. Shoaling of the "Middle Grounds" due to the uneven jetty system, makes this area unpredictable and hazardous and is an area to be avoided except on the calmest of seas.

4.7.2.2 Prior to 2019, the main approach over the bar was from the south through the South Hole which is the deep water area that runs north and south, just west of the end of the submerged rocks on the South Jetty. The approach was marked with a lighted whistle buoy 1.25 miles southwest of the seaward end of the south jetty and a green lighted bell buoy marking the west side of the "South Hole".

4.7.2.3 In the spring of 2019, in response to concerns from recreational boaters, as well as the crew at Station Tillamook Bay, that the South Hole was shoaling due to the deteriorating South Jetty and that the entrance buoy should be moved to the north, D13 Waterways Management Branch commissioned a Waterways Analysis and Management System (WAMS) study. It determined that the preferred route should be changed to the North Hole. As such, the lighted whistle buoy was moved to the northwest of the North Jetty tip. The green lighted bell buoy marking the west side of the South Hole was removed and, instead, a red lighted bell buoy was placed marking the west side of the North Hole.

4.7.2.4 The Coast Guard's movement of this buoy was, and still is, contentious. Local fisherman and the Port of Garibaldi have expressed concern about the Coast Guard's effort to provide notice and include as many voices as possible, in particular the voices of commercial fishermen, regarding the proposed buoy movement.

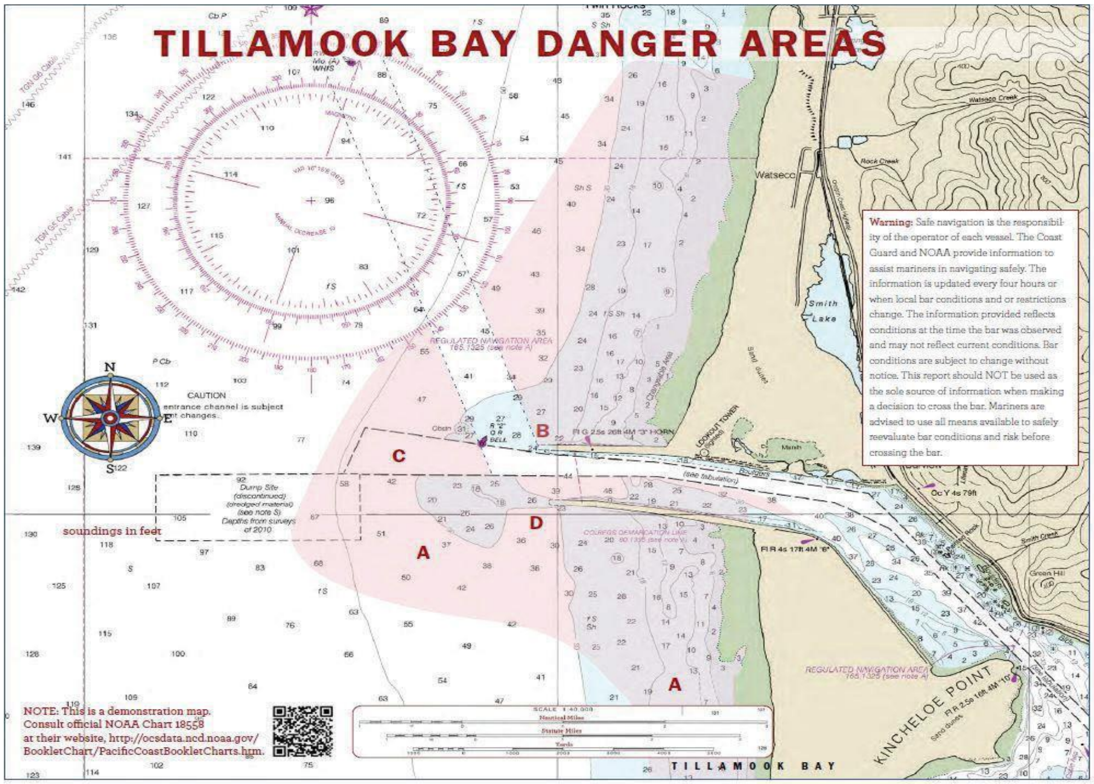
4.7.2.5 In March of 2019, the Coast Guard published a local notice to mariners announcing a public meeting to seek input on the buoy placement at the Tillamook entrance. They also issued a press release seeking the same, conducted an email campaign and phone conversations in an effort to drive input. The public meeting was held in Garibaldi, OR, on May 8, 2019, with very low turnout. The Coast Guard received a total of 9 surveys. Based on the input, along with a D13 Waterways Management Branch site visit, the proposed move was approved on October 2, 2019.

4.7.3 Station Tillamook Bay Navigational Control and Assistance

4.7.3.1 The Officer in Charge (OIC) of Station Tillamook Bay is designated as a Representative of the Captain of the Port, Sector Columbia River. He has been granted the authority to impose bar restrictions in accordance with the Regulated Navigation Area established for the Tillamook entrance.

4.7.3.2 The OIC's authority is limited to recreational vessels and uninspected passenger vessels. In order to control the movement of inspected vessels or commercial fishing vessels, the OIC must seek the authority of the COTP. The OIC Station Tillamook Bay exercises his authority diligently and bar restrictions generally follow the table that is identified in Chapter 2 of the Station's Operations Policy Manual. On the day of the incident, Station Tillamook Bay implemented its bar restriction authority in accordance with its policy.

4.7.3.3 Part of Station Tillamook Bay's duties is to educate the boating public regarding bar crossings. One such effort is distributing a joint publication with NOAA and the Oregon State Marine Board called "Crossing Tillamook Bay Bar." Station Tillamook reviews the material, Oregon State publishes it both in print and on-line. The Station places copies in the hands of mariners throughout the port. The version in place at the time of the casualty identifies the North Hole as the preferred route. The publication contains a chartlet (below) and it identifies the buoy watching on the north side of the bar. However, the publication states that the South Jetty has only 200 feet submerged.



4.7.3.4 The Coast Guard also educates the public through its Special Local Notice to Mariners (SLNM) program. On June 3, 2020, District Thirteen issued a press release identifying the release of the updated SLNM. The publication is easy to use and provides quick access to “Know Before You Go” a guide to crossing hazardous bars in Washington and Oregon. While the CFV COASTAL REIGN had mobile phone access, there is no evidence that suggests the operator accessed this information prior to making their decision to transit to Tillamook.

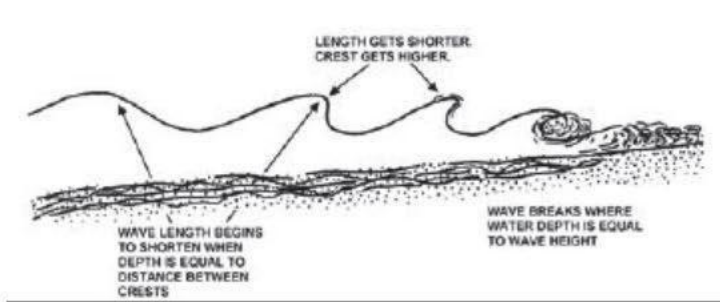
5. Additional/Supporting Information

5.1 The CFV COASTAL REIGN was destroyed as a result of sinking at the Tillamook Bay entrance and suffering the effects of the pounding surf. Parts of the vessel and its equipment washed ashore along the beach, but much of it was lost to the sea. As such, the vessel was not available for post-casualty inspection or analysis.

5.2 Post-casualty Department of Transportation drug testing of [redacted] and [redacted] showed [redacted]

5.3 The Tillamook Bay Bar Report at the time of the incident was 4-6 foot swells between the tips, 6-8 foot swells with occasional 8-10 foot breaking waves in the North Hole and Middle Grounds, and 8-10 foot swells in the South Hole. Winds were 5 knots from the south; visibility was 8 nautical miles; water temperature was 49°F, and air temperature was 44°F. The tide was flooding.

5.4 As deep-water waves approach the bar, they become organized by the effects of the contact with the bottom. As the depth of water decreases, the waves break and the crests tumble forward. They fall into the trough ahead usually as a mass of foaming white water. This forward momentum carries the broken water forward until the wave's last remaining energy becomes awash rushing up the beach or jetties. (USCG, 2003).



5.5 Plunging waves are breaking waves that result when there is a sudden lack of water ahead of the wave, such as in a steep rise of the ocean floor like the seaward edge of a bar or shoal. As a wave steepens, its momentum will cause it to fall forward or curl. This momentum gives the curl of breakers tremendous force. Waves can travel at up to 35 knots (40 mph), and very few boats can outrun a wave of that speed (note: an average fully loaded crab boat only makes approximately 6 to 10 knots). One cubic yard of seawater weighs almost a ton. A 20-foot breaker can drop 1,500 tons of water on a boat, and exert a force of up to 6000 PSI. (USCG, 2003). These types of breaks are usually found on the outer edge of the bar where deep water meets shallow depths. These types of breaks are common and visibly mark the end of the submerged portion of the South Jetty.

5.5.1 Breaking waves cause aerated water on the subsurface jetty. As the wave breaks, it combines with air, creating whitewater on the face of the breaker. As the breaker moves across the bar, it leaves a trail of pale or white aerated water behind it which takes some time to dissipate. This air-water mix can create changes in a boat's handling ability. A boat's propeller will not create as much thrust when operating in heavily aerated water. Likewise, a boat's rudder will not direct the propeller force as effectively in aerated water. A boat's response will be greatly slowed and create poor acceleration, cavitation (excessive engine RPM for a given throttle), and poor turning performance. (USCG, 2003).

5.5.2 Capsizing will generally occur when a boat is placed beam-to breaker the same height as the beam of the boat. (USCG, 2003).

5.6 Marine Casualties on the Tillamook Bay Bar

The bar at the entrance of Tillamook Bay is one of the most treacherous bars on the Oregon coast. Since 2003, there have been over 34 marine casualties in the immediate area. Eight of these marine casualties occurred as the vessels attempted to cross the bar while hazardous conditions existed and bar restrictions were in place. Forty-one lives were put at risk and the casualties resulted in the loss of 19 lives and include a total loss of the vessels involved. Four of these marine casualties involved the South Jetty.

Vessel Name	Date	Lives at risk	Lives lost	Vessel Value	Approach
COASTAL REIGN	February 20, 2021	04	02	$250,000	South
OR537ACN	March 23, 2012	02	00	UNK	North
DOUBLE EAGLE	October 4, 2010	02	00	$275,000	South
NETWORK	November 27, 2008	03	02	$300,000	North
STARRIGAVAN	January 24, 2007	04	01	$350,000	South
CATHERINE	Feb 7, 2006	03	03	$25,000	Middle
OR258ABL	October 15, 2004	04	00	$30,000	South
TAKI-TOOO	June 14, 2003	19	11	$180,000	North

6. **Causal Analysis**

6.1 *Failure to properly navigate in and through the "South Hole."*

The operators of both the CFV LADY LEE and the CFV PETRA MARIE stated that they watched the CFV COASTAL REIGN attempt to cross the bar and that the CFV COASTAL REIGN did not transit through the South Hole. Although the CFV LADY LEE and the CFV PETRA MARIE differ as to the exact starting location of the CFV COASTAL REIGN, they both confirmed that they saw the CFV COASTAL REIGN transit over the top of submerged south jetty. Both the CFV LADY LEE and CFV PETRA MARIE are home-based in Garibaldi and the operators have extensive experience crossing over the Tillamook Bay Bar in all types of weather. Both captains are experts at identifying the submerged portion of the South Jetty so as to avoid transiting near it. At the time of the casualty, there were no breaking waves in the South Hole. The CFV COASTAL REIGN transited over the submerged jetty, venturing too far east out of the south hole and failed to follow the line set by the CFV LADY LEE.

6.2 *Marijuana use.*

6.2.1 [redacted] While a [redacted] does not show [redacted] at the time of the casualty, the [redacted] If the deckhand is to be believed, the operator of the CFV COASTAL REIGN was [redacted] approximately 30 minutes prior making the transit. The deckhand's statement [redacted] by his accuracy as to the location and storage of the [redacted] on the vessel, the Station's positive Nik Kit test, along with the [redacted]. While a [redacted] does not show that a user was under the influence of the drug, [redacted]

6.2.2 The CDC has identified operating under the influence of drugs, including [redacted] as dangerous and illegal. Operating a vessel is a complex task requiring full attention in order to stay safe and alert [redacted] areas of the brain that control the body's movements, balance, coordination, memory, and judgment. [redacted] use can impair important skills required for safe vessel operation by slowing reaction time and the ability to make decisions, impairing coordination, and distorting perception.

6.2.3 [redacted] combined with fatigue, can result in an impairment of critical decision-making during a bar crossing and could be reasonably concluded as a causal factor to this marine casualty.

6.3 *Crewmembers' lack of proper rest*

6.3.1 The first weeks of the Dungeness crab season is critical to commercial fishermen. About half of the crab caught during the entire season is caught within the first two weeks of the season and that 75% of the total catch is brought in within the first eight weeks. Mr. [redacted] stated that he had very little time for rest between pulling pots. Mr. Chase informed the operator of the CFV PETRA MARIE that the crew was operating with very little rest over the previous 48-hour period. Mr. [redacted] rest schedule from 0500 on February 18, 2021 to 1637 on February 20, 2021, included just one short nap. At present, there are no work/rest regulations applicable to CFVs less than 200 GTs. The operation of the CFV COASTAL REIGN and other commercial marine vessels is similar in nature in terms of maneuvering, navigation and basic seamanship to larger vessels. Similarly, fatigue impacts mariners on any platform the same way.

6.3.2 The International Maritime Organization (IMO), which governs international maritime shipping, makes the following statement describing fatigue:

> *A state of physical and/or mental impairment resulting from factors such as inadequate sleep, extended wakefulness, work/rest requirements out of sync with circadian rhythms and physical, mental or emotional exertion can impair alertness and the ability to safely operate a ship or perform safety-related duties.* [5]

Furthermore, the IMO states:

> *Fatigue is a hazard because it may affect a seafarer's ability to do their job effectively and safely. Importantly, fatigue affects everyone regardless of skill, knowledge and training. The effects of fatigue can be particularly dangerous in the transportation sector, including the shipping industry. All stakeholders should be alert to the factors which may contribute to fatigue, and make efforts to mitigate and manage the risks posed by fatigue.*

6.4 *CFV COASTAL REIGN's reduced maneuverability due to position over the submerged jetty*

6.4.1 The CFV COASTAL REIGN attempted several times to maneuver itself to port in an effort to ride over the waves. Mr. [redacted] stated that when he saw the final wall of water coming towards the vessel from the port side that he put the CFV COASTAL REIGN hard over to port. However, the vessel failed to respond. In the video of the capsizing, it appears that the CFV COASTAL REIGN was moving forward straight ahead with no indication of turning to port and almost no forward momentum.

6.4.2 The operators of the CFV LADY LEE and the CFV PETRA MARIE stated that they saw the CFV COASTAL REIGN transiting over the white aerated water trailing behind the breaking waves over the top of the submerged jetty. The white aerated water has the capacity to change the vessel's handling ability as the propeller creates less thrust and the rudder less effective resulting in the CFV COASTAL REIGN being unable to turn. The operator of the CFV LADY LEE stated that had the CFV COASTAL REIGN turned to port and taken the waves straight on, they may have lost the front windows, but they likely would not have capsized. Had the CFV COASTAL REIGN's maneuverability not been reduced by the aerated whitewater located above the submerged jetty, the operator of the CFV COASTAL REIGN may have been able to turn into the oncoming breaking waves and may not have capsized.

[5] IMO Circular MSC.1/Circ. 1598 Guidelines on Fatigue

6.5 *The inherently dangerous nature of crossing the Tillamook Bay Bar.*

The Tillamook Bay Bar is considered one of the most dangerous bars on the Oregon Coast. Due to the extensive shoaling at the entrance caused by the severely damaged jetty system in place, vessels are unable to transit straight across the bar in the charted channel unless the sea state is calm. An approach through the Middle Grounds would allow operators to travel head into the direction of the waves. Shoaling at the entrance forces vessels to use the North Hole or the South Hole entrances to cross the bar. Operators must travel beam-to the direction of the waves for a period of time which places the vessel in an inherently dangerous condition. If the jetties were properly functioning, the increased velocity of the water as it passed through the channel may have prevented the shoaling from occurring at the entrance of the Tillamook Bay Bar. This would have made the crossing of the Tillamook Bay Bar less hazardous as the CFV COASTAL REIGN may have been able to cross the Tillamook Bay Bar head-into the direction of the waves, and would not have been beam-to the waves, and may not have capsized.

6.6 *Restrictions on commercial fishing vessels for Tillamook Bay bar crossings are not warranted by this case*

6.6.1 Coast Guard regulations and hazardous bar restrictions exist to prevent recreational and uninspected passenger vessels from crossing the bar. These restrictions do not apply to commercial fishing vessels unless the OIC seeks the authority of the Sector Columbia River COTP. The conditions of the bar at the time of the incident warranted diligent seamanship as portrayed by the CFV LADY LEE and the CFV PETRA MARIE. In the words of the CFV LADY LEE captain, the bar was "not that bad" despite the restrictions placed on the bar by Station Tillamook Bay.

6.6.2 In his first interview, Mr. [redacted] stated that he had crossed the bar under worse conditions. However, while Mr. [redacted] stated that he crossed the Tillamook Bay Bar many times in the past, he could not recall a winter bar crossing. As the bar shifts regularly due to shoaling, particularly in the winter due to extreme weather, crossing in February without heightened knowledge such as that exhibited by the CFVs LADY LEE and PETRA MARIE, would increase the risk of a casualty.

6.6.3 Bar crossings are challenging. However, prudent seamanship presumes the operator has adequate rest and is not operating under the influence of any substance that would impair judgment particularly in an unfamiliar location wherein conditions change seasonally from year to year. The Coast Guard regulates such conduct by way of licensure which helps provide some surety against drug use and prudent rest time. At issue is the regulatory action upon which the Coast Guard can take as a result of these departures from the requisite standard of care. As an unlicensed operator, action against the operator of the CFV COASTAL REIGN is limited to personal action whether it may be criminal in nature, or administrative through civil penalties. Under either enforcement regime, however, nothing prevents the operator from resuming fishing operations.

6.7 *Placement of buoys marking the north and south hole*

6.7.1 After completing a WAMS in 2019, the Coast Guard removed the green buoy that had marked the South Hole and placed a red buoy to mark the North Hole. Although the Coast Guard designated, charted, and marked the North Hole as the preferred route, the local mariners that cross the Tillamook Bay Bar on a regular basis do not choose the route based on the Coast Guard designation. The mariners choose which route to take by watching the conditions on the bar and choosing the safest route, which changes with weather and sea conditions. The red and the green buoys are used as a visual reference outside of the vessel and are used by mariners to ensure they stay clear of the submerged portions of both the North and South Holes as well as used to judge the height of incoming wave sets. Mariners prefer to keep their eyes outside the vessel to be able to watch the waves.

6.7.2 Both the operators of the CFV LADY LEE and the CFV PETRA MARIE stated that they believe that some sort of navigation aid where the old green buoy was marking the South Hole would be a visual aid and would help mariners know where the South Hole is and help avoid the submerged portion of the South Jetty. When asked about the lack of the green buoy to mark the South Hole, Mr. [redacted] of the CFV COASTAL REIGN exercised his right not to answer. Based on the opinions of the experienced mariners, however, a visual aid is a helpful and a preferred tool.

6.8 *Lifejacket usage*

6.8.1 Both deckhands were wearing US Coast Guard approved Type-I lifejackets while the operator and Mr. Chase were not. The Type-I is designed to turn most unconscious wearers face-up to prevent drowning. To properly secure the lifejackets, three sets of straps must be secured. Here, in order to secure the top and bottom sets of straps, Mr. Chase pulled the strap ends tight and tied them together as [redacted] and Zappone struggled with securing the straps. The middle set of straps consisted of a strap and clip on one side and a strap and ring on the other side. To secure the middle straps, the clip was secured to the ring and then the strap pulled tight. The middle strap was located just under the wearer's armpits. This middle strap is a vital part of the securing mechanism of the lifejacket as this secured the lifejacket securely around the wearer's body or chest.

6.8.2 Mr. [redacted] stated that he and Mr. Zappone had difficulty connecting the ring and clip as designed. He only remembered the top and bottom straps being tied together by Mr. Chase, but did not recall the middle clip ever being secured around either him or Mr. Zappone. The top and bottom set of straps were cut by the Coast Guard rescue team after Mr. [redacted] was recovered. Mr. Zappone was retrieved from the water, still in his life jacket, but with his head lowered in the jacket to where his chest should have been. When Coast Guard investigators received Mr. Zappone's lifejacket for further examination, the top and bottom straps were still tied together and the middle clip still clipped together. By the way that Mr. Zappone was retrieved from the water, and from Mr. [redacted] testimony, it is assumed that the clip was never secured around Mr. Zappone as it was supposed to have been. The Coast Guard was able to remove the life jacket without undoing any of the straps.

7. <u>Opinions and Conclusions</u>

7.1 Determination of Cause

7.1.1 The initiating event for this casualty occurred when the plunging waves hit the CFV COASTAL REIGN on her port side, beam-to, as she transited over the submerged portion of the South Jetty of the Tillamook Bay Bar. The causal factors leading to this event were:

7.1.1.1 The operator's impaired judgment due to [redacted]. Had the operator of the CFV COASTAL REIGN not [redacted] prior to crossing the bar, his decision-making and ability to react to rapidly changing conditions during the attempted crossing would have been improved. [redacted] at elevated levels. Additionally, [redacted] statements regarding drug use on the vessel and prior to crossing the bar are compelling. His statements are [redacted], but also by the identification of [redacted] found in Mr. Zappone's backpack which matched that which was described by [redacted]. [redacted] is [redacted]

7.1.1.2 The operator's judgment was impaired due to fatigue. Statements made by Mr. Chase to Mr. [redacted], along with statements by Mr. [redacted] during his first interview and that of Mr. [redacted], show that the crew of the CFV COASTAL REIGN was operating on very little sleep over the previous 48 hours. Mr. [redacted] short nap during the transit to Tillamook was the only rest he had in the immediate period leading up to the crossing. Fatigue is a primary factor affecting judgment. Without rest, his ability to operate the vessel in a prudent manner is reduced.

7.1.1.3 The operator's overconfidence in his abilities to safely transit through Tillamook Bay Bar while restrictions were in place are a causal factor. Mr. [redacted] failed to consider the changing bar conditions during the winter months. There is no evidence that he accessed any of the Coast Guard materials that would assist in his bar crossing. His previous bar crossings had occurred later in the season as he could not recall ever crossing the bar in the wintertime. Mr. [redacted] and Mr [redacted] both stated that they travel to the bar and watch the wave sets from shore prior to getting underway for the season. Watching the wave sets and the breaking pattern of the waves allows them to assess the current shoaling conditions of the bar. This provides the basis for prudent crossing decisions. Mr. [redacted] did not have that local knowledge, nor did he consider it essential. Instead, he mistakenly relied on crossings from previous seasons to serve as a basis for his crossing.

7.1.1.4 The operator lost situational awareness once he started his transit in the South Hole. Relying solely on external factors, he failed to rely on his electronic chart which would have showed the South Jetty built out to its expected length. Navigating the vessel away from the charted jetty would have provided him sufficient distance from the submerged portion. Without consulting the chart, and relying on external information as he sought calmer water, Mr. [redacted] navigated his vessel towards the channel where the CFV LADY LEE was watching, having the effect of 'cutting the corner.' Both the CFV LADY LEE as well as the PETRA MARIE stated that the CFV COASTAL REIGN turned towards the channel too early, thereby placing the vessel directly over the jetty and subject to rising waves.

7.1.1.5 The reduced maneuverability of the CFV COASTAL REIGN due to the aerated water encountered over the submerged portion of the south jetty caused the vessel to not respond adequately to rudder commands. Without sufficient water from which to propel and turn, the CFV COASTAL REIGN was subject to wave action which pushed her further to east and further over the submerged jetty.

7.1.1.6 The hazardous plunging waves created by the submerged tip of the south jetty caused the vessel to capsize. Once over the jetty, even a crossing on a day that is described as "not so bad" becomes extremely hazardous. As described above, plunging waves appear quickly creating a situation from which a vessel sitting broadside cannot recover.

7.1.2 The first subsequent event was the capsizing of the CFV COASTAL REIGN. The causal factor leading to this event was the CFV COASTAL REIGN placed beam-to the wave action. Once beam-to and over the submerged jetty, the operator was unable to turn her into the waves in order to navigate over them. The wave that capsized the CFV COASTAL REIGN was nearly the same height as the boat.

7.1.3 The next subsequent event was the flooding of the pilot house of the CFV COASTAL REIGN. Once upside down, water pressure broke the side windows and the pilot house filled with water.

7.1.4 The next subsequent event were the injuries sustained by [redacted] and [redacted]. The causal factors leading to their injuries were the capsizing of the CFV COASTAL REIGN and their struggle to find air and a way out of the vessel. Both received minor injuries and mild hypothermia from being exposed to ocean water prior to rescue. Ocean water temperature was 54°F.

7.1.5 Deaths of the Mr. Chase and Mr. Zappone as a result of drowning. The causal factors leading to these events were:

7.1.3.1 Mr. Chase's inability to escape the pilot house. Mr. Chase made every effort to ensure his crew was safe and had the ability to get out of the pilot house if the vessel rolled. He assisted [redacted] and Mr. Zappone with the lifejackets despite the likelihood that the jackets were defective in their buckles and desired fit. However, despite helping others, he opted to not wear one. While there is no evidence to suggest that a lifejacket would have saved Mr. Chase, [redacted] tried to reach him while he was trapped in the pilot house. A lifejacket may have assisted in bringing Mr. Chase closer to the engine room compartment hatch so that [redacted] and Mr. Zappone could reach him. Other than that coincidental chance, there is no evidence that suggests that Mr. Chase would have survived the capsizing with a donned lifejacket.

7.1.3.2 Mr. Zappone was swept into the ocean due to extreme wave action after he escaped from the hull of the CFV COASTAL REIGN. A well-fitted and functional lifejacket would likely have saved Mr. Zappone's life. As he was found with his head in the area of the jacket that should have wrapped his chest, it is clear that the life jacket was not fitted properly. The jacket was tied by Mr. Chase but there is no evidence to suggest that it was tied poorly given the circumstances. The burden of providing well-fitted life jackets rest with the owner/operator of the vessel. The crew did not pre-fit the jackets prior to getting underway. Once in extremis, securing the jacket in a manner that best fit was Mr. Chase's only option while assisting the crew.

7.2 Evidence of acts or violations of law by any Coast Guard credentialed mariner subject to action under 46 U.S.C Chapter 77: Since no mariner on board was required to hold a credential, there is no act of misconduct, incompetence, negligence, unskillfulness, or violations of law by a credentialed mariner identified as part of this investigation.

7.3 Evidence of acts or violation(s) of law by U.S. Coast Guard personnel, or any other person: There is evidence that the operator of the CFV COASTAL REIGN was negligent on the vessel by transiting over the Tillamook Bay Bar in a restricted status, over a submerged jetty, while fatigued, [redacted], and resulting in the death of two persons, is in violation of 18 U.S.C. § 1115.

7.3.1 Evidence of State Law violations: Recommend consideration for referral to state prosecutor's office for violations of ORS 163.195, recklessly endangering another person; and ORS 830.325, operating a boat [redacted].

7.4 Evidence of acts subject to civil penalty: The operator's decision to cross the Tillamook Bay bar while a bar restriction was in place, failure to request an escort from Station Tillamook Bay, and navigating the vessel over the submerged portion of the South Jetty, while fatigued, [redacted], and operating a commercial vessel, is against the standard of care of a prudent mariner. The definition of negligence is provided in 46 C.F.R. § 5.29. It states, "[t]he commission of an act which a reasonable and prudent person of the same station, under the same circumstances, would not commit, or the failure to perform an act which a reasonable and prudent person of the same station, under the same circumstances, would not fail to perform." Mr. [redacted] actions endangered the life, limb, and property of others and is an act of negligence in violation of 46 U.S.C. § 2302(a).

7.5 Need for New or Amended U.S. Law or Regulation: While it is tempting for an agency to create new rules in response to a casualty, particularly in a local area prone to casualties, this case does not give rise to a new regulatory scheme or additional restrictions on vessels in this area. Prudent mariners who are able to navigate the bar safely under the conditions at the time of this incident should not be further restricted due to the actions of one individual whose seamanship was outside the scope of the standard of care. The matter that must be addressed is furthering the surety of safety of those operating commercial fishing vessels for the benefit of the crews entrusted to them. Implementing a credentialing regime for operators of commercial vessel less than 200 GT will be a tremendous positive step in ensuring drug free operators and would have potentially prevented this casualty.

7.6 Unsafe Actions or Conditions that Were Not Causal Factors

7.6.1 *Coast Guard Buoy Placement*

A primary issue in this case is whether the buoy that the Coast Guard moved from the South Hole to the North Hole was a causal factor in this casualty. While evidence shows that mariners use the buoys for a variety of reasons including determining the distance between the jetty and the bar as well as helping judge wave sets and height, there is no evidence that Mr. [redacted] would have used the navigational aid to his benefit. Mr. [redacted] had the assistance of two fellow fishing vessels of which he watched only one cross and didn't wait for the second. He also had a 32-inch chart plotter screen which displayed the area along with the South Jetty to its as-built location. While prospectively, Mr. [redacted] may have used the buoy to assist as a visual aid in order to determine the location of the South Hole, he stated that he was comfortable with his starting position based on the depth of his location. Once in transit, fatigued and [redacted], there is no evidence to suggest that the buoy placement would have changed the course of events. Additionally, without Mr. [redacted] answering questions regarding his situational awareness, the investigation team could gather no additional facts as to the efficacy of the buoy for this particular incident.

7.6.2 *CFV COASTAL REIGN Weight Distribution*

There is evidence that shows that the CFV COASTAL REIGN may have uneven fuel levels in the port and starboard fuel tanks creating a situation that predisposed the vessel to roll more easily to starboard. Without a vessel to inspect and no boat build plans, the investigation team did not seek the assistance of the Marine Safety Center to determine the vessel's likelihood of capsizing based on the weight distribution of fuel. Additionally, since video of the event shows an otherwise stable vessel, sitting broadside to plunging wave action that is nearly the same height as the CFV COASTAL REIGN, the fuel balancing was likely not a factor in this casualty.

8 Actions Taken Since the Incident

8.1 During the course of this investigation, the investigation team interviewed and discussed the casualty and circumstances of the Tillamook Bay Bar jetty system with the USACE Portland District. Despite years of funding requests for the south jetty repair project, and having the project in the top five projects of the District, it was never funded. However, on January 25, 2022, the USACE issued their Operation and Maintenance Work Plan of 2022-23. In it included $62M to repair the south jetty. Work is expected to begin in 2022.

9 Recommendations

9.1 Safety Recommendations

9.1.1 Recommend that the Commandant of the Coast Guard obtain legislative authority to require commercial fishing vessel operators of less than 200 GT to hold a valid Coast Guard issued Merchant Mariner Credential (MMC). This requirement would standardize level of competency, ensure medical fitness for CFV operators, and require enrollment in a drug-testing program. Credentialing would subject operators to the revocation or suspension of their credential should a mariner engage in unlawful drug use or otherwise breach the standard of care expected of prudent mariners.

9.1.2 Recommend that the Commandant of the Coast Guard collaborate with the Commercial Fishing Safety Advisory Committee (CFSAC) to establish a working group to draft and accept a Task Statement addressing the safety of commercial fishing vessels of less than 200 GT.

9.1.2.1 Recommend that the Coast Guard complete the implementation of the 2010 and 2012 legislation for commercial fishing vessels as specified in those Coast Guard Authorization Acts. These efforts should enact the provisions in the Coast Guard Authorization Act of 2010 regarding the certification of CFV operator competency.

9.1.2.2 Recommend a work group to propose initiatives and actions to eliminate drug and alcohol usage onboard commercial fishing vessels less than 200 GT.

9.1.2.3 Recommend that the collaborative CFSAC and Coast Guard work group develop a process to review and implement commercial fishing vessel mariner fitness-for-duty onboard CFVs of less than 200 GT. Fitness-for-duty should include an assessment of overall health and physical fitness, and contain provisions for the elimination of drug and alcohol use as well as fatigue management.

9.1.3 Recommend the Commandant of the Coast Guard develop a framework for Sectors to assess, document, and maintain mariner competency, in addition to the MMC requirement, to operate CFVs of less than 200 GRT, that will include local knowledge. This provision may be incorporated into annual fishing vessel safety exams.

9.1.4 Recommend that the Commandant of the Coast Guard request a review of the Fishing Vessel Casualty Task Force report, March 1999, with the aim of implementing recommendations. Comprehensive requirements should include the following: enrollment in drug testing program, watertight integrity and subdivision requirements, requirements to conduct and log safety drills, requirements for equipment maintenance, and regular dry dock examinations to ensure hull integrity.

9.1.5 Recommend that the Commandant of the Coast Guard to develop and implement a process for mariner’s fitness-for-duty onboard commercial fishing vessels of less than 200 GT. Recommend process to include mandatory rest requirements onboard the vessel.

9.1.6 Recommend Station Tillamook Bay, when announcing hazardous bar restrictions, to add this language to their broadcast notice to mariners as a reminder to vessels seeking entry through the bar:

> "Vessel operators are reminded to exercise extreme caution while transiting in the vicinity of the seaward end of the north and south jetties. Approximately XX yards of the North Jetty is submerged and XX yards of the South Jetty is submerged. The submerged portions of the jetties create an extreme hazard to navigation. Vessel operators are reminded not to transit over the submerged portion of the jetties."

9.2 Administrative Recommendations:

9.2.1. On 5 April 2021, this investigation team recommended that the Coast Guard Thirteenth District refer this case to the United States Attorney for the District of Oregon for criminal prosecution for alleged violations of 18 U.S.C. 1115 for the deaths of Mr. Todd Chase and Mr. Zachary Zappone. The U.S. Attorney's office did not take action after review of the case. This recommendation renews the request to submit this case for action to the State of Oregon for consideration.

9.2.2 Recommend that MSU Portland, who has designated OCMI authority from Sector Columbia River, initiate civil penalty action against the F/V COASTAL REIGN's owner for alleged violations of 46 USC § 2302.

9.2.3. Recommend that D13 Dpw immediately conduct a local WAMS study for the placement of buoy on the south hole and maintain two buoys due to unpredictable shoaling. Buoys, while difficult to maintain in the area, provide some surety to mariners regarding distance from the submerged jetties.

9.2.4 Recommend that D13 dpw engage with the USACE Portland Division to determine, and publish, the actual length of the submerged portion of the jetties. Distance ranges include 200 feet as published by the Station Tillamook Bay, 'Crossing the Tillamook Bay Bar,' pamphlet as compared to the USACE's 1100 feet as described in their project survey.

9.2.5 Recommend that the Commandant of the Coast Guard provide a copy of this report to the next-of-kin of Mr. Todd Chase and Mr. Zachary Zappone.

9.2.6 Recommend a public meeting to present the findings of this investigation to interested parties. Recommend the hearing take place in Garibaldi, OR, with the investigation team along with dpw and the ACOE. While the facts of this case are relatively simple, the more complex issues involve those two bodies that must be able to answer the publics question regarding future operations in the area.

9.3 Recommend this investigation be closed.

COUTU.CHRISTOPHER.F [redacted] Digitally signed by [redacted]
Date: 2022.04.20 14:46:40 -08'00'

Capt Christopher Coutu
Lead Investigating Officer

United States Coast Guard

Report of Investigation into the Circumstances Surrounding the Incident Involving F/V CURRENT LOSS OF LIFE

On 03/17/2012

MISLE Activity Number: 4267048
Originating Unit: Sector Puget Sound
MISLE Activity Owner: Sector Puget Sound
MISLE Activity Controller: Sector Puget Sound
MISLE Case Number: 587185

U.S. Department of Homeland Security
United States Coast Guard

Commandant
United States Coast Guard

U.S. Coast Guard STOP 7501
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Washington, DC 20593-7501
Staff Symbol: CG-INV
Phone: (202) 372-1030
Fax: (202) 372-1904

16732/IIA#4267048
05 May 2022

THE LOSS OF LIFE ONBOARD THE COMMERCIAL FISHING VESSEL CURRENT SOUTH WEST OF CAPE ALAVA, WA MARCH 17, 2012

ACTION BY THE COMMANDANT

The record and the report of the investigation convened for the subject casualty have been reviewed. The record and the report, including the findings of fact, analysis, and conclusions are hereby closed.

The investigation's safety recommendation will remain under review and consideration by the responsible program office(s). The response to the recommendations and any resultant actions will be documented separately.

[redacted]

R. S. WADDINGTON
Commander, U.S. Coast Guard
Acting Chief, Office of Investigations & Casualty Analysis (CG-INV)

U.S. Department of Homeland Security
United States Coast Guard

United States Coast Guard
Sector Puget Sound

1519 Alaskan Way South
Seattle, WA 98134
Phone: (206) 217-6252
Fax: (206) 217-6213

16671
03 MAR 15

MEMORANDUM

From: [redacted]
Marine Investigato[redacted] CAPT

To: [redacted], CAPT 3/9/2015
CG SECTOR Puget Sound

Subj: LOSS OF LIFE ONBOARD THE COMMERCIAL FISHING VESSEL CURRENT (ON. 990938) ON MARCH 17, 2012

Ref: (a) USCG Marine Safety Manual Volume V, COMDTINST M16000.10A
(b) COMDT (CG-545) memo 16732 of 17 Mar 11

Preliminary Statement:

In accordance with references (a) and (b), an investigation was conducted and a report of investigation produced, regarding the death of a deckhand onboard the U.S. flagged Commercial Fishing Vessel (CFV) CURRENT (O.N. 990938) on March 17, 2012.

Factual evidence was collected in order to conduct a thorough analysis of the incident. All times are approximate and reflect local Pacific Standard Time. The MISLE Activity number for this investigation is 4267048.

Executive Summary:

On March 17, 2012, the tribal CFV CURRENT was underway fishing near the Juan De Fuca Canyons off the coast of Washington. At 1745 local time, Sector Puget Sound's Command Center was notified by the vessels operator that a deckhand had been found entangled in the propeller shaft by his sweat shirt, was unresponsive and not breathing. Minutes prior to the incident, the deckhand was working in the engine room on the propeller shaft's dripless water seal alone. The operator and remaining crew conducted cardiopulmonary resuscitation (CPR) on the victim for more than 15 minutes without any response. Sector Puget Sound's Command Center contacted Air Station/Sector Field Office Port Angeles to discuss a medical evacuation plan (MEDEVAC). Once the Coast Guard flight surgeon was contacted, he advised not to conduct the MEDEVAC as the victim was unresponsive and did not have a pulse for more than 15 minutes. The victim was subsequently pronounced dead. The CFV transited to Station Neah Bay where authorities were awaiting the vessel's arrival. The next morning the Port Angeles Deputy Coroner reported the cause of death was strangulation.

Vessel Data:

Figure 1: Picture of CFV CURRENT (ON 990938)

Name:	CURRENT
Official Number:	990938
Service:	Commercial Fishing Vessel
Year Built	1993
Built By:	Alexey Reutov
Gross Tons:	30
Net Tons:	Unknown
Length:	41 Foot
Breadth:	Unknown
Depth:	Unknown
Owner & Operator:	[redacted]

Personnel Data:

Name	Position	Sex	Age	Status
[redacted]	Owner/Operator	Male	[redacted]	Witness
James Rollins	Deckhand 1	Male	26	Deceased
[redacted]	Deckhand 2	Male	[redacted]	Witness
[redacted]	Deckhand 3	Male	[redacted]	Witness

Weather:

Winds:	15-20 knots
Waterway:	6-8 foot seas
Visibility	Clear and fair
Air temperature	37

1. **Findings of Fact:**

a. The CFV CURRENT's engine room consists of a single engine with a reduction gear. Attached to the reduction gear is a coupling that the propeller shaft connects to. The shaft transits the engine room aft bulkhead through a dripless shaft seal to prevent water intrusion into the engine room. The shaft seal is designed to allow water to travel through a stern tube which lubricates and cools the shaft seal. Directly above the shaft seal is the diesel generator. To access the generator or the propulsion shaft area crewmembers must walk around a narrow alleyway around the main engine, as shown in Figure 2.

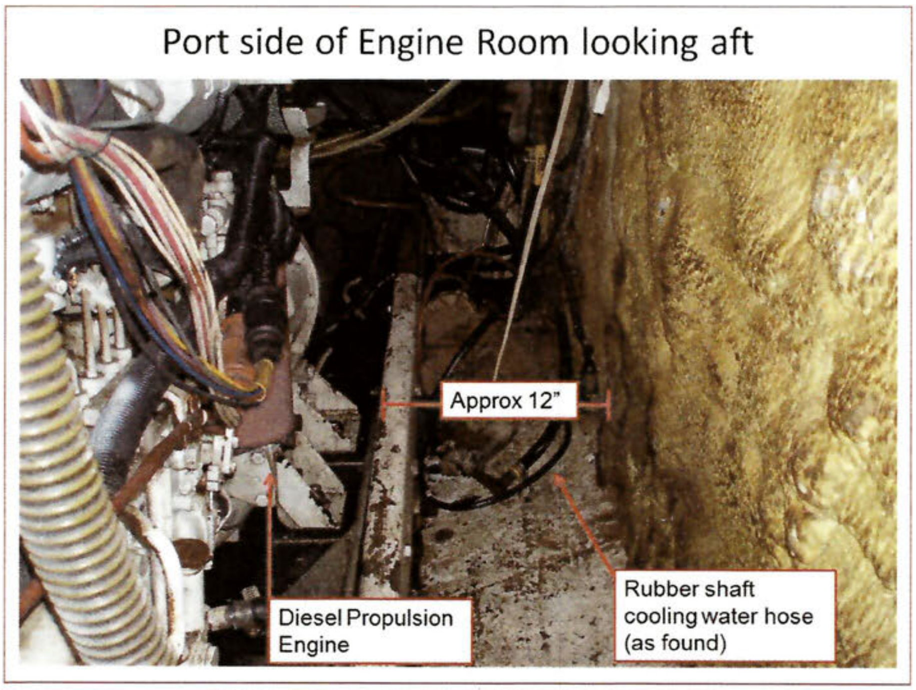

Figure 2: outboard side of main engine

b. On March 6, 2012, the CFV CURRENT was examined by a member from Sector Puget Sound's Commercial Fishing Vessel Exam Branch. At the time of the inspection, the examiner noted a total of 9 discrepancies and cleared 7 of them prior to departing the vessel.

c. On March 15, 2012, a follow up examination from a commercial fishing vessel examiner was conducted to clear the remaining two discrepancies from the March 6, 2012 examination. All discrepancies were cleared and the vessel was issued a new commercial fishing vessel sticker.

d. On March 17, 2012 at approximately 0200 local time, the CFV CURRENT got underway from Neah Bay, Washington enroute to fishing grounds approximately 10 nautical miles off the coast of Washington with 4 personnel.

e. Once the vessel arrived in the fishing area the crew put out the first set of long lines and prepared the deck for hauling them.

f. After hauling in the first set of fishing lines, the operator made the decision to move locations approximately 36 nautical miles to the Juan de Fuca Canyons. The on scene weather was 6 to 8 foot seas, wind was approximately 15 to 20 knots and the air temp was 37 degrees Fahrenheit.

g. When they arrived at their new location, the crew prepared the deck to set the long lines. The weather and sea conditions remained the same as at the previous location. After they set the lines, the vessel's crew started to clean and prepare the deck to haul the lines back onto the vessel.

h. Sometime later during the evening of March 17^{th} the operator told everyone to get something to eat before preparing to haul the lines back onto the vessel.

i. While the crew was eating their meal, the bilge alarm went off in the bridge. James Rollins (deckhand 1) and [redacted] (the owner / operator) proceeded into the engine room to identify the cause of the alarm. Mr. Rollins found that the shaft's dripless water seal had a fitting that broke and was leaking water into the bilge causing the bilge alarm to sound. He immediately told Mr. [redacted] he could fix it and Mr. Aguirre left the engine room to make some soup.

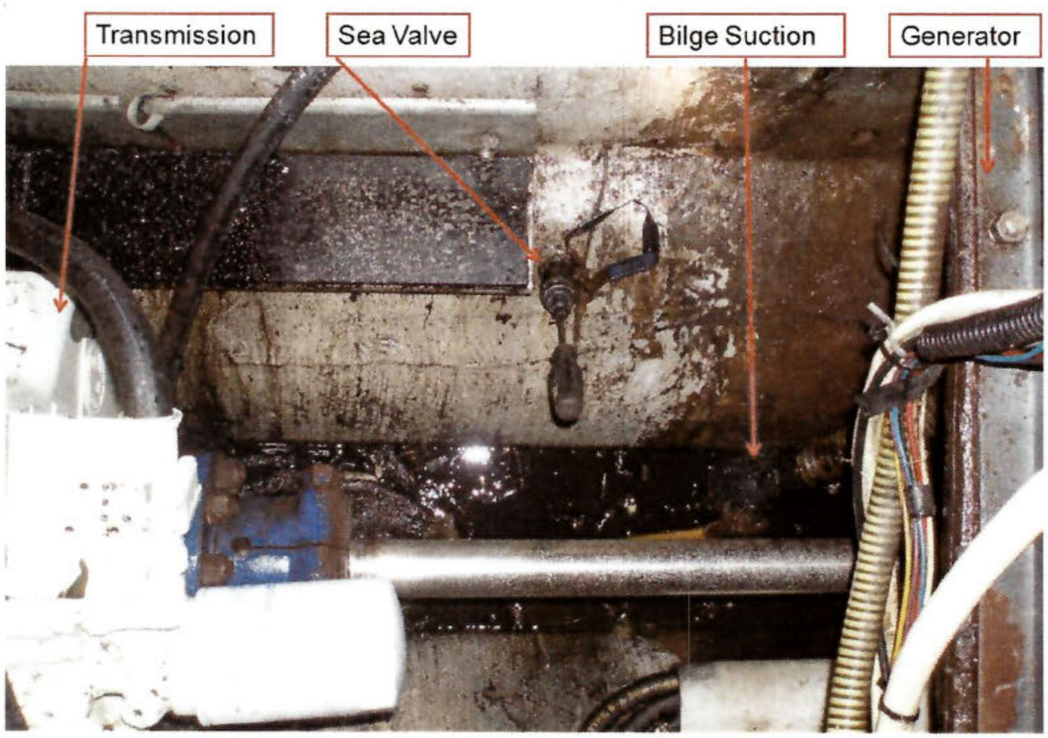

Figure 3: Engine room shaft and bilge area

j. Approximately six or seven minutes later, Mr. [redacted] went to check on Mr. Rollins' progress. He found Mr. Rollins unconscious lying over the top of the propeller shaft with his sweatshirt tangled in the shaft with the shaft still turning.

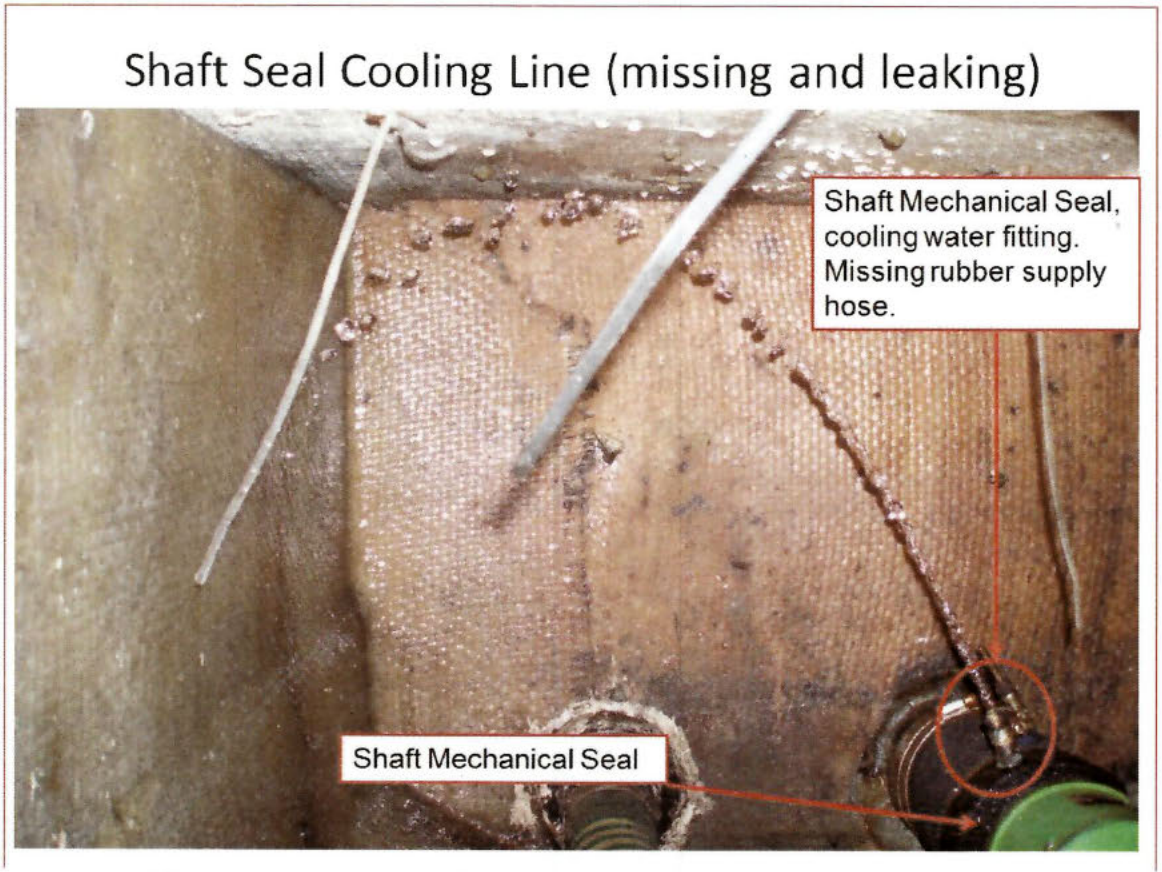

Figure 4: Dripless Shaft Seal Cooling Line missing supply hose

k. Mr. [redacted] shut the engine down and yelled for help. Mr. [redacted] (deckhand 2) came into the engine room to assist Mr. [redacted] in removing Mr. Rollins from the engine room. The engine room compartment is very close quarters, dark, hot, and slippery due to residual oil on the deck.

l. At 1745, Mr. [redacted] radioed the Coast Guard (CG) for assistance

m. At 1800, the CG Station Quillayute River launched a 47' Motor Lifeboat (MLB) to assist the CFV CURRENT.

n. At 1806, CG Sector Puget Sound contacted CG Air Station/Sector Field Office Port Angeles and spoke with the Air Station's flight surgeon about attempting a CG MEDEVAC for the unconscious deckhand onboard the CFV.

o. At 1815, the flight surgeon advised against a CG MEDEVAC due to the low chance of survival at that point, since the deckhand had been without a pulse for more than 15 minutes. The Coast Guard Sector Commander concurred with the flight surgeon.

p. At 1910, CG Station Neah Bay launched a 47' MLB to relieve the original 47' MLB from Quillayute River and escort the CFV CURRENT to the Coast Guard dock at Station Neah Bay.

q. On March 18, 2012 at 0023, the CFV CURRENT and 47' MLB arrived at CG Station Neah Bay. On the pier awaiting the vessel's arrival were the local police chief, two other police officers and Station Neah Bay's Commanding Officer.

r. On March 18, 2012 at approximately 0100, CG station Neah Bay conducted a post Search and Rescue (SAR) boarding on the CFV CURRENT and found no discrepancies.

s. At 0228, the deputy coroner arrived at CG Station Neah Bay and pronounced Mr. James Rollins deceased, with the cause of death believed to be strangulation.

t. On March 20, 2012, a death certificate was signed by deputy coroner [redacted] stating the cause of death was strangulation.

2. Post Casualty Drug and Alcohol Testing

a. Post Casualty/SMI chemical testing was not conducted on the surviving crew of the vessel being the only individual directly involved in the serious Marine incident was the deceased.

3. Analysis:

a. *Physical Condition:* Mr. Rollins was a 26 year old male at the time of the incident. He did not have any physical impairments. He had been employed by Mr. [redacted] for one year and had worked in the fishing industry off and on for the last two to three years.

b. *Environmental Conditions:* The incident occurred in a dark and cramped location in the engine room. The space was hot and noisy as well. The seas were approximately 6 to 8 feet. (See figures 2 and 3)

c. *Vessel Operation:* The CFV CURRENT was underway at the time of the incident.

d. *Vessel Condition:* The CFV CURRENT is a U.S. documented long liner that had been examined by a USCG commercial fishing vessel examiner on March 5, 2012. After the examination, the inspector issued a Commercial Fishing Vessel decal. A post SAR boarding was conducted at Station Neah Bay with zero violations noted.

4. Conclusions:

a. In accordance with Marine Safety Manual, Volume V, the initiating event (or the first unwanted outcome) that led to the death of a crewmember onboard the CFV CURRENT was a broken water cooling line to the propulsion shaft's dripless water seal. [Finding of fact: i]

b. The causal factors that led to this casualty are as follows:

i) Human Error: There were four human error causal factors identified.

(a) The vessel had been underway for more than 15 hours at the time of the incident and the crew was operating on minimal sleep. [Finding of Fact: d, e, f, l.]

(b) The crewmember working on the shaft cooling line did not secure the main engine and stop the propeller shaft prior to working near the rotating shaft. [Finding of Fact: i, k.]

(c) The crewmember did not recognize the hazards in his surrounding environment, including a dark working area, hot environment, and tight working quarters. [Finding of Facts: a, k.]

(d) The crewmember was wearing a loose fitted hooded sweatshirt while working on or near rotating machinery. [Finding of Facts: j.]

ii) Environment: There were two environmental causal factors identified:

(a) The vessel was operating in seas of approximately 6 to 8 feet. [Finding of Fact: g.]

(b) The engine room deck was slippery due to water and leaking machinery equipment. [Finding of Fact: a, k.]

iii) The investigation revealed the following:

(a) During the most recent Coast Guard Dockside Fishing Vessel exam, the examiner issued nine (09) deficiencies to the vessel. However, the examiner did not identify any deficiencies onboard the vessel with regards to guards protecting rotating machinery (see 46 CFR 28.215). All discrepancies noted were corrected prior to the vessel getting underway.

(b) No evidence of actionable misconduct, inattention to duty, or negligent or willful violation of law or regulation on the part of Coast Guard licensed or certificated personnel.

(c) No acts of misconduct, incompetence, negligence, unskillfullness, or willful violation of law committed by any Coast Guard personnel, including an officer or employee, contributed to the cause of the incident.

(d) There is no evidence that an act has been committed that would subject an offender to a civil penalty under the laws of the United States.

(e) There was no evidence that a criminal act under the laws of United States has been committed.

5. Safety Recommendations:

a. Safety Recommendation 9389 - Fatigue Training

Currently, 46 CFR Part 28 does not establish appropriate and adequate watch standing schedule requirements or fatigue standards for commercial fishermen. This investigation revealed a latent unsafe condition (LUC) with regard to working in the commercial fishing industry and growing accustomed to working on and operating vessels while fatigued. Because the deckhand had grown up in this culture, he did not realize the dangers from being fatigued and operating on minimal sleep. He was not aware and had not been trained on crew endurance management. I recommend that the Officer in Charge of Marine Inspection promote fatigue mitigation and crew endurance management training to not only the tribal commercial fisherman, but all commercial fishing vessel operators in his area of responsibility.

b. Safety Recommendation 9390 - Develop regulations for commercial fishing vessel maintenance program.

Currently, there are no regulations requiring commercial fishing vessels to have any type of maintenance program nor method of recording what work has been completed on the vessel. I recommend CG-CVC-3 initiate regulations requiring all commercial fishing vessels to develop a maintenance program using best engineering practices and previous casualty data analysis. The maintenance program shall include, but not limited to: internal compartment inspections; hull exams (conducted at dry-dock and/or in the water); shaft inspections; rudder examinations; machinery maintenance to include deck gear, propulsion engines, electrical systems, bilge manifold system, etc. I recommend that the recording of any completed maintenance be kept in a safe location off of the vessel. The implementation of this safety recommendation is intended to reduce the risk of marine casualties for the entire fishing fleet, which may be related to the material condition of the vessel or the lack of maintenance being conducted on board the vessel.

6. Enforcement Actions:

a. There was no enforcement action taken by the Coast Guard. The marine casualty investigation revealed no acts of misconduct, negligence, or violation of any laws.

7. Administrative Recommendations:

a. I recommend this investigation be closed.

#

UNITED STATES COAST GUARD

REPORT OF THE INVESTIGATION
INTO THE
SINKING OF THE COMMERCIAL FISHING VESSEL EMMY ROSE (O.N. 909149), APPROXIMATELY 27 NAUTICAL MILES NORTHEAST OF PROVINCETOWN, MA, RESULTING IN THE LOSS OF FOUR LIVES ON NOVEMBER 23, 2020

MISLE ACTIVITY NUMBER: 7100250

U.S. Department of Homeland Security

United States Coast Guard

Commander
First Coast Guard District

408 Atlantic Avenue
Boston, MA 02110
Staff Symbol: (d)
Phone: (617) 223-8480

16732/20-090
DEC 0 2 2020

MEMORANDUM

[redacted]

From: Tom G. Allan Jr., RDML
CGD ONE (d)

02DEC2020

To: Trevor C. Cowan, CDR
CGD ONE (dpd)

Subj: FORMAL MARINE CASUALTY INVESTIGATION CONCERNING TOTAL LOSS OF F/V EMMY ROSE ON NOVEMBER 23, 2020

Ref: (a) Title 46 United States Code, Chapter 63
(b) Title 46 Code of Federal Regulations, Part 4
(c) Marine Safety Manual, Volume V; COMDTINST M1600010.A
(d) CG-545 Policy Letter 5-10

1. Pursuant to the authority contained in reference (a) and (b), you are to convene a formal investigation for the marine casualty of the F/V EMMY ROSE (O.N. 909149) that occurred on November 23, 2020. In conducting your investigation, you shall follow as closely as possible the policy guidance and operational procedures for Coast Guard Marine Investigations Programs, as found in reference (c) and (d).

2. Due to the scope and complexity of the investigation, I have assigned the following persons to assist you with your investigation. For purposes of this investigation, the below persons are all designated as investigating officers as defined under reference (b).

- CWO [redacted] USCG, Assistant Investigating Officer
- Mr. [redacted] USCG, Assistant Investigating Officer
- LT [redacted] USCG, Recorder
- LT [redacted], USCG, Legal Counsel
- Mr. [redacted] USCG, Technical Advisor

3. Upon completion of the investigation, you will issue a Report of Investigation (ROI) to me with the collected evidence, the established facts, conclusions and recommendation. Conclusions and recommendations concerning commendatory actions or misconduct that would warrant further inquiry shall be referred to me by separate correspondence for consideration and action as appropriate. A weekly summary of significant events shall be transmitted to CGD ONE (dp) while the investigation is in formal session.

4. You will complete and submit your investigation report to me by June 22, 2021. If this deadline cannot be met you shall submit a written explanation for the delay and notice of the expected completion date. You are highly encouraged to submit any interim recommendations intended to prevent similar causalities, if appropriate, at any point in your investigation.

5. The National Transportation Safety Board (NTSB) is also charged with the responsibility of determining the cause or probable cause of this casualty by the Independent Safety Board Act of

1974 (49 U.S.C. § 1901, et. seq.) and has designated Mr. [redacted] to participate in this investigation. Mr. [redacted] may make recommendations regarding the scope of the inquiry, may identify and examine witnesses, and may submit or request additional evidence.

6. CGD ONE (dpi) will furnish such funding and technical assistance as may be required by the investigation when deemed appropriate and within the requirements for the scope of the work. Your point of contact for funding and obtaining technical assistance is LCDR [redacted]

#

Copy: COMDT (CG-INV)
LANTAREA (54)
CGD ONE (dp)(dl)
Sector Boston
Sector Northern New England
Investigations NCOE

U.S. Department of Homeland Security
United States Coast Guard

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16732/IIA#7100250
17 May 2022

THE SINKING OF THE COMMERCIAL FISHING VESSEL EMMY ROSE APPROXIMATELY 27 MILES NE OF PROVINCETOWN, MA, RESULTING IN THE LOSS OF FOUR LIVES ON NOVEMBER 23, 2020

ACTION BY THE COMMANDANT

The record and the report of the investigation convened for the subject casualty have been reviewed. The record and the report, including the findings of fact, analysis, and conclusions are approved. The investigation's safety recommendations remain under review. The Commandant's response to the recommendations and any resulting actions will be documented separately. This marine casualty investigation is closed.

[redacted]
[redacted] J. D. NEUBAUER
Captain, U.S. Coast Guard
Chief, Office of Investigations & Casualty Analysis (CG-INV)

U.S. Department of Homeland Security
United States Coast Guard

Commander
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16732
08 Apr 2022

SINKING OF THE COMMERCIAL FISHING VESSEL EMMY ROSE (O.N. 909149), APPROXIMATELY 27 NM NORTHEAST OF PROVINCETOWN, MA, RESULTING IN THE LOSS OF FOUR LIVES ON NOVEMBER 23, 2020

ENDORSEMENT BY THE COMMANDER, FIRST COAST GUARD DISTRICT

The record and the report of the investigation convened for the subject casualty were reviewed. The record and the report, including the findings of fact, analysis, conclusions, and recommendations are approved subject to the following comments. It is recommended that this marine casualty investigation be closed.

COMMENTS ON THE REPORT

1. The loss of the EMMY ROSE and her four crewmembers was a tragic and preventable accident. I offer my sincerest condolences to the families and friends of the mariners whose lives were lost.

2. This unfortunate incident highlights the importance of judicious caution when engaging in commercial fishing operations and the need for increased Coast Guard oversight of Commercial Fishing Vessels (CFV). The Coast Guard regulates CFVs in accordance with 46 Code of Federal Regulations (CFR) Part 28, "Requirements for Commercial Fishing Vessels." Within Part 28, there are variances in the applicability of certain regulations; specifically in Subpart E of Part 28, a CFV of less than 79 feet in length is not required to meet any standards for vessel stability. Conversely, all inspected commercial vessels and CFVs greater than 79 feet in length are required to conduct stability analysis. Since 2014, the First Coast Guard District did not experience the loss of any inspected vessels or their crewmembers and therefore were not required to investigate. During that same timeframe, there were 158 CFVs lost (sunk) and 68 CFV crewmember deaths in First Coast Guard District waters, with 58 of those CFV sinking while underway and 100 sinking at the pier or mooring.

3. While the commercial fishing industry must adhere to basic safety regulations established in federal and state laws and regulations, these laws and regulations exist to create a baseline of safety. In some cases, the owners and operators of CFVs may need to go above and beyond the requirements in the regulations to ensure the safety of their vessels and crews. Underestimating the underlying risks of the commercial fishing industry and unwillingness to

go beyond the requirements of the regulations may drastically affect vessel safety and expose crews to dangerous situations.

Safety Recommendation 1: It is recommended that the Commandant implement new regulations under 46 CFR Part 28 requiring commercial fishing vessels 79 feet or greater in length undergo vessel stability periodic verification, by a qualified individual, every 5 years and/ or after a major modification to ensure the vessel is still in compliance with their required stability instructions.

Endorsement: Concur; a periodic verification of the vessel's profile ensures a CFV remains in compliance with its stability instruction. Furthermore, recommend the Commandant amend applicability for CFVs subject to 46 CFR Subchapter C, Subpart E-Stability to include all CFVs that operate outside of three nautical miles from the baseline. Of the 158 CFVs lost in the First Coast Guard District since 2014, 156 were less than 79 feet in length and stability regulations were not applicable.

Safety Recommendation 2: It is recommended that the Commandant amend 46 CFR Part 28 to reflect requirements enacted under the Coast Guard Authorization Act of 2010, specifically provisions for individuals in charge of vessels operating beyond three nautical miles from the baseline to pass a training program covering certain competencies, including stability.

Endorsement: Concur; this requirement would provide vital training for operators and ensure their competency to command a vessel.

Safety Recommendation 3: It is recommended that the Commandant amend 46 CFR Part 28 and Part 42 to reflect the requirements enacted under the Coast Guard Authorization Act of 2010, specifically 46 U.S.C. §5102(b) requiring applicable CFVs to have a load line assigned.

Endorsement: Concur; modifications made to a vessel over time will affect the vessel's stability and seaworthiness, as was a causal factor in the loss of the EMMY ROSE. An alternate load line program will ensure any modifications or alterations made remain within limits to provide recommended standards of safety for the vessel.

Safety Recommendation 4: It is recommended that the Commandant implement new regulations requiring certain crewmembers aboard CFV to be subject to a chemical testing program such as prescribed by 46 CFR 16.

Endorsement: Concur; the drug epidemic has affected the First Coast Guard District CFV community greatly. In the last 10 years, there were approximately 50 drug overdose events, resulting in 15 deaths. Instituting a pre-employment, random, and reasonable cause drug testing program covering all crew members who are in safety sensitive positions would reduce the risk of injury and death to crews and damage and loss to vessels.

Safety Recommendation 5: It is recommended that Commandant (CVC-3) provide guidance and instruction to CFV Examiners to conduct CFV Stability Training and Outreach.

Endorsement: Concur; CFV Examiners play a vital role in the Coast Guard's relationship with commercial fishermen. By providing stability training to CFV Examiners, we are giving them a greater opportunity for outreach and an outstanding tool to improve CFV safety.

Safety Recommendation 6: It is recommended that Commandant (CVC-3) provide guidance and instruction to CFV Examiners to conduct Crew Endurance Management System and Anti-Fatigue Training and Outreach.

Endorsement: Concur; in maritime operations, exposure to 24/7 operations, restricted sleep opportunities, and frequent sleep disruptions reduces crewmember's ability to avoid fatigue and maintain situational awareness, compromising their alertness and performance. A targeted CFV Examiner training initiative on Crew Endurance Management would provide commercial fishermen with vital information on how fatigue can negatively impact physical functioning, attention, memory and communication. This awareness can enable companies and crewmembers to manage the occurrence and effects of crew endurance risk factors that can lead to human error and performance degradation in maritime work environments.

[redacted]

Tom G. Allan Jr. [redacted]
Rear Admiral, U.S. Coast Guard
First Coast Guard District

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LIST OF ACRONYMS

Acronym	Title
CFR	Code of Federal Regulations
CGC	Coast Guard Cutter
COD	Certificate of Documentation
CFV	Commercial Fishing Vessel
EPIRB	Emergency Position Indicating Radio Beacon
EST	Eastern Standard Time
F	Degrees Fahrenheit
GT	Gross Tons
HP	Horse Power
KW	Kilowatt
MA	Massachusetts
ME	Maine
MPH	Miles Per Hour
MSC	Marine Safety Center
NM	Nautical Mile
NOAA	National Oceanic and Atmospheric Administration
NTSB	National Transportation Safety Board
NVIC	Navigation and Vessel Inspection Circular
O.N.	Official Number
ROV	Remotely Operated Vehicle
SMC	Search and Rescue Mission Coordinator
SQFT	Square Feet
USC	United States Code
USCG	United States Coast Guard
VMS	Vessel Management System
WHOI	Woods Hole Oceanographic Institute

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16732

SINKING OF THE COMMERCIAL FISHING VESSEL EMMY ROSE (O.N. 909149), APPROXIMATELY 27 NAUTICAL MILES NORTHEAST OF PROVINCETOWN, MA, RESULTING IN THE LOSS OF FOUR LIVES ON NOVEMBER 23, 2020.

EXECUTIVE SUMMARY

On Tuesday, November 17, 2020, at approximately 1603, the 82-foot U.S. flagged Commercial Fishing Vessel EMMY ROSE (O.N. 909149), a flush deck Gulf shrimper style, reconfigured as a ground fishing stern trawler, departed Portland, Maine with four crewmembers onboard. The EMMY ROSE conducted fishing operations in the Gulf of Maine off the coast of Massachusetts. On Sunday, November 22, 2020, at approximately 1900, the EMMY ROSE began transiting towards Gloucester, MA for a scheduled offload of catch.

During the early morning hours of Monday, November 23, 2020, the EMMY ROSE was on a course of 277 degrees and a speed of 7 knots. At 0100, the last transmittal of the vessel's position was 42° 18' 53.1" N, 069° 33' 7.14" W, as recorded by the Vessel Monitoring System (VMS). At this point, the vessel was approximately 27 NM northeast of Provincetown, MA.

At 0129, the First Coast Guard District Rescue Coordination Center in Boston, MA, received an emergency 406 MHz EPIRB distress alert from position 42° 16' 12" N, 069° 38' 18" W, which was confirmed by the EPIRB's registration to be from the EMMY ROSE. There was no MAYDAY call and when attempts to hail the vessel failed, the Coast Guard launched Search and Rescue (SAR) operations. Multiple Coast Guard aircraft and vessels participated in SAR operations. At approximately 0307, a Coast Guard helicopter located the empty inflated life raft, and at 0326 the EPIRB was located in a debris field. SAR operations did not locate the EMMY ROSE or any of the four crewmembers. The Coast Guard suspended search operations on November 24, 2020, at 1722.

On May 19-20, 2021, the NOAA vessel AUK used side scan sonar and located the EMMY ROSE, at a depth of approximately 800 feet, approximately 27 NM northeast of Provincetown, MA and approximately 3.5 NM west of the last known position of the EMMY ROSE. Images from the operation showed that the EMMY ROSE is sitting upright on the seafloor with the bow oriented at 135° (southeast orientation) and the outriggers are fully deployed. There was no apparent damage to EMMY ROSE evident in the sonar data.

On September 22 and 23, 2021, Woods Hole Oceanographic Institute (WHOI) deployed a Remotely Operated Vehicle (ROV) over the site to collect imagery of the wreck. The ROV confirmed vessel was in upright position in last known position with no evidence of any constructive damage to the vessel.

As a result of the investigation, the First Coast Guard District Formal Board of Investigation has determined that the initiating event of the sinking of the EMMY ROSE was a shift of weight to the starboard side within the vessel. This internal shift, either fuel or cargo, caused the EMMY ROSE to experience a catastrophic and unrecoverable shift in the vessel's vertical center of gravity. Subsequent events include the flooding of the aft deck by the boarding seas, which led to down flooding into the unsecure lazarette and fish hold, causing the vessel to sink with all four crewmembers missing and presumed deceased.

The causal factors of the internal transverse weight shift within the vessel include: (1) the typical operation aboard the EMMY ROSE of burning fuel from just one tank, and then transferring fuel throughout the voyage; (2) crewmembers had not received proper training in accordance with 33 CFR 155.715; (3) crewmembers experiencing loss of situational awareness due to chronic fatigue; and (4) modifications made since the 2002 stability analysis added significant weight to the vessel, further reducing the righting arm of the EMMY ROSE.

The causal factors which led to flooding of the aft deck include: (1) the EMMY ROSE was returning to Gloucester, MA in a port quartering sea; (2) the freeing ports of the EMMY ROSE were not in compliance with 46 CFR 28.555, which allowed water to board the vessel and when secure, prevented water from draining off the aft deck; (3) three of the four freeing ports on the port side were in the open position, allowing the quartering sea to flood the deck; and (4) the two aft freeing ports on the starboard side were closed, causing water to build in the starboard aft quarter.

The casual factors which led to the down flooding of the lazarette and fish hold, and the sinking of the EMMY ROSE include: (1) the lazarette and fish hold hatches were not watertight and were not fitted with securing devices; and (2) the lazarette hatch was only raised by a 4-inch coaming.

The casual factors which led to the loss of life include: (1) the crewmembers experienced chronic fatigue, leading to loss of situational awareness and ability to identify extremely hazardous condition aboard the EMMY ROSE; and (2) limited time and ability to take emergency action including MAYDAY radio calls for assistance, donning immersion/survival suits, deploying and entering the liferaft.

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16732

SINKING OF THE COMMERCIAL FISHING VESSEL EMMY ROSE (O.N. 909149), APPROXIMATELY 27 NM NORTHEAST OF PROVINCETOWN, MA, RESULTING IN THE LOSS OF FOUR LIVES ON NOVEMBER 23, 2020

INVESTIGATING OFFICER'S REPORT

1. Preliminary Statement

1.1. This marine casualty investigation was conducted, and this report was submitted in accordance with Title 46, Code of Federal Regulations (CFR), Subpart 4.09, and under the authority of Title 46, United States Code (USC), Chapter 63.

1.2. In accordance with 46 CFR § 4.03-10, BOAT AARON & MELISSA INC, owner of the vessel involved in the marine casualty, and the operating manager of the vessel involved in the marine casualty were designated as party-in-interest. No other individuals, organizations or parties were designated a party-in-interest.

1.3. The Coast Guard was the lead agency for all evidence collection activities involving this investigation. The National Transportation Safety Board (NTSB) assisted with the investigation. Marine Safety Center (MSC), Woods Hole Oceanographic Institute (WHOI), MIND Technologies, and National Oceanographic and Atmospheric Administration (NOAA) provided technical assistance. No other persons or organizations assisted in this investigation.

1.4. All times listed in this report are in Eastern Standard Time using a 24-hour format and are approximate.

2. Vessel Involved in the Incident

Figure 1: Photograph of EMMY ROSE courtesy of Robert Serbagi, retrieved via open source on November 25, 2020.

Official Name:	EMMY ROSE
Identification Number:	O.N. 909149
Flag:	United States of America
Vessel Class/Type/Sub-Type:	Fish Catching Vessel
Build Year:	1987
Gross Tonnage:	129 GT
Length:	82 feet
Beam/Width:	22.9 feet
Draft/Depth:	11.6 feet
Main/Primary Propulsion: (Configuration/System Type, Ahead Horsepower)	12 Cylinder Caterpillar/625 HP
Owner:	BOAT AARON & MELISSA INC. Westbrook, Maine
Operator:	BOAT AARON & MELISSA INC. Westbrook, Maine

3. Deceased, Missing, and/or Injured Persons

Relationship to Vessel	Sex	Age	Status
Captain	Male	[redacted]	Presumed Dead
Deckhand 1	Male	[redacted]	Presumed Dead
Deckhand 2	Male	[redacted]	Presumed Dead
Deckhand 3	Male	[redacted]	Presumed Dead

4. Findings of Fact

4.1. The Incident

4.1.1. At 1603, on November 17, 2020, the EMMY ROSE departed Vessel Services in Portland, ME with 04 crewmembers aboard for a seven-day ground fishing trip in the Gulf of Maine.

Figure 2: CCTV footage of the EMMY ROSE just prior to departure from Portland, Maine. Courtesy of Vessel Services, Portland, Maine

4.1.2. At 1428, on November 22, 2020, the Captain of the EMMY ROSE contacted Fisherman's Wharf in Gloucester, MA to schedule arrival and offload arrangements. The Captain of the EMMY ROSE stated they would arrive at the dock at 0600 on November 23rd with 45,000 pounds of various ground fish to be offloaded.

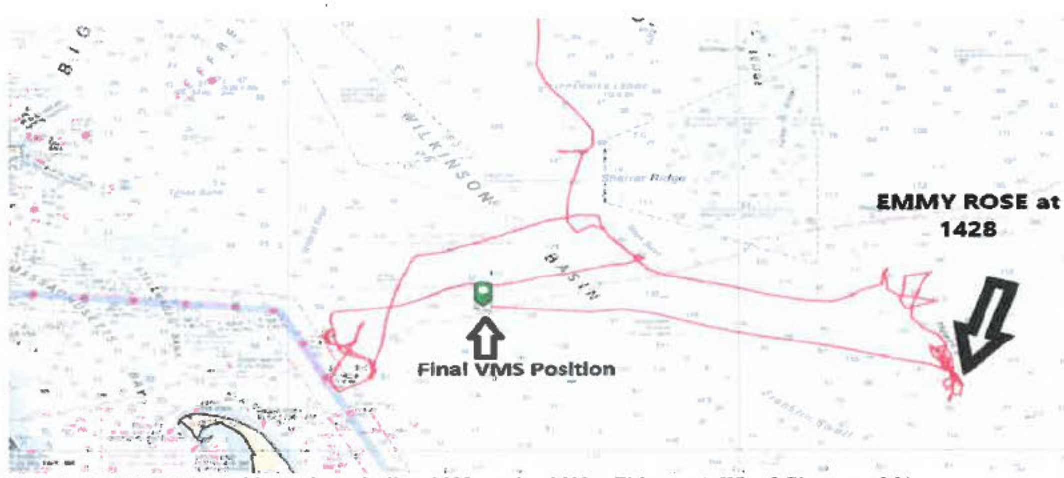


Figure 3: EMMY ROSE position at time of call on 22 November 2020 to Fisherman's Wharf, Gloucester, MA.

4.1.3. At 1600, the Captain of the EMMY ROSE contacted the Captain of the CFV THREE GIRLS and stated that he was doing routine welding on the trawl doors.

4.1.4. At 1839, the Captain of the EMMY ROSE contacted his fiancée via the satellite phone, their conversation lasted approximately seven minutes.

4.1.5. At 1848, Deckhand 3 contacted his girlfriend via the satellite phone for approximately four minutes. Deckhand 3 stated they had completed fishing operations and were enroute to Gloucester, MA to offload the catch. During the conversation, he was on the helm but was being relieved soon and was heading to bed. The girlfriend stated that during their conversation she could hear the crew in the background acting very excited.

4.1.6. At 1900, the EMMY ROSE began heading towards Gloucester, MA. The course was steady between 283-289 degrees at 7 knots.

4.1.7. At 2101, a call was made from an unidentified landline to the EMMY ROSE's satellite phone. The phone call lasted approximately five minutes.

4.1.8. At 2330, the CFV BLUE CANYON was on a course of 085 degrees at 3 knots and passed within 1 NM of the EMMY ROSE. The EMMY ROSE maneuvered around the BLUE CANYON and continued on course for Gloucester, MA at 7 knots. The Captain of the BLUE CANYON observed an illuminated deck and movement on the aft deck of the EMMY ROSE. There were no communications between the EMMY ROSE and the BLUE CANYON during this passing.

Figure 4: Location of EMMY ROSE and BLUE CANYON at 2330 on November 22, 2020.

4.1.9. At 0100 on November 23, 2020, the EMMY ROSE was identified on the Vessel Monitoring System (VMS) to be 27 NM Northeast of Provincetown, MA in position 42° 18' 53.1"N, 069° 33' 7.14"W on a course of 277 degrees at 7 knots. This would be the last VMS position given for the EMMY ROSE.

4.1.10. At 0129, the First Coast Guard District Rescue Coordination Center received a 406 MHz Emergency Position Indicating Radio Beacon (EPIRB) alert registered to the EMMY ROSE. The intial unconfrimed position was at 42° 15' 12" N, 069° 36' 24" W.

4.1.11. At 0130, the first confirmed EPIRB position was received from position 42° 16' 12" N, 069° 38' 18" W, approximately 2.4 NM from the last VMS position of the EMMY ROSE.

4.1.12. At 0154, The First Coast Guard District Search and Rescue Mission Coordinator (SMC) in Boston, MA diverted the Coast Guard Cutter (CGC) VIGOROUS to assist with Search and Rescue efforts.

4.1.13. At 0228, Coast Guard Helicopter (CG-6039) launched from Coast Guard Air Station Cape Cod enroute to the confirmed EPIRB position.

4.1.14. At 0300, CG-6039 arrived on scene and commenced search patterns.

4.1.15. At 0307, CG-6039 located the inflated life raft in position 42° 19' 40.8 N, 069° 39' 9" W. The CG-6039 passed the position to the CGC VIGOROUS.

4.1.16. At 0321, CGC VIGOROUS arrived in the vinicity of the life raft. Upon arrival at the life raft location, the crew reported a strong diesel smell.

4.1.17. At 0326, CG-6039 observed a strobe light located 500 yards from the life raft in a debris field approximately ¼- ½ mile in radius. Upon investigation by CG-6039, the strobe light was confirmed to be the EPIRB. CG-6039 dropped a Self Locating Datum Marking Buoy near the EPIRB.

4.1.18. At 0356, the CGC VIGOROUS launched a rescue boat crew to look inside the life raft; there were no crewmembers found inside the life raft.

4.1.19. At 0403, the EPIRB was recovered by the rescue swimmer of CG-6039 in position 41° 19' 48" N, 069° 39' 24" W. The EPIRB was confirmed to be registered to the EMMY ROSE.

4.1.20. At 0423, the 47-foot Motor Life Boat (CG-47243) from Coast Guard Station Provincetown, MA, got underway, enroute to search area.

4.1.21. At 0603, Coast Guard fixed wing aircraft, C144 (CG-2312), arrived onscene and commenced search.

4.1.22. At 0641, a 600 foot sheen was located in position 42° 18' 58.2" N, 069° 37' 46.8" W.

4.1.23. At 0732, CG-47243 crew recovered the life raft in position 42° 21' 45" N, 069° 43' 39.6" W.

4.1.24. At 0912, the CGC VIGOROUS crew recovered a life ring and two wooden fish hold covers belonging to the EMMY ROSE in position 42° 10' 4.2" N, 069° 28' 60" W.

Figure 5: EMMY ROSE life ring recovered by the U.S. Coast Guard.

4.1.25. At 1722 on November 24, 2020, search and rescue efforts were suspended by the First Coast Guard District SMC. The EMMY ROSE was not located, and all crewmembers of the EMMY ROSE remain missing and are presumed deceased.

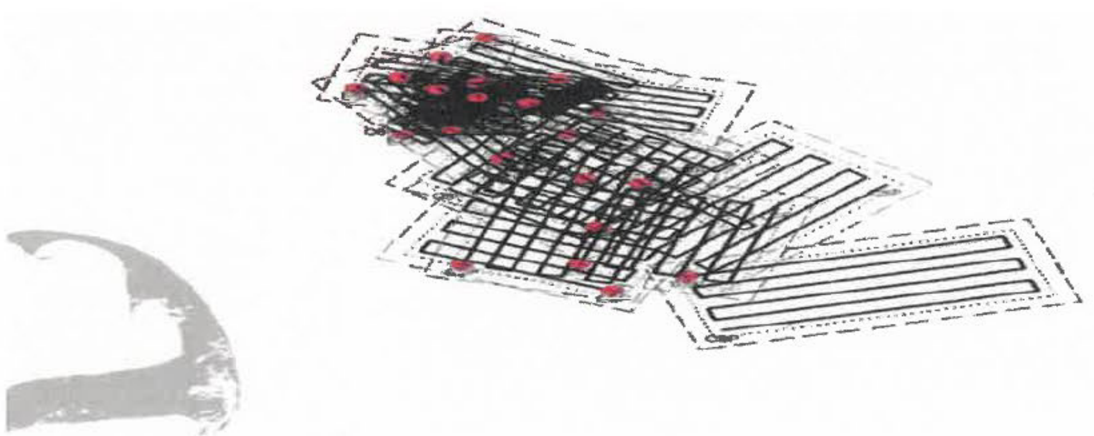


Figure 6: Search patterns completed by Coast Guard Search and Rescue units.

4.2. EMMY ROSE Crew

4.2.1. The vessel manager of the EMMY ROSE has a long history working in the fishing industry. The manger has been working on fishing vessels in all capacities for approximately 35 years and has owned approximately 12 fishing vessels in that time. On May 6, 2020, the manger purchased the SASHA LEE and renamed it the EMMY ROSE and transferred ownership to BOAT AARON & MELISSA, INC.

4.2.2. In July 2020, the manger hired the Captain to operate the EMMY ROSE, he was the only Captain the EMMY ROSE had while it was actively fishing. The manger allowed the vessel Captain to select the vessel's crew.

4.2.3. The manager of the vessel required the crew to sign a contract for employment aboard the EMMY ROSE. Each crewmember had signed the contract, which required the member to agree to refrain from any illegal or unprofessional activity while in the service of the vessel, whether ashore or on board, including but not limited to: refusal or failure to obey a lawful command, desertion, intoxication, use or possession of any alcohol, drugs or narcotics, sleeping on watch, dangerous use of the vessel's gear or equipment, fighting, bringing unauthorized guests onboard, and failure to know and abide by all fishery laws and regulation.

4.2.4. The crewmembers onboard the EMMY ROSE had various amounts of experience working in the fishing industry and had various start dates.

EMMY ROSE Crew Experience

Crewmember	Approximate Years in Industry	Approximate Time onboard
Captain	25	4 Months
Deckhand 1	35	1 Month
Deckhand 2	20	3 Months
Deckhand 3	3	3 Months

4.2.5. U.S. Code and federal regulations exempt vessels of less than 200 GT from compliance with the Officers Competency Certificates Convention, 1936, implemented in 46 USC 8304 and 46 CFR 15. Therefore, the EMMY ROSE was not required to have any crewmember hold a valid Merchant Mariner license or credential.

4.2.6. No crewmembers had ever held Merchant Mariner credentials.

4.3. Weather

4.3.1. The National Weather Service Ocean Prediction Center released their Offshore Waters Forecast for November 23rd at 2140 on November 22nd. The overall synopsis for New England stated that a high pressure currently north of the area will shift northeast of the region tonight into Monday as a strengthening warm front gradually moves northeast across the waters. Developing low pressure will track northeast and pass north of the region Monday and Monday night while pulling a strong cold front east across the waters. Predicted winds and seas were southeast winds 20-30 knots and seas 5 to 8 feet for the evening of Sunday, November 22nd. The afternoon on Monday, November 23rd, called for south to southeast winds 25-35 knots, becoming 20-30 knots with seas 8-14 feet with a chance of rain.

4.3.2. The EMMY ROSE email account received the Offshore Waters Forecast notification email from the National Weather Service at 2210 on November 22nd.

4.3.3. The National Buoy Data Center owns and maintains a data buoy, located 9 NM north of Provincetown, MA (Station 44018). The buoy is approximately 21 miles to the east of the last known position of the EMMY ROSE. At 0040 on November 23, 2020, the weather from the buoy was:

Wind Direction (Dcr)	Wind Speed (knots)	Wind Gust (knots)	Significant Wave Height (feet)	Dominant Wave Period (S)	Average Wave Period (S)	Wave Direction From (Deg)
115	20.7	24.8	4.59	4.76	4.36	83

4.3.4. Coast Guard assets on scene provided observed weather in the last known position of the EMMY ROSE. At 0300, CG-6039 on scene observed 30 knots wind speed, coming from the direction of 150 degrees. The sky condition was overcast and visibility was approximately 4 NM. At 0300, the CGC VIGOROUS reported on scene weather as seas of 2-4 feet with winds at 18 knots.

4.3.5. The CFV BLUE CANYON, which was fishing in the general vicinity of the EMMY ROSE, estimated the weather to be, "nothing that the EMMY ROSE couldn't easily handle." The Captain of the BLUE CANYON described the seas as sloppy but no bigger than 5-8 footers with a wind of approximately 20-30 knots.

4.3.6. Weather data for the last known position at 0100 on November 23, 2020 for the EMMY ROSE was 18 knot winds at 120 degrees and a 5.3 foot significant wave height.

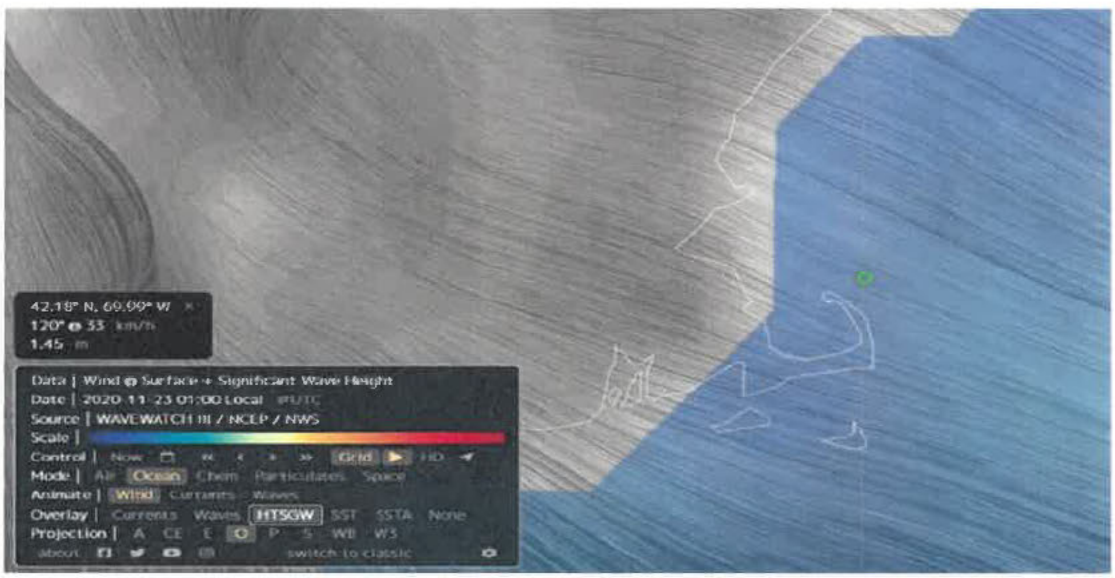


Figure 7: Winds and seas at the last know location of the CFV EMMY ROSE. Image courtesy of www.windy.com

4.4. Vessel History

4.4.1. The vessel was built in New Iberia, LA in 1987. It was built as a Gulf Shrimp style vessel. Gulf Shrimp style vessels are single chine, steel hull, with a raised bow and stern, built to handle the majority of the weight amidships. This is due to the nature of the shrimp fisheries, where nets are deployed over the sides of the vessel, vice the stern, as done in the Northeast ground fishing fleet.

4.4.2. In January 2001 the vessel was sold to Sasha Lee, Inc., homeport was changed to New Bedford, MA and the vessel was renamed the SASHA LEE. With the change in location and fishery, the vessel was then modified to accommodate the regional fishery. Two 7-foot in diameter steel net drums and mounting were added to the stern of the vessel, amongst other various mechanical additions. The port and starboard walkways were closed off and the bulwarks were extended to provide protection from the elements for the crew on the aft deck.


Figure 8: Net reels added to the SASHA LEE in 2001. Image courtesy of Thomas M. Farrell Naval Architects.

4.4.3. In March of 2002, SASHA LEE underwent an incline stability analysis in Fairhaven, MA. The survey was conducted by Thomas M. Farrell Naval Architects. According to their report, the SASHA LEE met the required stability characteristics in all intact stability conditions.

4.4.4. On August 5, 2019, a marine survey was conducted by Marine Safety Consultants, Inc. The survey consisted of two parts: 1) in water survey completed in New Bedford, MA and 2) out of water survey completed in Fairhaven Shipyard, MA. Approximately 80 spot reads on the underwater body were taken. The thickness of the steel of the EMMY ROSE was 3/8th inch (0.375). Readings showed very little overall wastage, the lowest readings were noted along the garboard plate on either side as well as on the transom where there was a low reading of 0.263 with multiple other low similar readings taken below the net drum. The stern of the vessel had three readings taken and all three readings were approximately 30% wastage (see image below). The general overall condition of this vessel was found to be very good. The report stated, "The pilothouse, accommodation spaces and galley still appear brand new, neat, clean and very well maintained. The machinery space was found to be neat and clean, and the vessel is considered fit for service as an offshore ground fish vessel."

Figure 9: SASHA LEE hull during haul out, August 2019. Image courtesy of Marine Safety Consultants.

Transom

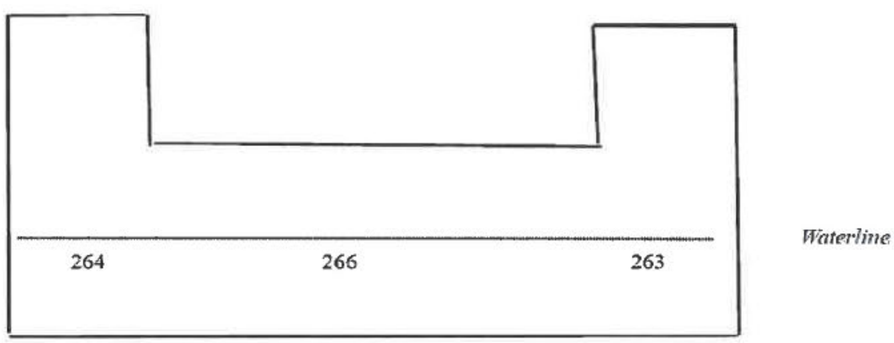


Figure 10. Stern ultrasonic test readings taken during evaluation, Aug 2019. Image courtesy of Marine Safety Consultants.

4.4.5. In May 2020, the vessel was hauled out in Fairhaven, MA to have a survey to ascertain the general overall condition and valuation of the underwater body for insurance underwriting purposes. The survey was conducted accompanied in part by the new manger. The vessel was found to be in very good condition below the waterline. Underwater and anti-fouling coatings were reported to be generally intact and there was little evidence of hull plate doubling or replacement.

4.4.6. In May 2020, the SASHA LEE was sold to BOAT AARON & MELISSA, INC. The vessel's name was changed to the EMMY ROSE and homeport was moved to Westbrook, ME. The EMMY ROSE hailing port was Portland, ME.

4.4.7. On July 21, 2020, a Commercial Fishing Vessel Examination was conducted in Portland, ME by a Third-Party Commercial Fishing Vessel Examiner (see section 4.7). The examiner identified two deficiencies, EPIRB battery expired and no waste management plan. Those deficiencies were corrected, and Commercial Fishing Vessel Decal #20-274319 was issued on July 22, 2020.

4.4.8. On July 30, 2020, the EMMY ROSE embarked on its initial fishing trip under its current owner, BOAT AARON & MELISSA, INC. The EMMY ROSE departed from Portland, ME, to fish in the Gulf of Maine for various ground fish species. The crew was made up of a Captain and three deckhands.

4.4.9. On September 11, 2020, the EMMY ROSE was hauled out at Portland Yacht Services to have the propeller resized to minimize the wear on the engine, as it had been running warm and producing black smoke out the exhaust. The pitch of the propeller was adjusted to 60 inches using heat and a press. All four blades were welded, adding thickness and filling cracks. All blades were reconditioned and balanced.

4.4.10. On November 11, 2020, the trawl doors were replaced with larger doors (approximate weight 1300-1800lbs).

4.4.11. On November 16, 2020, the EMMY ROSE loaded 17 tons of ice, while moored at Vessel Services in Portland, ME

4.4.12. A new stability test was not conducted on the EMMY ROSE.

4.5. Vessel Operational History

4.5.1. The EMMY ROSE completed 12 fishing trips over six months. The average trip lasted between 5-7 days; the vessel would depart Portland, ME and fish in the Gulf of Maine. The vessel would land their catch at Fisherman's Wharf in Gloucester, MA, take on fuel, and then return to Portland, ME. There were three occasions in which the vessel completed a back-to-back fishing trip, often referred to as a "turn and burn."

Vessel name	Permit	Start date	End date	Duration
Emmy Rose	330795	20201118 00:00		
Emmy Rose	330795	20201112 18:50	20201113 02:20	07:30:00
Emmy Rose	330795	20201105 00:20	20201112 11:50	7 11:30:00
Emmy Rose	330795	20201102 19:25	20201103 03:55	08:30:00
Emmy Rose	330795	20201026 22:30	20201102 13:30	6 15:00:04
Emmy Rose	330795	20201021 22:20	20201022 05:20	07:00:00
Emmy Rose	330795	20201015 21:35	20201021 16:57	5 19:22:10
Emmy Rose	330795	20201009 02:04	20201015 10:35	6 08:30:44
Emmy Rose	330795	20201004 17:08	20201005 00:08	07:00:00
Emmy Rose	330795	20200929 22:18	20201004 12:18	4 14:00:36
Emmy Rose	330795	20200923 22:57	20200929 08:28	5 09:30:40
Emmy Rose	330795	20200920 20:12	20200921 03:42	07:30:00
Emmy Rose	230795	20200914 18:51	20200920 11:52	5 17:00:40
Emmy Rose	330795	20200910 16:18	20200910 23:48	07:30:00
Emmy Rose	330795	20200904 21:57	20200910 10:28	5 12:30:40
Emmy Rose	330795	20200901 16:37	20200901 23:37	07:00:04
Emmy Rose	330795	20200827 00:41	20200901 08:12	5 07:30:40
Emmy Rose	330795	20200825 15:01	20200825 22:31	07:30:04
Emmy Rose	330795	20200819 01:40	20200825 07:41	6 06:00:44
Emmy Rose	330795	20200815 16:15	20200816 00:15	08:00:00
Emmy Rose	330795	20200808 20:09	20200815 04:30	6 08:20:48
Emmy Rose	330795	20200805 18:54	20200806 02:24	07:30:00
Emmy Rose	330795	20200730 13:58	20200805 07:14	5 17:15:44

Figure 11: EMMY ROSE underway trips since new ownership in May 2020. Image courtesy of NOAA, 2021.

4.5.2. The EMMY ROSE always had a four-person crew (1 Captain and 3 deckhands). The Captain was hired by the vessel manager and the Captain was responsible for hiring the crew. There had only been one Captain of the EMMY ROSE under the most recent ownership. The crew was paid a share, based upon experience and workload.

4.5.3. Over their 12 previous trips, their average catch for those trips was approximately 36,369 pounds of assorted ground fish. The largest offload of ground fish from the EMMY ROSE was 50,150 pounds. The vessel was estimated to be able to hold over 100,000 pounds of fish in the fish hold.

4.5.4. In between trips, the shore engineer would conduct maintenance on the vessel. The shore engineer would be left a written note by the Captain, identifying what maintenance tasks needed to be completed. While onboard, the shore engineer would, at times, test the engine room and fish hold bilge alarms. He would test them by lifting the float on the high-water alarm in each space. The shore engineer had never gone into the lazarette to do the bilge alarm test. He was unaware of how the lazarette bilge alarm was tested as he reported it was done by the crew.

4.5.5. The vessel did not have a Safety Management System nor logs to document the testing of alarms and inspection of lifesaving appliances.

4.5.6. The owner and manager were not aware of any emergency drills that were conducted, nor did they know who the qualified drill conductor was. They left this to the Captain of the vessel and stated that he determined when they should be completed. Although there was no regulatory requirement to log drills, the Third-Party Examiner provided the vessel with a log book, which was not utilized by the crew. Previous crew members stated that new crew would receive an orientation to the vessel, but no drills were ever conducted aboard the EMMY ROSE, while they were aboard.

4.5.7. The vessel did not have a drug policy in place for the Captain or crew. The owner stated that it was up to the Captain to drug test the crew if he so desired. It was observed by previous persons who had sailed onboard the EMMY ROSE, that some of the crew would frequently be smoking what appeared to be marijuana while onboard.

4.5.8. Prior to departure, the vessel would typically load approximately 15 – 18 tons of ice and miscellaneous supplies from Vessel Services in Portland, ME. The crew would ice the 10 fish hold pens, as well as ice the floor, because the fish hold did not have a refrigeration unit.

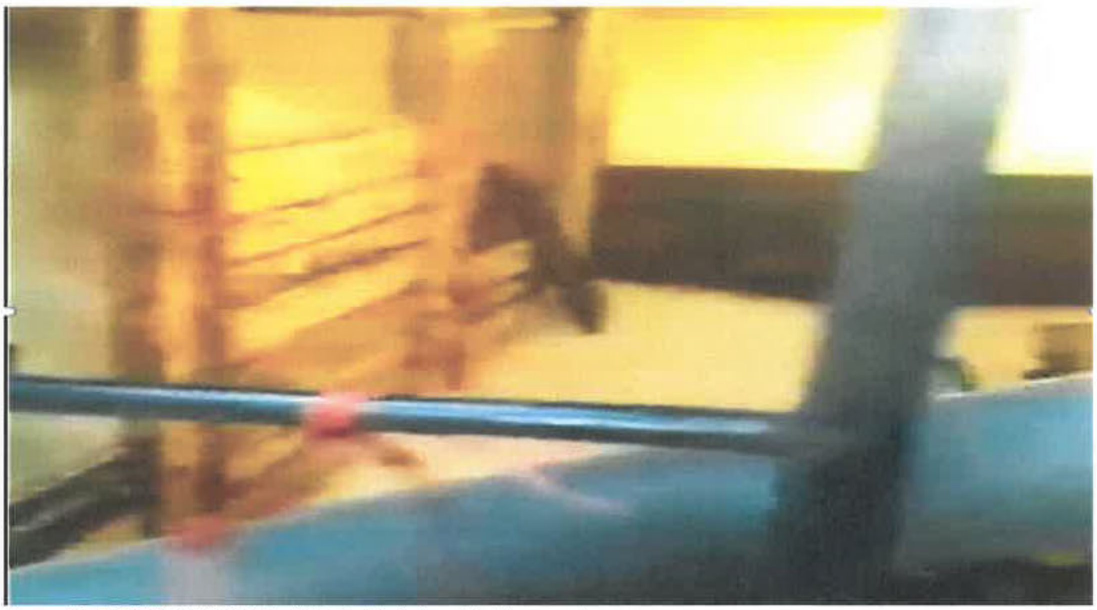


Figure 12: EMMY ROSE fish hold during the icing of the floors and pens.

4.5.9. The vessel would then depart the pier and head for the fishing grounds. The crew would deploy the outriggers once they cleared the harbor.

Figure 13: EMMY ROSE departing Portland Harbor.

4.5.10. There are no regulatory requirements for watchstanding, manning, or work rest hour restrictions for commercial fishing vessels. There was no set watch rotation for the crew. The Captain would determine the watch and rest rotation based upon the fishing cycle.

4.5.11. During fishing operations, the Captain was normally at the helm, except when deploying and hauling back the nets, where he would transfer control to the aft control station located on the back deck.

4.5.12. It is common for Captains of fishing vessels to talk on the VHF radio, satellite phone, and communicate via email, engaging in cooperative fishing discussion as well as vessel status and weather conditions, as was done on this final fishing trip. The Manager would keep in contact with the vessel via email and satellite phone while it was underway. No notification of any abnormal issues or problems were made to the Manager or any other fishing vessels with which they had conversations with during the final trip.

4.5.13. Once the nets were deployed, the vessel would drag for approximately 3-4 hours. It was noted that there were times when the EMMY ROSE Captain had fallen asleep at the helm, allowing the nets to drag for too long, causing damage to the nets.

4.5.14. Once ready to recover the nets, the Captain would transfer back to the aft control station and haul back the nets. The crew would begin to process the catch on deck and once cleaned, the fish would then be lowered down into the fish hold, where they were put in pens, sorted by species. Depending on the size of the catch, this process would take a few hours. Once the nets were clear of fish, they would go right back into the water and the dragging process would start all over again.

4.5.15. Persons who had previously sailed aboard the EMMY ROSE stated that fishing would be constant all day and night throughout the trip with little to no rest for the Captain and crew. It was noted that the vessel would operate on autopilot for most of the voyage.

4.5.16. The Captain of the vessel would handle all engine room and welding duties while underway. He was said to be a very experienced engineer and welder. He would routinely weld on the trawl doors to build up the worn shoes of the doors.

4.5.17. It was stated that various bilge alarms would sound throughout the trip and would be silenced by the crew.

4.5.18. Typically, when the vessel completed its last haul and was headed back into Gloucester, MA to offload, the crew would clean the deck and prepare for offload. Once cleanups were complete, it was typical for the Captain to be at the helm with the autopilot on and throttles set at approximately 6-8 knots. The crew were allowed to do as they wanted.

4.5.19. The EMMY ROSE would burn between 550-600 gallons of fuel per day while underway fishing. It was known that the vessel had loaded 4,297 gallons of fuel in Gloucester, MA on November 12, 2020. It was stated that the Captain usually fills the two fuel tanks to approximately 3/4 full, which is approximately 11,250 gallons. It is unknown the exact amount of fuel on the vessel at the time of the casualty; however, it is estimated there was approximately 6,000 gallons onboard the vessel.

4.5.20. During the return trip, it was common practice for the Captain to transfer fuel between the wing tanks to help control the list of the vessel. It was also necessary to transfer fuel to the starboard tank from the port tank to ensure there was enough fuel to supply the engine for the return voyage to Gloucester, MA. The EMMY ROSE did not have fuel oil transfer procedures required for all vessels capable of carrying more than 10,500 gallons as required by 33 CFR Part 155. It was reported that on two separate prior occasions, the Captain began a fuel transfer and would not actively monitor the transfer. In these two specific instances, excessive fuel was transferred between tanks which caused a severe list to starboard, which woke the crew. On both occasions, the crewmembers found the Captain asleep in his bunk while the transfer was in progress. On both occasions the list was so severe that the water was coming over the starboard bulwark with the aft deck awash. The lists were corrected by transferring enough fuel back to the port wing tank to stabilize the vessel. Both previous crewmembers who reported the condition stated they would never sail with the Captain again.

4.5.21. Once the EMMY ROSE arrived at Fisherman's Wharf in Gloucester, the crew would offload their catch and then get fuel from Felicia Oil Co, Inc. Depending on the fishing and the price, the Captain would determine if they were going to head back to Portland, ME or out for a second trip, turn and burn, which was going to be the case on this final trip.

4.6. Vessel Profile / General Arrangement

4.6.1. The vessel was modified from a Gulf shrimp side trawl to a stern trawl style vessel after it was sold to SASHA LEE Inc. in 2001. The vessel was a flush deck Gulf shrimper style welded steel hull vessel with a raked stem, single hard chine and displacement hull configuration. The EMMY ROSE was said to have a "banana" shape where the amidship is lower than the bow and the stern. The vessel was fitted with a round pipe mast supported to port and starboard, fore and aft, with round pipe braces. The mast was fitted with yardarm with cradles for stowage for the outriggers.

Figure 14: EMMY ROSE in Portland Harbor, taken after May 2020.

4.6.2. The port and starboard walkways were closed, forming stowage areas and the overhead was extended aft on the cargo deck area forming a sheltered area for the trawl winches. Aft on the work deck are port and starboard pillar style gallows. The structure is braced aft and supports the twin hydraulic net reels, which are suspended over port and starboard net ramps built into the vessel's transom. Sometime after 2001 modifications were made to the vessel's twin hydraulic net reels. It appears an additional 24" of reel was added to the vessel on each side.


Figure 15: EMMY ROSE aft deck, facing the bow. Image courtesy of Atlantic Brokerage, 2019.


Figure 16: EMMY ROSE trawl net reels. Image courtesy of Atlantic Brokerage, 2019.

4.6.3. The superstructure, consisting of the raised pilothouse forward is stepped up and raised over a storage area between its deck and the main deck. The pilothouse is fitted with seven forward facing Lexan windows and three aft facing which provide a view of the roof of the accommodation space and a restricted view of the aft working deck. Access to the pilothouse is through the port and starboard watertight doors or from the internal ladder from the accommodation space.

Figure 17: EMMY ROSE pilothouse. Image courtesy of Atlantic Brokerage, 2019

4.6.4. The accommodation spaces for the crew are located on the main deck below and aft of the pilothouse. Accommodations consist of a 4-bunk room on the starboard side aft of the pilothouse, the crew's head on the port side aft of the pilothouse followed aft on the port side by a 2-man bunk room. All the way aft is the galley area, with a watertight door on the port side aft leading to the work deck. This port side aft watertight door is the only immediate access to the aft working deck.


Figure 18: EMMY ROSE accommodation space, facing aft. Image courtesy of Atlantic Brokerage, 2019.

4.6.5. The cargo deck area forward is fitted with port and starboard Pine Hill seven piston hydraulic trawl winches. Each drum holds 400 fathoms of 7/8" trawl wire. The wire is led directly aft of the port and starboard gallows frame. This forward winch area is sheltered by an extended O1 deck level above. The control for the trawl winches is a control panel located on the centerline between the winches.

Figure 19: EMMY ROSE, aft control station. Image courtesy of Atlantic Brokerage, 2019.

4.6.6. The hydraulic port and starboard boom winches are located on the O1 deck. The O1 deck also houses the mast, which is constructed of 12" diameter round steel fitted with a single crosstree with cradles for the port and starboard outriggers.

4.6.7. The haul back area aft is fitted with 36 ½" steel bulwarks which are constructed of 5/8" steel plate at the landing area bulwark. Forward of the landing area, the bulwarks rise to meet the O1 deck level, forming a shield for the cargo deck area port and starboard sides. The aft deck of the vessel houses three hatches which provide access to the lazarette, fish hold, and engine room.

Figure 20: EMMY ROSE haul back area. Image courtesy of Atlantic Brokerage, 2019.

4.6.8. The lazarette is the furthest aft access which is accessed through a 6" high x 24" x 24" steel coaming located centerline aft and is fitted with a steel cap resting on the knife edge (not watertight). Within the lazarette are the hydraulic ram steering system, a high-water alarm, and a bilge suction from the engine room pumping system.

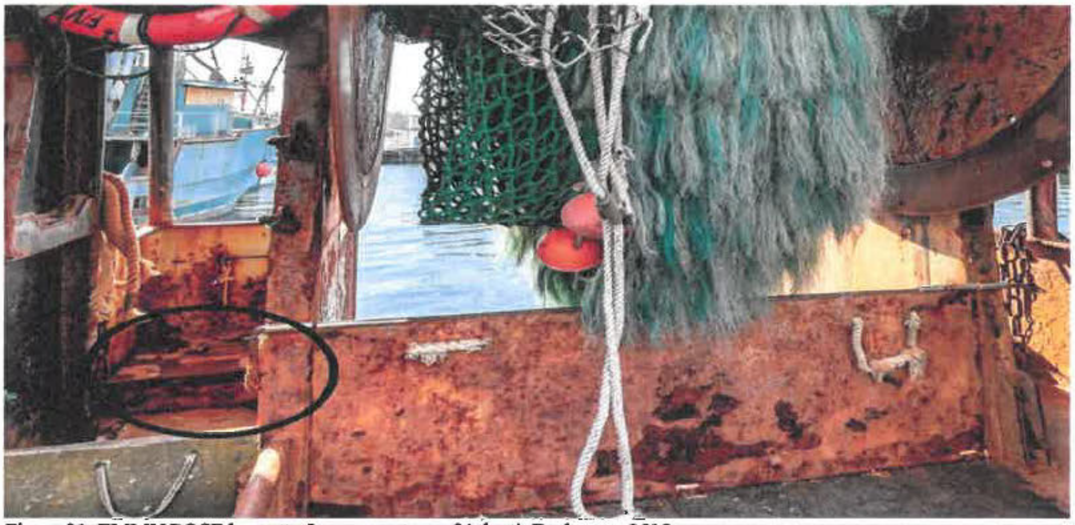


Figure 21: EMMY ROSE lazarette. Image courtesy of Atlantic Brokerage, 2019.

4.6.9. The main hold is the fish hold which is located directly aft of the engine room, which can be accessed through a 32" high x 46" x 48" steel raised coaming. The hold is weathertight, secured with a two-piece stainless-steel cover, which is then covered with two wooden removable covers. The fish hold is subdivided into twelve individual two tiered pens. The stuffing box for the shaft through hull penetration is housed in the bilge of the fish hold. This area is fitted with a high-water alarm and bilge suctions from the engine room pumping system.

Figure 22: EMMY ROSE fish hold hatch. Image courtesy of Atlantic Brokerage, 2019.

Figure 23: EMMY ROSE fish hold, looking aft. Image courtesy of Marine Safety Consultants, 2019.

4.6.10. The door to the engine room is located on the port side of the forward bulkhead of the aft deck. The engine room houses the main propulsion system, two diesel generators, and four pumps for the bilge manifold.

Figure 24: EMMY ROSE engine room door. Image courtesy of Atlantic Brokerage, 2019.

4.6.11. Vessel propulsion is provided by a single Caterpillar Model 3412 marine diesel engine rated at approximately 624 HP at 1800 RPMs. This 12-cylinder engine is turbocharged, after cooled with cooling provided by a keel cooler. It is electrically started and fitted with a dry vertical exhaust.

Figure 25: EMMY ROSE Maine Diesel Engine, looking aft. Image courtesy of Atlantic Brokerage.

4.6.12. Primary AC power is provided by a Caterpillar Model 3304 four-cylinder marine diesel engine directly coupled to a 65 kW 220V AC generator unit at 1800 RPMs. This engine is electrically started, keel cooled and fitted with a dry vertical exhaust. Also provided for electrical power is a Detroit Diesel Model 2-71 marine diesel engine coupled directly to a Delco 20 kW 230V AC generator unit at 1200 RPMs. This engine is keel cooled, electrically started and fitted with dry vertical exhaust.

Figure 26: EMMY ROSE generator set, looking forward. Image Courtesy of Atlantic Brokerage.

4.6.13. The hull of the vessel features a raked stem with a single hard chine in a displacement hull configuration. Propulsion is provided by a four-blade bronze propeller set on a 6" shaft. There is a semi-balanced steel rudder that is skeg hung. At the transom there are port and starboard net drum ramps. On the port side there is a single Fernstrum keel cooler that is protected by a steel guard. On the starboard side there another Fernstrum keel cooler protected by a steel guard.

Figure 27: EMMY ROSE port side hull. Image courtesy of Marine Safety Consultants, 2019.

Figure 28: EMMY ROSE running gear. Image courtesy of Marine Safety Consultants, 2019

4.6.14. The EMMY ROSE fuel storage consists of port and starboard wing tanks located in the engine room with a total capacity of 15,000 gallons. Each tank is filled and vented from the main deck level. The fuel system is fitted with hard piping and flexible rubber hoses with all equipment provided with Racor filter separator units. There is a fuel transfer pump located on the starboard fuel tank that was estimated to pump 26 gallons per minute. The transfer pump was used to transfer fuel between the tanks for both fuel supply and to control the vessel's list. The main engine is typically supplied from the starboard side tank and returns to the port tank.

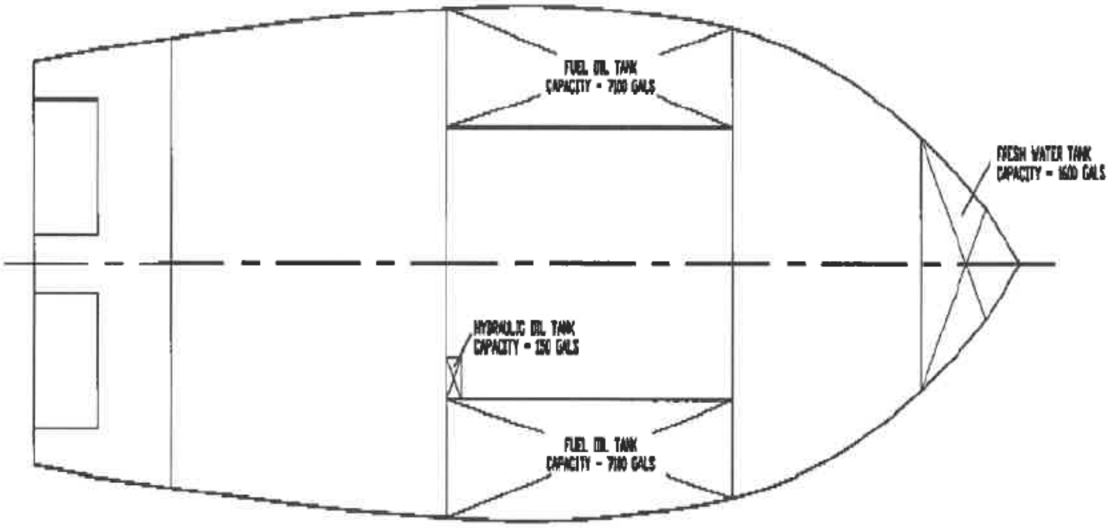


Figure 29: EMMY ROSE tank capacity plan. Image courtesy of Thomas M. Farrell Naval Architects, 2002.

4.6.15. Hydraulic oil is stowed in a bilge tank located in the aft port side of the forward engine space. The capacity is approximately 300 gallons.

4.6.16. A lube oil storage tank is in the engine room. The tank capacity is approximately 160 gallons.

4.6.17. Fresh water is stowed in the forepeak with a capacity of approximately 1600 gallons.

4.6.18. A Type III Marine Sanitation Device is equipped on the vessel. Tank capacity is approximately 40 gallons.

4.6.19. Main bilge pumping capacity is provided by three (3) Baldor 3HP electrically driven Flomax 2" bilge and washdown pumps. The bilge system is fitted with two (2), three-valve independent manifolds. The port manifold is pressurized with two pumps and the starboard manifold with one pump. The bilge manifold was labeled in Portuguese.

Figure 30: EMMY ROSE bilge manifold system. Image courtesy of Marine Safety Consultants.

4.6.20. The engine room, fish hold, and lazarette are fitted with high water bilge alarms with audible and visual alarms in the pilothouse. A Murphy alarm system was used for the bilge alarms.

4.6.21. The vessel is fitted with eight handheld portable fire extinguishers and a deck wash-down system that may be used for firefighting purposes in an emergency.

4.6.22. The lifesaving equipment aboard the vessel consists of:

4.6.22.1. Life raft: (1) New Wave 6-person, SOLAS A pack
4.6.22.2. EPIRB: (1) ACR SatFind RLB32 406 ADCD021D614401
4.6.22.3. (4) Personal Survival suits
4.6.22.4. Distress signal kits: (6) Handheld, (3) Rockets, (3) Buoyant smoke
4.6.22.5. Life ring buoys: (3) life rings with line, one (1) with a light
4.6.22.6. First aid kit: (1) in wheelhouse

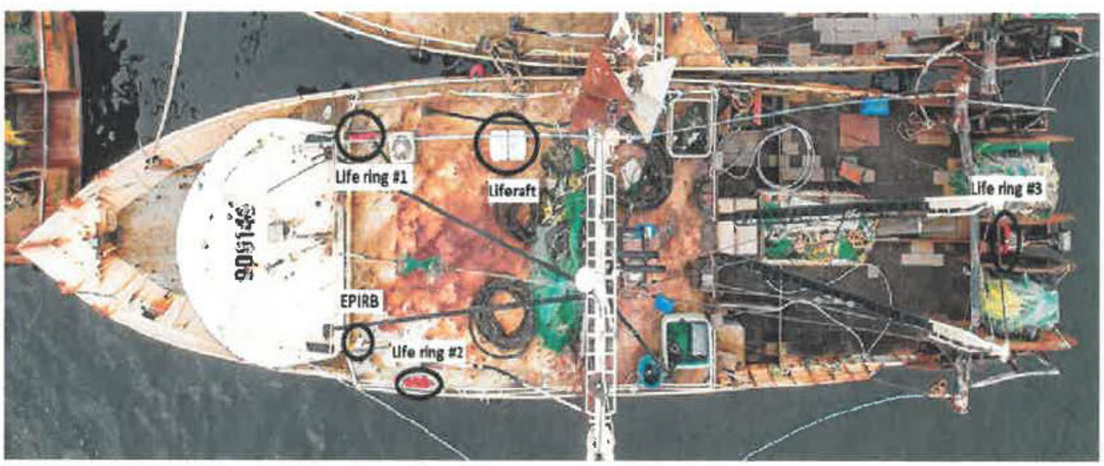


Figure 31: EMMY ROSE on deck lifesaving equipment. Image courtesy of Atlantic Brokerage.

4.6.23. All recovered lifesaving equipment, life ring buoy, EPIRB and life raft were inspected post casualty and had functioned properly. Both the EPIRB and life raft were deployed hydrostatically, meaning that no crewmember deployed either device.

4.6.24. The vessel is fitted with navigation and communication electronics equipment to include the following: two radars, two GPS navigation systems, three VHF radios, one SSB radio, one Automated Identification System (AIS), one autopilot, one compass, three computers and one satellite telephone.

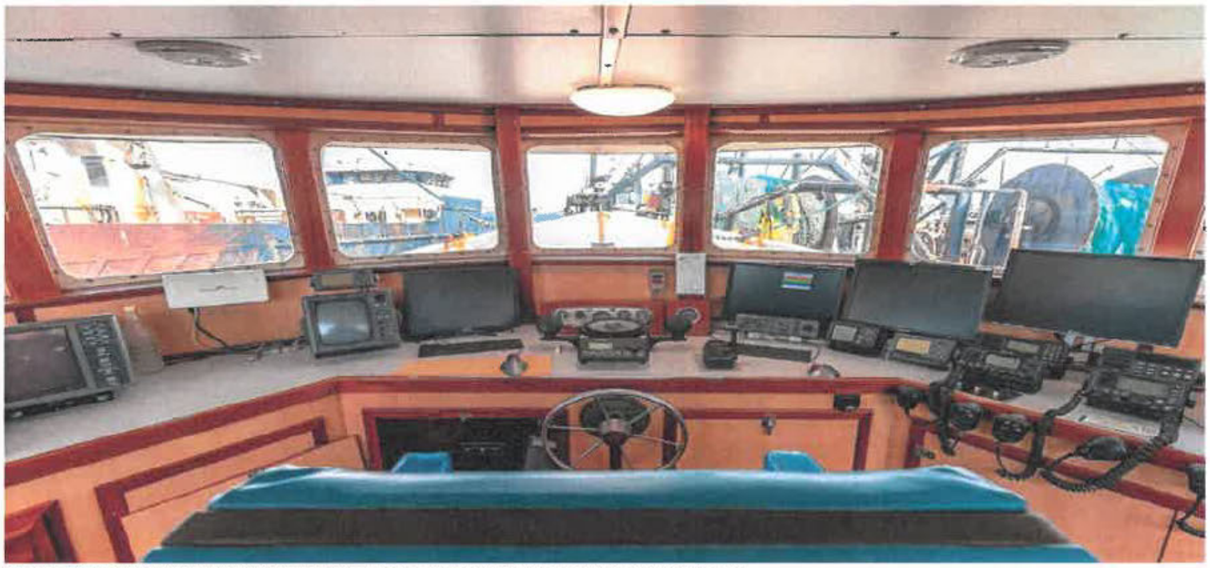


Figure 32: EMMY ROSE Pilot House Electronics. Image Courtesy of Atlantic Brokerage.

4.6.25. The autopilot only controls rudder direction and is not tied into the engine for speed control.

Figure 33: EMMY ROSE autopilot. Image Courtesy of Atlantic Brokerage.

4.6.26. A segregated 12V DC power supply, with Phase III charger, is supplied for emergency communications.

4.6.27. The vessel is fitted with a CCTV camera system that monitored the aft deck and engine room.

4.7. Regulatory Oversight / Commercial Fishing Vessel (CFV) Examination History

4.7.1. The EMMY ROSE operated as a CFV, primarily engaged in Northeast ground fisheries. The vessel also fished for lobsters while engaging in ground fisheries.

4.7.2. The EMMY ROSE held a valid Coast Guard Certificate of Documentation (COD) issued on May 18, 2020, in accordance with 46 Code of Federal Regulations (CFR) Part 67- Documentation. The COD listed Fishery as its only endorsement.

4.7.3. As a fishing vessel less than 200 Gross Tons (GT), the EMMY ROSE was not subject to Coast Guard inspection and certification or manning and licensing requirements. Title 46 United States Code (USC) 3301 and 3302 exempts fishing vessels from inspection and certification requirements.

4.7.4. Title 46 CFR 28 final rule became effective on September 15, 1991. The Coast Guard issued the regulations for U.S. documented or state numbered uninspected fishing, fish processing, and fish tender vessels to implement provisions of the Commercial Fishing Industry Vessel Safety Act of 1988, codified in 46 USC 4501-4508. The intent of these regulations is to improve the overall safety of commercial fishing industry vessels, and to reduce CFV fatalities and losses. These regulations provide requirements for the equipment, design, and operations of vessels, and include provisions for lifesaving, firefighting, navigation, communication, emergency instructions, and stability which includes righting energy criteria and freeing port clearing area

4.7.5. As a commercial fishing vessel with a fuel capacity of 250 or more barrels (10,500 gallons), the EMMY ROSE is required to comply with 33 CFR 155 Subpart C. A letter designating a Person in Charge (PIC) of the transfer of fuel was required. The designated PIC should have received sufficient formal instruction from the operator or agent of the vessel to ensure their ability to safely and adequately carry out the duties and responsibilities of the PIC.

4.7.6. As a CFV engaged in catching operations, the EMMY ROSE is subject to the federal regulatory requirements of Title 46 CFR Subchapter C- Uninspected Vessels, Part 28- Requirements for Commercial Fishing Industry Vessels. The intent of these regulations is to improve the overall safety of commercial fishing vessels and to reduce fatalities and casualties. Regulations in this subchapter include provisions for lifesaving, firefighting, navigation, communication, dewatering systems and emergency instructions/drills.

4.7.7. The Coast Guard Authorization Act of 2010 and the Coast Guard and Maritime Transportation Act of 2012 both amended 46 USC Chapter 45- Uninspected Commercial Fishing Industry Vessels. It amended 46 USC 4502(f) requiring vessels that operate three NMs beyond the shore must complete a Coast Guard dockside safety examination no later than October 15, 2015. The safety examination must be completed at least once every five years.

4.7.8. COMDTINST 16711.13B, Implementation of the Commercial Fishing Industry Vessel Regulations, directs dockside safety examiners to use the CFV Safety Examination Booklet, CG-5587. This booklet assists examiners to document exams by providing a comprehensive listing of regulations in a simple checklist format. The instruction indicates the booklet is self-explanatory and lets the examiner and fishing vessel operator know exactly which regulations are applicable, complied with, and whether there are any deficiencies.

4.7.9. The CFV Safety Examination Booklet, CG-5587, under certain checklist items, references and directs dockside safety examiners to utilize the supplement, CG-5587B. The supplement provides additional checklist items, including requirements based on tonnage, operating area, alteration or conversion date, and pollution prevention requirements.

4.7.10. If deficiencies are noted during the exam, the examiner shall advise the operator of the deficiency and document it in writing using the examination form and encourage the operator to correct all deficiencies as soon as possible. Coast Guard examiners document the results of the dockside safety exam into the Coast Guard MISLE database, under a fishing vessel examination activity.

4.7.11. Coast Guard regulations contained within 46 CFR 28.73 and 28.76 and policies detailed in NVIC 13-91, Fishing Industry Vessel Third Party Examinations and Procedures for Designation of "Accepted Organizations" and "Similarly Qualified Organizations, NVIC 13-91 (CH-1), and Commandant Office of Compliance (MOC) Policy Letter 04-07 establish the Third-Party Examiner Program. Under the program, designated third party examiners (third party surveyor) are authorized to conduct periodic voluntary dockside safety examinations upon the request of the vessel owners. Accepted organizations or similarly qualified organizations request designation from Coast Guard Commandant to carry out dockside safety examinations.

4.7.12. Title 46 CFR 28.73 states, when submitting an application to the Coast Guard for authorization as an accepted organization, the organization must verify that its surveyors are familiar with CFV requirements, operations and equipment. The organization must also verify that it is an organization with a Code of Ethics, whose only interest in the fishing vessel industry is in ensuring the safety and surveying of CFVs, has procedures for accepting and terminating membership, has minimum professional qualifications for surveyors, and maintains a roster of present and former accepted members and surveyors.

4.7.13. Coast Guard MOC Policy Letter 04-07 states, accepted third parties must maintain a list of surveyors for the past five years. Newly qualified examiners are supposed to notify Coast Guard District fishing vessel coordinators prior to conducting examinations within their area. In addition, the policy authorizes a Coast Guard Officer in Charge Marine Inspection to remove an examiner from the list for cause.

4.7.14. Coast Guard Headquarters / COMDT CG-CVC-3 (Office of Commercial Vessel Compliance- Fishing Vessels) maintains a list of accepted organizations. Currently, the list includes the National Association of Marine Surveyors, Inc. (NAMS), NAVTECH/U.S. Surveyors Association (NAVTECH/USSA), Bowditch Marine, Inc. and Society of Accredited Marine Surveyors (SAMS).

4.7.15. SAMS was the third party examiner authorized to conduct periodic voluntary dockside examinations of the EMMY ROSE. COMDT CG-CVC-3 first accepted SAMS as a designated third-party organization in a letter dated September 20, 1993. In a letter dated August 22, 2017, CG-CVC-3 acknowledged SAMS' continuation as a designated organization.

4.7.16. SAMS maintains a Fishing Vessel Examiner Qualification Process for its member surveyors to issue reports and Coast Guard examination decals. SAMS maintains a roster of their accepted surveyors on their webpage at www.marinesurvey.com.

4.8. SASHA LEE / EMMY ROSE Dockside Safety Examination History

4.8.1. The SASHA LEE / EMMY ROSE has participated in the Dockside Safety Examination Program since 2002. The vessel completed a safety exam and was issued a safety decal in 2002, 2004, 2005, 2007, 2009, 2011, 2012, 2013, 2015, 2017 and 2020.

4.8.2. Between 2002 and 2017, Coast Guard Commercial Fishing Vessel Safety Examiners (CFVSE) conducted dockside safety examinations on the SASHA LEE and issued examination decals (years '02, '04, '05, '07, '09, '11, '12, '13, '15 and '17). A third-party examiner from SAMS, an accepted organization, conducted the last dockside safety examination on July 21, 2020 and an examination decal was issued on July 22, 2020.

4.8.3. During the last dockside safety examination, two deficiencies were identified: 1) an expired EPIRB battery; and 2) no waste management plan.

4.8.4. Supplement 3 of CG-5587 is required to be used for vessels that have the capacity to carry more than 10,500 gallons of oil or hazardous materials. The EMMY ROSE is fitted with two, 7,500-gallon fuel tanks, totaling 15,000 gallons. The third-party surveyor entered "No" to the checklist section of the examination form corresponding to Pollution Prevention- vessel capacity to carry more than 10,500 gallons of oil or hazardous materials.

4.8.5. During the exam, the third-party examiner wrote the name of the qualified drill conductor on the CG-5587. The examiner did not verify the name by looking at the drill conductor card. Neither the owner nor the manager knew who the person was that the third-party examiner had written down.

4.9. Marine Safety Center Analysis

4.9.1. The investigation team provided documents to the Coast Guard Marine Safety Center (MSC) to aid in the creation of an accurate computer-generated hull model for the stability analysis. For the creation of the hull model, line plans from 2002 were used to create a 3-D model in Rhinoceros software. MSC then exported the Rhinoceros model to General Hydro Statics (GHS) software for stability analysis (Appendix).

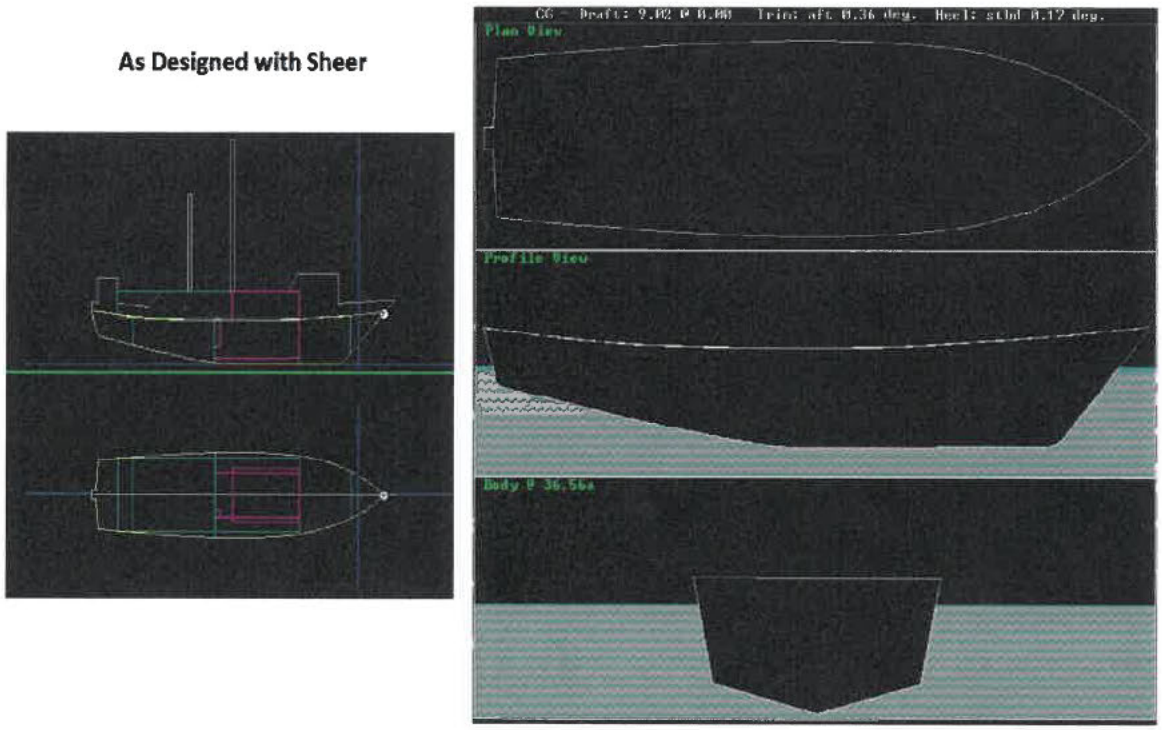


Figure 34: MSC recreation of EMMY ROSE as designed with sheer.

4.9.2. Using the data from the 2002 stability test with the computer model, MSC calculated the vessel's lightship characteristics (vessel weight and center of gravity). The calculated lightship characteristics were within 2% of those calculated in the 2002 analysis thus verifying the model's characteristics below the waterline.

4.9.3. MSC identified possible down flooding points based on photographs with estimated locations and information provided in the 2002 stability test.

4.9.4. Using testimony regarding normal operation of the vessel, they were able to establish loading conditions to cover the range of loads the vessel would encounter during routine operations:

4.9.4.1. Loading conditions 1 through 7 covered departure, mid voyage with different cargo loads, and arrival with different cargo loads, all of which matched those of the 2002 stability analysis for comparison.

4.9.4.2. Loading condition 8 accounted for port arrival after a long transit without fishing.

4.9.4.3. Loading condition 9 represented the loading condition at the time of incident based on all available information.

4.9.4.4. Based on previous crewmember testimony of the fuel transfer operation conducted as common practice by the Captain, loading condition 10 represents a fuel load difference of ¼ tank between port and starboard fuel tanks.

4.9.4.5. Loading condition 11 represents a fuel load difference of ½ tank between port and starboard fuel tanks.

4.9.5. Serving as an uninspected fishing vessel, EMMY ROSE was subject to 46 CFR Subchapter C regulations for stability requirements. The applicable stability criteria at the time of the incident used in the analysis is 46 CFR 28.565 Water on Deck, 46 CFR 28.570 Intact Righting Energy, and 46 CFR 28.575 Severe Wind and Roll.

4.9.6. Based on the analysis, the vessel lacked sufficient stability in all load conditions, specifically at the time of incident, per the regulatory criteria in 46 CFR Subchapter C. The limiting criteria in all cases was 46 CFR 28.570 Intact Righting Energy. At the time of incident, the vessel failed by 20% or more in each failure of this criteria. The failure percentage exceeds any expected differences from the assumptions made in the analysis, therefore indicating the vessel lacked sufficient stability per the regulatory standards. Although failure of the criteria does not necessarily indicate capsize, the likelihood is increased. Additionally, any off center loading or weight shifts that would cause a list would have reduced the vessel's stability further. This could be caused by large shifting weights on deck, shifting catch in the fish hold, or internal liquid transfers. The lack of sufficient drainage could also cause entrapment or pocketing of water on deck, producing a heeling moment and list.

4.9.7. MSC also evaluated 46 CFR 28.580 "Unintentional Flooding" stability criteria considering flooding in each of the three watertight compartments at the request of the investigation team. Unintentional flooding criteria was not required since the vessel was built before September 15, 1991. The vessel fails the damage criteria with any of the three compartments flooded. It is important to note that a failure of the stability criteria does not necessarily mean the vessel capsizes but rather has inadequate stability according to the regulations. However, when the forward auxiliary/engine room compartment or aft fish hold compartment floods, the result is capsize. When the aft lazarette compartment floods, the vessel remains afloat with a significant aft trim.

4.10. Side Scan Sonar Operation

4.10.1. Klein, a MIND Technology Business, was requested by the National Oceanic and Atmospheric Administration (NOAA), U.S. Coast Guard (USCG) and the National Transportation Safety Board (NTSB) to conduct a side scan sonar search for the fishing vessel EMMY ROSE.

4.10.2. The MIND Technology team worked closely with the USCG, NTSB and NOAA in analyzing the vessel positional information to define search blocks for the survey. This analysis resulted in two search blocks being defined: Block 1 covering 26 km² and Block 2 covering 10 km². The survey lines were numbered in the order in which they were planned to be acquired.

4.10.3. The side scan sonar search plan was based on using a scan range of 200 m (producing a 400 m wide seafloor swath) and survey lines were spaced 350 m apart to ensure sufficient coverage of adjacent swaths.

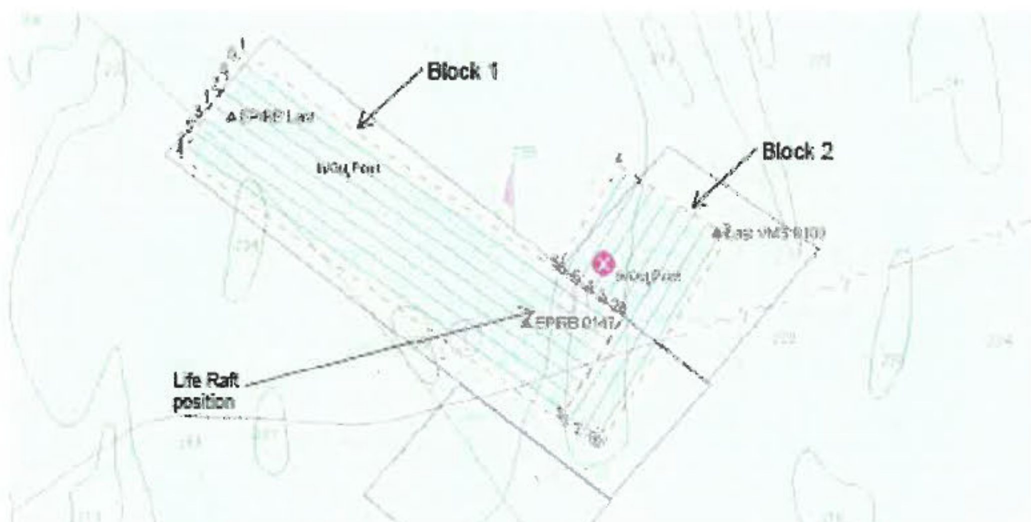


Figure 35: Chart of MIND Technology's survey Blocks (red dashed lines) and survey line plan (blue lines) in relation to the Last VMS position of the EMMY ROSE, EPIRB position at 0147 and the last EPIRB position at 0302. The NTSB proposed search blocks are presented as purple lines. Image courtesy of MIND Technologies.

4.10.4. The side scan sonar search for the EMMY ROSE was conducted off NOAA's vessel RV AUK over the period May 17-21, 2021. RV AUK is a 15 m long aluminum foil-assisted, research catamaran with a beam of 5.6 m and a draft of 1.4 m.

Figure 36: NOAA's RV AUK in Scituate Harbor, MA. Image courtesy of MIND Technologies.

4.10.5. A Klein 4000 (100 kHz/400 kHz) and prototype Klein 4K-SVY (300 kHz/600 kHz) side scan sonars were mobilized onto the RV AUK.

Figure 37: Klein 4000, primary side scan sonar used for search for EMMY ROSE. Imagery courtesy of MIND Technologies.

4.10.6. The RV AUK was mobilized on May 17 & 18 with sonar trials and crew training being performed off Scituate, MA on May 18. The EMMY ROSE search began on May 19 and was completed by May 20 with the acquisition of high-resolution side scan sonar data over the wreck site.

4.10.7. The EMMY ROSE was located on the 4th survey line after 6.5 hours (39.9 line km) of the side scan sonar search on May 19 at 1415. The wreck site is approximately 3.5 NM west (274.5°) of the last VMS position at a depth of 794 feet. The WGS84 coordinates of wreck site are: 42° 19' 08.1067" N 069° 37' 50.7668" W.

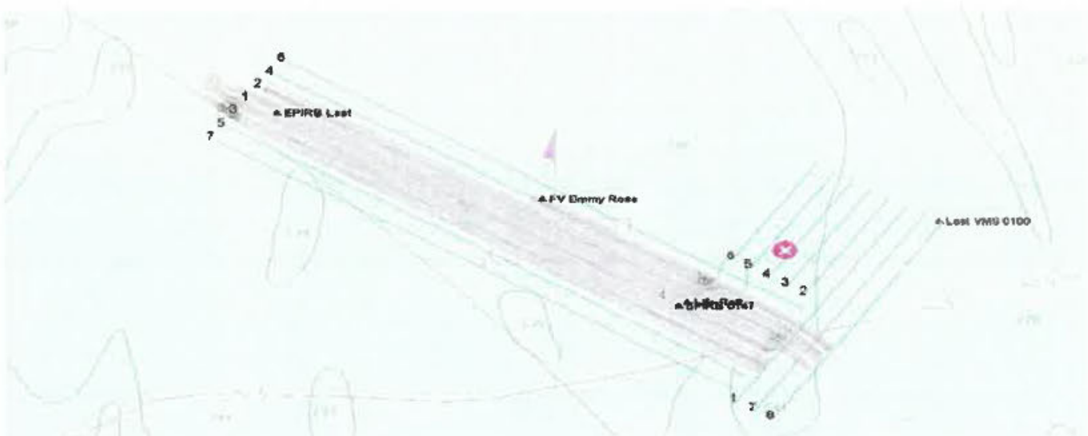


Figure 38: 110 kHz side scan sonar mosaic of 4 lines covered in Block 1 to locate the EMMY ROSE (location identified w/ flag). Image courtesy of Kline Technologies

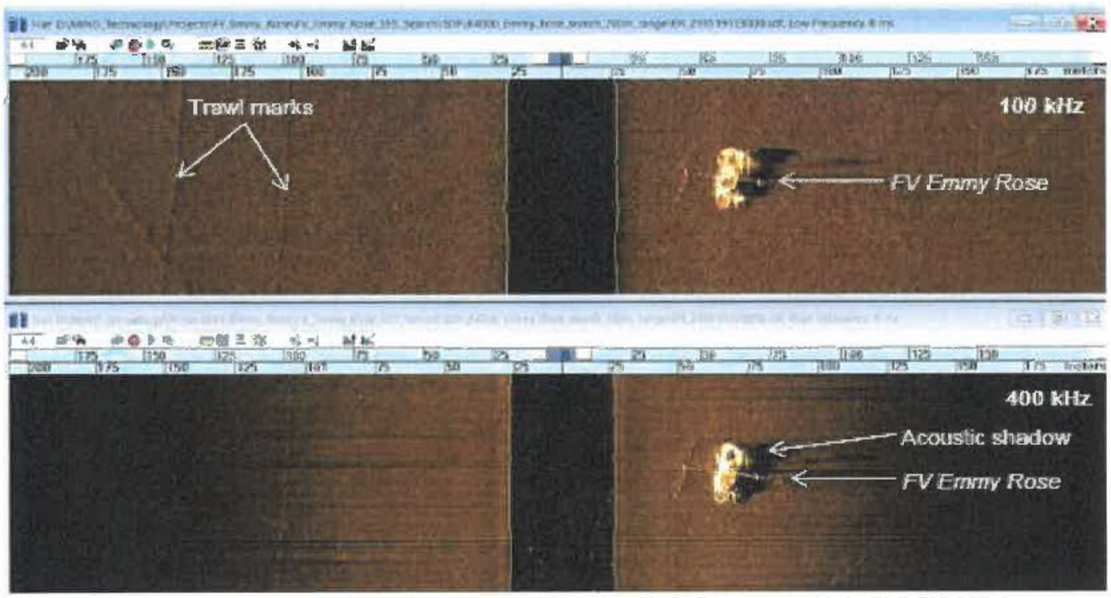


Figure 39: Klein 4000 (100 kHz & 400 kHz; 200 m scan range) imagery with the first contact with the EMMY ROSE. Image courtesy of MIND Technology, 2021.

4.10.8. According to MIND Technologies, the EMMY ROSE is sitting upright on the seafloor with the bow oriented at 135° (southeast orientation) and the outriggers fully deployed. There is no apparent debris field on the seafloor close to the wreck. Additionally, there is no visible damage to EMMY ROSE evident as the mast, wire rigging, and superstructure features all appear intact. The ladders on both port and starboard outriggers are clearly visible in the sonar imagery. Figure 41 shows that the paravanes were deployed from the outriggers prior to the vessel sinking. A paravane system uses two wing-shaped weights (often called "birds") that are dragged through the water on cables to assist with stability. The port paravane cable is taut whereas the starboard paravane cable appears to be slack. The position of the paravanes forward of the vessel bow indicates that the stern sunk to the seafloor before the bow at least just prior to the vessel making contact with the seafloor. All analysis in 4.10.8. and associated images was provided by MIND Technologies.

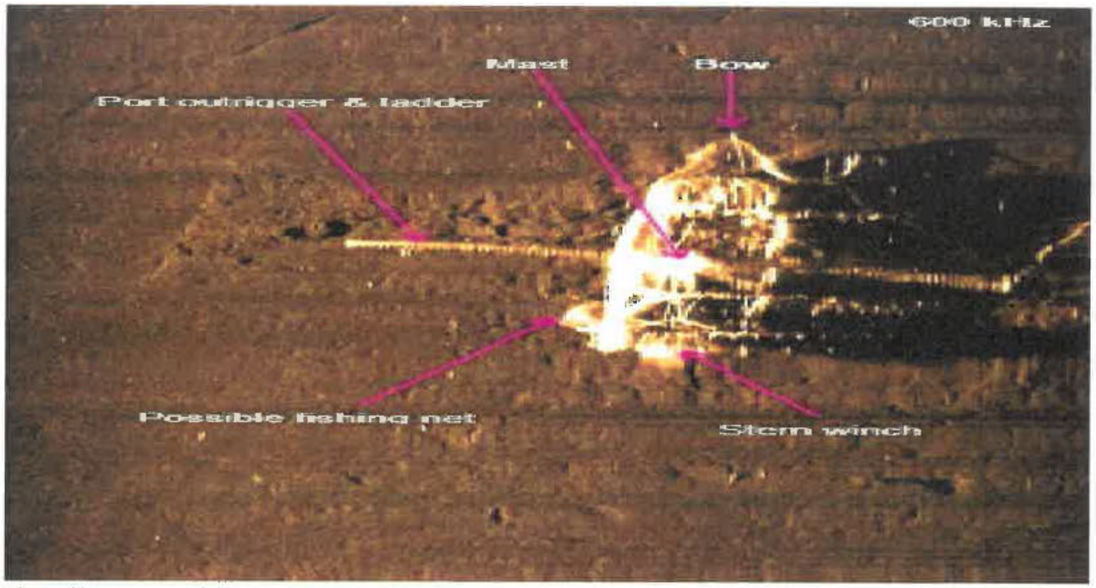


Figure 40: Prototype Klein 4K-SVY 600 kHz (75 m scan range) imagery of the FV EMMY ROSE lying upright on the seafloor with the port and starboard outriggers deployed. No vessel damage is visible. Image courtesy of MIND Technology, 2021.

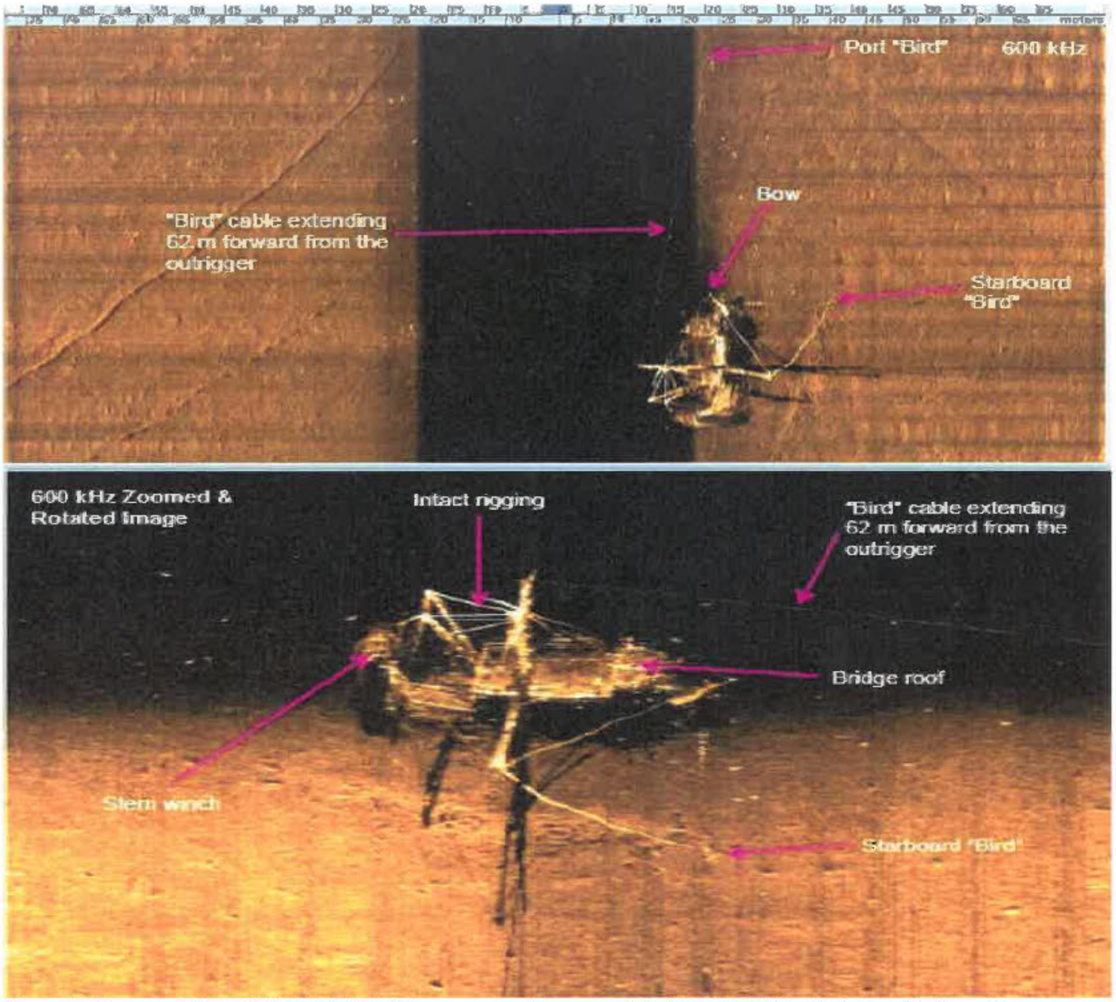


Figure 41: Prototype Klein 4K-SVY 600 kHz (75 m scan range) imagery of the EMMY ROSE with the towfish flown almost directly over the wreck. Image courtesy of Klein Technologies.

4.11. Remotely Operated Vehicle Operation

4.11.1. WHOI was requested by the USCG and the NTSB to conduct a Remotely Operated Vehicle (ROV) survey of the EMMY ROSE.

4.11.2. The USCG and NTSB provided the location, depth of the vessel as well as a high-resolution sidescan survey to support planning. The USCG also supplied current models of the area to better understand the environmental parameters of the location. Upon review of the provided data, WHOI performed a risk review for the survey and agreed the available ROV was suitable for the operation.

4.11.3. The CGC SYCAMORE was used as the platform for the ROV operation. The CGC SYCAMORE is a 225 foot Juniper-class buoy tender, homeported in Newport, RI.

Figure 42: CGC SYCAMORE.

4.11.4. WHOI utilized the Saab Sea Eye Falcon DR ROV as the vehicle for the operation. The SeaEYE Falcon can operate up to 850-meter depth.

Figure 43: Saab SeaEye Falcon DR ROV. Image courtesy of WHOI, 2021.

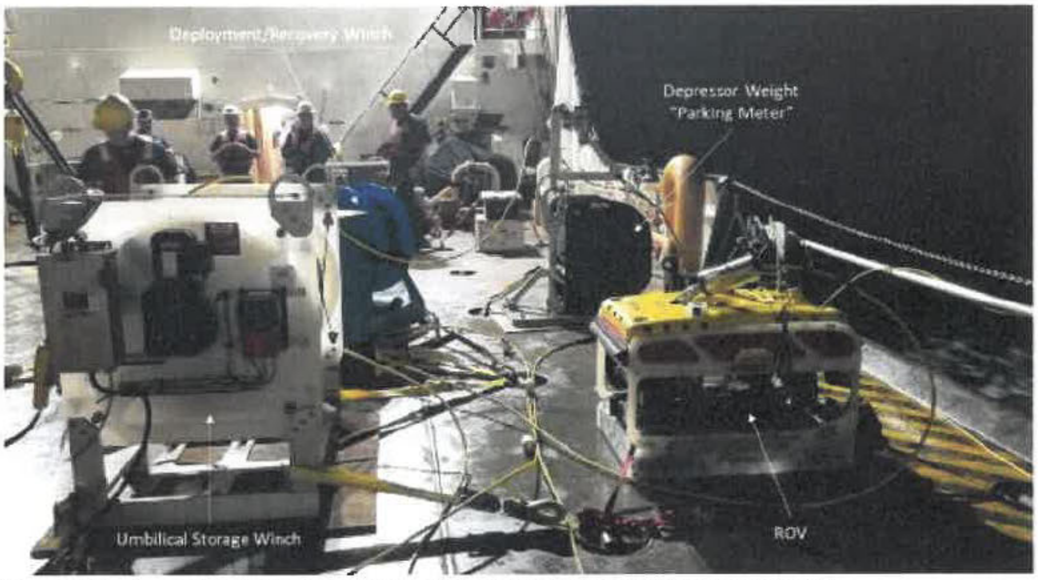


Figure 44: Equipment layout on the deck of the CGC SYCAMORE. Image courtesy of WHOI, 2021.

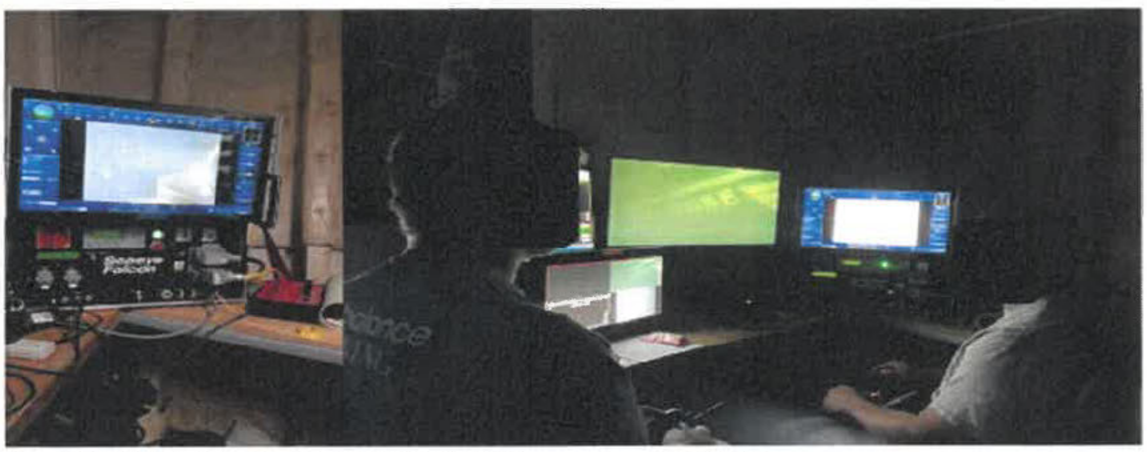


Figure 45: ROV pilot station aboard the CGC SYCAMORE. Image courtesy of WHOI, 2021.

4.11.5. On the morning of September 21, 2021, the WHOI team mobilized their equipment and conducted a test dive aboard the CGC SYCAMORE in Newport, RI. After all tests were complete and satisfactory, the CGC SYCAMORE departed Newport, RI during the evening hours.

4.11.6. On September 22, 2021, the CGC SYCAMORE arrived at the position of the EMMY ROSE (see section 4.10.7).

4.11.7. At 1310 on September 22, 2021, the ROV was deployed and acquired the EMMY ROSE on sonar.

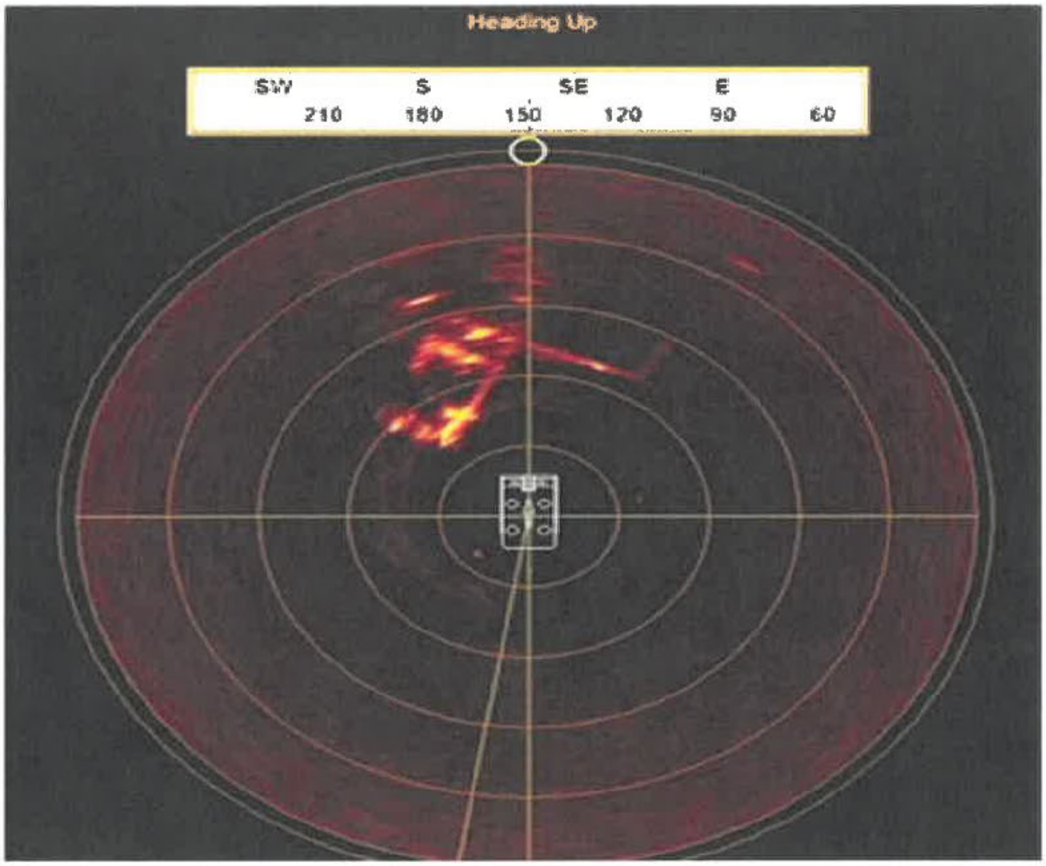


Figure 46: ROV sonar image of the EMMY ROSE. Image courtesy of WHOI, 2021.

4.11.8. At 1420, the EMMY ROSE was located visually. Visibility was poor and currents were increasing, therefore the team decided to move away from the vessel and standby. At 1505, currents continued to increase and the ROV was pushed into the vessel and became entangled with the VHF antenna.

4.11.9. At 2200, the port quarter of the EMMY ROSE was visually located. As the ROV surveyed the port side of the vessel it was noted that the port side trawl door was out of place.

Figure 47: Port quarter of the EMMY ROSE. Image courtesy of WHOI, 2021.

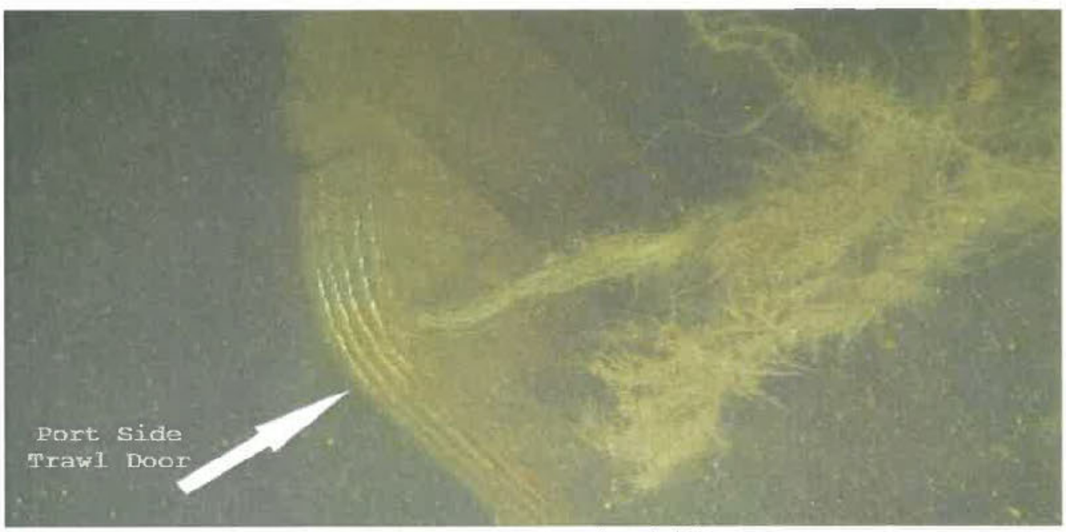


Figure 48: Port side trawl door of the EMMY ROSE. Image courtesy of WHOI, 2021.

4.11.10. The ROV continued down the port side and located the white rub rail and found the freeing port #1 was open (freeing ports numbered from stern going forward). The ROV continued down the port side, freeing port #2 was found to be closed, #3 was partially open, and #4 freeing port was open.

Figure 49: Port side freeing port #1 of the EMMY ROSE. Image courtesy of WHOI, 2021.

4.11.11. The ROV then returned to the stern and moved up the port stern bulwark and located the net on the drum.

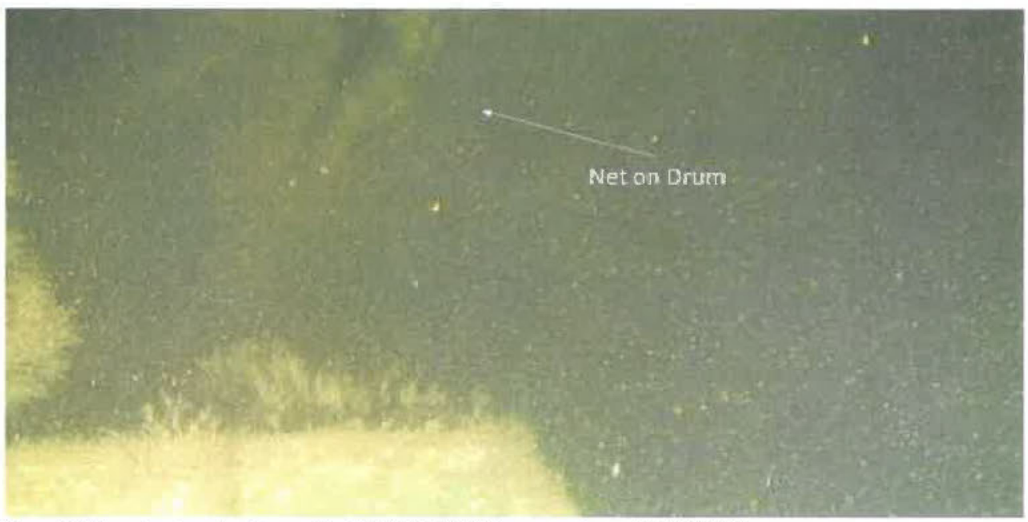


Figure 50: Trawl net on stern drum of the EMMY ROSE. Image courtesy of WHOI, 2021.

4.11.12. At approximately 2230, the team began the survey of the starboard side starting at the stern. Trawl chain was located hanging from starboard side near the stern. Following down the starboard side of the vessel, freeing port #1 and #2 (numbered from stern going forward) were found closed. The starboard side trawl door was found stowed.

Figure 51: Trawl chain hanging over the starboard side of the EMMY ROSE. Image courtesy of WHOI.

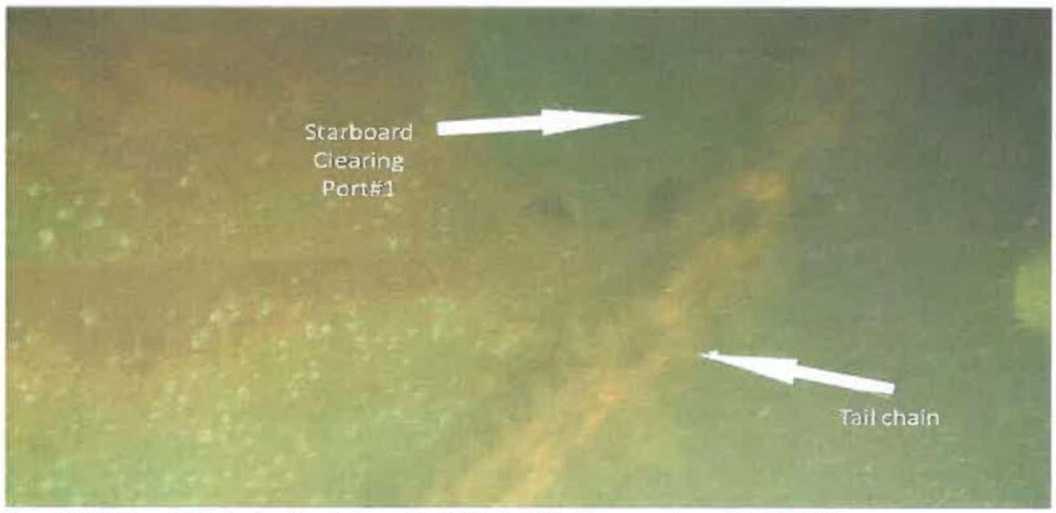


Figure 52: Starboard side clearing (freeing) port #1, tail chain visible. Image courtesy of WHOI, 2021.

Figure 53: Starboard side trawl door. Image courtesy of WHOI, 2021.

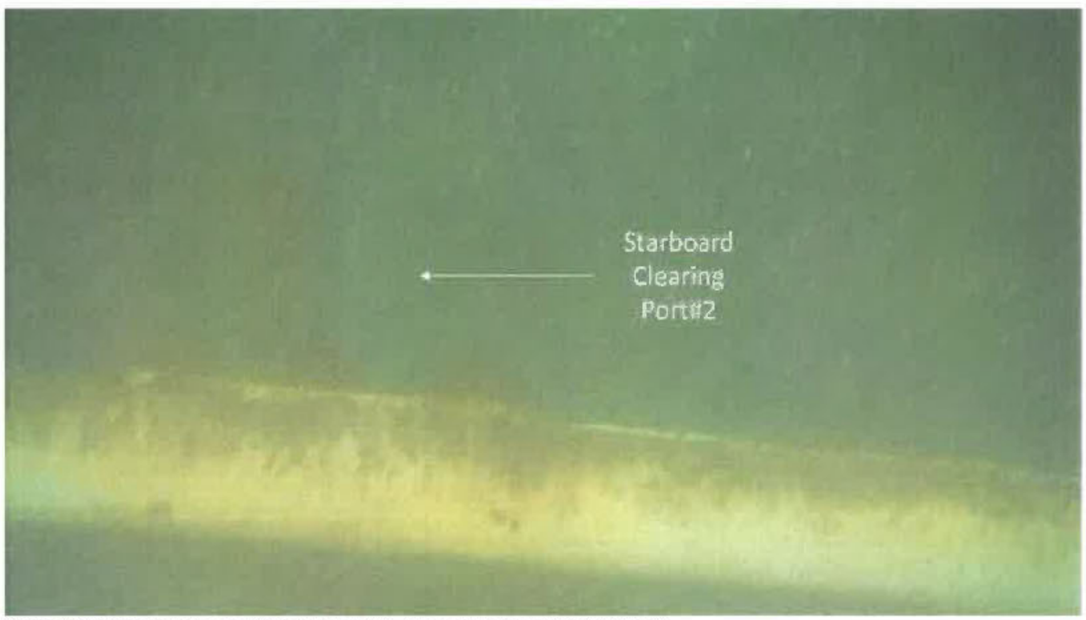


Figure 54: Starboard clearing (freeing) port #2. Image courtesy of WHOI, 2021.

4.11.13. Starboard freeing ports #3 and #4 were found in the open position with chain and rope hanging through them.

Figure 56: Starboard clearing (freeing) port #3. Image courtesy of WHOI, 2021.

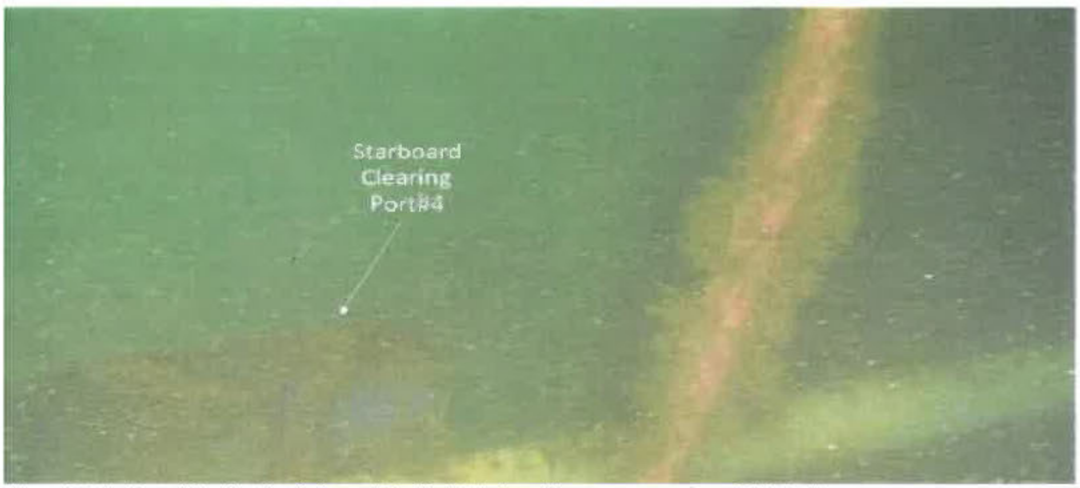


Figure 57: Starboard clearing (freeing) port #4 of the EMMY ROSE. Image courtesy of WHOI, 2021.

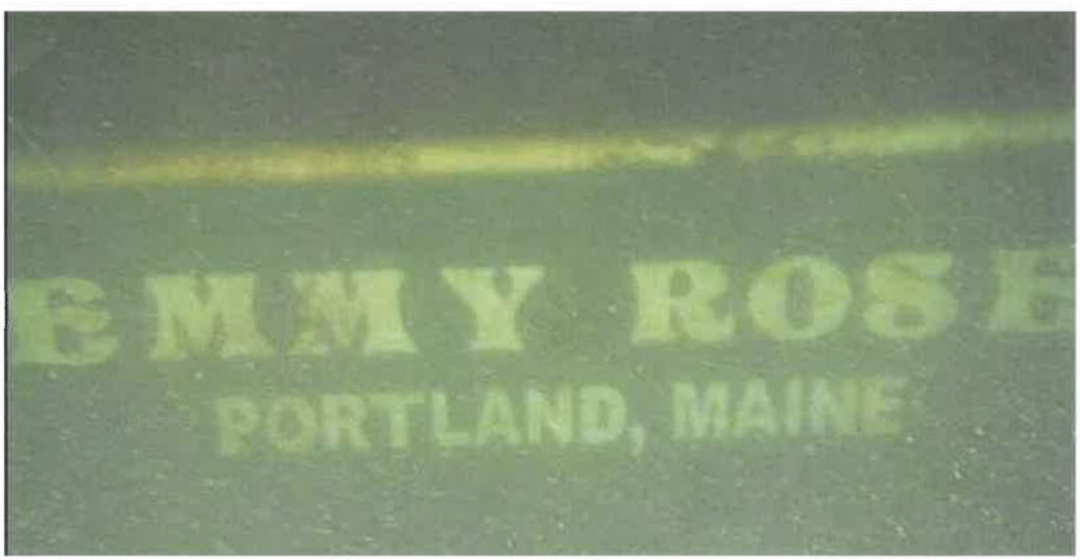


Figure 58: Stern of the EMMY ROSE. Image courtesy of WHOI, 2021.

4.11.14. The ROV then moved to the port side to inspect the outrigger; port pipe stay, junction box, outrigger stay and turnbuckle were identified and appeared to be in good condition. Following the completion of the outrigger survey, the team attempted to move to the starboard forward end of EMMY ROSE. Currents were too high and the vessel could not be re-engaged. The ROV was recovered and stowed for the night at approximately 0300 on September 23rd.

Figure 59: Port side outrigger stay and turnbuckle of the EMMY ROSE. Image courtesy of WHOI, 2021.

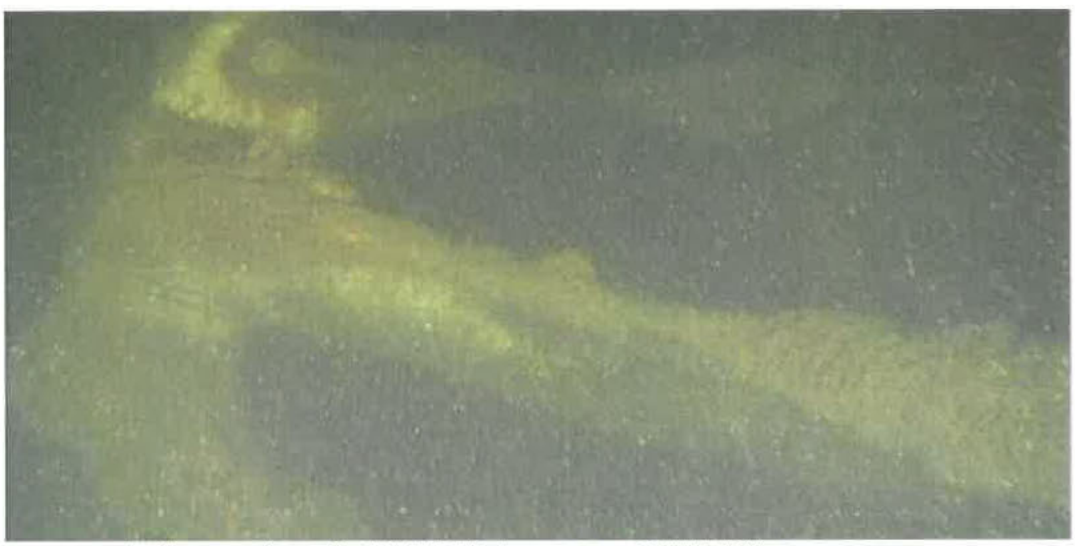


Figure 60: End of the port outrigger of the EMMY ROSE. Image courtesy of WHOI, 2021.

4.11.15. At approximately 1610 on September 23, 2021, the ROV was able to locate the starboard side bow of the EMMY ROSE. An inspection of the starboard side of the hull showed it to be intact there did not appear to be any damage.

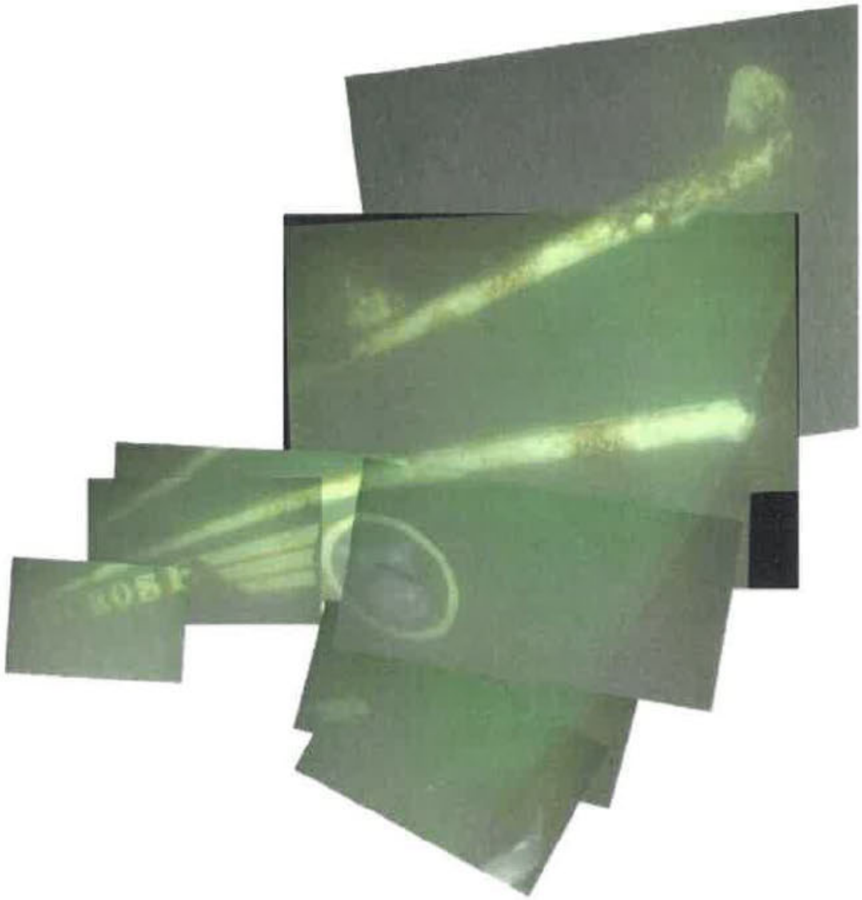


Figure 61: Starboard side bow of the EMMY ROSE. Image courtesy of WHOI, 2021.

4.11.16. The ROV then visually inspected the bridge engine room vent and forward engine room/ auxiliary space hatch. The bridge doors and hatch were secure and all windows intact.

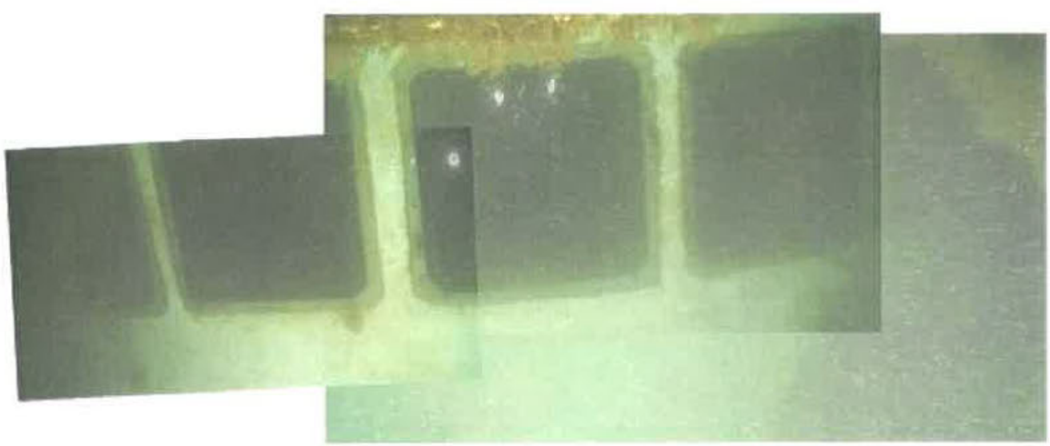


Figure 62: Pilothouse windows of the EMMY ROSE. Image courtesy of WHOI, 2021.

4.11.17. The ROV reversed away from the bridge and worked its way around the port side bow. Imagery showed the port bow intact and with no apparent damage.

Figure 63: Port side bow of the EMMY ROSE. Image courtesy of WHOI, 2021.

Figure 64: Port side bow with chain hanging over crest of the EMMY ROSE. Image courtesy of WHOI, 2021.

4.11.18. An inspection was completed on the port side outrigger; the port outrigger stay, turnbuckle, and paravanes chain, were all identified and appeared to be free of damage. The port paravanes chain went straight down to the sea floor. At approximately 2030, the survey was complete and dive operations were terminated.


Figure 65: Port outrigger and turnbuckle of the EMMY ROSE. Image courtesy of WHOI, 2021.


Figure 66: Port paravanes chain leading directly to the seafloor. Image courtesy of WHOI, 2021.

Figure 67: Forward bit of EMMY ROSE. Memorial plaque from CGC SYCAMORE. Image courtesy of WHOI, 2021.

4.11.19. The ROV survey results found the vessel to be in the same relative position as the previous sidescan survey, in a water depth of approximately 794 feet, sitting upright on the sea floor, with the bow oriented of 135 degrees (southeast).

4.11.20. There is no visible damage to the vessel on the bow, port and starboard sides, stern, and the bridge where the ROV was able to inspect. The ROV could not image the starboard outrigger, stern doors, or stern deck hatches due to the risk of entanglement and maneuvering in the currents.

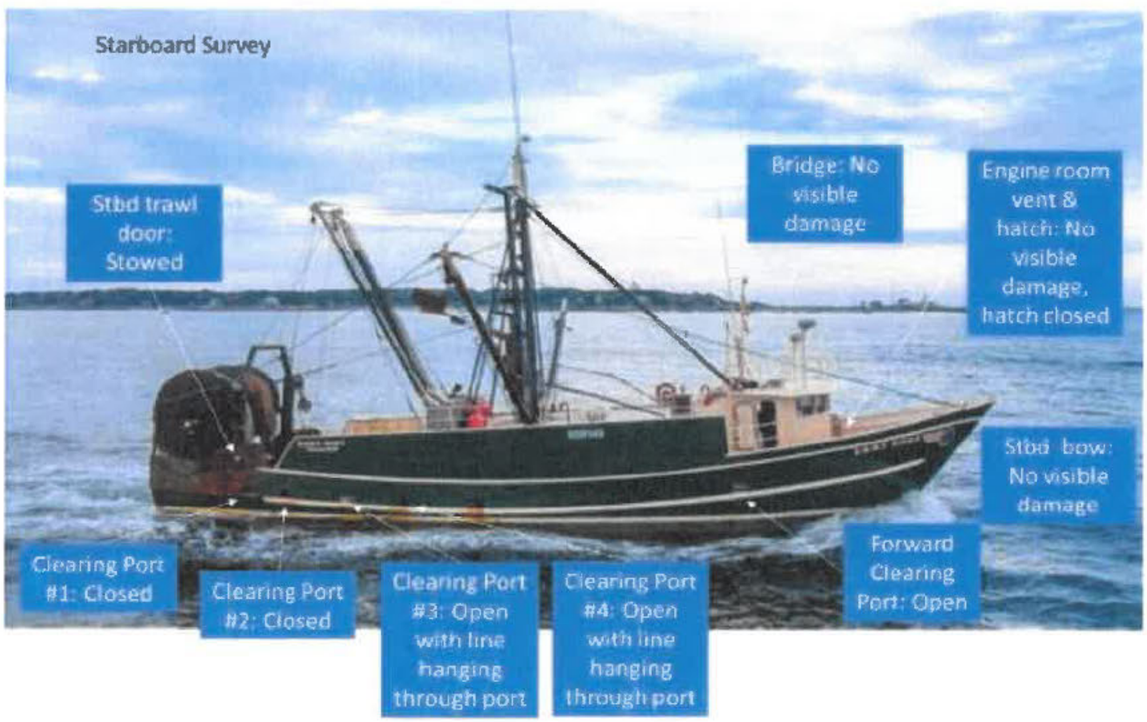


Figure 68: Starboard side ROV survey results of the EMMY ROSE. Image courtesy of WHOI, 2021.

Figure 69: Port side ROV survey results of the EMMY ROSE. Image courtesy of WHOI, 2021.

5. Analysis

At 0100 on November 23, 2020, the EMMY ROSE was identified on VMS to be in position 42° 18' 53.1" N, 069° 33' 7.14" W on a course of 277° at 7 knots. The vessel was located on the seafloor in position 42° 19' 8.106" N, 069° 37' 50.766" W. The EMMY ROSE's resting position was approximately 3.5 NM at a 275° course from its last known position. This position indicates that the EMMY ROSE would have maintained a speed of 7 knots at a course of about 275°- 277° until approximately 0129.

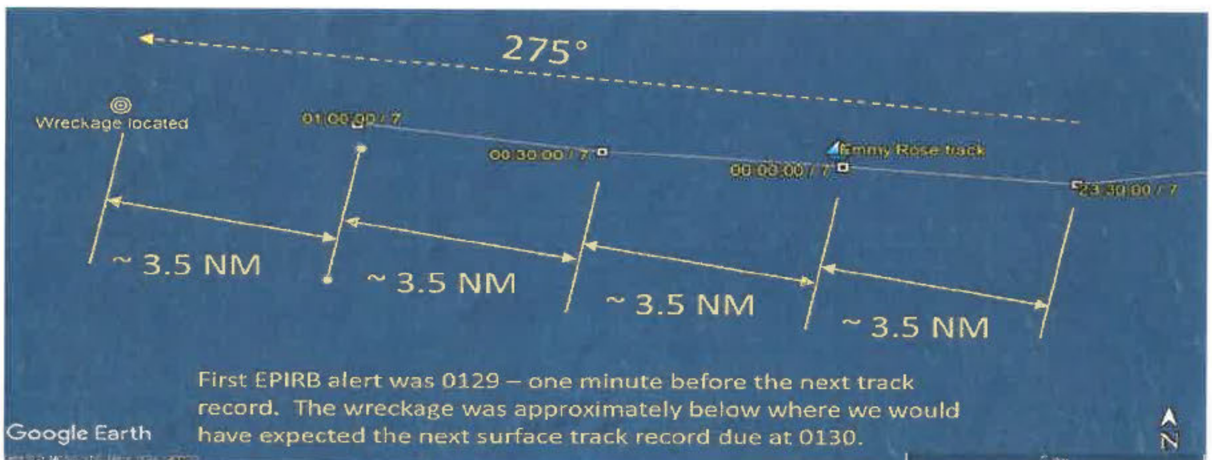


Figure 70: EMMY ROSE trackline relative to vessel location on seafloor. Courtesy of NTSB, 2021.

The evidence collected would suggest that at approximately 0129, the EMMY ROSE experienced an event that caused the vessel to lose stability, take on water, and quickly sink.

There were no witnesses to this casualty, or any MAYDAY calls to identify any possible causes of distress. The facts and evidence collected for this investigation suggest that fire, explosion, grounding, collision, or water intrusion from a through hull fitting or apparatus appear to be an unlikely cause of this casualty.

It is unlikely that a fire or explosion occurred aboard the vessel. The images obtained of the EMMY ROSE on the sea floor did not indicate any signs of fire. The hull and superstructure appear to be completely intact with no evidence of a fire. Had there been a fire onboard, causing the vessel to sink, there would have been discernable evidence of a fire or explosion and most likely a reduction in speed.

It is unlikely that the vessel grounded and sank. The EMMY ROSE's track line did not pass over any areas of shallow water, average depth on trackline was 600-800 feet. The imagery collected did not indicated any signs of a grounding with the observable areas of the hull appearing intact.

A collision between EMMY ROSE and another vessel is unlikely as well. The images collected of the EMMY ROSE's hull and structures appear to show no apparent damage. If there were a collision, the bow and or side shell would have sustained major damage. Furthermore, an analysis of the area determined that there were no other vessels within 10 NM of the EMMY ROSE at the time of her sinking.

It is unlikely that water intrusion from a through hull fitting caused the vessel to sink within the known timeline of 30 minutes. To cause a rapid catastrophic flooding situation, the rudder post in the lazarette and the propeller shaft located in the fish hold would need to have fallen completely off. Given the location of the EMMY ROSE on the sea floor, it has been determined that the vessel never lost propulsion or steerage as it maintained the same course and speed for approximately 6.5 hours before sinking. Furthermore, the skeg hung design of the propulsion gear protects the rudder and propulsion shaft from inadvertently falling out of the vessel. Thus, making rapid catastrophic flooding through a hull fitting very unlikely.

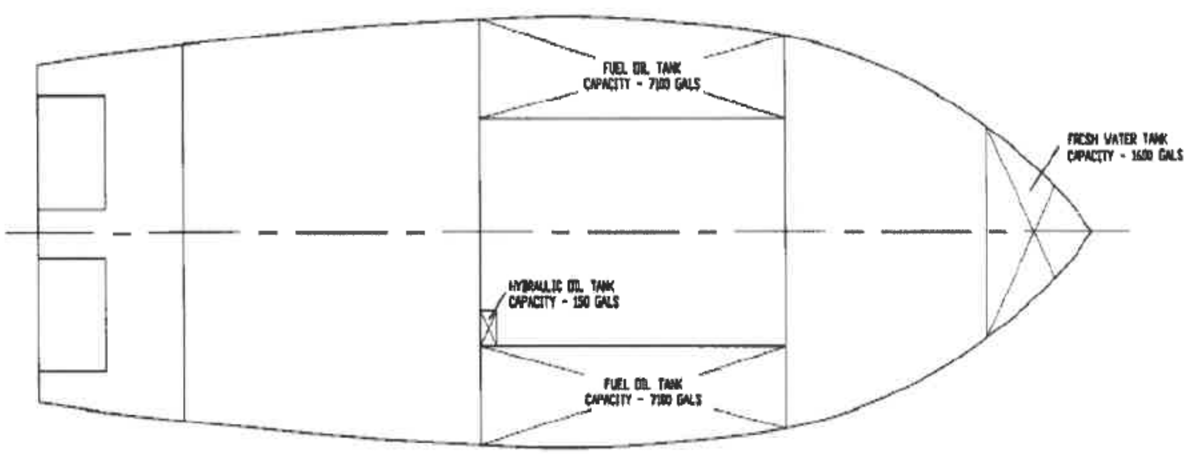
Figure 71: Skeg hung steering and propulsion gear of the EMMY ROSE, Image courtesy of Marine Safety Consultants.

While we cannot conclusively identify any one event or action as the key cause. The facts and evidence collected indicate the most probable event and cause of the casualty is a loss of stability from a shift of weight.

5.1. Failure to recognize and take corrective actions on critical internal transverse weight shift

At approximately 0129, the EMMY ROSE experienced an event which severely degraded the stability of the vessel. Given the facts and evidence collected, the most probable initiating event that led to the sinking has been determined to be an internal force or shift of weight within the vessel.

One source of weight that had the potential to put the vessel in an unrecoverable listed condition would be an excessive internal transfer of fuel. The EMMY ROSE was equipped with two fuel tanks, which were located in the engine room and used for service to the main diesel engine and generators. Each tank was located at the outermost part of the engine room and made the port and starboard hull bulkheads. Each tank had a capacity of 7,500 gallons, were cross connected, and were both capable of providing fuel to the main engine.



TANK CAPACITY PLAN

Figure 72: EMMY ROSE Fuel Tank layout. Image courtesy of Thomas M. Farrell Naval Architects, 2002.

As a commercial fishing vessel with a fuel capacity of 250 or more barrels (10,500 gallons), the EMMY ROSE is required to comply with 33 CFR 155 Subpart C. Since the EMMY ROSE did not have a crewmember that held a merchant mariner credential, there should have been a letter designating a Person in Charge (PIC) of the transfer of fuel. The designated PIC should have received sufficient formal instruction from the operator or agent of the vessel to ensure their ability to safely and adequately carry out the duties and responsibilities of the PIC. The EMMY ROSE did not have a crewmember who held a PIC endorsement thus making an excessive transfer of fuel a possibility. This deficiency had not been identified on the most recent voluntary examination (see section 4.8.4).

As a CFV loads its catch, fish are sorted in the fish hold by species. An overabundance of weight of a certain species of fish on either the port or starboard side fish hold may cause the vessel to list. Whenever the center of gravity of a vessel is moved off centerline, the vessel will create an inclining moment. If no external forces are present, the ship will assume a list. In a listed condition, righting arms are significantly reduced when the center of gravity is off centerline. It is a known practice to shift weight to correct a list. This can be done by transferring fuel to the high side of the list and recentering the vessels stability.

The typical procedure aboard the EMMY ROSE was to utilize the starboard fuel tank as the primary supply tank for the main engine and to use the port fuel tank as the return tank. The EMMY ROSE was equipped with a fuel transfer pump that was rated at approximately 26 gallons per minute. This pump was used to transfer fuel between the tanks for supply to the main engine and could be used to manage any list of the vessel.

Previous crewmembers stated that on two separate occasions, a transfer of fuel between the port and starboard tank caused the EMMY ROSE to list severely to starboard. These fuel transfers were unmonitored as the crewmembers who had both been asleep were awaken by a severe list in the vessels profile. Upon exiting the accommodation space to the aft deck, they witnessed the starboard side outrigger completely underwater with sea water coming over the top of the eight foot starboard bulwark rail, and the aft deck awash. On both occasions, the crewmembers went back into the accommodation space and found the Captain asleep in his bunk. Once awoken, the Captain proceeded to the engine room to transfer fuel back to the port tank, correcting the severe list.

In the two previous instances identified above, as the excessive amount of fuel was transferred transversely to the starboard tank, it negatively affected the vessels stability by shifting the vessel's center of gravity to the low (outboard) side. The EMMY ROSE laid over or "listed" about the angle of heel where the righting arm curve is zero. In this condition the vessel will not return to the upright condition due to the shift in the fuel's center of gravity, unless immediately corrected.

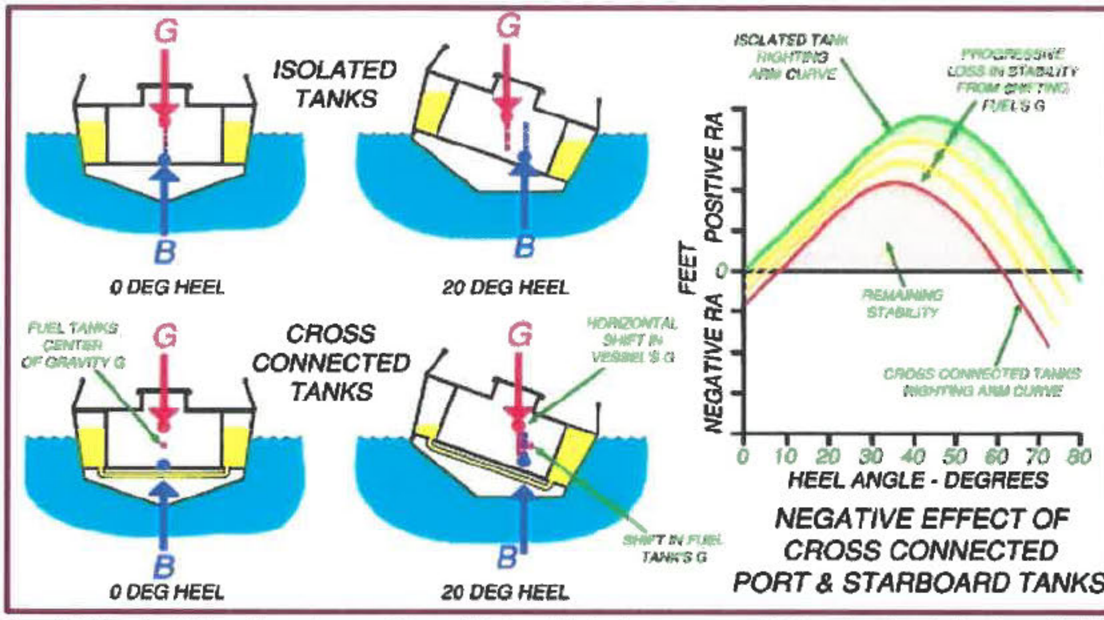


Figure 73: Negative Effect of Cross Connected Port and Starboard Tanks. Image courtesy of "A Best Practices Guide to Vessel Stability- Second Edition", USCG.

A shifting of the vessel's catch within the fish hold is another possible cause for a vessels stability to be affected. Although no collected evidence or witness testimony stated this as a likely possibility, it is still possible and would have had the same effect on the vessel's stability as the excessive fuel transfer.

In stability analysis, the total buoyancy forces, which are distributed over the part of the hull below the water, are mathematically combined into a single point called the center of buoyancy. This point is labeled "B" on stability model diagrams. When the shifting of a fishing vessel's catch or heavy fishing gear occurs during the voyage, its overall stability is reduced because the vessel's center of gravity "G" is shifted farther outboard because the catch has fallen to the lower outboard side. The vessel will not return to the upright condition due to the permanent shift in the catch's center of gravity. It lays over or "lists" about the angle of heel where the righting arm curve is zero.

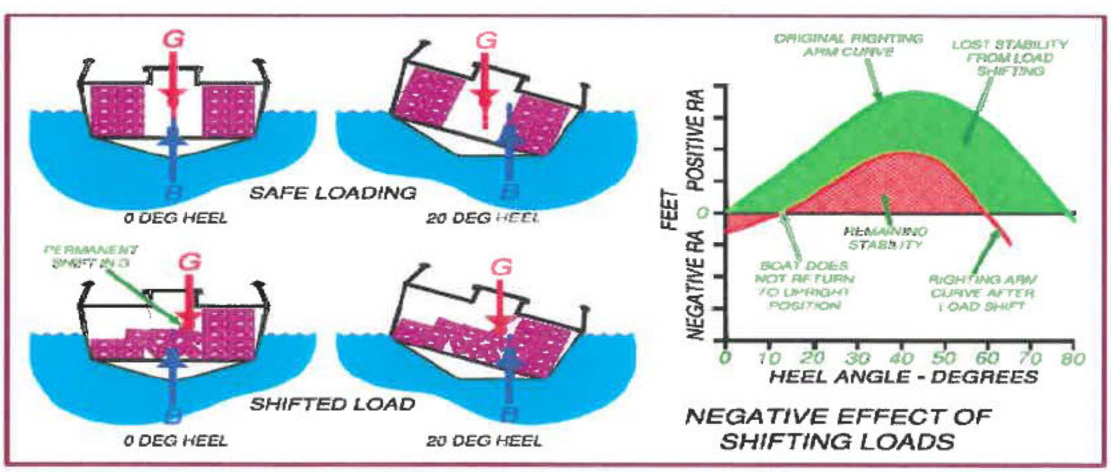


Figure 74: Negative effects of shifting loads. Image courtesy of "A Best Practices Guide to Vessel Stability- Second Edition", USCG.

As the EMMY ROSE was heading into Gloucester, the winds and seas would have been approaching the EMMY ROSE from the port quarter, adding to the internal force, driving the vessel further into a starboard list. Operating in quartering seas (waves on the vessel's stern quarters) is the most dangerous sea conditions for a fishing vessel (See Analysis 5.2).

Evidence of the starboard list was identified while examining the freeing ports on the EMMY ROSE (see section 4.11). The imagery shows that two of the four starboard freeing ports were closed. The port side had 2 open, 1 partially open, and 1 closed. All of the open port side freeing ports were free and clear of gear, whereas the starboard open freeing ports had line and wire protruding through them. This is evidence that as the vessel listed to the starboard side, loose gear on deck shifted to the starboard side and washed out of the opened freeing ports.

Figure 75: Starboard clearing (freeing) port #3, Image courtesy of WHOI, 2021.

As noted in 4.9. MSC's stability analysis of the EMMY ROSE showed inadequate stability according to the 46 CFR Subchapter C regulatory criteria. Any condition that causes the vessel to list, degrades stability further from the even keel condition such as the reported fuel transfer operation. MSC modeled two load conditions regarding differences in fuel between the port and starboard tank: ¼ difference and ½ difference. The EMMY ROSE failed all regulatory requirements when modeled under these two conditions. Failure to meet regulatory stability standards is not an indication of capsize or sinking; however, by not meeting regulatory stability, EMMY ROSE had a reduced ability to withstand wind and waves. EMMY ROSE's ability to withstand environmental conditions would have been further reduced by off-center weights such as fuel or cargo. The EMMY ROSE's reduced stability was a latent unsafe condition, which would have been exacerbated by a shift of weight. Either an internal fuel transfer or cargo shift form the catch would have been enough weight to set the vessel into an unrecoverable list and cause the vessel to sink quickly.

5.2. Failure of EMMY ROSE freeing port design and operation

On the morning of November 23rd at approximately 0100, the EMMY ROSE was traveling on a course of 277° at 7 knots. The winds were approximately 19 miles per hour sustained with 25 knot gusts at 120°. The seas were approximately 4-6 foot at 105°. As the EMMY ROSE was heading on its course into Gloucester. The winds and seas were approaching the EMMY ROSE from the port quarter adding an internal force that was driving the vessel further into a starboard list. Operating in quartering seas is the most dangerous sea conditions for a fishing vessel. The negative effects of the following stern and beam seas are combined to significantly reduce a fishing vessel's stability in the following ways:

First, there is an increased chance of being swamped by a boarding wave. The added weight of the water on deck raises the center of gravity and creates a sizable free surface capsizing moment. The EMMY ROSE was fitted with four freeing ports on each side of the vessel. The EMMY ROSE's freeing ports were not in compliance with 46 CFR 28.555. The regulation states that freeing port covers are permitted provided that the freeing port area is not diminished, and the covers are constructed and fitted so that water will readily flow outboard but not inboard. The EMMY ROSE freeing ports had a closure device that could be slid down over the port to close off the port, negating any water from running off or on the deck. The closed freeing ports were also not in compliance with the EMMY ROSE Stability Operating Instructions, which states that deck freeing ports shall be maintained operable and completely unobstructed at all times. Furthermore, drainage requirements, 46 CFR 28.555, required the EMMY ROSE to have 55.54 sqft of freeing port area. MSC calculated that the actual freeing port area of the EMMY ROSE was 26.25 sqft, a difference of 29.29 sqft without the installed closure devices. The total freeing port area with the closure devices is further reduced to 1.57 sqft, a difference of 53.97 sqft from the required 55.54 sqft.

We know from the ROV images that the port side freeing ports were open, and that the aft three starboard ports were closed. The open ports on the port side would allow waves to wash over the deck and the closed starboard aft ports would create a pocket for water to collect on the starboard aft working deck. Water from boarding seas that remains trapped on a fishing vessel's deck by her bulwarks can significantly reduce its overall stability because:

> The center of gravity "G" is raised from the added weight of the trapped water high on the decks. The freeboard is reduced due to the added weight, which causes the deck edge to submerge at smaller heel angles. The effects of the trapped water on deck shifting reduce the righting arms. Because the trapped water on deck is located high on the vessel, the fishing vessel may not return to the upright equilibrium condition. Instead, it will lay over or "Roll" at the angle of heel where the new righting arm curve goes through zero.

Second, the wave alters the crucial shifting of the center of buoyancy "B" to create a capsizing condition. When the vessel is upright the center of buoyancy "B" shifts outboard due to the beam wave's shape to create a capsizing moment. And when the vessel heels over, which in previous examples creates a positive righting moment, a capsizing moment is still present because the beam wave's shape on the hull has prevented the center of buoyancy "B" from shifting outboard.

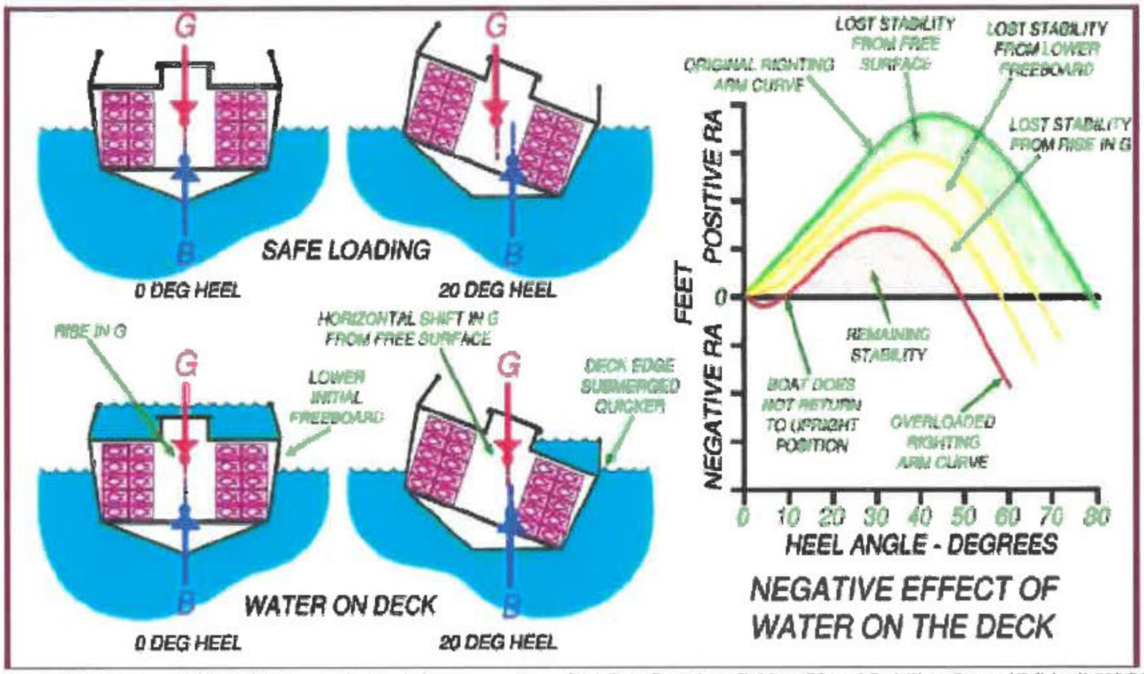


Figure 76: Negative Effect of Water on the Deck. Image courtesy of "A Best Practices Guide to Vessel Stability - Second Edition", USCG.

The added weight and the free surface effect on the deck would further reduce the stability of the EMMY ROSE's already listed profile. As the EMMY ROSE listed further to starboard, approaching the angle of capsize, more and more water would continue to collect in the starboard aft pocket of the vessel, further exacerbating the situation. According to the MSC stability analysis for the EMMY ROSE, the vessel failed to meet the stability criteria while having water on deck and at ½ and ¼ fuel differential, as would be the case determined by our analysis. Had the freeing ports onboard the EMMY ROSE been designed in compliance with regulations, the boarding waves would not have been able to swamp the deck of the vessel and any water on deck would have been able to run off through the hinged flaps fitted to the outside of the hull. Proper design and operation of the freeing ports would have reduced excess deck weight and free surface effect from sea water, increasing the EMMY ROSE's ability to maintain stability.

5.3. Failure of through deck hatches to be watertight

As the EMMY ROSE listed to the starboard and the deck became awash from the boarding seas and intrusion over the starboard rail, excess weight began to build on the vessel, lowering the freeboard of the stern. Water collected on the stern would have entered into the lowest accessible hatch of the vessel, the lazarette. The lazarette was protected by a 6" coaming that was not secured with a watertight hatch, it was a semi weathertight cap that rested on the hatch.

Down flooding is the entry of water into an undamaged vessel hull than can lead to progressive flooding throughout the hull and negatively affect stability. It occurs when water enters the hull or superstructure through an opening that is not watertight. Down flooding adversely affects vessel stability in multiple ways: it reduces the vessels righting energy, introduces free surface effect from the water that enters the hull, and the additional weight will reduce the vessels freeboard.

Failure to maintain the integrity of a fishing vessel's watertight envelope can significantly reduce the overall stability due to unintentional flooding. After down flooding occurs, the vessel's overall stability is reduced because:

- The center of gravity "G" is shifted farther outboard as the water sloshes to the low side.

- The freeboard is reduced because of the added weight, causing the deck edge to submerge faster.

- In cases of severe down flooding, the vessel may not return to the upright condition, but will hang or "loll" at the angle of heel where the new righting arm curve goes through zero (about 10 degrees in the example).

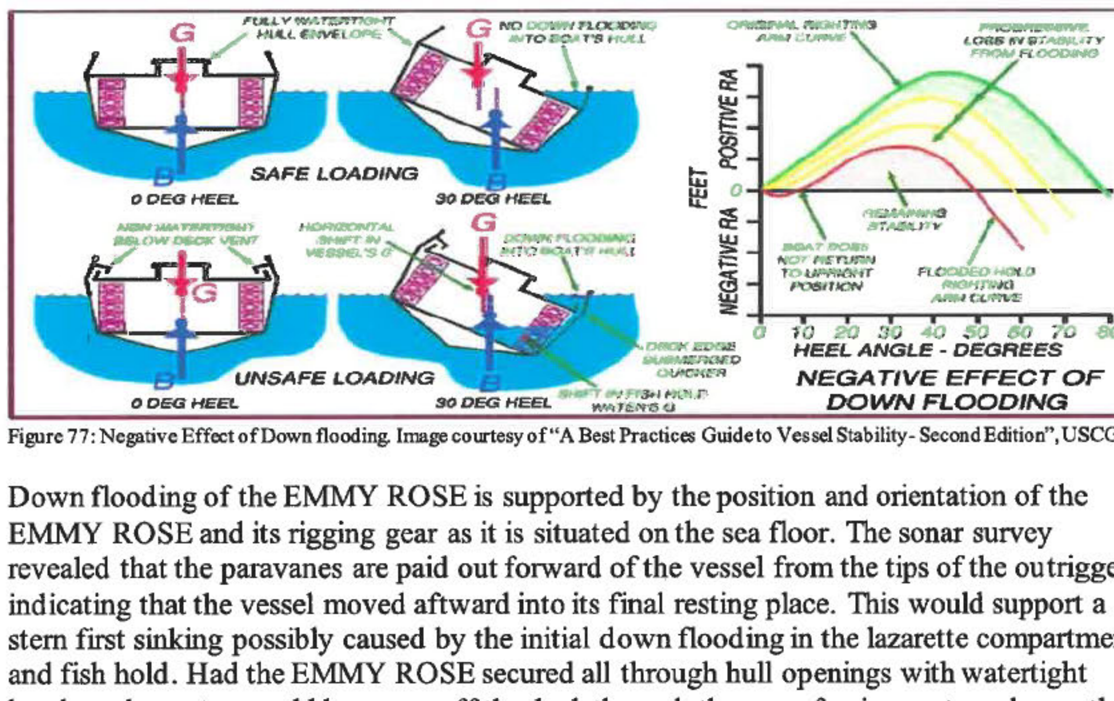


Figure 77: Negative Effect of Down flooding. Image courtesy of "A Best Practices Guide to Vessel Stability - Second Edition", USCG.

Down flooding of the EMMY ROSE is supported by the position and orientation of the EMMY ROSE and its rigging gear as it is situated on the sea floor. The sonar survey revealed that the paravanes are paid out forward of the vessel from the tips of the outriggers, indicating that the vessel moved aftward into its final resting place. This would support a stern first sinking possibly caused by the initial down flooding in the lazarette compartment and fish hold. Had the EMMY ROSE secured all through hull openings with watertight hatches, the water would have run off the deck through the open freeing ports and over the bulwarks, allowing the vessel to maintain its watertight integrity.

5.4. Failure to verify and re-evaluate vessel stability in accordance with Stability Booklet

In 2001, the EMMY ROSE was modified from a Gulf shrimp style vessel to a stern trawler for the North Atlantic fishery. In March of 2002, the vessel underwent an incline stability analysis in Fairhaven, MA. At the time of the analysis, the modifications were not complete, and the new gear was not onboard. The weight added for the test to account for all the vessel supplies, furniture, trawl doors, nets and cable for winches was approximately 24,917lbs (11.149 tons).

As part of the investigation, MSC utilized the 2002 stability analysis for the EMMY ROSE.

As outlined in section 4.9, MSC's analysis indicated that the vessel failed one or more of the 46 CFR Subchapter C Stability criteria in every loaded condition. One possible reason for this outcome is the inability to definitively account for the model used by Thomas M. Farrell Naval Architects, the downflooding points and weight differences of the additional gear.

Since the stability analysis in 2002, the vessel had made changes to its configuration which were not accounted for when the vessel stability was assessed in 2002. Based upon imagery available, it has been determined that the net reels were expanded to accommodate larger nets, a 500-gallon lobster tank (approx. 4,000 lbs) was added to the starboard side of the uppermost deck, and just prior to the departure for the final trip, new trawl doors (approx. 1,300- 1800 lbs) were also added to the vessel.

Weight creep from these known modifications and the accumulation of extra spare parts, fishing gear or a series of seemingly small modifications to the vessel or its fishing gear can significantly reduce a fishing vessel's overall stability. The weight creep often occurs over long periods of time in small amounts so the crew may not notice reduced initial stability levels. The vessel's overall stability has been reduced from the accumulated total weight because the center of gravity "G" is raised from the added weight higher above the center of gravity (net reels, nets, lobster tank, larger trawl doors) and the freeboard is reduced because of the added weight that causes the deck edge to submerge at smaller heel angles.

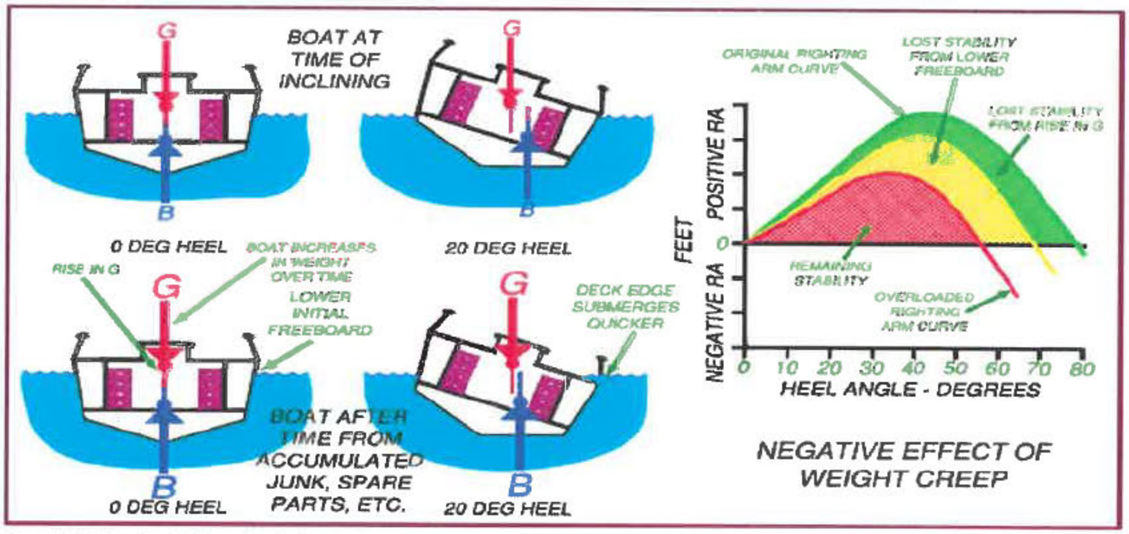


Figure 78: Negative Effect of Weight Creep. Image courtesy of "A Best Practices Guide to Vessel Stability- Second Edition", USCG.

On November 23, 2020, it had been 18 years and 9 months since the EMMY ROSE had its stability analyzed in 2002. We have been able to identify numerous weight additions associated with modifications in the images obtained. The Operating Instructions from the 2002 Stability Analysis of the SASHA LEE states that no weights shall be added, removed, or relocated without determining the effect on the stability of the vessel. To our knowledge, the initial Stability Analysis was the only one ever conducted on the hull of the EMMY ROSE. The Coast Guard's Voluntary Safety Initiatives and Good Marine Practices for CFV published in January 2017 recommends the owner have the stability instructions reviewed by a qualified individual at least every five years, or after the vessel has been modified or altered in any way that changes its stability or handling characteristics. Had there been a periodic or modification stability analysis conducted on the EMMY ROSE, the qualified individual may have determined the vessel to be unstable in its configuration and alterations may have been implemented to increase the stability and safety of the vessel.

5.5. Failure of crewmembers to mitigate fatigue

A known historical issue within the commercial fishing industry, fishermen receive very little rest when on a fishing trip. It is typical for a fisherman to work 16-18 hours per day and sleep only 2-6 hours per day when fishing. As was identified as a finding of fact in this investigation, previous crewmembers and other witnesses stated that the crew of the EMMY ROSE received very little uninterrupted rest while fishing aboard the vessel.

Fatigue is defined as a reduction in physical and/ or mental capability as the result of physical, mental or emotional exertion which may impair nearly all physical abilities including strength, speed, reaction time, coordination, decision making or balance. Fatigue is caused from lack of sleep, poor quality of sleep, insufficient rest periods between work periods, noise and vibrations, ship movement and a heavy workload. All these contributors to fatigue were experienced by and affected the crewmembers of the EMMY ROSE. Furthermore, previous crewmembers and persons who had sailed with the crew of the EMMY ROSE, stated that the crew would smoke marijuana while onboard. Marijuana has a central nervous system depressant effect, which can cause fatigue and drowsiness, impairing attention, judgement, and coordination.

It was typical for the vessel to have one person on the helm, while the other crewmembers slept on the return trip to Gloucester, MA. The crew of the EMMY ROSE had been conducting non-stop fishing operations for approximately 6 days with little to no uninterrupted sleep. It has been determined that the crew of the EMMY ROSE may have been chronically fatigued, detrimentally affecting their performance, attention to detail, and their ability to react to stimuli. Furthermore, the EMMY ROSE return voyage to Gloucester, MA began at 1900 on November 22, 2020, and was scheduled to arrive at Fisherman's Wharf at 0600 November 23, 2020. The vessel sank at approximately 0129 on November 23, 2020, which is the time frame at which the human body has the lowest level of energy and alertness.

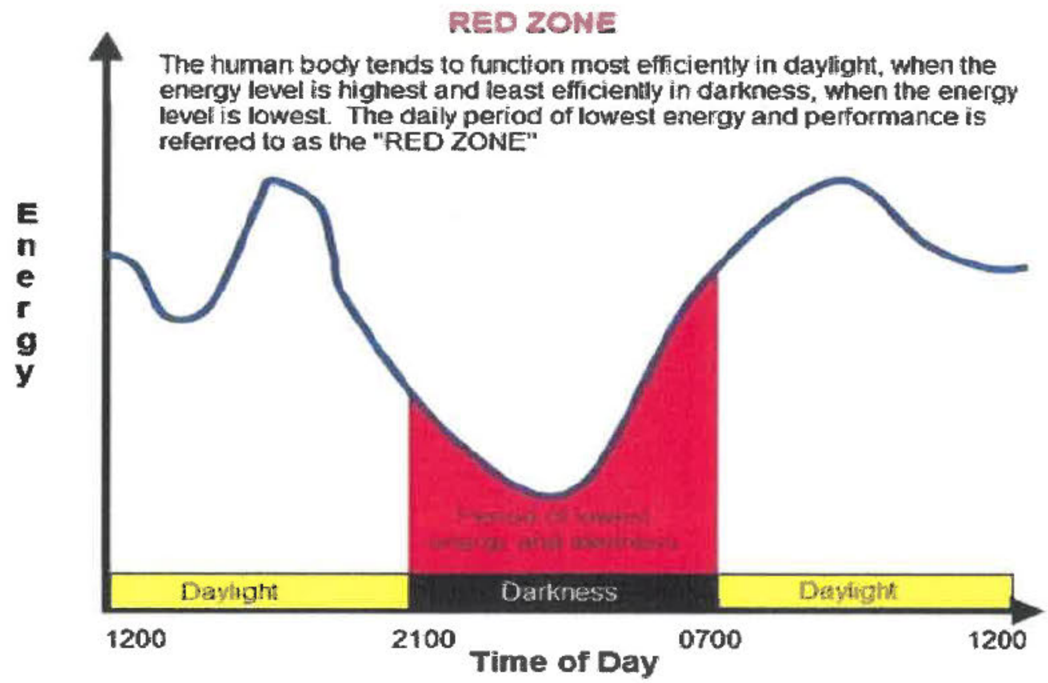


Figure 79: Fatigue energy levels throughout the day. Image courtesy of FishSafeWest.info.

It is suspected that the crew of the EMMY ROSE would have been experiencing the symptoms of being chronically fatigued while on the return trip to Gloucester, MA. Three of the crewmembers are suspected to be in their bunks asleep with one person on the helm. The crewmember on the helm would have reached extreme exhaustion during this period (Red Zone) of lowered energy and alertness exacerbated by the work routine of the previous 6 days fishing operations. The helmsman at the time of the sinking may have had a loss of situational awareness caused by extreme exhaustion. The loss of situational awareness was a contributing factor to not identifying the weight shift and excess water on deck and properly responding to the hazards aboard the EMMY ROSE. Had the helmsman received sufficient sleep and rest prior to taking the overnight helmsman watch, they may have had a better chance to remain vigilant and able to identify the hazardous situation, possibly correct the list, and communicate the situation via a MAYDAY call to the Coast Guard and other vessels.

6. Conclusions

6.1. Determination of Cause

6.1.1. It is believed that the initiating event for this casualty was a shift of weight to the starboard side within the EMMY ROSE. This internal shift, either fuel or cargo, caused the EMMY ROSE to experience a catastrophic and unrecoverable shift in the vessel's vertical center of gravity, which led to the next event. The causal factors leading to this event were:

6.1.1.1. The typical operation aboard the EMMY ROSE of burning fuel from just one tank, and then transferring fuel throughout the voyage; rather than burn from both, ensuring equal distribution of fuel burn weight throughout the trip.

6.1.1.2. No crewmember had received sufficient formal instruction to carry out their ability to safely and adequately carry out the duties and responsibilities as a person in charge of the transfer of fuel in accordance with 33 CFR 155.715.

6.1.1.3. Crewmembers were likely experiencing chronic fatigue and loss of situational awareness, and were unable to correct the catastrophic list.

6.1.1.4. Modifications made since the 2002 stability analysis added significant weight to the vessel, further reducing the righting arm of the EMMY ROSE.

6.1.2. Subsequent to the shift of internal weight which caused a severe starboard list of the EMMY ROSE, was the aft deck becoming flooded from boarding seas, adding additional weight on the deck further reducing the buoyancy and stability. The causal factors leading to this event were:

6.1.2.1. The EMMY ROSE was returning to Gloucester, MA with approximately 46,000 pounds of catch onboard in a port quartering sea. External wind and wave action further reduced the vessels righting energy.

6.1.2.2. The freeing ports of the EMMY ROSE were not in compliance with 46 CFR 28.555 which prevented water from draining off the aft deck.

6.1.2.2. Three of the four freeing ports on the port side were in the open position, allowing the quartering sea to flood the deck.

6.1.2.3. The two aft freeing ports on the starboard side were closed, causing water to build in the starboard aft quarter.

6.1.3. Subsequent to the aft deck becoming flooded was the down flooding of the lazarette and fish hold, which caused the EMMY ROSE to lose all buoyancy and sink. The causal factors leading to the down flooding and sinking of the vessel were:

6.1.3.1. The lazarette and fish hold hatches were not watertight and were not fitted with securing devices.

6.1.3.2. The lazarette hatch was only raised by a 4 inch coaming.

6.1.4. Subsequent to the catastrophic flooding of the EMMY ROSE's lazarette and fish hold, the vessel sank with all four crewmembers missing and presumed deceased. Causal factors contributing to the loss of life were:

6.1.4.1. Crewmembers experienced chronic fatigue, leading to loss of situational awareness and ability to identify extremely hazardous conditions aboard the EMMY ROSE.

6.1.4.2. Limited time and ability to take emergency action including MAYDAY radio calls for assistance, donning immersion/survival suits, deploying and entering the liferaft.

6.2. Evidence of Act(s) or Violation(s) of Law by Any Coast Guard Credentialed Mariner Subject to Action under 46 USC Chapter 77: There were no acts of misconduct, incompetence, negligence, unskillfulness, or violations of law by a credentialed mariner identified as part of this investigation.

6.3. Evidence of Act(s) or Violation(s) of Law by U.S. Coast Guard Personnel, or any other person: There were no acts of misconduct, incompetence, negligence, unskillfulness, or violations of law by Coast Guard employees or any other person that contributed to this casualty.

6.4. Evidence of Act(s) Subject to Civil Penalty: This investigation did not identify acts subject to civil penalties.

6.5. Evidence of Criminal Act(s): This investigation did not identify violations of criminal law.

6.6. Need for New or Amended U.S. Law or Regulation:

6.6.1. Implement new regulations under 46 CFR Part 28 that Commercial Fishing Vessels 79 feet and over undergo vessel stability verification, by a qualified individual, every 5 years and/or after a major modification to ensure the vessel is still in compliance with their required stability booklet. (Safety Recommendation 1 and 3)

6.6.2. Implement new or amended regulations that were signed into law from the CG Authorization Act of 2010, specifically Section 604, Commercial Fishing Vessel Safety. (Safety Recommendation 2 and 3)

6.6.3. Implement new regulations requiring certain crewmembers aboard commercial fishing vessels to be subject to a chemical testing program such as prescribed by 46 CFR 16. (Safety Recommendation 4)

6.7. Unsafe Actions or Conditions that Were Not Causal Factors: This investigation did not identify any unsafe actions or conditions that were not causal factors.

7. Actions Taken Since the Incident

7.1. In response to the tragic loss of the EMMY ROSE and her four crewmembers, as well as the growing number of commercial fishing vessel deaths over the past two years in the Northeast, the First Coast Guard District has established a district-wide Commercial Fishing Vessel Safety Workgroup Charter. The purpose of the charter is to examine casualty data trends with the goal to recommend non-regulatory interventions to reduce the number of lives lost on commercial fishing vessels.

8. Recommendations

8.1. Safety Recommendations

8.1.1. Safety Recommendation 1. It is recommended that the Commandant implement new regulations under 46 CFR Part 28 requiring commercial fishing vessels 79 feet or greater in length undergo vessel stability periodic verification, by a qualified individual, every 5 years and/ or after a major modification to ensure the vessel is still in compliance with their required stability instructions.

Implementing this regulation will ensure that a vessels profile has not been substantially altered in a manner which adversely affects its stability, including the cumulative effects of all alterations. This regulation will be applicable to all Commercial Fishing Vessel which measure 79 feet or greater and operate beyond 3 nautical miles from the baseline.

Many commercial fishing vessels frequently add new gear and equipment, even alter their configuration to adapt to different types of fisheries. These modifications frequently change the vessel's center of gravity and freeboard and are often accomplished with no oversight from a qualified individual. As was determined to be a causal factor during this investigation, these modifications are frequently a major contributing factor in loss of vessel/loss of life cases.

8.1.2. Safety Recommendation 2. It is recommended that the Commandant amend 46 CFR Part 28 to reflect requirements enacted under the Coast Guard Authorization Act of 2010, specifically provisions for individuals in charge of vessels operating beyond 3 nautical miles from the baseline to pass a training program covering certain competencies, including stability.

Most fishing vessel operators are unlicensed, and a licensed operator is only required on vessels over 200 gross tons. This new training requirement for operators will help ensure their competency to command the vessel. Individuals in charge of a fishing vessel will have to pass a training program or demonstrate knowledge and competency in seamanship, navigation and publications, collision prevention, stability, firefighting and prevention, damage control, personal survival, emergency medical care, emergency drills, weather, and emergency communication.

8.1.3. Safety Recommendation 3. It is recommended that the Commandant amend 46 CFR Part 28 and Part 42 to reflect the requirements enacted under the Coast Guard Authorization Act of 2010, specifically 46 U.S.C. §5102(b) requiring applicable Commercial Fishing Vessels to have a load line assigned.

The Coast Guard Authorization Act of 2010 amended 46 U.S.C. §5102(b) to require that fishing vessels 79 feet or greater in length and that are built after July 1, 2012, have a load line assigned. The Act also adds a new subsection (c) to 46 U.S.C. §5103 that requires a fishing vessel built on or before July 1, 2012, that undergoes a substantial change to the dimension of or type of vessel completed after July 1, 2012, or a later date set by the Coast Guard, to comply with an alternate load line compliance program developed in cooperation with the industry.

A load line indicates the minimum safe freeboard to which a vessel may be loaded. Conditions evaluated when calculating and assigning a load line include watertight integrity of the vessel, subdivision, and loading capacity. Fishing vessels are often modified such that their dimensions are changed, or they are converted to a different type of fishing vessel. When this action is taken, the loading conditions and seaworthiness of the vessel can be affected. Re-evaluation of the watertight integrity and safe loading capacity of the vessel may not always be performed. An alternate load line compliance program is to be developed by the Coast Guard in cooperation with the commercial fishing industry. This program should ensure these substantially changed vessels meet an equivalent standard of safety for the vessel that would have been met if there had been a load line assigned to the vessel.

8.1.4. Safety Recommendation 4. It is recommended that the Commandant implement new regulations requiring certain crewmembers aboard commercial fishing vessels to be subject to a chemical testing program such as prescribed by 46 CFR 16.

It is recommended that the Commandant should require pre-employment, random, and reasonable cause drug testing for those crew members who are in safety sensitive positions onboard documented commercial fishing industry vessels operating beyond the 3 nautical miles of the baseline line.

Individuals in charge and crew aboard commercial fishing vessels less than 200 gross tons are not required to hold Merchant Mariner Credentials, therefore the only instance when they are required to be drug tested is after a serious marine incident. Instituting a pre-employment, random, and reasonable cause drug testing program covering all crew members who are in safety sensitive positions would reduce the risk to crews and vessels.

8.1.5. Safety Recommendation 5. It is recommended that COMDT (CVC-3) provide guidance and instruction to Commercial Fishing Vessel Examiners to conduct Commercial Fishing Vessel Stability Training and Outreach.

It is recommended that COMDT (CVC-3) provide guidance and instructions to Commercial Fishing Vessel Examiners to conduct education and outreach to promote awareness, compliance, and provide training opportunities targeted specifically on CFV stability instructions requirements of 46 CFR 28 Subpart E – Stability. The education should include regulatory requirements required by Subpart E, to include proper freeing port design and the importance of maintaining watertight integrity. The Coast Guard should also highlight the owner's responsibilities to select qualified individuals to conduct stability assessments consistent with regulatory requirements, and to provide their captains with accurate stability instructions that reflects vessel alterations, modifications and changes to any new fishing gear. Education and outreach can include developing safety alerts, attending industry workshops or hosting industry days with local CFV owners, captains, operators and naval architects or qualified individuals.

8.1.6. Safety Recommendation 6. It is recommended that COMDT (CVC-3) provide guidance and instruction to Commercial Fishing Vessel Examiners to conduct Crew Endurance Management System and Anti-Fatigue Training and Outreach.

It is recommended that COMDT (CVC-3) provide guidance and instruction to Commercial Fishing Vessel Examiners to conduct education and outreach to promote awareness and provide Crew Endurance Management System and Anti-Fatigue training. Fatigue experienced by commercial fishing vessel crewmembers while fishing is a chronic issue and often a contributing factor to marine casualties within the commercial fishing vessel community. This investigation revealed a latent unsafe condition where the crews of the EMMY ROSE, who had been working in the commercial fishing industry for their entire adult life had grown accustomed to working and operating vessels while fatigued. Because they had grown accustom in this culture, they thought they could operate their vessels safely with minimal sleep. They were not aware and had not been trained on crew endurance management, nor the impact a crew endurance management system could have on fishing operations and the safe operation of the vessel. Education and outreach can include developing safety alerts, presenting a training module at industry workshops and industry days with local CFV owners, captains, and operators.

8.2. Administrative Recommendations

8.2.1. Recommend this investigation be closed.

COWAN.TREVO [redacted]
R.C.[redacted]

T. C. Cowan
Commander, U.S. Coast Guard
Lead Investigating Officer

Enclosure: District Formal Board of Investigation Convening Order

Appendix: Coast Guard MSC Post Sinking Stability Analysis and Enclosures

United States Coast Guard

MISLE Incident Investigation Report

into the grounding and total constructive loss of the ILA (O.N. 243404) 1 nautical mile south of Grays Harbor south jetty in Westport, WA on 20 August 2016

MISLE Activity Number: 6106373
MISLE Case Number: 1041009

U.S. Department of Homeland Security
United States Coast Guard

Commandant
United States Coast Guard

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16732/IIA# 6106373
15 June 2022

THE GROUNDING AND LOSS OF THE COMMERCIAL FISHING VESSEL ILA ONE NAUTICAL MILE SOUTH OF GRAYS HARBOR, WA ON AUGUST 20, 2016

ACTION BY THE COMMANDANT

The record and the report of the investigation convened for the subject casualty have been reviewed. The record and the report, including the findings of fact, analysis, and conclusions are hereby closed.

The investigation's safety recommendations will remain under review and consideration by the responsible program office(s). The response to the recommendations and any resultant actions will be documented separately.

[redacted]
A. L. FAHRIG
Commander, U.S. Coast Guard
Acting Chief, Office of Investigations & Casualty Analysis (CG-INV)

U.S. Department of Homeland Security
United States Coast Guard

Commanding Officer
U.S. Coast Guard
Marine Safety Unit Portland

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Phone: (503) 240-9314
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16732
19 March 2020

MEMORANDUM

[redacted]

From: A. H. Moore, Jr., CAPT
CG MSU Portland

To: CGD THIRTEEN (dpi)

Subj: OCMI ENDORSEMENT OF SAFETY RECOMMENDATIONS REGARDING THE GROUNDING OF ILA (O.N. 243404)

Ref: (a) Title 46 Unites States Code (U.S.C.) Chapter 63 - Investigating Marine Casualties
(b) Title 46 Code of Federal Regulations (CFR) Subpart 4.07 - Investigations
(c) Marine Safety Manual, Volume V: Investigations, COMDTINST M16000.10 (series)
(d) Marine Investigations Management and Documentation Requirements, CG-INV Policy Letter 3-18

1. Pursuant to references (a) through (d), an informal marine casualty investigation into the grounding and subsequent total constructive loss of the commercial fishing vessel ILA was conducted. The investigation and corresponding MISLE Activity 6106373 are forwarded for final action. The vessel was grounded on the beach in Westport, WA, due to the vessel operator falling asleep. The operator was the only person onboard the vessel. This investigation revealed various factors that led to the grounding. Factors included the operator falling asleep while at the vessel's controls, no requirement for a licensed Master to be in charge, no requirement for adequate manning, no requirement for the use of a watch alarm, and the operator's consumption of alcohol within 4 hours of operating the ILA. These factors all contributed to the grounding and subsequent loss of the ILA.

2. **Safety Recommendation (7.1.1): Manning, Watch Standing Schedule Requirements and Fatigue Standards for Commercial Fishing Vessels.** Concur. This investigation identified a latent unsafe condition, which increases the risk of future marine casualties. The control measures in place were inadequate, and the control measures articulated in the recommendation would mitigate or eliminate the latent unsafe condition and significantly reduce the risk of a future casualty of this nature. These control measures entail amending 46 CFR Part 28 - Requirements for Commercial Fishing Industry Vessels (CFIVs) to include language that requires vessel owners, agents, masters, operators, and person in charge, shall implement crew manning and endurance management policies on CFIVs of similar construction, size, and type as the ILA.

3. Administrative Recommendations: I concur with all administrative recommendations and recommend that the investigation be officially closed.

#

U.S. Department of Homeland Security
United States Coast Guard

Commander
Thirteenth Coast Guard District

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16732
MAR 26 2020

FIRST ENDORSEMENT on CG MSU Portland Memo 16732 of 19 Mar 2020

[redacted]

From: P. S. McElligatt, CAPT
CGD THIRTEEN (dp)

To: COMDT (CG-INV)

Subj: GROUNDING OF THE F/V ILA (O.N. 243404), 1 NM SOUTH OF GRAYS HARBOR SOUTH JETTY, ON AUGUST 20, 2016

I reviewed the Investigating Officer's report of investigation and I am forwarding the report recommending approval. I concur with the Investigating Officer's Safety Recommendation, with the following amplifying comments:

> **Recommendation: The Coast Guard amend 46 CFR Subchapter C to include language that requires vessel owners, operators, agent, masters, and persons- in-charge, to implement crew manning and endurance management policies and practices.** Concur. I recommend that Commandant make a change to 46 CFR Subchapter C that implements crew manning and endurance management policies and practices.

#

Copy: CG MSU Portland

U.S. Department of Homeland Security
United States Coast Guard

Commander
United States Coast Guard
Marine Safety Unit Portland

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Phone: (503) 240-9309

16732
30 March 2017

ILA (O.N. 243404) Grounding and Constructive Total Loss
1 NM South of Grays Harbor South Jetty in Westport, WA on 20 August 2016

INVESTIGATING OFFICER'S REPORT

Executive Summary

The ILA (O.N. 243404) is a 36.8 foot, 14 Gross Ton, uninspected commercial fishing vessel (CFV) constructed of wood and built in 1943 in Seattle Washington. A Coast Guard Dockside Examination was completed and a commercial fishing vessel decal was issued to the vessel on 07 April 2016. At the time of this casualty, the ILA was considered to be in good condition for the age and service of the vessel. The regulations that govern the ILA are found in Title 46 of the Code of Federal Regulations, Subchapter C – Uninspected Vessels.

On the evening of 19 August 2016, the ILA, a Commercial Fishing Vessel (CFV) owned and operated out of Westport, WA, got underway at approximately 2230 from float 7 at Westport Marina in Westport, Washington. The vessel operator navigated the ILA toward Ledbetter Point off the Columbia River entrance. There were no other personnel on board. The vessel was equipped with autopilot, but it was not determined whether it was activated at anytime during the ILA's transit that night. The unlicensed operator purchased the ILA on 12 July 2016 and was unfamiliar with fishing the waters off the southern Washington coastline. The Operator stated that he had been drinking in town earlier that night, just prior to getting the CFV ILA underway.

On 20 August 2016, while underway, the operator fell asleep four to five miles off shore. Hours later the ILA and its operator grounded one nautical mile south of Grays Harbor south jetty, in Westport, WA. After running the ILA aground, the operator hailed the U.S. Coast Guard over channel 16 and declared that he had fallen asleep and woke up on the beach.

The Operator disembarked the vessel by jumping over the side onto the beach where U.S. Coast Guard personnel from Station Grays Harbor awaited. While attempting to evaluate the operator's condition, Coast Guard personnel noted the smell of alcohol emanating from the operator and that he was not wearing clothing from the waist down. The Operator was taken to Coast Guard Station Grays Harbor and was later released.

Numerous attempts to contact the operator after the casualty were unsuccessful. Federal funding was sought by the U.S. Coast Guard to remove the fuel on board the ILA. Washington State Department of Environmental Protection hired additional response contractors to remove oil soaked debris and additional fuel oil from the ILA. Washington State Department of Natural Resources ultimately took possession of the ILA and had it removed from the beach. On 23 August 2016, three days after the vessel grounded, the ILA broke apart, making it a hazard to persons frequenting the location.

Through its investigation, the Coast Guard determined the initiating event of this casualty was the vessel's grounding which led to the subsequent loss of propulsion and total constructive loss of the ILA. Causal factors contributing to this event were: 1) The operator falling asleep while at the vessel's controls, 2) No requirement for a licensed Master to be in charge, 3) No requirement for adequate manning, 4) No requirement for use of a watch alarm, and 5) The operator's consumption of alcohol within 4 hours of operating the ILA.

Section 1 – Preliminary Statement (Required)

This investigation involving the grounding and subsequent total constructive loss of the Commercial Fishing Vessel ILA one nautical mile south of Grays Harbor south jetty on 20 August 2016 In Grays Harbor WA, along with the submission of this report, were conducted in accordance with Title 46, Code of Federal Regulations, Part 4, and under the authority of Title 46, United States Code, Chapter 63.

1.1. [redacted] Senior Investigator with the Washington State Department of Ecology provided pictures and invaluable investigative analysis for the U.S Coast Guard's investigation.

1.2. There are no persons designated parties-in-interest.

1.3. All times listed in this report are in Pacific Standard Time using a 24-hour format. The Incident Investigation Activity Number for this investigation is 6106373.

Section 2 – Vessels Involved in the Incident

Vessel Name:	ILA
Vessel Identification Number:	243404
Flag:	US
Vessel Class/Type/Sub-Type	Fishing Vessel
Material Type:	Wood Plank on Frame
Build Year:	1943
Gross Tons:	14
Length:	36.8
Breadth:	11
Depth:	5.7
Main/Primary Propulsion:	Single keel-cooled diesel engine

Commercial Fishing Vessel ILA Grounded on 20 August 2016

Section 3 – Record of Deceased, Missing, and Injured

3.1 No one is injured, missing, or dead as part of this casualty.

Section 4 – Findings of Fact

4.1. On the evening of 19 August 2016, the ILA, a Commercial Fishing Vessel (CFV) owned and operated out of Westport, WA [redacted] got underway at approximately 2230 from float 7 at Westport Marina in Westport, Washington. The vessel operator navigated the ILA toward Ledbetter Point off the Columbia River entrance. There were no other personnel on board. The vessel was equipped with autopilot, but it was not determined whether it was activated at anytime during the ILA's transit that night. The unlicensed operator purchased the ILA on 12 July 2016 and was unfamiliar with fishing the waters off the southern Washington coastline. The Operator stated that he had been drinking in town earlier that night, just prior to getting the CFV ILA underway.

4.2. Sometime between 2300 on 19 August 2016 and 0300 on 20 August, the operator fell asleep while operating the ILA four to five miles west of Grays Harbor entrance while making seven knots.

4.3. Sometime between 0300 and 0327 on 20 August, the CFV ILA ran aground while under its own power near Grays Harbor entrance one mile south of the south Grays Harbor Entrance jetty in Westport, WA. The location of the grounding was approximately two miles from Westport Marina.

4.4. At approximately 0330 on 20 August 2016, USCG Station Grays Harbor personnel made contact with the ILA on the beach after spotting a red flare that was discharged by the operator. The Operator, who at the time had no pants on, jumped off the boat on to shore and walked to USCG Station Grays Harbor shore side personnel. As Station Grays Harbor personnel drove the operator back to their Station, both personnel smelled alcohol coming from the ILA's operator [redacted] There was no field sobriety test or breathalyzer administered.

4.5. At approximately 0700 on 20 August 2016, [redacted] did not reply to contact attempts by USCG Pollution Response personnel. USCG Pollution Response personnel opened federal funding to remove 200 gallons of diesel from on board the CFV ILA.

4.6. At approximately 0730 on 20 August 2016, the owner/operator began selling off portions of the ILA's equipment while at the Knotty Pine Tavern (201 E Dock St, Westport, WA 98595).

4.7 At approximately 2240 on 20 August 2016, USCG procured contractors removed 165GAL of diesel fuel from the vessel's port and starboard tanks and used damage control plugs to prevent any remaining residue from spilling.

4.8 At approximately 1200 on 22 August 2016, Washington State Department of Ecology found the ILA's engine tachometer (rpm indicator) stuck at 1,300 to 1,400 rpm. In addition, the transmission for the engine was found in the forward position, and the throttle lever was in the forward position as well.

August 22nd photo of the wheelhouse of the ILA *showing engine controls (gear control indicated by black arrow; throttle indicated by red arrow) and engine tachometer (circled in blue at lower right).*

4.9 At approximately 1200 on 22 August 2016, Washington State Department of Natural Resources took emergency temporary custody of the vessel and hired Global Diving and Salvage to remove the wreck of the ILA from the beach. A backhoe and dump trucks were brought to the beach on August 23rd to remove the ILA which was already in pieces on the beach due to previous tidal cycles.

CFV ILA *being dismantled on August 23rd.*

Photograph taken August 23rd, of the removal of the wrecked FV ILA.

4.10 This incident was not determined to be a Serious Marine Incident as per 46 CFR § 4.03-2. The vessels value was found to be below $100,000.00. Operator was not subjected to post-casualty drug and alcohol testing in accordance with 46 CFR Subpart 4.06.

Section 5 – Analysis and Opinions

5.1 *Falling Asleep While at Vessel's Controls*: A recent analysis of NTSB accident investigations found fatigue was cited as a probable cause, contributing factor or a finding in 20 percent of all recent major investigations in all modes of transportation. Although the operators work rest habits were never ascertained due to his lack of cooperation with this investigation, the operator had fallen asleep while in control of the ILA. This finding along with the operator's consumption of alcoholic beverages (which have a sedative quality) just prior to getting underway with the ILA, was the primary contributing cause of this casualty.

5.2 *No Requirement for a Licensed Master to be In Charge:* There are no statutory requirements for licensed individuals to be onboard fishing vessels of less than 200 gross tons operating on the high seas, with the exception of certain fish processing vessels, or fish tending vessels in Aleutian trade. Seagoing uninspected and documented fishing vessels of 200 or more gross tons on the high seas are required at a minimum to have a licensed Master on board. Every uninspected passenger vessel must be under the command of an individual holding a license or MMC endorsed as master. These Master's at a minimum have proven proficiency in practical aspects of boating, including rules of the road, radio operation, survival techniques, distress signaling, boating terminology, boat equipment, seamanship, firefighting and more. They bring a level of knowledge, experience, and professionalism that is crucial when operating in commercial service. If a licensed mariner was required on board the ILA, that Master's professionalism and training may have ensured a proper watch was stood and that proper arrangements for the vessel's manning were made.

5.3 *No Requirement for Adequate Manning:* There are no statutory requirements for watch systems or manning on fishing vessels of less than 200 gross tons operating on the high seas. Masters of seagoing uninspected towing vessels of at least 26 feet and every operator of an uninspected passenger vessel are required to ensure adequate manning and watches for the safety of the vessel, crew and passengers. While there may be individuals who can routinely and safely perform work for periods in excess of 12 consecutive hours, it is not in the best interest of the vessel's safe operation. The operator's own statements suggested that he would be in operation of the ILA well past 12 hours during his declared voyage. If a prudent mariner were at the operational controls of the ILA and an adequate watch system and manning were ensured, the operator may have had another individual on board to pass the watch to instead of falling asleep at the controls. An alert mariner at the helm may have prevented this casualty.

5.4 *No Requirement for Use of a Watch Alarm:* There are no statutory requirements for the use of watch alarms on board commercial fishing vessels. Watch alarms are required equipment on board some inspected vessels. A watch alarm monitors the awareness of the person on watch and automatically alerts through a series of indications and alarms to help ensure an alert watch. If the vessel had an effective watch alarm and used it, it may have prevented this casualty.

5.5 *Consumption of Alcohol within 4 Hours of Operating:* Under 33 CFR § 95.045, "a crewmember (including an officer), pilot, or watch stander while on an inspected vessel, or vessel subject to inspection, shall not perform or attempt to perform any scheduled duties within four hours of consuming any alcohol". The Operator, [redacted] consumed alcohol within 4 hours of operating the ILA on the night of 19 August 2016. If [redacted] had not consumed alcohol, he may not have succumbed to its sedative effects and might not have fallen asleep. This may have prevented this casualty.

Section 6 - Conclusions:

6.1 Cause of the Casualty:

6.1.1. The initiating event for this casualty occurred when the ILA ran aground one nautical mile south of Grays Harbor south jetty in Westport, WA. Actions and conditions which caused the ILA to ground were: 1) the operator falling asleep while at the vessel's controls, 2) No licensed Master in charge, 3) No adequate manning , 4) no use of a watch alarm, and 5) the operator’s consumption of alcohol within 4 hours of operating the ILA.

6.1.2. As a result of the grounding the vessel experienced a subsequent loss of propulsion.

6.1.3. As a result of the grounding, the vessel experienced subsequent material failure leading to its total constructive loss. Actions and conditions which led to the vessel’s material failure: 1) improper support of vessel’s hull which led to plank damage due to point loading, and 2) lack of any effort on the part of the owner/operator to salvage the vessel in a timely manner.

6.2 Violations of Law by Credentialed Mariners: The CFV ILA is less than 200 Gross Tons and is not required to have a credentialed mariner operate the vessel. [redacted] not a credentialed mariner.

6.3 Violations by Members of the Coast Guard: There is no evidence of actionable misconduct, inattention to duty, or negligent or willful violation of law or regulation on the part of Coast Guard licensed or certificated personnel.

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6.4 Violations Subjecting Parties to a Civil Penalty:

6.4.1 The actions described in paragraph 6.1.1 above represent a violation of 46 USC § 2302(a) (negligent operations) by the operator of the ILA for failure to safely manage and operate the CFV ILA.

6.4.2 Following the reportable marine casualty of the CFV ILA, the owner and/or operator failed to submit a written report via form CG-2692 within five days to the U. S. Coast Guard. The failure to submit this form constitutes a violation of 46 CFR § 4.05-10.

6.4.3 The actions described in paragraph 6.1.1 above represent a violation of 33 CFR § 95.050(b). Evidence shows that the operator of the ILA was intoxicated due to personal observations of his manner, disposition, general appearance and behavior. [redacted] own statements made to Department of Ecology personnel from the State of Washington confirm that he had been drinking alcohol just prior to getting underway with the ILA. His failure, as the marine employer allowing an individual to stand watch or perform other duties while intoxicated, constitutes a violation of 33 CFR § 95.50(b).

6.5 Violations of Criminal Law: There is no evidence of any potential criminal acts.

6.6 Need for New or Amended Laws/Regulations: There is evidence of a need for new laws or regulations, or amendment or repeal of existing laws or regulations to prevent recurrence of a similar casualty (see 7.1.1).

Section 7 - Recommendations:

7.1. Safety Recommendations:

7.1.1 **Manning, Watch Standing Schedule Requirements and Fatigue Standards for Commercial Fishing Vessels:**

Currently, 46 CFR Subchapter C, does not establish any manning, watch standing schedule requirements or fatigue standards for those working aboard CFV's of less than 200GT.

This investigation revealed a latent unsafe condition (LUC) with regard to the operator, who had fallen asleep while on watch and at the controls of the ILA. There were no additional personnel on board the ILA. A requirement for a licensed Master to be on board whose responsibility it would be to ensure adequate manning and watch keeping may reduce the occurrence of this LUC on all U. S. commercial fishing vessels. The existence of a regulation mandating watch schedules would eliminate the cultural norm currently expecting commercial fisherman to work, fish, stand watches and operate vessels safely beyond what they are physiologically capable of doing. This regulation would instead mandate that all mariners aboard commercial fishing vessels meet a minimum manning and rest standard.

RECOMMEND that the Coast Guard amend 46 CFR Subchapter C to include language that requires vessel owners, operators, agent, masters, and person's in-charge, to implement crew manning and endurance management policies and practices.

7.2. Administrative Recommendations:

7.2.1 Recommend a Notice of Violation be issued [redacted] for violations of:

7.2.1.1 46 USC § 2302 (a) A person operating a vessel in a negligent manner or interfering with the safe operation of a vessel, so as to endanger the life, limb, or property of a person.

7.2.1.2 46 CFR § 4.05-10(a) The owner, agent, master, operator, or person in charge shall, within five days, file a written report of any marine casualty required to be reported under §4.05-1. Owner failed to file written CG-2692.

7.2.1.3 33 CFR § 95.050(b) If the marine employer has reason to believe that an individual is intoxicated, the marine employer shall not allow that individual to stand watch or perform other duties. Marine employer permitted individual to stand watch while intoxicated.

7.2.2 It is recommended that this investigation be closed.

[redacted]

Investigating Officer
U.S. Coast Guard

I concur with the Investigating Officer's findings.

[redacted]

T. A. GRIFFITTS
Captain, U.S. Coast Guard
Officer in Charge, Marine Inspection

UNITED STATES COAST GUARD

REPORT OF THE INVESTIGATION INTO THE LOSS OF LIFE ONBOARD THE COMMERCIAL FISHING VESSEL (CFV) INVICTUS (O.N. 914373), APPROXIMATELY 68 MILES EAST OF CAPE MAY, NEW JERSEY, ON APRIL 15, 2020.

MISLE ACTIVITY NUMBER: 6944417

U.S. Department of Homeland Security
United States Coast Guard

Coast Guard Sector Delaware Bay
United States Coast Guard

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16732
March 25 2021

REPORT OF INVESTIGATION INTO THE LOSS OF LIFE ONBOARD THE COMMERCIAL FISHING VESSEL (CFV) INVICTUS (O.N. 914373), APPROXIMATLEY 68 MILES EAST OF CAPE MAY, NEW JERSEY, ON APRIL 15, 2020

INVESTIGATING OFFICER'S REPORT

Executive Summary

At approximately 2205 EST, on April 15, 2020, the CFV INVICTUS (the vessel) was fishing in the Atlantic Ocean approximately 68 nautical miles east of Cape May, NJ. The vessel was fishing for scallops, and in the process of dredging, when one of its crewmembers (the subject) went missing sometime between 2205 and 2215. This event occurred while three other crewmembers were in the mud room, the master was in the wheelhouse, and the mate was in the galley. At no time did the aforementioned crewmembers observe the subject depart the vessel. At approximately 2215, the crewmembers placed another load of scallops on deck and began to process this catch. One of them quickly realized that the subject was not present with them working on deck and they immediately notified the master. The crewmembers and mate conducted an extensive and thorough search of the vessel, but they were unable to locate the subject. Once the search was completed, and it was determined that the subject was not onboard, the most probably explanation was that the subject had gone overboard. The vessel's master then called the Coast Guard for assistance on VHF Ch. 16 and commenced searching the water for the subject. The on scene weather was: visibility 10 nautical miles, the sky was clear, barometric pressure was 29.91, the dry bulb temperature was 49 degrees Fahrenheit (9.4 degrees Celsius), wet bulb temperature was 60 degrees Fahrenheit (15.5 degrees Celsius), sea water temperature was 42 degrees Fahrenheit (5.5 degrees Celsius), sea waves were out of 320 at approximately one foot, and swell waves were out of 320 at approximately two feet.

The vessel and the Coast Guard searched throughout the night for the subject. At approximately 0700 EST on April 16, 2020, the vessel spotted the subject floating in the water. The master maneuvered the vessel alongside the subject and instructed the one crewmember on deck to maintain positive control of the subject's body. The Coast Guard arrived on scene at approximately 0723, and dispatched a small boat to recover the subject. The Coast Guard transported the subject to Cape May, NJ, where the subject was pronounced deceased and subsequently transported to the Cape May County Medical Examiner's office.

As a result of its investigation, the Coast Guard has determined that the initiating event for this casualty was the subject going overboard. The causal factors that contributed to this casualty include: (1) the subject was under the influence of fentanyl; (2) regulatory pre-employment or random drug test requirements do not exist for commercial fishing operations; (3) the company

that owns/operates the INVICTUS did not have a drug testing policy (see #2 above).

1. Preliminary Statement

1.1. This marine casualty investigation was conducted and this report submitted in accordance with Title 46, Code of Federal Regulations (CFR), Subpart 4.07, and under the authority of Title 46, United States Code (USC) Chapter 63.

1.2. The Investigating Officer designated two parties-in-interest in this investigation.

1.2.1. Legal counsel for Glaucus, LLC, the owner of the INVICTUS. Glaucus, LLC is entitled to party-in-interest status as per 46 USC 6603(1).

1.2.2. Legal counsel for the subject's estate. The legal counsel for the subject's estate was granted PII to assist the Investigator with collection of evidence.

1.3. The Coast Guard was the lead agency for all evidence collection activities involving this investigation.

1.4. All times listed in this report are approximate and are given in Eastern Standard Time using a 24-hour format.

2. Vessel Involved in the Incident

Figure 1. Photograph of the INVICTUS provided by CG Sector Long Island Sound on April 25, 2020.

Official Name:	INVICTUS
Identification Number:	914373
Flag:	United States
Vessel Class/Type/Sub-Type	Commercial Fishing Vessel
Build Year:	1987
Gross Tonnage:	111 GTR
Length:	74.1 Ft.
Beam/Width:	24 Ft.
Draft/Depth:	12.2 Ft.
Main/Primary Propulsion: (Configuration/System Type, Ahead Horse Power)	Diesel Engine
Owner:	Glaucus LLC, 322 New Haven Avenue Milford, Connecticut, 06460
Operator:	Glaucus LLC, 322 New Haven Avenue Milford, Connecticut, 06460

3. Deceased, Missing, and/or Injured Persons

Relationship to Vessel	Sex	Age	Status
Crewman	Male	51	Deceased

4. Findings of Fact

4.1. The Incident:

4.1.1. At 0830, on April 14, 2020, the crew of the vessel commenced preparations to get underway from Stonington, CT. The subject assisted with preparations, including fueling the vessel and bringing on supplies. While preparing the vessel to get underway the master of the vessel interacted with the subject and found him to be in a sound state of mind.

4.1.2. Between 0930 and 1200, the subject departed the vessel to retrieve items from his home for the upcoming voyage. During this drive he visited at least two associates before returning to the vessel.

4.1.3. At 1200, the subject returned to the vessel where he interacted with two of the crewman from the CFV REGULUS. One crewmember off the REGULUS had difficulty communicating with the subject, and reported that the subject had difficulty maintaining his train of thought.

4.1.4. At 1600, the vessel and its crew got underway heading toward their intended fishing ground in the Atlantic Ocean. The location they were fishing was approximately 68 miles east of Cape May, NJ.

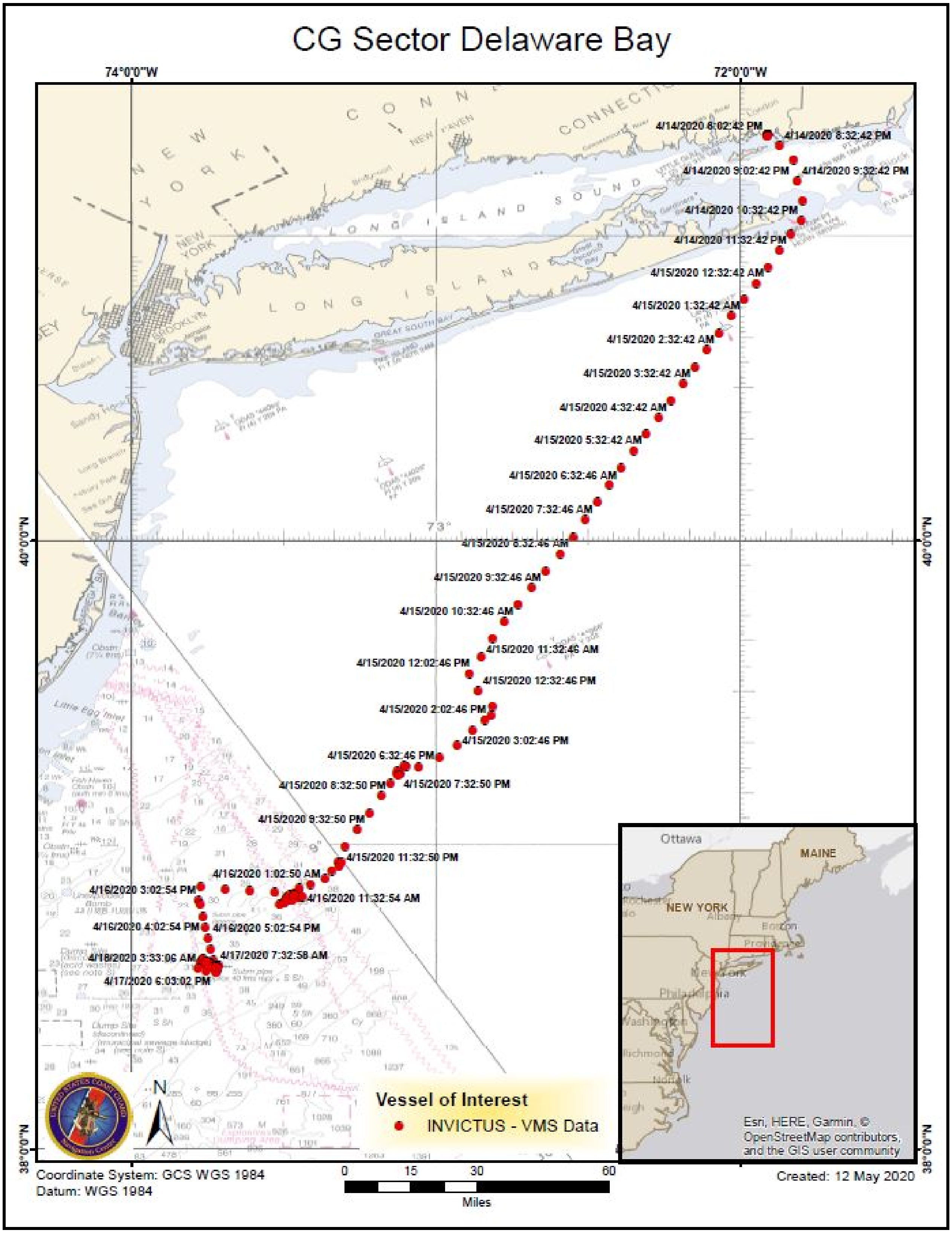

Figure 2. INVICTUS VMS Data provided by SkyMate. All times are in Zulu, subtract four (4) hours for EST.

4.1.5. The subject rested from approximately 1600 on April 14 until 0900 the morning of April 15.

4.1.6. At 0900, on April 15, the subject started his first shift on deck cutting scallops. The shift lasted until 1600 the same day.

4.1.7. At 1600, the subject rested until 2130 the same day.

4.1.8. At 2130, the master of the vessel woke the subject up in preparation for his next shift.

4.1.9. At 2150, the subject arrived on deck and started assisting the other crewmembers with processing the scallops.

4.1.10. At approximately 2205, the vessel's crewmembers finished processing the scallops on deck and took a break. Three crewmembers were in the mudroom, the mate was in the galley, the master was in the pilot house, and the subject was alone on the aft deck.

4.1.11. At approximately 2220, the vessel hauled back another catch of scallops and the crewmembers started processing the catch. They soon discovered that the subject was not on deck with them and notified the master. The master instructed the crewmembers to search the vessel for the subject.

4.1.12. At 2243, the vessel's master hailed the Coast Guard via CH. Ch. 16 (412.975 Mhz) notifying them that the subject had gone overboard. At about the same time, the vessel commenced searching the water for the subject.

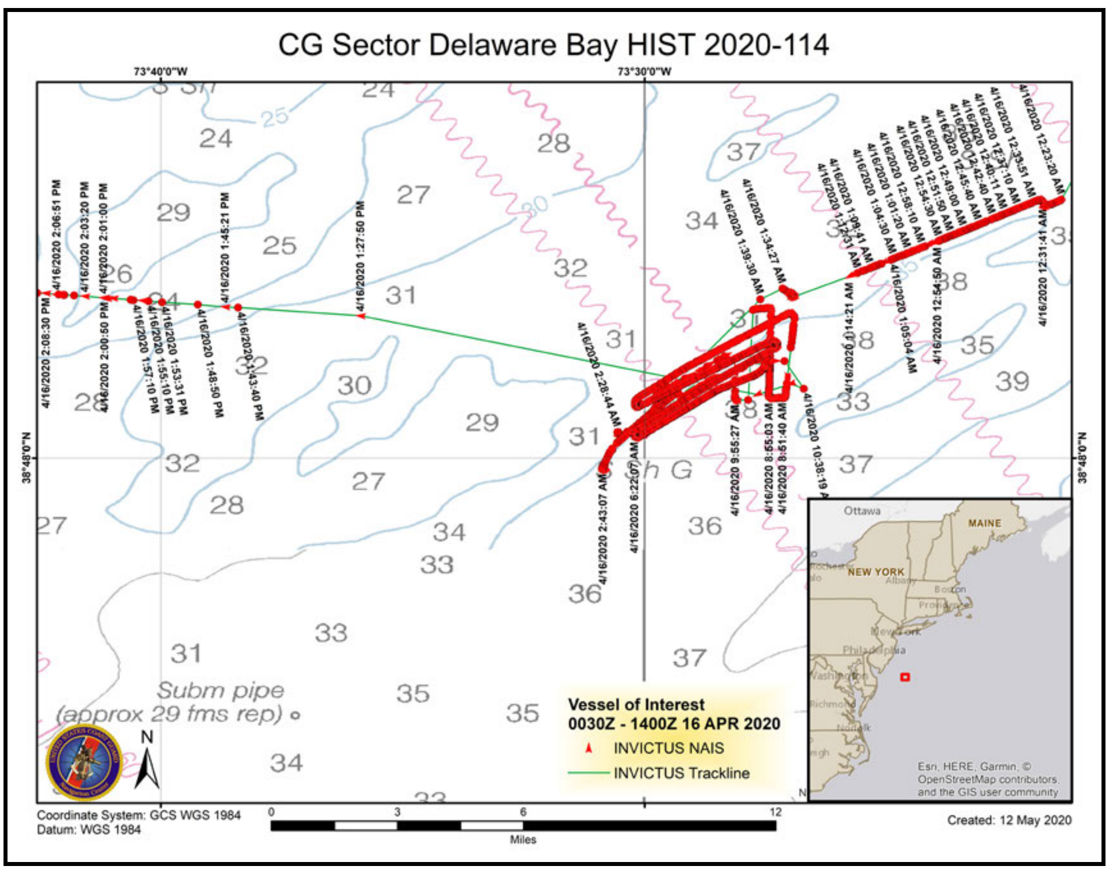

Figure 3. INVICTUS VMS Data provided by SkyMate. All times are in Zulu, subtract four (4) hours for EST. Close up of INVICTUS's search pattern.

4.1.13. At 0123, on April 16, the vessel's master administered breathalyzer tests to the remaining crewmembers onboard the vessel, and all of the test results were [redacted] blood alcohol content.

4.1.14. At approximately 0700, one of the vessel's crewmembers spotted the subject's body floating on the water. The crewman notified the master who maneuvered the vessel toward the subject. The subject was unresponsive and appeared to be drowned, so two of the crewmembers attached a line with a buoyant fender to the subject's body to keep it afloat.

4.1.15. At 0723, a Coast Guard small boat arrived on scene from the Coast Guard Cutter CGC LAWRENCE LAWSON to recover the subject's remains and transport the subject back to shore. Upon recovering the subject's body, the CGC LAWRENCE LAWSON returned to Cape May, NJ.

4.1.16. At approximately 1200, the subject's remains were transferred to the Cape May County Medical Examiner's office.

4.2. Additional/Supporting Information:

4.2.1. At 2200, on April 15, 2020, the on-scene weather was: visibility 10 nautical miles, the sky was clear, barometric pressure was 29.91, the dry bulb temperature was 49 degrees Fahrenheit (9.4 degrees Celsius) wet bulb temperature was 60 degrees Fahrenheit (15.5 degrees Celsius), sea water temperature was 42 degrees Fahrenheit (5.5 degrees Celsius), sea waves were out of 320 at approximately one foot, swell waves were out of 320 at approximately two feet.

4.2.2. On November 6, 2019, the subject started seeing a physician for opioid addiction. The physician prescribed a Suboxone treatment program.

4.2.3. On January 22, 2020, the subject's physician decided to stop treatment and recommended the subject to seek medical care elsewhere.

4.2.4. On April 15, 2020, the subject had 18 packets of Suboxone Film in his possession and one of them was opened.

4.2.5. Common side effects of Suboxone include, but are not limited to: respiratory problems; sleepiness; dizziness; problems with coordination; opioid withdrawal; a decrease in blood pressure; intoxication; fainting; and sleepiness.

Figure 3. Photograph provided by CG Sector Long Island Sound.

4.2.6. Buprenorphine and naloxone (Suboxone) were not screened for on the subject's toxicology report.

4.2.7. Toxicology revealed that the subject had 14.27 mcg/L of fentanyl in his femoral blood.

4.2.8. Effects of fentanyl on the body include: relaxation; euphoria; pain relief; sedation; confusion; drowsiness; dizziness; nausea; vomiting; urinary retention; pupillary constriction; and respiratory depression.

4.2.9. Toxicology revealed that the subject had 2.43 mcg/L norfentanyl in his femoral blood. The National Library of Medicine defines norfentanyl as "a major metabolite of fentanyl."

5. <u>Analysis</u>

5.1. *The company that owns and operates the INVICTUS did not have a drug testing policy in place (no drug testing policy is required by current regulation)*. As identified by the New Jersey Medical Examiner, a contributing condition to the subject's death was the adverse effects of fentanyl. The toxicology report revealed that the subject was found with fentanyl in his blood. The medical records suggest that he had been receiving treatment for opioid addiction since November 6, 2019, but failed to show for random urine screens on November 20, 2019, or any subsequent urine screens. If the company had pre-employment and random drug testing program in place they may have discovered that the subject was suffering from opioid addiction, and they may have prevented him from sailing, likely preventing him from going overboard and subsequently drowning.

5.2. *Regulatory pre-employment or random drug test requirements do not exist for commercial fishing operations*. There are no laws or regulations requiring fishing vessel owners, managers, operators, or employees to submit to, or to submit their employees to pre-employment or random drug screening. The crewmember was found to have fentanyl present in his blood at the time of death. Additionally, he had recently received treatment for opioid addiction. Had there been a drug testing program in place, the subject's employer may have prevented him from sailing, likely preventing him from going overboard and subsequently drowning.

5.3. *Subject was under the influence of fentanyl.* The subject was recovered with 14.27 mcg/L of fentanyl in his blood. Some of the effects of fentanyl may include dizziness, drowsiness, euphoria, and nausea. Reports from the other crewmembers onboard with the subject attested that he was uncharacteristically lethargic, and the crewmembers of the REGULUS observed that the subject had difficulty carrying on a conversation prior to getting underway. Had the subject not been under the influence of fentanyl he may not have suffered the side effects of drowsiness, or other side effects associated with fentanyl, and he likely would not have gone overboard and subsequently drowned.

6. Conclusions

6.1. Determination of Cause:

6.1.1. The initiating event for this casualty was the subject going overboard. It is undetermined how or why the subject went over the side of the INVICTUS because there were no witnesses to, and no recordings of the event.

6.1.2. The first subsequent event was the subject suffered from hypothermia, as evidenced by the report of autopsy.

6.1.2.1. If the subject had an immersion suit on he may not have suffered from hypothermia.

6.1.3. The second subsequent event was the subject drowning.

6.1.3.1. The subject did not have a personal flotation device on to maintain positive buoyancy. The New Jersey Medical Examiner ruled the cause of death to be drowning.

6.2. Evidence of Act(s) or Violation(s) of Law by Any Coast Guard Credentialed Mariner Subject to Action under 46 United States Code (USC) Chapter 77: There were no acts of misconduct, incompetence, negligence, unskillfulness, or violations of law by a credentialed mariner identified as part of this investigation.

6.3. Evidence of Act(s) or Violation(s) of Law by U.S. Coast Guard Personnel, or any other person: There were no acts of misconduct, incompetence, negligence, unskillfulness, or violations of law by any U.S. Coast Guard personnel, or any other person, identified as part of this investigation.

6.4. Evidence of Act(s) Subject to Civil Penalty: There is no evidence of acts subject to civil penalty.

6.5. Evidence of Criminal Act(s): There is no evidence of criminal acts.

6.6. Need for New or Amended U.S. Law or Regulation: The regulations found in 46 Code of Federal Regulations (CFR) Part 28 should be updated to incorporate the requirements of 46 C.F.R. Part 16. Safety Recommendation 8.1.1 below further outlines this recommendation for implementing drug testing on commercial fishing vessels.

6.7. Unsafe Actions or Conditions that Were Not Causal Factors: No unsafe actions or conditions that were not causal factors were identified during this investigation.

7. Actions Taken Since the Incident

7.1. No action has been taken by the Coast Guard since the incident.

8. Recommendations

8.1. Safety Recommendation:

8.1.1. Recommend Commandant of the Coast Guard review and consider amending the regulations contained in 46 CFR Part 28 to require that all operators and crewmembers onboard commercial fishing vessels be subject to the drug testing requirements outlined in 46 CFR Part 16. The purpose of 46 CFR 16 is to "provide a means to minimize the use of intoxicants by merchant marine personnel and to promote a drug free and safe work environment," and it "prescribe[s] the minimum standards, procedures, and means to be used to test for the use of dangerous drugs". Requiring marine employers and commercial fisherman to meet the requirements of 46 CFR Part 16 provides commercial fisherman with a similarly safe work environment to their peers in the merchant marine and would likely prevent a host of accidents and deaths in the future.

8.1.2. Recommend the Department of Transportation review and consider amending 49 CFR 40.87(a) to include fentanyl, buprenorphine, and naloxone. The drug landscape in the United States changes rapidly, and the use of fentanyl has become prolific. Buprenorphine and naloxone are chemicals found in some of popular opioid treatment medications. Testing for fentanyl, buprenorphine, and naloxone will protect the maritime transportation system by minimizing the use of intoxicants by marine employee and promote a drug free and safe work environment.

8.2. Administrative Recommendations: No administrative recommendations have been made as a result of this investigation.

[redacted]
Chief Warrant Officer, U.S. Coast Guard
Investigating Officer

United States Coast Guard

MISLE Incident Investigation Report For

KENDRA & MAYSIE Grounding/Sinking/Pollution

On 15Jul2014 00:00:00 Z

MISLE Activity Number: 4924016
MISLE Case Number: 691183

I. PRELIMINARY INVESTIGATION – GENERAL INFORMATION

I.I EXCEPTIONS

Marine Casualty Investigation: No

Criteria Met:

Pollution Investigation: No

Criteria Met:

Personnel Investigation: NA

Criteria Met:

I.II DETAILS

Incident Involves: Marine Casualty, Reportable; Discharge of Oil; Alleged Civil Offense(s)

Level Of Investigation: Informal

IMO Classification: Routine

US Classification: Routine

Serious Marine Incident: Yes

Was a Marine Board convened by Commandant? No

I.III LOCATIONS

Description	Latitude	Longitude
Lawry's Narrows: Hurricane Sound	44°04.2 N	068°54.3 W
At a Facility: Health Connections, Rockport ME	44°09.4 N	069°05.9 W

I.IV INVOLVED PERSONNEL

I.V INVOLVED TEAM

I.VI INVOLVED SUBJECTS

Involved Vessels

Name:	KANOCERA
Flag:	UNKNOWN
Primary VIN:	
Call Sign:	
Damage Status:	Undamaged
Role:	Transiting Vicinity of Primary Subject
Classification, Type, Subtype:	, ,
Gross Tonnage:	
Net Tonnage:	
Dead Wt. Tonnage:	
Length:	
Home/Hailing Port:	
Keel Laid Date:	
Delivery Date:	
Place of Construction:	
Builder Name:	
Propulsion Type:	
Ahead HP:	
Master:	

Classification Society:
Owner:
Operator:
Inspection Subchapter:
Most Recent Vessel Inspection Activity:

Name:	KENDRA & MAYSIE
Flag:	UNITED STATES
Primary VIN:	1111464
Call Sign:	
Damage Status:	Damaged
Role:	Involved in a Marine Casualty
Classification, Type, Subtype:	Fishing Vessel, Fish Catching Vessel, General
Gross Tonnage:	15
Net Tonnage:	12
Dead Wt. Tonnage:	
Length:	38.2
Home/Hailing Port:	
Keel Laid Date:	
Delivery Date:	
Place of Construction:	E BLUE HILL, Maine, UNITED STATES
Builder Name:	WEBBER COVE BOAT YARD
Propulsion Type:	Diesel
Ahead HP:	885
Master:	
Classification Society:	
Owner:	[redacted]
Operator:	
Inspection Subchapter:	
Most Recent Vessel Inspection Activity:	

Involved Persons

[redacted]

Status:	At Risk, Not Injured
Role:	Subject of Investigation
Gender:	
Age:	
SSN:	[redacted]
Birth Date:	
Email Address:	
Phone Number:	
Address (Home/Primary Residence):	[redacted]
Comments:	

[redacted]

Status:	At Risk, Not Injured
Role:	Subject of Investigation
Gender:	Male
Age:	
SSN:	
Birth Date:	
Email Address:	
Phone Number:	
Address (Mailing):	[redacted]
Comments:	

[redacted]

Status:	Not at Risk
Role:	Medical Review Officer
Gender:	Male
Age:	

SSN:
Birth Date:
Email Address:
Phone Number (Work): [redacted]
Address (Work): FIRST ADVANTAGE
[redacted]

Comments:

[redacted]

Status: Not at Risk
Role: Medical Review Officer
Gender: Male
Age:
SSN:
Birth Date:
Email Address:
Phone Number (Work): [redacted]
Address (Work): LexisNexis
[redacted]

Comments:

Drug and Alcohol Testing. The following people have been determined by the Coast Guard, Law Enforcement Personnel, and/or the Marine Employer to have been directly involved in a Serious Marine Incident as defined in 46 CFR 4.03-2:

[redacted]; Subject of Investigation
[redacted].; Subject of Investigation

Involved Organizations: None

Involved Facilities

Facility Name: Health Connections, Rockport ME
Type: Approved Equipment Laboratory
Status: Undamaged - Operational
Role: Site of Investigation
Contact Phone:
Location: Latitude:
Longitude:

Involved Waterways: None

Involved Other Subjects: None

II. INCIDENT INVESTIGATION – GENERAL INFORMATION

On July 15, 2014 the CFV KENDRA & MAYSIE (O.N. 1111464) was underway in Hurricane Sound near Vinalhaven, ME getting ready to fish for lobster. The vessel experienced engine problems and the master shut down the engine and changed the fuel filter while drifting. The vessel grounded on a ledge and started taking on water. The master and crewmember abandoned the vessel in a life raft, and the vessel later sank ultimately discharging approximately 50 gallons of oil. The master and crewmember were rescued five hours after the grounding by a Good Samaritan on the sailing vessel KANOCERA, no injuries were reported. The vessel was later salvaged for repairs. No other incidents were reported to the USCG.

<u>Personnel Casualty Summary</u>

Total Missing = 0

Total Dead = 0

Total Injured = 0

Total At Risk, Not Injured = 2

Total People At Risk = 2

Vessel(s) Status Summary

Actual Total Loss = 0

Total Constructive Loss Salvaged = 0

Total Constructive Loss Unsalvaged = 0

Damaged = 1

Undamaged = 1

Property Damage Summary

Vessel(s) = $ 160000

Cargo = $ 0

Facility(s) = $ 0

Other = $ 0

* Includes estimates

II.I LOCATIONS

Description	Latitude	Longitude
Lawry's Narrows: Hurricane Sound	44°04.2 N	068°54.3 W
At a Facility: Health Connections, Rockport ME	44°09.4 N	069°05.9 W
CARVERS HARBOR	44°02.8 N	068°50.0 W
Inner Bay Ledges: West Penobscot Bay	44°06.0 N	069°05.0 W
Lawry's Narrows: Hurricane Sound	44°04.2 N	068°54.3 W

II.II INVOLVED PERSONNEL

Name: [redacted]

Team Lead: No

Point Of Contact: No

Role: Investigation General - Legacy

Status:

Department Id: 004320

Type/Rank: Warrant - Warrant Officer (W4)

Agency Type/Agency: Unknown/Unknown

Source Id/Source: [redacted]/Direct Access Personnel

Comments:

Name: [redacted]

Team Lead: No

Point Of Contact: No

Role: Investigation General - Legacy

Status:

Department Id: 004320

Type/Rank: Officer - Military Officer (O5)

Agency Type/Agency: Unknown/Unknown
Source Id/Source: [redacted]/Direct Access Personnel
Comments:

Name: [redacted]

Team Lead: No
Point Of Contact: No
Role: Investigation General - Legacy
Status:
Department Id: 004320
Type/Rank: Enlisted - Military Enlisted (E7)
Agency Type/Agency: Unknown/Unknown
Source Id/Source: [redacted]/Direct Access Personnel
Comments:

II.III INVOLVED TEAM

II.IV INVOLVED SUBJECTS

Involved Vessels

Name:	KANOCERA
Flag:	UNKNOWN
Primary VIN:	
Call Sign:	
Damage Status:	Undamaged
Role:	Transiting Vicinity of Primary Subject
Classification, Type, Subtype:	, ,
Gross Tonnage:	
Net Tonnage:	
Dead Wt. Tonnage:	
Length:	
Home/Hailing Port:	
Keel Laid Date:	
Delivery Date:	
Place of Construction:	
Builder Name:	
Propulsion Type:	
Ahead HP:	
Master:	
Classification Society:	
Owner:	
Operator:	
Inspection Subchapter:	
Most Recent Vessel Inspection Activity:	

Name:	KENDRA & MAYSIE
Flag:	UNITED STATES
Primary VIN:	1111464
Call Sign:	
Damage Status:	Damaged
Role:	Involved in a Marine Casualty
Classification, Type, Subtype:	Fishing Vessel, Fish Catching Vessel, General
Gross Tonnage:	15
Net Tonnage:	12
Dead Wt. Tonnage:	
Length:	38.2

Home/Hailing Port:	
Keel Laid Date:	
Delivery Date:	
Place of Construction:	E BLUE HILL, Maine, UNITED STATES
Builder Name:	WEBBER COVE BOAT YARD
Propulsion Type:	Diesel
Ahead HP:	885
Master:	
Classification Society:	
Owner:	[redacted]
Operator:	
Inspection Subchapter:	
Most Recent Vessel Inspection Activity:	

Involved Persons

[redacted]

Status:	At Risk, Not Injured
Role:	Subject of Investigation
Gender:	
Age:	
SSN:	[redacted]
Birth Date:	
Email Address:	
Phone Number:	
Address (Home/Primary Residence):	[redacted]
Comments:	

[redacted]

Status:	At Risk, Not Injured
Role:	Subject of Investigation
Gender:	Male
Age:	
SSN:	
Birth Date:	
Email Address:	
Phone Number:	
Address (Mailing):	[redacted]
Comments:	

[redacted]

Status:	Not at Risk
Role:	Medical Review Officer
Gender:	Male
Age:	
SSN:	
Birth Date:	
Email Address:	
Phone Number (Work):	[redacted]
Address (Work):	FIRST ADVANTAGE [redacted]
Comments:	

[redacted]

Status:	Not at Risk
Role:	Medical Review Officer
Gender:	Male
Age:	
SSN:	
Birth Date:	
Email Address:	
Phone Number (Work):	[redacted]

Address (Work): LexisNexis
[redacted]

Comments:

Drug and Alcohol Testing. The following people have been determined by the Coast Guard, Law Enforcement Personnel, and/or the Marine Employer to have been directly involved in a Serious Marine Incident as defined in 46 CFR 4.03-2:

[redacted] Subject of Investigation
[redacted].; Subject of Investigation

Involved Organizations: None

Involved Facilities

Facility Name: Health Connections, Rockport ME
Type: Approved Equipment Laboratory
Status: Undamaged - Operational
Role: Site of Investigation
Contact Phone:
Location: Latitude:
Longitude:

Involved Waterways

Hurricane Sound
Role: Location
Description: Lawry's Narrows: Hurricane Sound

Hurricane Sound
Role: Location
Description: Lawry's Narrows: Hurricane Sound

Hurricane Sound
Role: Location
Description: Lawry's Narrows: Hurricane Sound

Involved Other Subjects: None

II.V EVIDENCE

Control Number: 4924016-CGMSL-001
Description: U.S. Coast Guard Marine Safety Lab analysis report for Incident Investigation Activity #4924016
Evidence Type: Oil Sample Analysis Report
Collection Information
Date/Time: 27Aug2014 13:02:00 Z
Location: U.S. Coast Guard Marine Safety Lab
Collected By: [redacted] CG MSL, CG MSL

Attachments

MSL Case Report 14-208; Legacy - Unknown;
10Sep2015 21:17:57 Z; No

Control Number: 4924016-MISLE-001

Description: MISLE Notification #648011 for report of incident received by Telephone call to Coast Guard.

Evidence Type: Standard

Collection Information

Date/Time:	15Jul2014 18:25:00 Z
Location:	Marine Safety Detachment Belfast
Collected By:	[redacted] MSD Belfast, Marine Safety Detachment Belfast

Attachments

Control Number: 4924016-WAW-002

Description: Diesel Fuel sample of the KENDRA & MAYSIE taken from the fuel filter.

Evidence Type: Oil Sample

Collection Information

Date/Time:	21Jul2014 11:30:00 Z
Location:	Journey's End , Rockland , ME
Collected By:	[redacted] MSD Belfast, MSD Belfast

Sample Data

FPN#	Unspecified
Priority:	Routine
Sample Type:	Suspect Source Sample
Date Needed:	31Jul2014 00:00:00 Z
Projected Disposal Date:	21Jul2019 00:00:00 Z
Point of Contact:	
Oil Seepage Through Soil:	No
Possible Contamination Sources:	Fuel was taken from a fuel filter, vessel was sunk in 50 foot of water for approximately a week and
Other CG Comments:	We are specifically looking for evidence of sugar in the fuel or evidence of non-naturally occurring salt. (iodized)

Attachments

Control Number: 4924016-WAW-003

Description: CG 2692 A

Evidence Type: Standard

Collection Information

Date/Time:	24Jul2014 09:58:00 Z
Location:	Rockland, ME
Collected By:	[redacted]; MSD Belfast, MSD Belfast

Attachments

CG 2692; CG-2692-Rpt of Marine, Comm Dive, or OCS Casualty;
10Sep2015 21:17:57 Z; No

Control Number: 4924016-WAW-004

Description: Witness Statement from the Master of the KENDRA AND MAYSIE

Evidence Type: Standard

Collection Information

Date/Time:	24Sep2014 14:00:00 Z
Location:	Rockland, ME
Collected By:	[redacted]; MSD Belfast, MSD Belfast

Attachments

Witness Statement Master; Legacy - Unknown;
10Sep2015 21:17:57 Z; No

Control Number: 4924016-WAW-005

Description: Insurance survey report

Evidence Type: Standard

Collection Information

Date/Time:	08Sep2014 11:00:00 Z
Location:	MSD Belfast
Collected By:	[redacted]; MSD Belfast, MSD Belfast

Attachments

Survey Report Kendra and Maysie; Legacy - Unknown;
10Sep2015 21:17:57 Z; No

Control Number: 4924016-WAW-006

Description: Marine casualty investigator's statement

Evidence Type: Standard

Collection Information

Date/Time:	24Sep2014 12:59:00 Z
Location:	MSD Belfast
Collected By:	[redacted]; MSD Belfast, MSD Belfast

Attachments

Marine Investigators Statement; Legacy - Unknown;
10Sep2015 21:17:57 Z; No

Control Number: 4924016-WAW-007

Description: Drug test results for master

Evidence Type: Standard

Collection Information

Date/Time:	18Jul2014 13:15:00 Z
Location:	MSD Belfast
Collected By:	[redacted]; MSD Belfast, MSD Belfast

Attachments

Drug Test Master; Legacy - Unknown;
10Sep2015 21:17:57 Z; No

Control Number: 4924016-WAW-008

Description: Drug test results for crewmember

Evidence Type: Standard

Collection Information

Date/Time: 31Jul2014 13:24:00 Z

Location: MSD Belfast

Collected By: [redacted]; MSD Belfast, MSD Belfast

Attachments

Drug Test Crewman; Legacy - Unknown;
10Sep2015 21:17:57 Z; No

Control Number: 4924016-WAW-009

Description: Certificate of life raft inspection

Evidence Type: Standard

Collection Information

Date/Time: 28Oct2014 13:27:00 Z

Location: MSD Belfast

Collected By: [redacted]; MSD Belfast, MSD Belfast

Attachments

Liferaft Test record; Legacy - Unknown;
10Sep2015 21:17:57 Z; No

Control Number: 4924016-WAW-010

Description: Repair work list and cost report from Farrin's Boat shop

Evidence Type: Standard

Collection Information

Date/Time: 15Oct2014 14:15:00 Z

Location: MSD Belfast

Collected By: [redacted]; MSD Belfast, MSD Belfast

Attachments

Repair quote Kendra and Maysie; Legacy - Unknown;
10Sep2015 21:17:57 Z; No

Control Number: 4924016-WAW-011

Description: Weather report (Wunderground.com)

Evidence Type: Standard

Collection Information

Date/Time: 29Oct2014 13:46:00 Z

Location: MSD Belfast

Collected By: [redacted]; MSD Belfast, MSD Belfast

Attachments

weather report; Legacy - Unknown;
10Sep2015 21:17:57 Z; No

Control Number: 4924016-WAW-012
Description: Cell phone subpoena results
Evidence Type: Standard

Collection Information
Date/Time: 08Oct2014 14:42:00 Z
Location: MSD Belfast
Collected By: [redacted]; MSD Belfast, MSD Belfast

Attachments

Cell Phone records; Legacy - Unknown;
10Sep2015 21:17:57 Z; No

Control Number: 4924016-WAW-013
Description: PR statement
Evidence Type: Standard

Collection Information
Date/Time: 29Oct2014 08:22:00 Z
Location: MSD Belfast
Collected By: [redacted]; MSD Belfast, MSD Belfast

Attachments

PR Statement; Legacy - Unknown;
10Sep2015 21:17:57 Z; No

Control Number: 4924016-WAW-014
Description: Pictures of the KENDRA & MAYSIE hauled out.
Evidence Type: Standard

Collection Information
Date/Time: 21Jul2014 09:33:00 Z
Location: Journey's End Marina
Collected By: [redacted]; MSD Belfast, MSD Belfast

Attachments

IMG_0285; Legacy - Unknown;
Picture from the Starboard Bow of the KENDRA & MAYSIE; 10Sep2015 21:17:57 Z; No
IMG_0293; Legacy - Unknown;
Picture showing damage from the Starboard Side amidships.; 10Sep2015 21:17:57 Z; No
IMG_0287; Legacy - Unknown;
Picture of the starboard side of the stern showing the keel damage.; 10Sep2015 21:17:57 Z; No
IMG_0304; Legacy - Unknown;
Port side damage hypothesized to be impact damage from the ledge or when the vessel hit the bottom after sinking.; 10Sep2015 21:17:57 Z; No

Control Number: 4924016-WAW-015

Description: Statement from interview with the master of the KENDRA & MAYSIE

Evidence Type: Standard

Collection Information

Date/Time: 30Oct2014 13:35:00 Z

Location: MSD Belfast

Collected By: [redacted]; MSD Belfast, MSD Belfast

Attachments

Bickford Interview; Legacy - Unknown;
10Sep2015 21:17:57 Z; No

Control Number: 4924016-WAW-016

Description: CG 2692 B

Evidence Type: Standard

Collection Information

Date/Time: 24Jul2014 14:54:00 Z

Location: MSD Belfast

Collected By: [redacted]; MSD Belfast, MSD Belfast

Attachments

CG 2692B; CG-2692B-Rpt of Mandatory Chem Test Following SMI;
10Sep2015 21:17:57 Z; No

Control Number: 4924016-WAW-017

Description: Approximate location of grounding and where survivors were found

Evidence Type: Standard

Collection Information

Date/Time: 07Jan2015 16:17:00 Z

Location: Belfast, ME

Collected By: [redacted] MSD Belfast, MSD Belfast

Attachments

Position of grounding and liferaft; Legacy - Unknown;
10Sep2015 21:17:57 Z; No

II.VI TIMELINE

10Jul2014 10:00:00 Z to 14Jul2014 00:00:00 Z (Estimated): Master of the KENDRA & MAYSIE has changed his fuel filter four times due to alleged fuel contamination.

Timeline Type: Action

Timeline Subtype: Engineering Operations - Unscheduled, Corrective Repair

Location: Known

Primary Location: No

Description: CARVERS HARBOR

Latitude: 44°02.8 N   Longitude: 068°50.0 W

Subject(s) and Details

Name	Type	Status	Role
RICHARD C BICKFORD	Person	At Risk, Not Injured	Subject of Investigation

15Jul2014 03:55:00 Z to 15Jul2014 05:00:00 Z (Estimated): Historical weather near Rockland, ME was obtained, and on scene weather was witnessed by the master of the vessel.
Timeline Type: Condition
Timeline Subtype: Environment - Water Conditions
Location: Known

Primary Location: Yes
Description: Lawry's Narrows: Hurricane Sound

Latitude: 44°04.2 N Longitude: 068°54.3 W

Subject(s) and Details

Name	Type	Status	Role
Lawry's Narrows: Hurricane Sound	Waterway		Location

Weather Condition

Sky Condition: Overcast

Weather And Precipitation: Rain showers

Visibility And Precipitation: Fog

24-Hour Precipitation Amount (inches): 0.17

Wind Speed (knots): 15 Ceiling (feet):

Wind Direction From (degrees): 180 Visibility (nautical miles): 1.0

Wind Gusts (knots): Air Temp (F): 60

Atmospheric Pressure (millibars): 1009.00

Water Condition

Character Of Ice:

Tide: Slack after ebb

Warnings In Effect:

Water Depth/River Stage (feet above MLLW):

Tidal Current Speed (knots): 1 Water Temperature (F):

Tidal Current Direction To (degrees): 170 Ice Coverage (percent):

River Current Speed (knots):

River Current Direction To (degrees):

Wave Height (feet): Swell Height (feet):

Wave Direction To (degrees): Swell Direction To (degrees):

Wave Period (seconds): Swell Period (seconds):

15Jul2014 04:30:00 Z to 15Jul2014 04:35:00 Z (Estimated): Vessel got underway from Vinalhaven, ME with a master and crewmember.
Timeline Type: Condition
Timeline Subtype: Vessel - Material/Equipment Condition
Location: Known

Primary Location: No
Description: CARVERS HARBOR

Latitude: 44°02.8 N Longitude: 068°50.0 W

Subject(s) and Details

Name	Type	Status	Role
KENDRA & MAYSIE	Vessel	Damaged	Involved in a Marine Casualty

System: Operations/Management

Subsystem: Vessel Activity

Component: Underway

Cite:

Involves CG Approved Equipment: No

Security Violation: No

Deficiency: No

15Jul2014 04:35:00 Z to 15Jul2014 05:00:00 Z (Estimated): Vessel's main engine was experiencing performance issues and was not operating as designed.

Timeline Type: Condition
Timeline Subtype: Vessel - Material/Equipment Condition
Location: Known

Primary Location: Yes
Description: Lawry's Narrows: Hurricane Sound

Latitude: 44°04.2 N Longitude: 068°54.3 W

Subject(s) and Details

Name	Type	Status	Role
KENDRA & MAYSIE	Vessel	Damaged	Involved in a Marine Casualty

System: Engineering

Subsystem: Fuel Oil Service System

Component: Filter

Cite:

Involves CG Approved Equipment: No

Security Violation: No

Deficiency: No

Failure/Malfunction Type:

15Jul2014 04:43:00 Z to 15Jul2014 04:50:00 Z (Estimated): Master shutdown the engine to replace the main engine fuel filter.

Timeline Type: Action
Timeline Subtype: Engineering Operations - Unscheduled, Corrective Repair
Location: Known

Primary Location: Yes
Description: Lawry's Narrows: Hurricane Sound

Latitude: 44°04.2 N Longitude: 068°54.3 W

Subject(s) and Details

Name	Type	Status	Role
[redacted]	Person	At Risk, Not Injured	Subject of Investigation

15Jul2014 04:44:00 Z to 15Jul2014 04:44:00 Z (Known): With the main engine shut down, the vessel did not have a means of propulsion.
Timeline Type: Event
Timeline Subtype: Loss/Reduction of Vessel Propulsion/Steering
Location: Known

Primary Location: Yes
Description: Lawry's Narrows: Hurricane Sound

Latitude: 44°04.2 N Longitude: 068°54.3 W

Subject(s) and Details

Name	Type	Status	Role
KENDRA & MAYSIE	Vessel	Damaged	Involved in a Marine Casualty

15Jul2014 04:45:00 Z to 15Jul2014 04:49:00 Z (Known): Without a means of propulsion, vessel drifted outside of the channel.
Timeline Type: Condition
Timeline Subtype: Vessel - Material/Equipment Condition
Location: Known

Primary Location: Yes
Description: Lawry's Narrows: Hurricane Sound

Latitude: 44°04.2 N Longitude: 068°54.3 W

Subject(s) and Details

Name	Type	Status	Role
KENDRA & MAYSIE	Vessel	Damaged	Involved in a Marine Casualty

System: Operations/Management

Subsystem: Vessel Activity

Component: Other

Cite:

Involves CG Approved Equipment: No

Security Violation: No

Deficiency: No

15Jul2014 04:50:00 Z to 15Jul2014 04:50:00 Z (Estimated): Master repaired and restarted the main engine.
Timeline Type: Action
Timeline Subtype: Engineering Operations - Unscheduled, Corrective Repair
Location: Known

Primary Location: Yes
Description: Lawry's Narrows: Hurricane Sound

Latitude: 44°04.2 N Longitude: 068°54.3 W

Subject(s) and Details

Name	Type	Status	Role
[redacted]	Person	At Risk, Not Injured	Subject of Investigation

15Jul2014 04:51:00 Z to 15Jul2014 04:59:00 Z (Estimated): Master was preoccupied with the main engine fuel pressure gauge and lost situational awareness of where the vessel was located.

Timeline Type: Condition
Timeline Subtype: Person - Person Condition
Location: Known

Primary Location: Yes
Description: Lawry's Narrows: Hurricane Sound

Latitude: 44°04.2 N Longitude: 068°54.3 W

Subject(s) and Details

Name	Type	Status	Role
[redacted]	Person	At Risk, Not Injured	Subject of Investigation

System: Personnel

Subsystem: Physical Condition

Component: Other physical capability

Cite:

Involves CG Approved Equipment: No

Security Violation: No

Deficiency: No

15Jul2014 05:00:00 Z to 15Jul2014 05:00:00 Z (Estimated): Vessel struck a submerged ledge.

Timeline Type: Event
Timeline Subtype: Grounding
Location: Known

Primary Location: Yes
Description: Lawry's Narrows: Hurricane Sound

Latitude: 44°04.2 N Longitude: 068°54.3 W

Subject(s) and Details

Name	Type	Status	Role
KENDRA & MAYSIE	Vessel	Damaged	Involved in a Marine Casualty

Type Of Grounding: Hard

Type Of Bottom: Rock

Charted Depth Of Water (feet): 0

Actual Depth Of Water (feet): 0

Recorded Depth Of Water (feet): 0

Part Of Vessel Aground: Centerline Bow

Additional Information: Not known exactly where the vessel went aground.

15Jul2014 05:00:00 Z to 15Jul2014 05:00:00 Z (Estimated): The Vessel was on course of 109 M at a speed of 15 Knots.

Timeline Type: Condition
Timeline Subtype: Vessel - Material/Equipment Condition
Location: Known

Primary Location: Yes
Description: Lawry's Narrows: Hurricane Sound

Latitude: 44°04.2 N Longitude: 068°54.3 W

Subject(s) and Details

Name	Type	Status	Role
KENDRA & MAYSIE	Vessel	Damaged	Involved in a Marine Casualty

System: Operations/Management

Subsystem: Vessel Activity

Component: Underway

Cite:

Involves CG Approved Equipment: No

Security Violation: No

Deficiency: No

15Jul2014 05:01:00 Z to 15Jul2014 05:01:00 Z (Estimated): The keel of the vessel split open.

Timeline Type: Event
Timeline Subtype: Material Failure/Malfunction
Location: Known

Primary Location: Yes
Description: Lawry's Narrows: Hurricane Sound

Latitude: 44°04.2 N Longitude: 068°54.3 W

Subject(s) and Details

Name	Type	Status	Role
KENDRA & MAYSIE	Vessel	Damaged	Involved in a Marine Casualty

System: Construction/Loadline

Subsystem: Hull

Component: Keel

Cite:

Involves CG Approved Equipment: No

Security Violation: No

Deficiency: No

Failure/Malfunction Type: Catastrophic Failure/Malfunction

15Jul2014 05:01:15 Z to 15Jul2014 05:01:15 Z (Estimated): Master attempted (unsuccessfully) to free the vessel from the ledge.

Timeline Type: Action
Timeline Subtype: Bridge Operations - Shiphandling
Location: Known

Primary Location: Yes
Description: Lawry's Narrows: Hurricane Sound

Latitude: 44°04.2 N Longitude: 068°54.3 W

Subject(s) and Details

Name	Type	Status	Role
[redacted]	Person	At Risk, Not Injured	Subject of Investigation

15Jul2014 05:01:30 Z to 15Jul2014 06:00:00 Z (Estimated): Vessel began to take on water through the damaged keel.

Timeline Type: Event
Timeline Subtype: Flooding - Initial
Location: Known

Primary Location: Yes
Description: Lawry's Narrows: Hurricane Sound

Latitude: 44°04.2 N Longitude: 068°54.3 W

Subject(s) and Details

Name	Type	Status	Role
KENDRA & MAYSIE	Vessel	Damaged	Involved in a Marine Casualty

Subdivision Standard: None

Watertight Subdivision Intact: None Fitted

Watertight Subdivision Compromised:

Description Of Compromise: Legacy Unknown

Initial Source Of Flooding Details

Initial Source Of Flooding: Damage to Hull

Area Submerged: Engine Room

Route Of Water Into Vessel: Through the keel

15Jul2014 05:02:00 Z to 15Jul2014 05:02:00 Z (Estimated): The master sent the deckhand below to check the integrity of the hull.

Timeline Type: Action
Timeline Subtype: Deck Operations - Vessel Stability and Integrity Management
Location: Known

Primary Location: Yes
Description: Lawry's Narrows: Hurricane Sound

Latitude: 44°04.2 N Longitude: 068°54.3 W

Subject(s) and Details

Name	Type	Status	Role
[redacted]	Person	At Risk, Not Injured	Subject of Investigation

Name	Type	Status	Role
[redacted]	Person	At Risk, Not Injured	Subject of Investigation

15Jul2014 05:03:00 Z to 15Jul2014 05:15:00 Z (Estimated): Master gave the abandon ship order, and had difficulty inflating the life raft.

Timeline Type: Action
Timeline Subtype: Safety and Emergency Operations - Abandon Vessel Operations
Location: Known

Primary Location: Yes
Description: Lawry's Narrows: Hurricane Sound

Latitude: 44°04.2 N Longitude: 068°54.3 W

Subject(s) and Details

Name	Type	Status	Role
[redacted]	Person	At Risk, Not Injured	Subject of Investigation

15Jul2014 05:15:30 Z to 15Jul2014 05:15:30 Z (Estimated): The master and crewmember abandoned the vessel in the life raft.
Timeline Type: Event
Timeline Subtype: Abandonment
Location: Known

Primary Location: Yes
Description: Lawry's Narrows: Hurricane Sound

Latitude: 44°04.2 N Longitude: 068°54.3 W

Subject(s) and Details

Name	Type	Status	Role
KENDRA & MAYSIE	Vessel	Damaged	Involved in a Marine Casualty

People On Board Prior To Abandonment: 2

Abandoning Into The Water

Without Lifesaving Equipment: 0

With Immersion Suits: 0

With Other Lifesaving Equipment: 0

Abandoning Without Entering The Water

Into Lifeboats/Liferafts And Other Out Of Water Lifesaving Equipment: 2

Directly To Another Vessel, Facility, Or Ashore: 0

By Other Means: 0

Abandoning Using Evacuation Systems: 0

Total Abandoning Vessel Or Factility: 2

15Jul2014 05:16:00 Z to 15Jul2014 05:16:00 Z (Estimated): Vessel's life raft was set adrift with the master and crewmember onboard.
Timeline Type: Event
Timeline Subtype: Set Adrift
Location: Known

Primary Location: Yes
Description: Lawry's Narrows: Hurricane Sound

Latitude: 44°04.2 N Longitude: 068°54.3 W

Subject(s) and Details

Name	Type	Status	Role
KENDRA & MAYSIE	Vessel	Damaged	Involved in a Marine Casualty

15Jul2014 05:29:00 Z to 15Jul2014 05:29:00 Z (Estimated): Vessel sank after it was abandoned.

Timeline Type: Event
Timeline Subtype: Sinking
Location: Known

Primary Location: Yes
Description: Lawry's Narrows: Hurricane Sound

Latitude: 44°04.2 N Longitude: 068°54.3 W

Subject(s) and Details

Name	Type	Status	Role
KENDRA & MAYSIE	Vessel	Damaged	Involved in a Marine Casualty

15Jul2014 05:29:30 Z to 19Jul2014 18:00:00 Z (Estimated): Vessel discharged approximately fifty gallons of oil as the vessel sank and continued to sheen for several days afterwards.

Timeline Type: Event
Timeline Subtype: Discharge/Release - Pollution
Location: Known

Primary Location: Yes
Description: Lawry's Narrows: Hurricane Sound

Latitude: 44°04.2 N Longitude: 068°54.3 W

Subject(s) and Details

Name	Type	Status	Role
KENDRA & MAYSIE	Vessel	Damaged	Involved in a Marine Casualty

Substance	Potential Amount	Not Discharged	Discharged
Oil: Diesel	120.0	70.0	50.0

Reportable Quantity Amount (pounds): N/A

Potential Discharge/Release Details

Volume/Amount: 120.0 Known/Estimated: Known

Units: Gallon

Potential Only: No

Discharged/Released Details

Overall Volume/Amount: 50.0

Units: Gallon

Volume/Amount In Water: 50.0 Known/Estimated: Estimated

Units: Gallon

Volume/Amount On Land: 0.0 Known/Estimated: Estimated

Units: Gallon

Volume/Amount In Enclosed Space: 0.0 Known/Estimated: Estimated

Units: Gallon

Volume/Amount In Air: 0.0 Known/Estimated: Estimated

Units: Gallon

Not Discharged/Released Details

Volume/Amount: 70.0

Units: Gallon Known/Estimated: Estimated

15Jul2014 05:30:00 Z to 20Jul2014 16:00:00 Z (Estimated): Vessel discharged oil into the navigable waterway violating 33 USC 1321 (B) (3)

Timeline Type: Action
Timeline Subtype: Alleged Criminal/Civil Offense
Location: Known

Primary Location: Yes
Description: Lawry's Narrows: Hurricane Sound

Latitude: 44°04.2 N Longitude: 068°54.3 W

Subject(s) and Details

Name	Type	Status	Role
[redacted]	Person	At Risk, Not Injured	Subject of Investigation

15Jul2014 13:30:00 Z to 15Jul2014 13:30:00 Z (Known): The master and crewmember were rescued by the Good Samaritan S/V KANOCERA, approximately 2.5 nautical miles from where they abandoned the vessel.

Timeline Type: Action
Timeline Subtype: Safety and Emergency Operations - Person Overboard Procedures
Location: Known

Primary Location: No
Description: Inner Bay Ledges: West Penobscot Bay

Latitude: 44°06.0 N   Longitude: 069°05.0 W

Subject(s) and Details

Name	Type	Status	Role
[redacted]	Person	At Risk, Not Injured	Subject of Investigation

Name	Type	Status	Role
[redacted]	Person	At Risk, Not Injured	Subject of Investigation

16Jul2014 09:30:00 Z to 17Jul2014 10:20:00 Z (Estimated): Both the master and crewmember were ordered to take a post casualty drug test. The crewmember tested positive for both cocaine and marijuana.

Timeline Type: Action
Timeline Subtype: Drug/Alcohol Testing - DOT Drug Testing
Location: Known

Primary Location: No
Description: At a Facility: Health Connections, Rockport ME

Latitude: 44°09.4 N   Longitude: 069°05.9 W

Subject(s) and Details

Name	Type	Status	Role
[redacted]	Person	At Risk, Not Injured	Subject of Investigation

Reason Directed To Provide Sample(s): Post-casualty

Direction To Provide Sample(s)

Date/Time Directed: 15Jul2014 15:00 Z

Means Of Direction: Ordered by telephone

Organization Directing Chemical Test Sample: U.S. Coast Guard

Description: Verbal

Mariner Directed To Get A DOT Drug Test: Yes

Chemical Test Sample Provided: Yes

Sample

Drug Test Sample Taken Using DOT Protocols: Yes

Sample Type: Urine

Date/Time Sample Was Taken: 16Jul2014 09:30 Z

Sampling Location: Health Connections, Rockport, ME

Collection Agent: Unknown

Collection Agent's Organization: Health Connections

Donor Certify Sample: Yes

Irregularities Noted: No

Drug Analysis

Analyzing Laboratory: MedTox Laboratories, Inc., ST. Paul, MN, 55112

Specimen Analyzed Using DOT Protocols: Yes

Specimen Transferred And Chain Of Custody Complete: Yes

Primary Specimen Test Result

Result: Negative

Positive For:

Specimen Dilute: No

Reason(s) Rejected For Testing:

Remarks:

Review Conducted By

Medical Review Officer: [redacted]

Coroner:

Determination/Verification: Negative

Specimen Dilute (MRO): No

Split Specimen Analyzed: No

Name	Type	Status	Role

WILLIAM L Jr. DEANE	Person	At Risk, Not Injured	Subject of Investigation

Reason Directed To Provide Sample(s): Post-casualty

Direction To Provide Sample(s)

Date/Time Directed: 15Jul2014 15:00 Z

Means Of Direction: Ordered over telephone

Organization Directing Chemical Test Sample: U.S. Coast Guard

Description: Verbal

Mariner Directed To Get A DOT Drug Test: Yes

Chemical Test Sample Provided: Yes

Sample

Drug Test Sample Taken Using DOT Protocols: Yes

Sample Type: Urine

Date/Time Sample Was Taken: 17Jul2014 10:20 Z

Sampling Location: Health Connections, Rockport

Collection Agent: Unknown

Collection Agent's Organization: Health Connections

Donor Certify Sample: Yes

Irregularities Noted: No

Drug Analysis

Analyzing Laboratory: MedTox Laboratories, Inc., ST. Paul, MN, 55112

Specimen Analyzed Using DOT Protocols: Yes

Specimen Transferred And Chain Of Custody Complete: Yes

Primary Specimen Test Result

Result: Positive

Positive For:	Cocaine Metabolite (BZE)
	Marijuana Metabolite (THCA)

Specimen Dilute: No

Reason(s) Rejected For Testing:

Remarks:

Review Conducted By

Medical Review Officer: [redacted]

Coroner:

Determination/Verification: Positive

Specimen Dilute (MRO): No

Split Specimen Analyzed: No

16Jul2014 09:30:00 Z to 17Jul2014 10:20:00 Z (Estimated): Both the master and crewmember were ordered to take a post casualty drug test. The crewmember tested positive for both cocaine and marijuana.

Timeline Type: Action
Timeline Subtype: Drug/Alcohol Testing - Alcohol Testing
Location: Known

Primary Location: No
Description: At a Facility: Health Connections, Rockport ME

Latitude: 44°09.4 N Longitude: 069°05.9 W

Subject(s) and Details

Name	Type	Status	Role
[redacted]	Person	At Risk, Not Injured	Subject of Investigation

Reason Directed To Provide Sample(s): Post-casualty

Direction To Provide Sample(s)

Date/Time Directed: 15Jul2014 15:00 Z

Means Of Direction: Ordered by telephone

Organization Directing Chemical Test Sample: U.S. Coast Guard

Description: Unknown

Chemical Test Sample(s) Provided: No

Reason: Unknown

Method Of Analysis:

Instrument Used For Analysis:

Date/Time Results Obtained: 01Jan0001 00:00 Z

Sample Test Results:

Blood Alcohol Content (BAC):

Laboratory/Individual Conducting Test:

Description Of Sample Analysis:

Irregularities In The Analysis Of The Sample: No

Name	Type	Status	Role
[redacted]	Person	At Risk, Not Injured	Subject of Investigation

Reason Directed To Provide Sample(s): Post-casualty

Direction To Provide Sample(s)

Date/Time Directed: 15Jul2014 15:00 Z

Means Of Direction: Ordered over telephone

Organization Directing Chemical Test Sample: U.S. Coast Guard

Description: Unknown

Chemical Test Sample(s) Provided: No

Reason: Unknown

Method Of Analysis:

Instrument Used For Analysis:

Date/Time Results Obtained: 01Jan0001 00:00 Z

Sample Test Results:

Blood Alcohol Content (BAC):

Laboratory/Individual Conducting Test:

Description Of Sample Analysis:

Irregularities In The Analysis Of The Sample: No

II.VII CORRESPONDENCE

NOFI

Source: USCG
Date: 7/24/2014 10:46:00 AM
Attachments:

NOFI Kendra and Maysie; Legacy - Unknown;
[redacted] 24Sep2014 00:00:00 Z; No

Maneuverability Details from MISLE Legacy Activity

Source: USCG
Date: 7/15/2014 4:45:00 AM
Attachments:

5001392; Other;
; 11Sep2015 00:48:38 Z; Yes

Material/Equipment Component Details from MISLE Legacy Activity

Source: USCG
Date: 7/15/2014 4:35:00 AM
Attachments:

7680086; Other;
; 11Sep2015 00:48:38 Z; Yes

Vessel Activity Details from MISLE Legacy Activity

Source: USCG
Date: 7/15/2014 4:30:00 AM
Attachments:

8098220; Other;
; 11Sep2015 00:48:38 Z; Yes

High Level Alarm Details from MISLE Legacy Activity

Source: USCG
Date: 7/15/2014 5:01:30 AM
Attachments:

9071757; Other;
; 11Sep2015 00:48:38 Z; Yes

Material/Equipment Component Details from MISLE Legacy Activity

Source: USCG
Date: 7/15/2014 5:01:00 AM
Attachments:

9112594; Other;

; 11Sep2015 00:48:38 Z; Yes

Lifesaving Details from MISLE Legacy Activity
Source: USCG
Date: 7/15/2014 5:15:30 AM
Attachments:

9726491; Other;
; 11Sep2015 00:48:38 Z; Yes

COMDT FAM
Source: USCG
Date: 5/26/2022 4:59:58 PM
Attachments:

4924016_KENDRA_&_MAYSIE_AFAM; Other;
[redacted]; 28Jun2022 12:56:14 Z; No

II.VIII CONCLUSIONS – PART 1. CAUSE

Initiating Event:
Loss/Reduction of Vessel Propulsion/Steering (15Jul2014 04:44:00 Z)

Defense

Inadequate - Material Failure (Vessels)
The fiberglass hull was not strong enough to take the impact of the vessel grounding on the ledge.

Event/Material Failure/Malfunction (15Jul2014 05:01:00 Z); Lawry's Narrows: Hurricane Sound ; The keel of the vessel split open.; KENDRA & MAYSIE

Does Not Exist - Flooding
There was no way to prevent water from entering the vessel after the keel was holed.

Event/Flooding - Initial (15Jul2014 05:01:30 Z); Lawry's Narrows: Hurricane Sound ; Vessel began to take on water through the damaged keel.; KENDRA & MAYSIE

Inadequate - Sinking
The bilge pumps were unable to neither keep up with the flooding nor prevent the vessel from sinking.

Event/Sinking (15Jul2014 05:29:00 Z); Lawry's Narrows: Hurricane Sound ; Vessel sank after it was abandoned.; KENDRA & MAYSIE

Does Not Exist - Damage to the Environment
Once the vessel sank, there was no way of preventing oil that may have been in the bilges from entering the water.

Event/Discharge/Release - Pollution (15Jul2014 05:29:30 Z); Lawry's Narrows: Hurricane Sound ; Vessel discharged approximately fifty gallons of oil as the vessel sank and continued to sheen for several days afterwards.; KENDRA & MAYSIE

Inadequate - Vessel, Facility, Equipment, Gear, or Cargo
The main engine fuel filters were not able to properly filter the fuel, thus the engine was experiencing performance issues and the master was forced to shut it down for repairs.

Condition/Vessel - Material/Equipment Condition (15Jul2014 04:35:00 Z); Lawry's Narrows: Hurricane Sound ; Vessel's main engine was experiencing performance issues and was not operating as designed.; KENDRA & MAYSIE

Precondition

Vessel/Facility/Equipment (Hardware)– Condition - Vessel, Facility, Equipment, Gear, or Cargo
Vessel's main engine was experiencing performance issues. Potentially due to a fuel contamination

issue. Master had changed the fuel filter four times in the recent past, more than should have been required.

Condition/Vessel - Material/Equipment Condition (15Jul2014 04:35:00 Z); Lawry's Narrows: Hurricane Sound ; Vessel's main engine was experiencing performance issues and was not operating as designed.; KENDRA & MAYSIE

Production

Planning Error - Violation (Exceptional Adaptation) - Engineering Operations - Unscheduled, Corrective Repair

With the engine not operating properly; the master was forced to shut it down to investigate and change the fuel filter, thus the vessel was without propulsion.

Action/Engineering Operations - Unscheduled, Corrective Repair (15Jul2014 04:43:00 Z); Lawry's Narrows: Hurricane Sound ; Master shutdown the engine to replace the main engine fuel filter.; [redacted]

Execution Error – Attention Failure - Person

After the master changed the fuel filter he was able to restart the engine. With the engine restarted, he was preoccupied with the fuel pressure gauges and lost situational awareness of the vessel's location.

Condition/Person - Person Condition (15Jul2014 04:51:00 Z); Lawry's Narrows: Hurricane Sound ; Master was preoccupied with the main engine fuel pressure gauge and lost situational awareness of where the vessel was located.; [redacted]

Failures of Defense Against Subsequent Events in the Incident

Subsequent Event # 1:

Material Failure/Malfunction (15Jul2014 05:01:00 Z)

Defense Factors

Inadequate - SMS

If the vessel would have had SMS or any maintenance system to keep track of vessel's vessel maintenance needs this vessel would have not likely had a material failure.

Condition/Vessel - Material/Equipment Condition(15Jul2014 04:35:00Z); Lawry's Narrows: Hurricane Sound ; Vessel's main engine was experiencing performance issues and was not operating as designed.; KENDRA & MAYSIE

Subsequent Event # 2:

Sinking (15Jul2014 05:29:00 Z)

Defense Factors

Inadequate - Training

If the vessel would have had a master and crew that would have been properly trained and a vessel maintenance program the vessel would have likely not sank.

Condition/Person - Person Condition(15Jul2014 04:51:00Z); Lawry's Narrows: Hurricane Sound ; Master was preoccupied with the main engine fuel pressure gauge and lost situational awareness of where the vessel was located.; [redacted]

Subsequent Event # 3:

Discharge/Release - Pollution (15Jul2014 05:29:30 Z)

Defense Factors

Disabled - Vessel Underwater

If the vessel is underwater to do poor training of crew and maintenance is likely that the fuel and other petroleum products aboard are going to go into the water.

Condition/Environment - Water Conditions(15Jul2014 03:55:00Z); Lawry's Narrows: Hurricane Sound ; Historical weather near Rockland, ME was obtained, and on scene weather was witnessed by the master of the vessel.; Lawry's Narrows: Hurricane Sound

Condition/Vessel - Material/Equipment Condition(15Jul2014 04:45:00Z); Lawry's Narrows: Hurricane Sound ; Without a means of propulsion, vessel drifted outside of the channel.; KENDRA & MAYSIE

Condition/Person - Person Condition(15Jul2014 04:51:00Z); Lawry's Narrows: Hurricane Sound ; Master was preoccupied with the main engine fuel pressure gauge and lost situational awareness of where the vessel was located.; [redacted]

II.IX CONCLUSIONS – PART 2. ENFORCEMENT REFERRALS

The following referrals for enforcement action have been made as a result of this investigation and represent those instances where the Coast Guard has gathered evidence that indicates one or more alleged violations or offenses may have occurred. Any determinations as to whether or not one or more actual violations or offenses have occurred are documented in the appropriate Coast Guard enforcement activities.

Referral #1:

[redacted]/KENDRA & MAYSIE/5 gallons

Party: [redacted]

Enforcement Type: Warning
Status: Open - Submitted for Review

Alleged Violations

Cite: 33USC§ 1321(b)(3)

Date/Time: 15Jul2014 05:29 Z

Event/Action/Condition: Discharge/Release - Pollution

Location: Lawry's Narrows: Hurricane Sound

Subject(s): KENDRA & MAYSIE

Evidence

II.X SAFETY RECOMMENDATIONS

Safety Recommendation # 004813 **: Amending the standard for under the influence of alcohol or a dangerous drug (33 CFR 95.020)**

Currently; the standard for operating a vessel under the influence of a dangerous drug requires observation of a person's manner, disposition, speech, muscular movement, general appearance, or behavior. 46 CFR 4.06-3 requires alcohol and drug testing following a serious marine incident. When non-credentialed crew members test positive for dangerous drugs, the Coast Guard cannot enforce 33 CFR 95.030 without observing that crew member, which is sometimes impossible. It is recommended to Commandant that 33 CFR 95.030 be amended to include a positive drug test as evidence of operating a vessel under the influence of dangerous drugs.

Date Created: 08Jan2015 Z
Current Owner Unit: COMDT INV
Date Last Modified: 28Jun2022 13:00:02 Z
Priority: Normal
Final Agency Action: Do Not Concur - No Action Necessary
Final Agency Comment: I do not concur with this recommendation. Title 33 CFR 95.030 already provides for a chemical test to be used as evidence of alcohol or dangerous drug use. Therefore, existing regulation already satisfies this recommendation.

<u>Safety Alerts:</u>

United States Coast Guard

MISLE Incident Investigation Report
For
Sinking / LADY DAMARIS

On 22Jun2017 12:10:00 CDT

MISLE Activity Number: 6183852
MISLE Case Number: 1084785

U.S. Department of Homeland Security

United States Coast Guard

Commandant
United States Coast Guard

U.S. Coast Guard STOP 7501
2703 Martin Luther King Jr. Ave. SE
Washington, DC 20593-7501
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Phone: (202) 372-1030
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16732/IIA# 6183852
14 June 2022

THE SINKING OF THE COMMERCIAL FISHING VESSEL LADY DAMARIS IN THE GULF OF MEXICO 33 NAUTICAL MILES SOUTHEAST OF GALVESTON, TX ON JUNE 10, 2017

ACTION BY THE COMMANDANT

The record and the report of the investigation convened for the subject casualty have been reviewed. The record and the report, including the findings of fact, analysis, and conclusions are hereby closed.

The investigation's safety recommendations will remain under review and consideration by the responsible program office(s). The response to the recommendations and any resultant actions will be documented separately.

[redacted]

A. L. FAHRIG
Commander, U.S. Coast Guard
Acting, Chief, Office of Investigations & Casualty Analysis (CG-INV)

U.S. Department of Homeland Security
United States Coast Guard

Commander
Eighth Coast Guard District
Hale Boggs Federal Bldg.

500 Poydras Street
New Orleans, LA 70130
Staff Symbol: dp
Phone: (504) 671-2087

16732
March 7, 2022

SINKING AND TOTAL LOSS OF THE LADY DAMARIS (O.N. 532206) IN THE GULF OF MEXICO 33 NAUTICAL MILES SOUTHEAST OF GALVESTON, 22 JUNE 2017

ENDORSEMENT BY THE COMMANDER, EIGHTH COAST GUARD DISTRICT

After careful review, I approve the record and the report of investigation, including the findings of fact, analysis, conclusions, and recommendations. My comments and endorsements are noted below. I recommend this marine casualty investigation be closed.

COMMENTS ON THE REPORT

The investigation and report contain valuable information which can be used to address the preventable chain of events that resulted in the flooding of the vessel and subsequent sinking, and to prevent similar incidents from occurring in the future.

ENDORSEMENT ON RECOMMENDATIONS

Safety Recommendation 1: It is recommended that the Commandant of the Coast Guard pursue rulemaking in 46 CFR Part 28 which requires each individual in charge of a commercial fishing vessel to complete an approved training program prior to operating a vessel and then complete a refresher training every five years. The Coast Guard Authorization Act of 2010, in Public Law 111-281, Section 604(g), required the Secretary of Homeland Secretary to prescribe these regulations; however, there are currently still no regulations to execute this law. As described in 46 USC 4502(g), this training program would provide knowledge and skills in the areas of seamanship, stability, damage control, personal survival, emergency drills, and weather, among others. Commercial fishing operations continue to pose a myriad of safety hazards for crewmembers; a great need exists for well-trained and competent operators who can effectively identify and mitigate hazards on board their vessels. As revealed in this investigation, a lack of training throughout the crew, particularly with the Master, can lead to poor decisions, placing others' lives at increased risk. A requirement for well-trained commercial fishing vessels masters would successfully implement the requirements of 46 USC 4502 and enhance crew competency in safety, navigation, and emergency operations.

Endorsement: I concur with this recommendation. The Coast Guard Authorization Act (CGAA) of 2010 requires these regulations, and they could significantly reduce casualties such as this one.

Safety Recommendation 2: It is recommended that the Commandant of the Coast Guard implement a requirement in 46 CFR Part 28 for mandatory hull examinations of commercial fishing vessels at regular intervals. An aging fleet of commercial fishing vessels presents an increasing risk for hull wastage and materiel failure as demonstrated in this investigation. With no requirement for periodic hull examinations, some operators will avoid proper hull repairs, or avoid dry docking altogether, to reduce costs, and these hazardous conditions will be left undetected. By requiring periodic hull examinations by the Coast Guard, hull defects may be identified and corrected prior to issuance of a Safety Decal, which would greatly reduce the likelihood of materiel failure similar to that which occurred in this incident.

Endorsement: I concur with the intent of this recommendation. A standardized requirement for regular hull exams on commercial fishing vessels could detect hazardous conditions before they lead to catastrophic casualties. The Commandant (CG-5P) should evaluate the number of commercial fishing vessel casualties over the last 20-30 years with a casual factor related to poor hull condition or hull penetrations. Based on this information, the Commandant (CG-5P) should consider whether there is evidence to support new regulations for mandatory hull exams.

Safety Recommendation 3: It is recommend that the Commandant of the Coast Guard amend 46 CFR Part 16 to extend applicability of chemical testing programs to commercial fishing vessels. During post-casualty drug testing, this investigation found that all three crewmembers tested positive for dangerous drug use, creating a latent unsafe condition aboard this commercial vessel. Based on the definitions in 46 CFR 16.105, a "Crewmember" subject to a chemical testing program means an individual who is engaged or employed onboard a vessel owned in the United States that is required by law or regulation to engage, employ, or be operated by an individual holding a credential issued under 46 CFR Subchapter B - "Merchant Marine Officers and Seamen". Currently, the only commercial fishing vessels that meet this definition are those 200 gross registered tons and more, excluding the many fishing vessels of smaller sizes which operate in similarly hazardous conditions. A requirement for chemical testing programs on commercial fishing vessels would likely reduce the incidence of dangerous drug use by crewmembers, which would significantly improve their capacity to effectively identify and mitigate the hazards that abound in their work environments.

Endorsement: I concur with the intent of this recommendation. The use of dangerous drugs in a dangerous environment can lead to catastrophic consequences, and the requirement to participate in a drug testing program could drive down the use of illegal drugs by commercial fishing vessel crews. The Commandant (CG-5P) should evaluate the number of casualties over the last 20-30 years with a causal factor related to illegal drug use. Based on this information, the Commandant (CG-5P) should consider whether there is evidence to support new regulations to expand chemical testing programs to include commercial fishing vessel crews.

Safety Recommendation 4: It is recommended that the Commandant of the Coast Guard implement an examination schedule in 46 CFR 28 similar to that which is required of inspected vessels. Title 46 USC 4502(f)(2) requires certain commercial fishing vessels to undergo a dockside examination at least once every five years and to be issued a certificate of compliance when successfully done. However, the current regulations do not discuss the frequency of these examinations. This investigation revealed that the vessel's hull had degraded and become susceptible to flooding since its last Coast Guard examination, which occurred approximately three and a half years earlier. The regulations should fully execute the provisions of 46 USC 4502 by mandating that an annual, or even a biennial, examination be required to maintain validity of the Fishing Vessel Decals issued to these types of vessels. More frequent examinations would increase the likelihood that the Coast Guard would be able to identify and mitigate a serious structural failure like the one seen in this investigation.

Endorsement: I concur with the intent of this recommendation. A standardized requirement for dockside examinations on commercial fishing vessels could detect hazardous conditions before they lead to catastrophic casualties. The Commandant (CG-5P) should evaluate the number of commercial fishing vessel casualties over the last 20-30 years with a causal factor related to poor hull conditions, hull penetrations or lack of Coast Guard examinations. Based on this information, the Commandant (CG-5P) should consider whether there is evidence to support new regulations that would require an expanded examination schedule.

Safety Recommendation 5: It is recommended that the Commandant of the Coast Guard implement a policy for boarding teams which would require any commercial fishing vessel found to have not undergone an examination or boarding in two or more years to be boarded. This investigation revealed that the vessel had not been boarded by the local Coast Guard Station or Cutters or other Coast Guard units in over three and a half years. A more recent boarding during the vessel's final voyage, or possibly a recent prior voyage, would have likely resulted in the discovery of flooding in the freezer or engine room, and the vessel's voyage could have been terminated for hazardous conditions, preventing the detrimental flooding which occurred during this incident.

Endorsement: I concur with the intent of this recommendation. Since this incident, the Commandant (CG-CVC) has developed and implemented a Risk Based Fishing Vessel Exam Program. This program directs Sector Commanders to leverage their fishing vessel examiners and boarding teams in order to target at risk fishing vessels and exam them to ensure compliance with relevant requirements. One of the factors used to identify an at risk fishing vessel is the recency of a Coast Guard examination or boarding. As such, this program meets the needs outlined in this safety recommendation, and I do not suggest any further action.

Safety Recommendation 6: It is recommended that the Commandant of the Coast Guard implement a requirement in 46 CFR 28 to require the keeping of a logbook on board commercial fishing vessels to record when the drills and instruction required by 46 CFR 28.270 are conducted. This requirement is already prescribed in 46 USC 4502(f)(1) but has not since been implemented by Coast Guard regulations. The logbook should be available for review by the Coast Guard upon request. While it is unknown when the LADY DAMARIS crew last conducted these drills and trainings, their actions showed that they were not proficient in at least one of the listed contingencies ("minimizing the effects of unintentional flooding"). The current regulation provides no means of accountability, as there is no way for the Coast Guard to verify when this training is being conducted. A requirement to record these drills and instruction in a logbook that is reviewed by the Coast Guard would incur more incentive for commercial fishing vessel crews to conduct them appropriately.

Endorsement: I concur with this recommendation. The Coast Guard Authorization Act (CGAA) of 2010 requires these regulations, and they could help to reduce casualties such as this one.

Safety Recommendation 7: It is recommended that the Commandant of the Coast Guard implement a requirement in 46 CFR 28 to require monthly testing of the required bilge pumps. The regulations currently hold no requirement for the bilge pumps to be tested. As discovered in this investigation, this can lead to materiel malfunctioning/failure of the pumps during emergencies as well as a lack of crew competency necessary to operate them and troubleshoot any issues during operation. A regulatory requirement for periodic testing of the bilge pumps would likely contribute to properly maintained equipment and better crew competency.

Endorsement: I concur with the intent of this recommendation. A standardized requirement for regular testing of bilge pumps on commercial fishing vessels could detect hazardous conditions before they lead to catastrophic results. The Commandant (CG-5P) should evaluate the number of commercial fishing vessel casualties over the last 20-30 years with a casual factor related to an inoperable bilge pump. Based on this information, the Commandant (CG-5P) should consider whether there is evidence to support new regulations for the regular testing of installed bilge pumps.

Safety Recommendation 8: It is recommended that the Commandant of the Coast Guard establish a standardized Commercial Fishing Vessel Examination Guide Book applicable to all districts across the Coast Guard. This investigation revealed that commercial fishing vessel safety examinations in the Seventh and Eighth Coast Guard Districts are conducted in accordance with a Guide Book that is not utilized by other districts. This Guide Book can be a powerful tool to direct Coast Guard examiners and educate vessel crews and even Coast Guard boarding teams, but it should align with the direction and education provided by other guide books as well. Commercial fishing vessels and Coast Guard examiners and boarding teams commonly operate across district boundaries. The regulations remain consistent across the Coast Guard, and the guidance which interprets and expounds upon the regulations should also remain consistent. A newly established Coast Guard Commercial Fishing Vessel Examination Guide Book would ensure that Coast Guard examinations and boardings are conducted to the same standards regardless of the location of the vessel and thus encourage judicious enforcement of the regulations throughout the Coast Guard.

Endorsement: I concur with the intent of this recommendation. It is important to ensure consistency of fishing vessel safety examinations throughout the Coast Guard. While CG-CVC-3 does not have a standardized Guide Book, they have issued the CG 5587 (Fishing Vessel Safety Exam Checklist) and a pamphlet laying out requirements for all commercial fishing industry vessels. The Seventh and Eighth Districts took the information from the pamphlet and removed items that were not applicable (i.e. immersion suits) to vessels operating in these areas, and created/updated their Guide Book. They also included amplifying information to assist owners/operators in understanding and complying with the requirements. The Commandant (CG-CVC-3) should consider whether there is a need to update their pamphlet and/or create a national Guide Book that includes amplifying information, similar to what is contained in the Guide Book used in Districts Seven and Eight.

Safety Recommendation 9: It is recommended that the Commandant of the Coast Guard require any published commercial fishing vessel examination guide book to include crew education in basic vessel stability and damage control. The current Guide Book which was used in prior examinations of the investigated vessel does not include any outreach or education for stability and damage control. Additionally, this Guide Book was only applicable to vessels examined in the Seventh and Eighth Coast Guard Districts; any updates to this Guide Book would best be incorporated into a single guide book used throughout the Coast Guard. This investigation revealed that the fishing vessel crew was incapable of effectively maintaining watertight integrity and controlling flooding aboard their vessel, which placed their lives at great risk. By requiring that all Coast Guard examinations in every district include a training discussion led by the examiners on the topics of damage control, watertight integrity, basic stability, etc, more fishing vessel crewmembers would be likely to take effective actions to protect their vessels from future flooding incidents. This education should focus on the importance of securing bulkhead penetrations, watertight doors, and any hull cracks or holes that may be discovered.

Endorsement: I concur with the intent of this recommendation. As discussed in recommendation 1, training can significantly reduce fishing vessel casualties. While recommendation 1 addresses future training requirements for individuals in charge of fishing vessels, it does not extend to other crewmembers. As such, additional guidance on crewmember training would provide numerous benefits. The Seventh and Eighth District's Guide Book currently provides more training information than CG-CVC 3's pamphlet, but it is lacking in depth. The Guide Book could be a place to provide amplifying educational information related to vessel stability and damage control. The Commandant (CG-CVC) should evaluate the current Guide Book and consider whether there is an opportunity to provide additional guidance on training related to stability and damage control.

Safety Recommendation 10: It is recommended that the Commandant of the Coast Guard require any published commercial fishing vessel examination guide book to include the witnessing of at least one drill from the list of required drills in 46 CFR 28.270(a). The current Guide Book which was used in prior examinations of the investigated vessel does not include a requirement for the Coast Guard to witness a crew drill. Additionally, this Guide Book was only applicable to vessels examined in the Seventh and Eighth Coast Guard Districts; any updates to this Guide Book would best be incorporated into a single guide book used throughout the Coast Guard. The drill performed during the examination should be randomly chosen by the Coast Guard, unannounced prior to the examination, and different from the drill witnessed at the previous examination. Current Coast Guard examinations are not required to include a drill conducted by the crews, so the examiners cannot effectively judge the crew's competency or evidence of training and also cannot provide constructive feedback to improve their competency. This investigation revealed that the vessel crew was not proficient in at least one of the listed contingencies ("minimizing the effects of unintentional flooding"). By requiring the crew to conduct a random, unannounced drill at each Coast Guard examination in every district, the crews would be incentivized to practice each of the required drills on their own prior to the examinations. It would provide the Coast Guard with the opportunity to ensure that each individual is familiar with their duties and can safely carry them out in an emergency.

Endorsement: I concur with the intent of this recommendation. The CG 5587 (Fishing Vessel Safety Exam Checklist) includes a check box for "drills witnessed" but the Guide Book does not. The 2014 exam checklist of the LADY DAMARIS had this box checked, but the examiner indicated he did not actually witness a drill. If a Coast Guard examiner witnesses a drill while onboard for a vessel safety exam, they may have a chance to detect and address deficiencies in responding to emergency situations. I recommend the

Commandant (CG-CVC-3) consider whether there is a need to provide guidance to fishing vessel examiners regarding the purpose of the "drills witnessed" box on the CG 5587. The Commandant (CG-CVC-3) should also consider whether there is a need to update the exam checklist and/or Guide Book.

Safety Recommendation 11: It is recommended that the Commandant of the Coast Guard require any published commercial fishing vessel examination guide book to include an internal structural examination of the hull and integrity of all watertight compartments during Coast Guard examinations. The current Guide Book which was used in prior examinations of the investigated vessel does not include a requirement for the Coast Guard to enter every non-hazardous space on commercial fishing vessels. Additionally, this Guide Book was only applicable to vessels examined in the Seventh and Eighth Coast Guard Districts; any updates to this Guide Book would best be incorporated into a single guide book used throughout the Coast Guard. A requirement for each Coast Guard examiner in every district to enter all non-hazardous spaces available and check for materiel failures, damage, open bulkhead penetrations, etc., would increase the likelihood that unsafe conditions will be identified and corrected before underway operations take place.

Endorsement: I concur with the intent of this recommendation. An internal check of all watertight compartments on a fishing vessel could detect hazardous conditions before they lead to catastrophic results. I recommend the Commandant (CG-CVC-3) consider whether there is a need to provide guidance or policy to fishing vessel examiners regarding internal checks.

Safety Recommendation 12: It is recommended that the Commandant of the Coast Guard require any published commercial fishing vessel examination guide book to include an operational test of each bilge pump. The current Guide Book which was used in prior examinations of the investigated vessel does not include a requirement for the Coast Guard to witness testing of bilge pumps. Additionally, this Guide Book was only applicable to vessels examined in the Seventh and Eighth Coast Guard Districts; any updates to this Guide Book would best be incorporated into a single guide book used throughout the Coast Guard. This investigation revealed that all three of the vessel's bilge pumps could not operate long enough to effectively dewater the vessel before it capsized and sank. It is unknown when the crew had last operated them prior to the incident. A requirement for the bilge pumps to be operationally tested during Coast Guard examinations in every district would provide the examiners an opportunity to identify any failures or malfunctioning before underway operations take place.

Endorsement: I concur with the intent of this recommendation. An operational bilge pump test could detect equipment failures before they lead to catastrophic results. I recommend Commandant (CG-CVC-3) consider whether there is a need to provide policy or guidance to fishing vessel examiners regarding bilge pump tests.

[redacted]

T. O. PHILLIPS
Captain, U.S. Coast Guard
Chief of Prevention, Eighth Coast Guard District
By Direction

U.S. Department of Homeland Security
United States Coast Guard

Commanding Officer
United States Coast Guard
Marine Safety Unit Texas City

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Phone: (409) 978-2700
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16732
07 Jun 2018

MEMORANDUM

[redacted]

From: G. A. Callaghan, CDR
CG MSU Texas City

To: CGD EIGHT (dpi)

Subj: SINKING AND TOTAL LOSS OF THE LADY DAMARIS (O.N. 532206) IN THE GULF OF MEXICO 33 NAUTICAL MILES SOUTHEAST OF GALVESTON, 22 JUNE 2017

Ref: (a) Title 46 United States Code, Chapter 63
(b) Title 46 Code of Federal Regulations (CFR), Part 4
(c) Marine Safety Manual Volume V, COMDINST M16000.10 (series)

1. In accordance with the above references, LT Simpson was designated to conduct an informal investigation into the sinking and total loss of the LADY DAMARIS (O.N. 532206) in the Gulf of Mexico 33 nautical miles southeast of Galveston, 22 June 2017. This incident was classified as a Major Marine Casualty in accordance with 46 CFR 4.40-5(d). In accordance with reference (c), numerous interviews were conducted, and the Coast Guard was able to gather facts, conduct analysis, draw conclusions and make recommendations regarding this marine casualty. All evidence, correspondence and testimony gathered during the investigation and used to create this report are included in the Coast Guard's Marine Information System for Law Enforcement (MISLE) electronic database under **Incident Investigation Activity Number 6183852.**

2. I have reviewed and concur with the findings of fact and analysis and concur with the conclusions and recommendations. No action has been taken with respect to the recommendations.

3. No actions have been taken under 46 CFR Part 5. There is recommended enforcement action against the vessel owner discussed within the ROI.

#

U.S. Department of Homeland Security
United States Coast Guard

ommanding Officer
United States Coast Guard
Marine Safety Unit Texas City

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16732
07 Jun 2018

Sinking and Total Loss of the LADY DAMARIS (O.N. 532206) in the Gulf of Mexico 33 Nautical Miles Southeast of Galveston, TX on 22 June 2017

INVESTIGATING OFFICER'S REPORT

Executive Summary

The LADY DAMARIS was a 46 year old commercial fishing vessel homeported in Brownsville, TX. It was built for shrimp catching and was regulated by the Coast Guard as an "uninspected vessel." In June 2017, the LADY DAMARIS was engaged in fishing operations off the coast of Louisiana. Early in the voyage, the crew discovered minor flooding in the engine room, which they minimized using an installed bilge pump once every two days. When a tropical disturbance began to form in the southern Gulf of Mexico on 19 June 2017, the Master decided to anchor the vessel near Port Fourchon, LA. On the morning of 20 June 2017, the LADY DAMARIS' anchor line failed, and the anchor was lost. The Master then decided to avoid the storm by heading west towards Galveston, TX. Later that day the tropical disturbance was upgraded to Tropical Storm Cindy. It traveled in a northwest direction towards Sabine Pass, TX, causing heavy seas and winds as the LADY DAMARIS traveled westward.

On the evening of 21 June 2017, prior to reaching Galveston, the crew realized that the flooding in the engine room had worsened. After discovering that there was a breach in the hull beneath the deck of the freezer, the crew spent most of the evening and the next morning attempting to plug the crack and dewater the freezer and engine room using their three bilge pumps. There was free communication between the two spaces, due to a drainage pipe left open by the crew. When the vessel was approximately 32 nautical miles southeast of Galveston, TX, the crew broadcasted a "MAYDAY" call to the Coast Guard. A Coast Guard helicopter and a Coast Guard boat were quickly dispatched to assist the LADY DAMARIS. By the time the Coast Guard reached the LADY DAMARIS, the vessel had experienced a loss of power and propulsion, and in turn, a loss of all bilge pumps. Three Coast Guard members boarded the LADY DAMARIS and attempted to dewater the engine room using their own pumps brought on board.

The flooding in the engine room and freezer could not be controlled, prompting the Coast Guard and LADY DAMARIS crews to eventually abandon the vessel and embarked the Coast Guard boat. At approximately 1210 on 22 June 2017, the LADY DAMARIS capsized and sank in the Gulf of Mexico with approximately 5,000 gallons of diesel fuel onboard. The LADY DAMARIS was declared a total loss with an estimated value of $225,000.

Through its investigation, the Coast Guard determined the initiating event to be the materiel failure of the hull. After the LADY DAMARIS sailed through Tropical Storm Cindy, the breach in the hull worsened and the crew could not effectively control the flooding or maintain watertight integrity of the freezer. Coast Guard crews provided assistance with additional pumps but were also unable to control the flooding, leading to the vessel finally capsizing and sinking. Causal factors contributing to the casualty were:

1) Lack of regulations for dry docking and hull examinations
2) Lack of regulations for the Master's training
3) Infrequent Coast Guard safety examinations and boardings
4) Lack of requirements for internal structural examinations
5) Failure of owner to make proper hull examinations and repairs
6) No means to prevent flooding after hull failure
7) Failure to avoid storm
8) Failure of crew to maintain watertight integrity
9) Lack of requirements to test bilge pumps
10) Failure of crew to secure source of flooding
11) Excessive debris in the freezer and engine room
12) Poor sea state
13) Lack of experience and training of crew
14) Lack of additional bilge pumps
15) Crew fatigue
16) No means for a pump to operate underwater
17) Insufficient number of Coast Guard pumps
18) No means to prevent sinking after flooding and capsizing
19) No means to prevent discharge from engine room and fuel tanks after vessel sinking

Section 1 – Preliminary Statement

This investigation involving the LADY DAMARIS sinking in the Gulf of Mexico on 22 June 2017, along with the submission of this report, were conducted in accordance with Title 46, Code of Federal Regulations, Part 4, and under the authority of Title 46, United States Code, Chapter 63.

1.1. National Transportation Safety Board (NTSB) investigator, [redacted] and Coast Guard investigators, [redacted] were present for a portion of the interviews and assisted in this investigation.

1.2. There was no person or organization requesting to be and/or designated a party-in-interest in this investigation in accordance with 46 CFR Subsection 4.03-10.

1.3. All times listed in this report are in Central Standard Time using a 24-hour format. The Incident Investigation Activity Number for this investigation is 6183852.

Section 2 – Vessels Involved in the Incident

Vessel Name:	LADY DAMARIS
Vessel Identification Number:	532206
Flag:	United States
Vessel Class/Type/Sub-Type	Fish Catching Vessel/Shrimping Vessel
Build Year:	1971
Gross Tons:	103 GRT
Length:	64.6 ft
Breadth:	20.1 ft
Depth:	11.3 ft
Main/Primary Propulsion:	Single diesel reduction engine, 365 HP, single screwed

Figure 1. Photo of the LADY DAMARIS in the Gulf of Mexico on 22 June 2017

Section 3 – Record of Deceased, Missing, and Injured

3.1 There were no deceased, missing, or injured personnel as a result of this marine casualty.

Section 4 – Findings of Fact

4.1 This Incident

4.1.1 On 08 June 2017, the LADY DAMARIS got underway from Brownsville, TX to catch shrimp off the Louisiana coast. The shrimping season for Texas waters would not begin until July 2017. There were four crewmembers onboard: the Master, the Rigman, and two Headers. Over the next two weeks, the crew hauled back approximately 6,000 lb shrimp, nearly filling the capacity of the freezer.

4.1.2 Around 10 June 2017, the crew noticed an ingress of seawater in the engine room. They did not know the source of flooding, but they began a process of dewatering the engine room with an electric bilge pump once every two days to keep the engine room dry.

4.1.3 On 19 June 2017, a tropical disturbance formed in the southern Gulf of Mexico, centered approximately 330 nautical miles (NM) south of the LADY DAMARIS' position near Louisiana. The National Hurricane Center set a tropical storm warning from Pearl River, LA to Intracoastal City, LA, which included Port Fourchon, LA.

4.1.4 Around this time, the vessel's owner, [redacted] communicated with the crew over their satellite phone and discussed the storm, which was projected to move northwest across the Gulf of Mexico. The owner did not instruct the Master where to move the vessel to take shelter from storm but advised the crew to be careful and pay attention to the weather forecasts. The Master decided to anchor the vessel near Port Fourchon, LA on after being told there was no dock space available for them in port. The local weather was already declining, and the seas had become heavier.

4.1.5 At approximately 0330, 20 June 2017, the vessel's anchor line failed, and the anchor was lost, forcing the crew to get underway. The Master decided to head west towards Galveston so as to ride "along with the waves." The vessel was approximately 230 NM from Galveston at the time.

4.1.6 At 1800, 20 June 2017, the National Hurricane Center upgraded the tropical disturbance to Tropical Storm Cindy. Since the day prior, it had strengthened and moved northwest and was centered approximately 200 NM south of the LADY DAMARIS, which was heading west. A Tropical Storm Warning was issued for Pearl River, LA to High Island, TX. The effects of the storm could be felt by the crew during the transit; they later described it as a very rough ride with 10-15 ft seas that struck the vessel's hull heavily.

4.1.7 Sometime while the LADY DAMARIS was transiting westward between 20 June and 21 June 2017, the crew discovered that the rate of flooding in the engine room had significantly increased, so they began pumping out the space every two hours using the three pumps available onboard.

4.1.8 At 0000 22 June 2017, Tropical Storm Cindy was centered 20-30 NM south of the LADY DAMARIS, causing winds up to 45 knots (kts) and seas around 14 ft. Around this time, the rate of flooding increased further, and the pumps were no longer able to control the flooding.

4.1.9 At approximately 0100, the Master and Rigman discovered the source of flooding. There was a hole or crack in the hull approximately three inches wide beneath the propeller shaft inside the freezer. They could feel the pressure of the water entering the space through the cement on the floor of the freezer. The floor of the freezer was lined with layers of cement and foam, which was believed by the owner and crew to be installed for stability or insulation purposes. The breach in the hull extended from the steel plating through the cement layer.

4.1.10 To control the flooding, they fabricated a plug using rags and the wooden handle of a hammer. They also moved the second electric pump into the freezer to assist in dewatering. Between the plug and the three pumps, the flooding seemed to be under control, so the crew decided to rest.

4.1.11 The flooding had progressed into the engine room through a drainage pipe that passed through the forward bulkhead of the freezer into the engine room. This pipe was fitted with a valve on the engine room side, which was left open by the Master intentionally for an unknown period of time. He believed the two pumps in the engine room would be more effective at removing the water than the pump in the freezer and thus preferred to allow the water to drain into the engine room. The Master also believed there were two wire or cable runs between the freezer and engine room approximately two feet above the deck, which the Master believed may have not been watertight.

4.1.12 At approximately 0300, the electric pump in the freezer began to fail. The Header, [redacted] had prior experience working on small machinery, such as lawn mowers, so he was woken up by the Rigman to repair the pump. [redacted] found the pump to be clogged with debris, such as shrimp bags, rags, etc. He attempted to keep it operating but was unsuccessful.

4.1.13 At approximately 0400, it seemed that the breach in the hull had increased in size, and the plug was no longer holding in place. Around this same time, the electric pump in the engine room became clogged with rags and other debris and began to malfunction. Consequently, the only operable pump remaining onboard was the hydraulic pump located in the engine room.

4.1.14 Shortly after noticing that the flooding had increased, the Master and Rigman attempted to apply a larger plug to the hole using rags, but they were unsuccessful in effectively reducing the flooding. [redacted] continued to work on the pumps, while [redacted] attempted to remove debris from the freezer and assist in plugging the hole.

4.1.15 The crew worked almost continuously through the night into the morning of 22 June 2017. Between the nights of 20 June 2017 and 21 June 2017, each crewmember recorded only resting approximately four hours total due to watchstanding, dewatering, and machinery repair work.

4.1.16 At approximately 0700, Tropical Storm Cindy was centered approximately 65 NM northeast of the LADY DAMARIS, making landfall at Sabine Pass, TX. A Tropical Storm Warning had been issued for Grand Isle, LA to San Luis Pass, TX, which included Galveston, TX. The weather offshore Galveston in the vicinity of the LADY DAMARIS consisted of 6-10 ft seas and 20-30 kt winds.

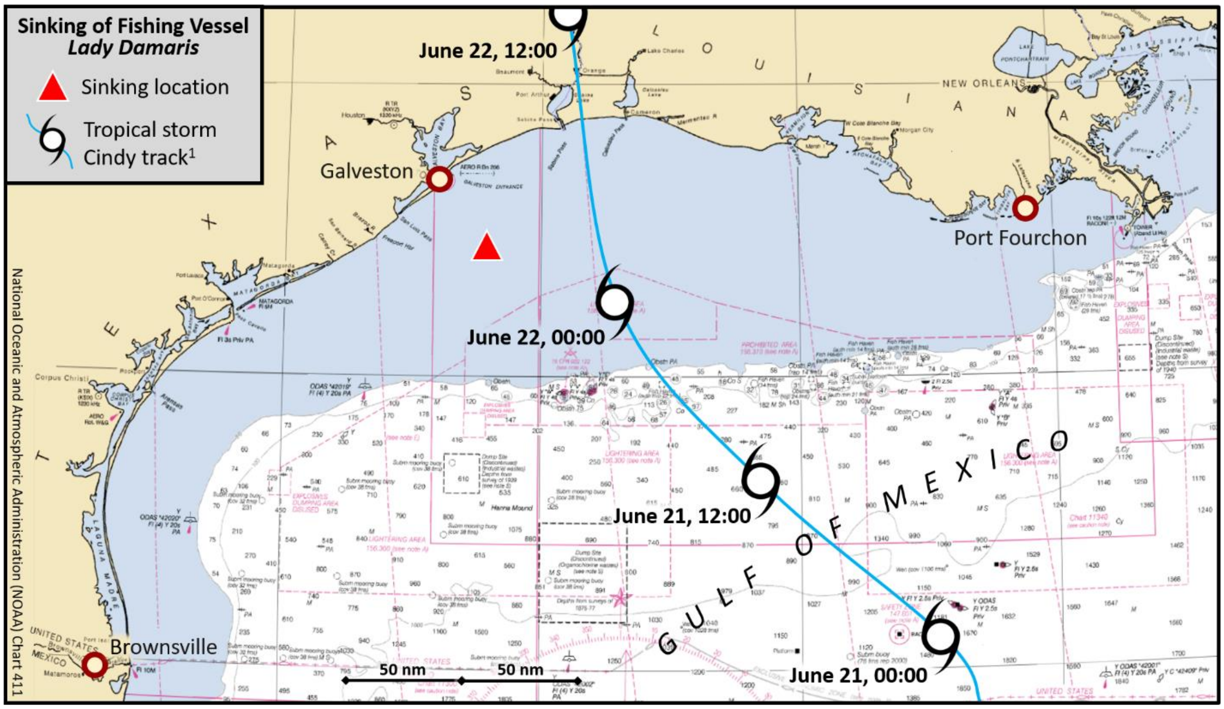

Figure 2. Depiction of Tropical Storm Cindy's track and the sinking location of the LADY DAMARIS. NTSB graphic, used with permission.

4.1.17 At approximately 0903, the Rigman broadcasted a "MAYDAY" call over VHF Ch 16, which was immediately heard and answered by the Coast Guard Sector Houston-Galveston Command Center. He reported over the radio that the engine room was approximately 30% full of water.

4.1.18 At approximately 0906, the Rigman reported over the radio that the level of water was rising at a rate of approximately one foot every 20-30 minutes and that the vessel was sinking.

4.1.19 At approximately 0911, Sector Houston-Galveston notified Coast Guard Air Station Houston and Station Galveston of the incident and requested their response.

4.1.20 At approximately 0912, the Rigman reported over the radio that the vessel’s engine was in neutral and they were not making way. It is unclear how long the LADY DAMARIS had been drifting at this point. One crewmember recalled having stopped the engine the night before when they were plugging the hole, but another crewmember recalled that they were enroute to Freeport, TX that morning before the “MAYDAY” call.

4.1.21 At approximately 0925, the LADY DAMARIS experienced a loss of power and a loss of propulsion. The water level in the engine room had risen above the main engine, generator, and alternator. Around this time, the hydraulic pump also failed, leaving the vessel with no operable bilge pumps.

4.1.22 At approximately 0930, Station Galveston boat CG45630 departed Station Galveston enroute to the LADY DAMARIS with two portable dewatering pumps. Their estimated time of arrival (ETA) was approximately one hour to the LADY DAMARIS’ position.

4.1.23 At approximately 0943, Air Station Houston helicopter CG6518 departed Air Station Houston enroute to the LADY DAMARIS with one portable dewatering pump. Their ETA was approximately 40 minutes to the LADY DAMARIS’ position.

4.1.24 At approximately 0950, the Rigman reported that approximately 65-70% of the engine room was full of water and that the hydraulic pump was “covered in water.” When asked by the Command Center if the engine room was watertight, he replied that it was not.

4.1.25 At approximately 1000, the crew donned their lifejackets and removed the vessel’s inflatable liferaft from its cradle onto the aft deck, in preparation to abandon ship.

4.1.26 At approximately 1009, CG6518 located the LADY DAMARIS and arrived on scene. They lowered one portable dewatering pump and one rescue swimmer down to the LADY DAMARIS to assist with dewatering the engine room. By 1037, the rescue swimmer believed that the pump was dewatering the space.

4.1.27 All pumps provided by the Coast Guard were the common type used for Coast Guard rescue operations. Each pump kit consisted of a Darley 2BE pump coupled to a 6.5 horsepower Honda gasoline engine, with a 15 ft suction hose, 20 ft discharge hose, and associated accessories packed into a kit container. At full throttle, the dewatering capacity is 250 gallons per minute (GPM) at a 12’ suction lift. The pump is commonly referred to as the “P6 pump.”

4.1.28 At approximately 1042, CG45630 located the LADY DAMARIS and came alongside. Two Coast Guard boarding team members embarked the LADY DAMARIS, along with one P6 pump, which was set up to dewater the freezer. The boarding team members observed the vessel to be listing slightly to starboard. Both outriggers were in the lowered position.

Figure 3. The LADY DAMARIS receiving assistance from CG6518 and CG45630.

4.1.29 At approximately 1108, an additional P6 pump was passed over from CG45630 to the LADY DAMARIS. CG6518 reported that the three pumps were running and the vessel's bow appeared to be getting higher out of the water. CG6518 then recovered the rescue swimmer and departed the scene to refuel.

4.1.30 At approximately 1112, the Coast Guard boarding team noticed that a significant amount of water was flowing down into the spaces due to the vessel's low waterline.

4.1.31 At approximately 1115, the vessel appeared to be taking on water at the same rate as the pumps were removing it.

4.1.32 At approximately 1120, CG45630 reported that the engine room was approximately 75% full of water.

4.1.33 At approximately 1121, the boarding team determined that the situation was becoming unsafe and recommended that the crews abandon ship and embark CG45630.

4.1.34 At approximately 1130, the boarding team members secured the pumps, packed them in their containers and released them overboard. They were later retrieved by the CG45630 crew.

4.1.35 At approximately 1135, the boarding team members and the crew abandoned the LADY DAMARIS and safely embarked CG45630.

4.1.36 At approximately 1155, the LADY DAMARIS capsized on its starboard side.

Figure 4. The LADY DAMARIS after capsizing on the starboard side, with the port outrigger exposed above water.

4.1.37 At approximately 1210, the LADY DAMARIS sank in approximately 50 ft of water in the Galveston Safety Fairway approximately 33 NM southeast of Galveston, TX. Within a few minutes, the Coast Guard Eighth District received an Emergency Position Indicating Radio Beacon (EPIRB) signal which correlated to the LADY DAMARIS' EPIRB.

4.1.38 At approximately 1230, the CG45630 crew recovered the LADY DAMARIS' liferaft, which had floated free from the vessel's aft deck and was still intact in its container.

4.1.39 At approximately 1245, the CG45630 crew observed the development of a sheen on the surface of the water approximately 100 yards in length. The LADY DAMARIS crew reported that the vessel had contained approximately 5,000 gallons of diesel fuel at the time of sinking. Coast Guard Marine Safety Unit (MSU) Texas City pollution responders inspected the site from a helicopter later that afternoon and determined that no pollution recovery efforts were possible. The owner of the LADY DAMARIS immediately decided he would not attempt to salvage the vessel. All records and logs from the vessel were unrecoverable.

4.1.40 All four members of the LADY DAMARIS crew were determined to be directly involved in the incident, and three members were subjected to post-casualty drug and alcohol testing in accordance with 46 CFR Subpart 4.06. One member was unavailable for testing due to detainment by Customs and Border Protection (CBP). All test results were negative for alcohol and positive for marijuana metabolites.

4.2 Additional/Supporting Facts

4.2.1 According to facts gathered from Coast Guard reports and a third party survey conducted on 15 January 2016, the LADY DAMARIS was a 103 GRT (gross registered tons), 64.6 ft shrimp trawler built in 1971 in Port Isabel, TX with an all welded steel construction "V" bottom hull. It was propelled by a single V8-cylinder diesel-reduction engine and powered by a 4-cylinder 4-cycle diesel engine 40 KW generator, 100 amp alternator, and complement of 32 volt and 12 volt DC batteries. The vessel's bilge/fire pumps included one electric 1.25" pump driven off the main engine, one portable electric motor driven 1.25" pump, and one hydraulic pump driven off the main engine. The pumping rates were not known by the crew or surveyor who attended in 2016, but the hydraulic pump was known by the crew to have a lower rating than the electric pumps. The vessel was outfitted with a 200 lbs anchor secured to a chain pendant, shackled to 600 feet of 1.5" nylon line. The vessel had one freezer (fish hold), which was located immediately aft of the engine room. There were five watertight bulkheads throughout the vessel, to include the bulkheads between the freezer and engine room. However, neither the hatch above the engine room nor the door at the forward engine room bulkhead were watertight.

4.2.2 [redacted] the managing owner of the LADY DAMARIS since 2012. He had been in the shrimping industry for 33 years and had been a shrimping boat owner since 2000. He also owned and operated two other commercial shrimping vessels, the MORGAN RAE (O.N. 598061) and the MISS CATHY (O.N. 575655). Both of these vessels were also engaged in fishing voyages like the LADY DAMARIS but took shelter in Galveston during Tropical Storm Cindy without incident.

4.2.3 The LADY DAMARIS was regulated as an “uninspected vessel” under 46 CFR Part 28. Because the LADY DAMARIS routinely operated more than 3 NM offshore, it was subject to safety examinations every five years by the Coast Guard as required by 46 USC 4502. It was last examined by the Marine Safety Detachment Brownsville Commercial Fishing Vessel Examiner on 03 January 2014. The examiner issued four deficiencies, which the owner soon rectified. He then issued the vessel a Commercial Fishing Vessel Safety Decal on 07 January 2014. At the time, safety examinations were required to be conducted every two years; however, in 2015, the law was changed to increase the cycle to five years. In 2017, the vessel still held a valid Commercial Fishing Vessel Safety Decal.

4.2.4 The LADY DAMARIS was required to be equipped with bilge pumps and bilge piping to drain any watertight compartment on the vessel; however, the regulations did not require specific pump sizes or dewatering capacities. The LADY DAMARIS was also required to be equipped with high water alarms in the freezer and engine room; the alarms were tested satisfactorily during the 2014 examination. The bilge pumps were not operationally tested.

4.2.5 Coast Guard examiners in the Seventh and Eighth District follow a Commercial Fishing Vessel Safety Examination Guide Book, which dictates the scope of examinations. Neither the regulations nor the Guide Book require an internal structural examination of all vessel spaces. There is also no requirement for the crew to periodically test their installed bilge pumps or for Coast Guard examiners to witness them being tested.

4.2.6 Coast Guard examiners are not required to witness the crew perform the drills or safety orientation required by 46 CFR 28.27. There is no regulatory requirement to log when these drills are conducted on board.

4.2.7 There are currently no regulatory requirements for the dry docking of fishing vessels. Owners may haul their vessels out of the water at any frequency they choose. The Coast Guard does not externally examine the hulls of fishing vessels or maintain any oversight or control over repairs and alterations done during dry dock periods, except for fish tender vessels engaged in the Aleutian trade in accordance with 46 CFR Part 28 Subpart G. The Coast Guard has observed that the shrimping vessels in Brownsville are typically hauled out by their owners every 5 to 10 years. It is believed that repairs commonly take place during these dry dock periods; the vessels' hulls are usually patched with doubler plates when hull defects appear.

4.2.8 There are currently no regulatory requirements for chemical testing programs on fishing vessels less than 200 gross tons. As such, employees on fishing vessels such as the LADY DAMARIS are exempt from 46 CFR Part 16 requirements for pre-employment, periodic, random, and reasonable cause tests for dangerous drug use as well as Employee Assistance Program training. They do remain subject to drug and alcohol testing following Serious Marine Incidents (SMIs) as required by 46 CFR 4.06.

4.2.9 There are currently no regulatory requirements for fishing vessel masters or crewmembers to hold merchant mariner credentials or to have completed any formal training or certification process, with the exception of drill instructor training required by 46 CFR 28.270. Title 46 CFR Part 15 Subpart F, which prescribes manning requirements for uninspected vessels, requires only uninspected passenger vessels and uninspected towing vessels to be under the direction and control of a credentialed mariner and prescribes no manning requirements for seagoing fishing vessels under 200 GRT. The Coast Guard Authorization Act of 2010, Public Law 111-281, required the Secretary of Homeland Secretary to establish regulations for an approved training program for each individual in charge of a commercial fishing vessel to complete; however, these regulations have not yet been established.

4.2.10 Current regulations required the liferaft to be serviced annually. However, the liferaft had not been serviced since 30 March 2016. The liferaft's hydrostatic release unit had also been expired since April 2017.

4.2.11 On 20 June 2014, the LADY DAMARIS was dry docked in Brownsville, TX. The vessel underwent the following work: hull cleaning and sandblasting of sides and bottom, painting of the bottom, zinc renewal, rudder replacement, propeller/coupling/shaft replacement, shaft bearing/packing replacement, welding multiple doubler plates on the hull including a 2 ft x 4 ft doubler plate in the vicinity of the bow, and other general maintenance. The owner did not recall the location of any doubler plates other than the one on the bow, but the dry dock invoice indicated that multiple doubler plates were installed. The owner did not gauge the hull during this dry docking to ascertain its thickness.

4.2.12 When his vessels are dry docked, the owner typically makes daily visits to the dry dock and approves all repairs in advance. He commonly has the hulls sandblasted, which he has believed could cause pinholes to develop in the hulls. He typically addresses pinholes by welding doubler plates over them during dry dock periods.

4.2.13 On 22 June 2017, the owner was unaware of any prior hull plating damage or failure along the shaft or any repairs that had been made to the hull in that area.

4.2.14 On 15 January 2016, a Condition and Valuation Survey was completed by Reyes Marine Industries, Inc. on the LADY DAMARIS while afloat in the Brownsville Shrimp Basin. The vessel was found to be in "average physical condition reflecting her age and service," and the freezer was found to be “clean and in fair condition.” The surveyor deemed it to be suitable for service based on all that could be examined while in the water. There was no gauging or testing for structural thickness, testing of any machinery, or inspection of normally concealed spaces. As a result of the survey, the vessel was later insured by G & M Marine, Inc. for $165,000.

4.2.15 Around the beginning of May 2017, the owner overhauled the LADY DAMARIS' main engine and cabin and replaced the transmission.

4.2.16 Over the last 10 to 15 years, the local Brownsville shrimping fleet has been observed to have decreased in size from approximately 200 to 100 vessels. Many vessels have been sold to foreign buyers in places like Haiti, Mexico, and South America. Most of the remaining vessels have been in service for several decades and are observed by the Coast Guard Marine Safety Detachment Brownsville fishing vessel examiner to be poorly maintained by their owners. The commonly known reason is due to limited funds available to invest in maintenance.

4.2.17 Shrimping vessel crewmembers in Brownsville commonly earn around $700 for a successful one month voyage. The market price of shrimp has remained fairly stagnant over the last few years and was selling at $4/lb at the time of this incident. A typical fishing voyage for a Brownsville shrimping vessel would result in approximately $42,000 gross income. After paying for fuel and supplies, there would usually be around $28,000 net profit. The owner typically paid his four crewmembers 30% of that profit, which is around $8,400, divided unequally amongst them based on their positions. The Captain and Rigman receive higher pay than the Headers.

4.2.18 The local Coast Guard examiner had observed that the Brownsville shrimping vessel owners often struggle to man their vessels with educated and experienced crewmembers who are also lawful residents or citizens of the United States. The crew turnover rate tends to be very high. A crewmember does not typically work on the same shrimping vessel for extended periods of time.

4.2.19 The current law, 46 USC 8103, allows only citizens of the United States to serve as masters, chief engineers, radio officers, or officers in charge of a deck watch or engineering watch on a documented vessel. All unlicensed seamen must be citizens of the United States, aliens lawfully admitted to the United States for permanent residence, or foreign nationals enrolled in the United States Merchant Marine Academy. Vessels are only checked for compliance with this law during Coast Guard boardings. The crewmembers that man the vessels during the fishing voyages are often not present and are not required to be present during Coast Guard Commercial Fishing Vessel Examinations. There is also no requirement for examiners to check the crewmember identification or employment contracts.

4.2.20 Federal immigration laws and fishing vessel regulations require any foreign nationals working on U.S. fishing vessels to hold an H-2B Visa. Should the owner/operator desire to man a vessel with more than 25% non-US citizens, the Coast Guard requires a waiver authorization first.

4.2.21 There were four crewmembers on board the LADY DAMARIS during this voyage who were all uncredentialed mariners with various levels of commercial fishing experience. It is unknown when the crew last conducted drills or safety orientations.

4.2.22 The Master, [redacted] had been a fishing vessel master for seven years. He had been the Master of the LADY DAMARIS for approximately three months, with this voyage being his second as Master. He could not communicate in English but could capably communicate with the crew in Spanish.

4.2.23 The Rigman, [redacted] had been working on fishing vessels for three years and working on the LADY DAMARIS for one month. The Rigman was second in charge on the vessel.

4.2.24 The Header, [redacted] was new to the LADY DAMARIS and to the fishing vessel industry. As a Header, he mainly worked to process (de-head) the shrimp that were caught and carry out basic duties as assigned by the Master or Rigman.

4.2.25 The other Header, [redacted] had been working on fishing vessels for 15 years and on the LADY DAMARIS for approximately for four months. He could not communicate in English and communicated with the rest of the crew in Spanish only. He was not a United States citizen, did not possess a Visa, and was not a lawfully residing alien in the United States.

Section 5 – Analysis and Opinions

5.1.1 *Lack of regulations for dry docking and hull examinations.* There are no current regulations requiring fishing vessels to be hauled out of the water for hull examinations and repairs. Each individual vessel owner maintains the prerogative to remove their vessels from service and invest in this work. A fishing vessel may be issued a Safety Decal by the Coast Guard without ever needing to be dry docked, even if the vessel has been in service as long as the LADY DAMARIS had been. When vessels are dry docked, the Coast Guard maintains no oversight as they do with inspected vessels. The Coast Guard is not typically made aware of and does not approve any repairs or alterations made to the vessels. All work is left to the discretion of the owners. Had there been regulations in place to require more frequent dry docking, the LADY DAMARIS may have been examined out of the water more recently than 2014. Routine dry docking periods prior to 2014 may have prevented any weaknesses or failures of the hull. Additionally, if the Coast Guard had the opportunity to examine the vessel's hull out of the water, it is likely that any vulnerable areas of the hull would have been identified, and the owner would have been required to properly address them. The area of the hull which was compromised and allowed for catastrophic flooding might have been identified and corrected before the vessel was placed back into service. Furthermore, had this been a regulatory requirement, the Coast Guard could have withheld issuance of a Safety Decal if there had been an uncorrected hull problem in order to gain compliance from the owner.

5.1.2 *Lack of regulations for the Master's training*. The Master was not a credentialed mariner and had not participated in any professional training program which would include sufficient training in seamanship, stability, damage control, emergency drills, or weather. This lack of knowledge and skill was evident throughout the course of the casualty, as the Master did not successfully secure the source of flooding, navigate the vessel around the storm, maintain watertight integrity, or use the available bilge pumps to dewater the space. Section 604(g) of Public Law 111-281 (Coast Guard Authorization Act of 2010), called for the development of regulations requiring commercial fishing vessel masters to complete an approved training program that would provide instruction in the topics listed above. This law was codified in 46 USC 4502(g) but has still not been implemented in any regulations. Had there been regulations in place to require the Master to undergo this professional training, he would have been more likely to take early and effective action to prevent the minor flooding incident from escalating into the eventual total loss of the vessel.

5.1.3 *Infrequent safety examinations and boardings*. The LADY DAMARIS had not been boarded by a Coast Guard Commercial Fishing Vessel Examiner or a boarding team since January 2014 and November 2013, respectively. Currently, there is only a requirement that a dockside safety examination take place once every five years for a vessel like the LADY DAMARIS, as described in 46 USC 4502(f). Had there been a requirement for a Coast Guard safety examiner or boarding team to board the vessel on a more frequent basis, the materiel failure of the hull would have been more likely to be identified and corrected prior to the vessel operating.

5.1.4 *Lack of requirements for internal examinations*. Although Coast Guard safety examiners and boarding teams enter most spaces on commercial fishing vessels and conduct a general safety check, there is no specific regulatory requirement or guideline for the examination of all accessible internal structural members, in which the Coast Guard would more closely look for vulnerabilities or failures in the hull and watertight bulkheads. The LADY DAMARIS' previous safety examinations had been conducted in accordance with the guidelines of the Seventh and Eighth District Commercial Fishing Vessel Safety Examination Guide Book, which does not specifically require or recommend an internal examination of structural members. It also does not require Coast Guard members to enter the freezer or lazarette during examinations due to the possibility of dangerous atmospheric conditions. In this incident, there was a breach in the hull as well as at least one open penetration in the watertight bulkhead between the engine room and freezer. Had there been a requirement in the regulations, Commandant policy, or the Seventh and Eighth District Commercial Fishing Vessel Safety Examination Guide Book for the Coast Guard to conduct internal examinations during the periodic safety examinations, these conditions would have likely been identified and corrected prior to the vessel operating.

5.1.5 *Failure of owner to make proper hull examinations and repairs.* The owner had dry docked the vessel three years earlier and had completed certain maintenance and repairs to the hull. There was little documentation to record the work that had been done, and the owner could not recall it in much detail. During this dry dock period, he did not gauge or otherwise test the thickness of the hull, despite it being in service for 46 years. He stated that there was at least one doubler welded onto the hull during this dry docking, in vicinity of the bow, but could not specifically remember any others. However, he attested that his common practice was to address any holes in the hull with doubler plates instead of cropping and renewing the hull plating. It is not known whether the welders that would have performed this work were qualified welders.

The owner also explained that each vessel dry docked undergoes sandblasting on the hull which can wear down the hull plating and cause pinholes to develop. An invoice from the 2014 dry docking indicated that multiple doubler plates were installed, the tasks stating "weld patches on bottom" and "weld patches on Quadrant". It is possible that the breach in the hull which led to catastrophic flooding on 22 June 2017 was first a pinhole that had a doubler plate welded over it during this dry docking. It is also possible that the breach developed from a pinhole or a thin area of hull plating which went undetected and unaddressed during the 2014 dry dock period. Due to the vessel's age, it would have been prudent to examine the hull closely and then crop and renew any wasted hull plating with new plating. The repairs made to the LADY DAMARIS' hull during the 2014 dry dock period were likely inadequate given the owner's history with maintenance, along with the vessel's increased need for repairs to its aging hull. Had the owner properly examined and repaired each vulnerable area of the hull, there would have likely not been a materiel failure of the hull which eventually led to catastrophic flooding of the vessel.

5.1.6 *Failure to avoid storm.* The owner, Master, and crew were all aware that a tropical storm was developing in the Gulf of Mexico and was forecasted to move north towards the position of the LADY DAMARIS off the coast of Louisiana. The crew was told that there was no dock space available for them in Port Fourchon but did not make concerted efforts to seek shelter in other nearby ports.

Since the owner provided no guidance or instruction to the crew for storm avoidance, the responsibility for storm avoidance fell upon the Master. First, he decided to anchor the vessel off the coast of Louisiana near their fishing grounds. After the anchor was lost, he chose to head west on the morning of 20 June 2017, which placed the vessel in the path of the strengthening storm. Several crewmembers noted that the seas were heavier than normal while the vessel was anchored and that the conditions only worsened as the vessel transited westward. They described the seas to be “pounding” and “banging” on the hull and believed that the waves “struck all the rust off the boat.” The rate of flooding seemed to increase as the vessel completed its transit, indicating that the size of the breach in the hull did in fact increase as well. Had the Master decided to move the vessel east towards Mississippi, Alabama, or Florida, or had he found a safe harbor of refuge, the vessel would have likely experienced calmer seas, and the hull would have likely been under less stress.

5.1.7 *Failure of crew to maintain watertight integrity.* According to the Master, there was a drainage pipe between the freezer and engine room. A common feature in shrimping vessels, the pipe was designed to drain melted ice and sea water into the engine room to be easily pumped out. This pipe was capable of being secured by means of a valve which was accessible from the engine room. This valve was left open throughout the voyage, although it is unclear when it was opened or who opened it. Since the flooding was first observed by the crew in the engine room and then traced back to the freezer, it is apparent that the valve had been open when the freezer first began to flood. Had the valve been closed at the beginning of the voyage, the freezer would have likely been watertight. Even after the Master and Rigman verified the source of the flooding to be in the freezer, they intentionally left the valve open. They knew the dewatering capabilities were higher in the engine room, so they believed they could dewater the vessel faster if they did it from the engine room.

This reasoning is contrary to basic principles of shipboard damage control. The Master’s failure to close this valve did not improve the dewatering capabilities of the vessel but only contributed to progressive flooding which became increasingly difficult to control during the voyage. By the time the crew called out to the Coast Guard on 22 June 2017, both spaces had suffered significant flooding, which greatly diminished the vessel’s stability. Had the drainage pipe been secured, the flooding would have likely been isolated to the freezer. When responding to flooding on a vessel, a prudent mariner would realize the importance of immediately isolating the flooding to protect the vessel’s stability. Had the crew maintained the watertight integrity of the freezer, the vital machinery in the engine room would have also been protected and would have likely not failed, leaving the vessel without propulsion or power.

5.1.8 *Lack of requirements to test bilge pumps*. The crew of the LADY DAMARIS struggled to maintain the operation of each of the three bilge pumps during the last evening and morning prior to capsizing. One by one, they all failed to operate and thus failed to dewater the freezer and engine room. It is unknown when the pumps were last tested, as the regulations and Guide Book in place do not require the crew to operate them on a periodic basis or during the Coast Guard safety examinations. There is also no Commandant policy which requires such testing during examinations either. Had there been a requirement in the regulations, Commandant policy, or the Seventh and Eighth District Commercial Fishing Vessel Safety Examination Guide Book for the bilge pumps to be tested prior to this incident, the crew would have likely been more familiar with their operation and may have been able to properly troubleshoot the malfunctioning that occurred with each one.

5.1.9 *Failure of crew to secure source of flooding.* The flooding was first discovered by the crew shortly after getting underway around 10 June 2017, but there is no evidence that the crew took any actions to secure the source of the flooding until much later in the voyage, on the evening of 21 June 2017. Instead, they choose to address the flooding by running a bilge pump every couple days to keep it under control. This approach was more reactive than preventative and contributed to subsequent problems.

While sailing west towards Galveston through Tropical Storm Cindy, the hull was still breached, allowing for continued flooding into the vessel. Once the Master and Rigman located the source of flooding in the early morning of 22 June 2017, they fabricated a plug, which seemed to be decrease the rate of flooding. However, after a few hours, the plug was no longer holding. The crew believed that the breach had worsened, so they added more rags to the crack in the cement to fill the gaps. The plug was insufficient, as evidence showed that the space continued to flood at a significant rate throughout the rest of the morning. Had the crew located and secured the source of flooding early in the voyage, when the breach in the hull was smaller, there would have likely been much less flooding into the freezer throughout the voyage.

5.1.10 *Excessive debris in the freezer and engine room.* After engaging in approximately two weeks of fishing operations, the crew had successfully hauled back around 6,000 lbs of shrimp. The freezer was nearly full with shrimp and associated equipment, like bags, nets, etc. There may have also been additional debris inside the freezer before the catch was brought on. The engine room also contained debris, such as rags and trash. When the crew began running the pumps to dewater those spaces, there was a considerable amount of debris that could easily be fouled in the pump and its suction line. By the time the crew called out to the Coast Guard, both electric pumps had become clogged and failed, leaving only the weaker hydraulic pump operable. Had the freezer and engine room been cleaned before or during the dewatering efforts, there would have likely been less debris available to clog the pumps and cause them to malfunction.

5.1.11 *Poor sea state.* Three days prior to the LADY DAMARIS sinking, Tropical Storm Cindy began to form in the southern region of the Gulf of Mexico. It was projected to strengthen and move northwest towards Texas and Louisiana. On 19 June 2017, the Master decided to anchor the LADY DAMARIS off the coast of Louisiana where the crew had been engaged in shrimp catching. The environmental conditions had already deteriorated, causing a heavier sea state and stronger winds. It is unknown whether the vessel was dragging anchor, and the materiel condition of the anchor line is unknown. However, the heavy seas likely added stresses to the anchor line and contributed to its failure. Furthermore, while the LADY DAMARIS was transiting westward, the weather continued to deteriorate, and the crew observed heavier seas as the days went on. On the morning of 22 June 2017, the LADY DAMARIS intersected the path of Tropical Storm Cindy and experienced the worst part of the storm with 10-15 ft seas and 20-30 kt winds. The heavy seas presented a rough ride for the crew and a significant increase of force on the hull, which had already been compromised. As the seas worsened, the stresses on the hull plating increased in the vicinity of the breach. Had the environmental conditions been calmer, the breach in the hull may not have developed further and the flooding would have likely been less significant.

5.1.12 *Lack of experience and training of crew.* Among the four crewmembers onboard, there was a total of approximately nine months experience working aboard the LADY DAMARIS. Each crewmember had been working on board four months or less; a portion of that time was spent with the vessel docked in Brownsville, not operating. In accordance with current requirements, none of them held merchant mariner credentials or underwent professional training to work in their positions. Consequently, they made several actions throughout the course of the fishing voyage that indicated they lacked sufficient expertise to protect the vessel and prevent marine casualties. After being made aware of the weather forecast, they decided to anchor off the coast of Louisiana, which was forecasted to be affected by the storm. Had the crew found a safe harbor of refuge or sailed the vessel to calmer waters, the anchor line may not have failed. Once underway again, the Master decided to sail the vessel on a path that would intersect the forecasted path of the storm. A transit to safer waters might have prevented the damaging effects of the heavy seas on the hull. When the flooding had progressed on the evening of 21 June 2017, the crew was unable to keep all the pumps operable and relied upon their most junior member to repair them, even though his only mechanical experience was on non-marine equipment, like lawn mowers. This indicates that the crew was unfamiliar with the pumps and lacked the training and experience to troubleshoot them. Had they been able to keep the pumps fully functional, the freezer and engine room may have been dewatered enough to allow the vessel to safely reach Galveston or Freeport.

5.1.13 *Lack of additional bilge pumps.* The LADY DAMARIS was equipped with three pumps that could have been used for dewatering the engine room and freezer. The rated dewatering capacity for each pump was unknown by the owner, crew, and Reyes Marine Industries, Inc surveyor. Regardless, due to the rate of flooding throughout the incident and the multiple failures experienced by the pumps, they could not effectively dewater the vessel. If the crew had had additional bilge pumps available on board, the aggregate dewatering capacity would have been higher in the early stages of the incident. More pumps would have also meant that the crew would have likely maintained some dewatering capabilities after the first three pumps had failed. With the assistance of additional pumps, the vessel might have safely reached Galveston or Freeport before losing propulsion and power.

5.1.14 *Crew fatigue.* By the morning of 22 June 2017, each crewmember of the LADY DAMARIS had been actively working almost continuously since the day prior, only having received approximately four hours of rest each between the previous two nights. Since departing Louisiana waters on 20 June 2017, the crew had been subjected to a rough ride from the heavy seas while working in the freezer and engine room, in addition to normal watchstanding and other duties. Beginning on the evening of 21 June 2017, they began working on locating the source of flooding, plugging the breach in the hull, and operating the bilge pumps, which kept malfunctioning. At the time of the "MAYDAY" call, the freezer and engine room were flooding rapidly. Evidence indicates that the crew was not effectively plugging the breach in the hull or repairing the pumps at this time. Both spaces were becoming more difficult to work in due to the high water level. It can be reasonably presumed that the crew suffered from fatigue by this time. Later that afternoon during interviews, Coast Guard investigators observed that the crew members demonstrated signs of mental and physically exhaustion. Had the crew received more rest during the previous two days and not been so heavily engaged in the flooding response for an extended period of time, they may have been able to respond more effectively to the situation on the morning of 22 June 2017 and the engine room may not have flooded to the point of engine and generator failures.

5.1.15 *Insufficient number of Coast Guard pumps.* Upon boarding the LADY DAMARIS, the Coast Guard utilized two dewatering pumps in the freezer and one in the engine room. These were the standard "P6" pumps the Coast Guard uses for rescue operations, rated at 250 GPM. With three pumps running at full capacity, the total dewatering rate was 750 GPM. Unfortunately, this was not enough to overcome the rate of flooding at the time. Based on the hole (or crack) being approximately nine feet below the waterline, calculations can be made to estimate the size of the hole and the rate of flooding. Given a three inch hole (as the crew reported), the rate of flooding would have been 530 GPM. Given a four inch hole, the rate of flooding would have been 943 GPM. Therefore, the breach in the hull was likely to have been approximately four inches wide, rendering the aggregate 750 GPM pumping capacity of the P6 pumps insufficient and ineffective. Had the Coast Guard utilized one or two additional P6 pumps, the flooding may have been controlled and the vessel may not have lost stability and capsized.

Section 6 - Conclusions:

6.1. Cause of the Casualty:

6.1.1 The initiating event for this casualty occurred when the hull developed a crack or hole amidships beneath the freezer some time before or during the fishing voyage. Causal factors which contributed to materiel failure of the hull were: 1) lack of regulations for dry docking and hull examinations, 2) lack of regulations for the Master's training, 3) infrequent Coast Guard safety examinations and boardings, 4) lack of requirements for internal structural examinations, and 5) failure of owner to make proper hull examinations and repairs.

6.1.2 After the hull was compromised, the freezer began to flood with seawater. The causal factor contributing to the initial flooding was: 1) no other means to prevent flooding.

6.1.3 The flooding eventually progressed forward to the engine room through an open drainage pipe. The causal factors contributing to the progressive flooding was: 1) lack of experience and training of crew, 2) failure of crew to maintain watertight integrity, 3) lack of regulations for the Master's training, and 4) lack of requirements for internal structural examinations.

6.1.4 While the LADY DAMARIS was anchored offshore Louisiana, the anchor line failed and the anchor was lost. Causal factors contributing to failed anchor line were: 1) failure to avoid storm, 2) lack of experience and training of crew, and 3) poor sea state.

6.1.5 During the transit westward, the LADY DAMARIS encountered heavy wave strikes which added increased stress to the poorly maintained steel hull. Causal factors contributing to the wave strikes were 1) failure to avoid storm, 2) lack of experience and training of crew, 3) lack of regulations for the Master's training, and 4) poor sea state.

6.1.6 On the last evening of the transit, the rate of flooding progressed past the dewatering capacity of the three bilge pumps onboard. The causal factor contributing to the progressive flooding was: 1) Failure of crew to secure source of flooding, 2) lack of experience and training of crew, and 3) lack of regulations for the Master's training.

6.1.7 Within a couple hours of running in the freezer, the electric pump began to malfunction and could not effectively dewater the space. The causal factors contributing to the materiel failure of the pump were: 1) Excessive debris in the freezer, 2) lack of requirements to test the bilge pumps, and 3) lack of regulations for the Master's training.

6.1.8 The vessel's hull continued to fail, and the hole or crack in the hull became greater in size, which rendered the previously installed plug ineffective. The causal factor contributing to materiel failure of the hull was: 1) poor sea state, 2) lack of experience and training of crew, and 3) lack of regulations for the Master's training.

6.1.9 The electric pump which had been running to dewater the engine room began to malfunction and was no longer effective. Causal factors contributing to the materiel failure of the pump were: 1) lack of experience and training of crew, 2) excessive debris in the engine room, and 3) lack of requirements to test the bilge pumps.

6.1.10 After making a "MAYDAY" call to the Coast Guard, the LADY DAMARIS experienced a loss of propulsion when the engine room was somewhere between 30% and 70% full of seawater. Causal factors contributing to the loss of propulsion were: 1) lack of additional bilge pumps, 2) failure of crew to maintain watertight integrity, and 3) crew fatigue.

6.1.11 Around the same time as the loss of propulsion occurred, the LADY DAMARIS experienced a loss of power when the generator and alternator were damaged by the flooding. Causal factors contributing to the loss of power were: 1) lack of additional bilge pumps, 2) failure of crew to maintain watertight integrity, and 3) crew fatigue.

6.1.12 With approximately half the engine room underwater, the hydraulic pump failed. The causal factor contributing to the hydraulic pump failure was: 1) no means for the pump to operate underwater.

6.1.13 After the crew and the Coast Guard boarding team abandoned the LADY DAMARIS, it capsized. The causal factor contributing to the capsize was: 1) insufficient number of Coast Guard pumps.

6.1.14 Soon after capsizing, the LADY DAMARIS sank. The causal factor contributing to the sinking was: 1) no means to prevent sinking after flooding and capsizing.

6.1.15 The diesel fuel onboard the LADY DAMARIS discharged and caused a sheen on the surface of the water. The causal factor contributing to the pollution was: 1) no means to prevent discharge from engine room and fuel tanks after vessel sinking.

6.1.16 Two additional latent unsafe conditions were present on the LADY DAMARIS, but there is no evidence indicating they contributed to any events. 1) The inflatable liferaft had not been inspected three months prior as it should have, and the hydrostatic release unit was also expired. Fortunately, the crew abandoned the LADY DAMARIS by directly embarking the Coast Guard boat, which prevented them from relying on the liferaft that may have not performed as designed. 2) All crew members who submitted to alcohol and drug testing (three out of four total crewmembers) were found to have tested positive for a dangerous drug. Because the drug can remain detectable for long periods of time after use and there was no evidence that indicated drug use affected the crew members' actions, it cannot be confirmed that the drug use contributed to any events in the casualty. It is unknown when the crewmembers' used the drug or what actions they took while they were under the influence of the drug.

6.2. Violations of Law by Credentialed Mariners: There were no acts of misconduct, incompetence, negligence, unskillfulness, or violations of law on the part any credentialed mariners involved in this incident that would warrant enforcement action under 46 USC, Subtitle II, Part E.

6.3. Violations by Members of the Coast Guard: There were no acts of misconduct, incompetence, negligence, unskillfulness, or violations of law by members of the Coast Guard that contributed to this casualty.

6.4. Violations Subjecting Parties to a Civil Penalty: The condition described in paragraph 6.1.16 above represent a violation of 46 CFR 28.140 by the owner of the LADY DAMARIS for failing to ensure the vessel’s liferaft was serviced annually and the liferaft’s hydrostatic release unit was not expired.

6.5. Violations of Criminal Law: There were no violations of criminal law identified as a result of this investigation.

6.6. Need for New or Amended Laws/Regulations: The conditions described in paragraphs 6.1.1, 6.1.3, 6.1.4, 6.1.5, 6.1.9, and 6.1.16 represent the potential need to amend 46 CFR Parts 16 and Part 28 to prevent the reoccurrence of a similar casualty. The specific changes recommended are addressed in Section 7 of this report.

Section 7 - Recommendations:

7.1. Safety Recommendations:

7.1.1 It is recommended that the Commandant of the Coast Guard pursue rulemaking in 46 CFR Part 28 which requires each individual in charge of a commercial fishing vessel to complete an approved training program prior to operating a vessel and then complete a refresher training every five years. The Coast Guard Authorization Act of 2010, in Public Law 111-281, Section 604(g), required the Secretary of Homeland Secretary to prescribe these regulations; however, there are currently still no regulations to execute this law. As described in 46 USC 4502(g), this training program would provide knowledge and skills in the areas of seamanship, stability, damage control, personal survival, emergency drills, and weather, among others. Commercial fishing operations continue to pose a myriad of safety hazards for crewmembers; a great need exists for well-trained and competent operators who can effectively identify and mitigate hazards on board their vessels. As revealed in this investigation, a lack of training throughout the crew, particularly with the Master, can lead to poor decisions, placing others’ lives at increased risk. A requirement for well-trained commercial fishing vessels masters would successfully implement the requirements of 46 USC 4502 and enhance crew competency in safety, navigation, and emergency operations.[1]

[1] There are 11 similar existing safety recommendations calling for credentialed or professionally trained fishing vessel operators that have not been implemented at this time.

7.1.2 It is recommended that the Commandant of the Coast Guard implement a requirement in 46 CFR Part 28 for mandatory hull examinations of commercial fishing vessels at regular intervals. An aging fleet of commercial fishing vessels presents an increasing risk for hull wastage and materiel failure as demonstrated in this investigation. With no requirement for periodic hull examinations, some operators will avoid proper hull repairs, or avoid dry docking altogether, to reduce costs, and these hazardous conditions will be left undetected. By requiring periodic hull examinations by the Coast Guard, hull defects may be identified and corrected prior to issuance of a Safety Decal, which would greatly reduce the likelihood of materiel failure similar to that which occurred in this incident.[2]

7.1.3 It is recommend that the Commandant of the Coast Guard amend 46 CFR Part 16 to extend applicability of chemical testing programs to commercial fishing vessels. During post-casualty drug testing, this investigation found that all three crewmembers tested positive for dangerous drug use, creating a latent unsafe condition aboard this commercial vessel. Based on the definitions in 46 CFR 16.105, a "Crewmember" subject to a chemical testing program means an individual who is engaged or employed onboard a vessel owned in the United States that is required by law or regulation to engage, employ, or be operated by an individual holding a credential issued under 46 CFR Subchapter B - "Merchant Marine Officers and Seamen". Currently, the only commercial fishing vessels that meet this definition are those 200 gross registered tons and more, excluding the many fishing vessels of smaller sizes which operate in similarly hazardous conditions. A requirement for chemical testing programs on commercial fishing vessels would likely reduce the incidence of dangerous drug use by crewmembers, which would significantly improve their capacity to effectively identify and mitigate the hazards that abound in their work environments.[3]

7.1.4 It is recommended that the Commandant of the Coast Guard implement an examination schedule in 46 CFR 28 similar to that which is required of inspected vessels. Title 46 USC 4502(f)(2) requires certain commercial fishing vessels to undergo a dockside examination at least once every five years and to be issued a certificate of compliance when successfully done. However, the current regulations do not discuss the frequency of these examinations. This investigation revealed that the vessel's hull had degraded and become susceptible to flooding since its last Coast Guard examination, which occurred approximately three and a half years earlier. The regulations should fully execute the provisions of 46 USC 4502 by mandating that an annual, or even a biennial, examination be required to maintain validity of the Fishing Vessel Decals issued to these types of vessels. More frequent examinations would increase the likelihood that the Coast Guard would be able to identify and mitigate a serious structural failure like the one seen in this investigation.

[2] There are 3 similar existing safety recommendations that have not been implemented at this time.
[3] There are 3 similar existing safety recommendations that have not been implemented at this time.

7.1.5 It is recommended that the Commandant of the Coast Guard implement a policy for boarding teams which would require any commercial fishing vessel found to have not undergone an examination or boarding in two or more years to be boarded. This investigation revealed that the vessel had not been boarded by the local Coast Guard Station or Cutters or other Coast Guard units in over three and a half years. A more recent boarding during the vessel's final voyage, or possibly a recent prior voyage, would have likely resulted in the discovery of flooding in the freezer or engine room, and the vessel's voyage could have been terminated for hazardous conditions, preventing the detetrimental flooding which occurred during this incident.

7.1.6 It is recommended that the Commandant of the Coast Guard implement a requirement in 46 CFR 28 to require the keeping of a logbook on board commercial fishing vessels to record when the drills and instruction required by 46 CFR 28.270 are conducted. This requirement is already prescribed in 46 USC 4502(f)(1) but has not since been implemented by Coast Guard regulations. The logbook should be available for review by the Coast Guard upon request. While it is unknown when the LADY DAMARIS crew last conducted these drills and trainings, their actions showed that they were not proficient in at least one of the listed contingencies ("minimizing the effects of unintentional flooding"). The current regulation provides no means of accountability, as there is no way for the Coast Guard to verify when this training is being conducted. A requirement to record these drills and instruction in a logbook that is reviewed by the Coast Guard would incur more incentive for commercial fishing vessel crews to conduct them appropriately.

7.1.7 It is recommended that the Commandant of the Coast Guard implement a requirement in 46 CFR 28 to require monthly testing of the required bilge pumps. The regulations currently hold no requirement for the bilge pumps to be tested. As discovered in this investigation, this can lead to materiel malfunctioning/failure of the pumps during emergencies as well as a lack of crew competency necessary to operate them and troubleshoot any issues during operation. A regulatory requirement for periodic testing of the bilge pumps would likely contribute to properly maintained equipment and better crew competency.

7.1.8 It is recommended that the Commandant of the Coast Guard establish a standardized Commercial Fishing Vessel Examination Guide Book applicable to all districts across the Coast Guard. This investigation revealed that commercial fishing vessel safety examinations in the Seventh and Eighth Coast Guard Districts are conducted in accordance with a Guide Book that is not utilized by other districts. This Guide Book can be a powerful tool to direct Coast Guard examiners and educate vessel crews and even Coast Guard boarding teams, but it should align with the direction and education provided by other guide books as well. Commercial fishing vessels and Coast Guard examiners and boarding teams commonly operate across district boundaries. The regulations remain consistent across the Coast Guard, and the guidance which interprets and expounds upon the regulations should also remain consistent. A newly established Coast Guard Commercial Fishing Vessel Examination Guide Book would ensure that Coast Guard examinations and boardings are conducted to the same standards regardless of the location of the vessel and thus encourage judicious enforcement of the regulations throughout the Coast Guard.

7.1.9 It is recommended that the Commandant of the Coast Guard require any published commercial fishing vessel examination guide book to include crew education in basic vessel stability and damage control. The current Guide Book which was used in prior examinations of the investigated vessel does not include any outreach or education for stability and damage control. Additionally, this Guide Book was only applicable to vessels examined in the Seventh and Eighth Coast Guard Districts; any updates to this Guide Book would best be incorporated into a single guide book used throughout the Coast Guard. This investigation revealed that the fishing vessel crew was incapable of effectively maintaining watertight integrity and controlling flooding aboard their vessel, which placed their lives at great risk. By requiring that all Coast Guard examinations in every district include a training discussion led by the examiners on the topics of damage control, watertight integrity, basic stability, etc, more fishing vessel crewmembers would be likely to take effective actions to protect their vessels from future flooding incidents. This education should focus on the importance of securing bulkhead penetrations, watertight doors, and any hull cracks or holes that may be discovered.[4]

[4] There are 3 similar existing safety recommendations that have not been implemented at this time.

7.1.10 It is recommended that the Commandant of the Coast Guard require any published commercial fishing vessel examination guide book to include the witnessing of at least one drill from the list of required drills in 46 CFR 28.270(a). The current Guide Book which was used in prior examinations of the investigated vessel does not include a requirement for the Coast Guard to witness a crew drill. Additionally, this Guide Book was only applicable to vessels examined in the Seventh and Eighth Coast Guard Districts; any updates to this Guide Book would best be incorporated into a single guide book used throughout the Coast Guard. The drill performed during the examination should be randomly chosen by the Coast Guard, unannounced prior to the examination, and different from the drill witnessed at the previous examination. Current Coast Guard examinations are not required to include a drill conducted by the crews, so the examiners cannot effectively judge the crew's competency or evidence of training and also cannot provide constructive feedback to improve their competency. This investigation revealed that the vessel crew was not proficient in at least one of the listed contingencies ("minimizing the effects of unintentional flooding"). By requiring the crew to conduct a random, unannounced drill at each Coast Guard examination in every district, the crews would be incentivized to practice each of the required drills on their own prior to the examinations. It would provide the Coast Guard with the opportunity to ensure that each individual is familiar with their duties and can safely carry them out in an emergency.

7.1.11 It is recommended that the Commandant of the Coast Guard require any published commercial fishing vessel examination guide book to include an internal structural examination of the hull and integrity of all watertight compartments during Coast Guard examinations. The current Guide Book which was used in prior examinations of the investigated vessel does not include a requirement for the Coast Guard to enter every non-hazardous space on commercial fishing vessels. Additionally, this Guide Book was only applicable to vessels examined in the Seventh and Eighth Coast Guard Districts; any updates to this Guide Book would best be incorporated into a single guide book used throughout the Coast Guard. A requirement for each Coast Guard examiner in every district to enter all non-hazardous spaces available and check for materiel failures, damage, open bulkhead penetrations, etc., would increase the likelihood that unsafe conditions will be identified and corrected before underway operations take place.

7.1.12 It is recommended that the Commandant of the Coast Guard require any published commercial fishing vessel examination guide book to include an operational test of each bilge pump. The current Guide Book which was used in prior examinations of the investigated vessel does not include a requirement for the Coast Guard to witness testing of bilge pumps. Additionally, this Guide Book was only applicable to vessels examined in the Seventh and Eighth Coast Guard Districts; any updates to this Guide Book would best be incorporated into a single guide book used throughout the Coast Guard. This investigation revealed that all three of the vessel's bilge pumps could not operate long enough to effectively dewater the vessel before it capsized and sank. It is unknown when the crew had last operated them prior to the incident. A requirement for the bilge pumps to be operationally tested during Coast Guard examinations in every district would provide the examiners an opportunity to identify any failures or malfunctioning before underway operations take place.

7.2. Administrative Recommendations:

7.2.1 It is recommended that appropriate recognition be given to the Coast Guard members on duty from Sector Houston-Galveston Command Center, Air Station Houston, and Station Galveston for their swift and effective actions during the search and rescue operations to save the lives of the four crewmembers.

7.2.2 It is recommended that MSU Texas City pursue enforcement action against the owner of the LADY DAMARIS with respect to the violation discussed in Section 6.4.

7.2.1 It is recommended that this casualty investigation be closed.

[redacted]

[redacted]

Investigating Officer
U.S. Coast Guard

United States Coast Guard

MISLE Incident Investigation Report
For
CFV LYDIA & MAYA
Loss of Vessel
On 17 August 2016

MISLE Activity Number: 5975481
MISLE Case Number: 1040450

U.S. Department of Homeland Security
United States Coast Guard

Commandant
United States Coast Guard

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16732/IIA#5975481
03 May 2022

THE SINKING AND LOSS OF THE COMMERCIAL FISHING VESSEL LYDIA & MAYA, APPROXIMATELY 45 MILES SOUTH OF SOUTHWEST HARBOR, ME, ON AUGUST 17, 2016

ACTION BY THE COMMANDANT

The record and the report of the investigation convened for the subject casualty have been reviewed. The record and the report, including the findings of fact, analysis, and conclusions are hereby closed.

The investigation's safety recommendation will remain under review and consideration by the responsible program office(s). The response to the recommendations and any resultant actions will be documented separately.

[redacted]

R. S. WADDINGTON
Commander, U.S. Coast Guard
Acting Chief, Office of Investigations & Casualty Analysis (CG-INV)

U.S. Department of Homeland Security

United States Coast Guard

Commander
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16732/5975481
21 APR 2017

MEMORANDUM

From: [redacted] LT
Investigating Officer

To: COMDT (CG-INV)
Thru: (1) CG SECTOR Northern New England [redacted]
(2) CGD ONE (dp) [redacted]

Subj: LOSS OF THE COMMERCIAL FISHING VESSEL LYDIA & MAYA IN THE GULF OF MAINE ON 17 AUGUST 2016

Executive Summary:

On 17 August 2016, at 12:08 a.m., Sector Northern New England received a radio distress call from the commercial fishing vessel LYDIA & MAYA, operating in Jordan Basin in the Gulf of Maine (approximately 45 nautical miles south of Southwest Harbor, Maine). The vessel was operating in six to eight foot seas and reported that they were "going down" as a result of taking on water. A determination to abandon ship was made by the vessel's operator. Crewmembers donned survival suits, activated the Emergency Position Indicating Radio Beacon (EPIRB), and launched the inflatable life raft. The life raft was embarked by the vessel's crew. At 02:11 a.m., Coast Guard Air Station Cape Cod's helicopter (CGR 6026) arrived on scene. The rescue swimmer was dispatched from CGR 6026 and recovered the four crewmembers through four rescue basket hoists. Crewmembers were then airlifted to Bar Harbor, Maine, where they were transferred to the care of emergency services personnel. The LYDIA & MAYA, which was partially submerged when abandoned, subsequently sank in 90 fathoms (540 feet) of water with a reported amount of 3500 gallons of fuel onboard. All times contained in this report are local and approximate. The MISLE activity for this incident is: 5975481.

Findings of Fact:

Vessel Data:

Name:	LYDIA & MAYA
Owner	[redacted]
Official Number	507419
Gross Tons	104
Net Tons	70
Date Built	1967
Manufacturer	Master Marine
Location Built	Bayou La Batre, Alabama

Subj: LOSS OF THE COMMERCIAL FISHING VESSEL LYDIA & MAYA IN THE GULF OF MAINE ON 17 AUGUST 2016

Length (in feet)	71.5 feet
Breadth (in feet)	20.5 feet
Depth (in feet)	10.9 feet
Hull Material	Steel
Engine Manufacturer	Lugger Marine Diesel
Horsepower	700
Number of Shafts	1
Vessel Type	Commercial Fishing Vessel (Trawler)

Figure 1 **- F/V LYDIA & MAYA (courtesy of USCG Sector Boston)**

The LYDIA & MAYA was subject to the commercial fishing vessel industry regulations of Title 46, Code of Federal Regulations, Part 28. As the LYDIA & MAYA fished beyond three nautical miles from the territorial sea baseline, it was required to obtain a mandatory dockside examination, conducted by a qualified Coast Guard Commercial Fishing Vessel Examiner (examiner). The vessel's last Coast Guard examination was on 17 November 2015. The examiner issued minor deficiencies for expired alcohol strips, labeling of high water alarms, missing charts, and a missing bracket for a CO2 extinguisher. These deficiencies were corrected to the satisfaction of the examiner and on 20 November 2015, the LYDIA & MAYA was issued Commercial Fishing Vessel Safety Examination Decal #221451 (valid until 20 November 2017), signifying compliance with the commercial fishing vessel industry regulations.

Personnel Information:

The following individuals were involved parties in the casualty and determined to be directly involved[1] for the purpose of drug and alcohol testing following a serious marine incident.

Name	Position/Role	Age	Status
[redacted]	Operator	[redacted]	At Risk, Not Injured
	Crewmember		At Risk, Not Injured
	Crewmember		At Risk, Not Injured
	Crewmember		At Risk, Not Injured

Timeline of Events:

At 6:00 p.m., on Friday, 12 August 2016, the LYDIA & MAYA departed from its homeport of Boston, Massachusetts, with four fishermen aboard, and transited for approximately 22 hours before it arrived at the fishing grounds of Jordan Basin in the Gulf of Maine. The crew reported that the three to four days of fishing had been very productive, catching upwards of 77,000 pounds of ground fish. The species of ground fish caught included Pollock, Haddock, and Hake.

At 8:00 p.m., on Monday, 15 August 2016, the LYDIA & MAYA began their final "haul back" of nets and catch, making way at approximately three to four knots speed (1000 RPMs on the main engine), as to prevent sloshing of the vessel's catch of ground fish. At about 09:30 p.m. that evening, all catch and nets were back onboard. The crew then proceeded to have dinner and take a thirty minute rest, planning to return on deck to sort and pack approximately 7,000 pounds of catch that remained on deck. At about 10:00 p.m., the LYDIA & MAYA altered course to return to Boston, Massachusetts. [redacted] the helmsman, and recalled being at the helm for approximately twenty minutes before he noticed the vessel started to list.

[1] As per 46 CFR 4.03-4, an *individual directly involved* in a serious marine incident is an individual whose order, action or failure to act is determined to be, or cannot be ruled out as, a causative factor in the events leading to or causing a serious marine incident.

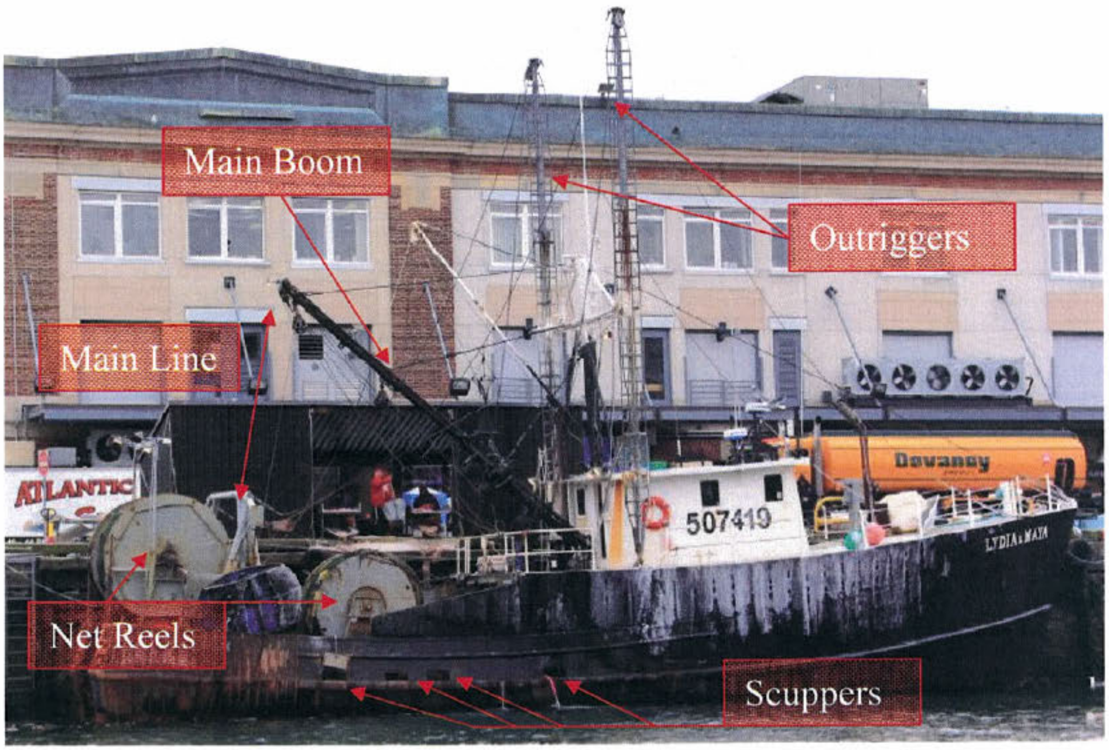

Figure 2 **– Starboard profile of the F/V LYDIA & MAYA. The furthest two scuppers (also known as freeing ports) aft were reported plugged on both the port & starboard side. This inhibited the drainage of water from the vessel's deck (courtesy of USCG Sector Boston).**

When the LYDIA & MAYA began to list, [redacted] described hearing a loud noise and feeling a change in how the vessel, previously transiting normally, felt like it was "dragging behind." [redacted] stepped outside the pilot house to investigate, he found the starboard quarter of the vessel was underwater with the starboard rail submerged. The scuppers aft of the fish pen were still plugged at this time and contributed to the accumulation of water at the starboard quarter.

Prior to the vessel listing, the LYDIA & MAYA was operating with both the port and starboard outriggers deployed, which assist in reducing the rolling movement of the vessel. [redacted] as a result of the list to starboard, the starboard outrigger was submerged below the water. This is not a design function of the outrigger and may have further contributed to the starboard list as the outrigger was dragged through the water.

The noise that [redacted] reported hearing was most likely the failure of the main boom. The main boom, which had previously supported a weight of approximately 7,000 pounds of netted catch, had since come loose and was swinging freely without secured rigging.

[redacted] after observing the amount of water on deck and the submerged starboard quarter, he immediately went to notify the Captain, [redacted] who instructed him to wake up the other crewmembers, [redacted] After waking the crew, [redacted] the vessel was at an extreme list to starboard and it was like "walking up a wall' to get across the deck. There was some confusion between crewmembers regarding the 7,000 pounds of netted catch. [redacted] observed [redacted] actively trying to "bleed" or cut the netting of the catch bag to let the fish out and take off the weight, which was "sloshing around" on the main deck. [redacted] the bag of catch went overboard and that he was making attempts to remove the scupper plugs aft, but could not remove them due to the risk of falling overboard. [redacted] he then mustered with the other crewmembers in the pilot house, where each member donned survival suits while MAYDAY calls were made over VHF Channel 16.

Shortly after midnight, at 12:08 a.m., Sector Northern New England watch standers reported receiving MAYDAY transmissions from the vessel LYDIA & MAYA. Upon reporting the distress signal to the Coast Guard's Rescue Coordination Center in Boston (CGRCC), CGRCC confirmed receiving a distress alert from the Emergency Positioning Indicating Radio Beacon (EPIRB) that was registered to the vessel. Coast Guard helicopter (CGR 6026) from Air Station Cape Cod was requested and launched at 01:00 a.m. en route to the LYDIA & MAYA's last known position, approximately forty-five nautical miles south of Southwest Harbor, Maine (*see figure 3*).

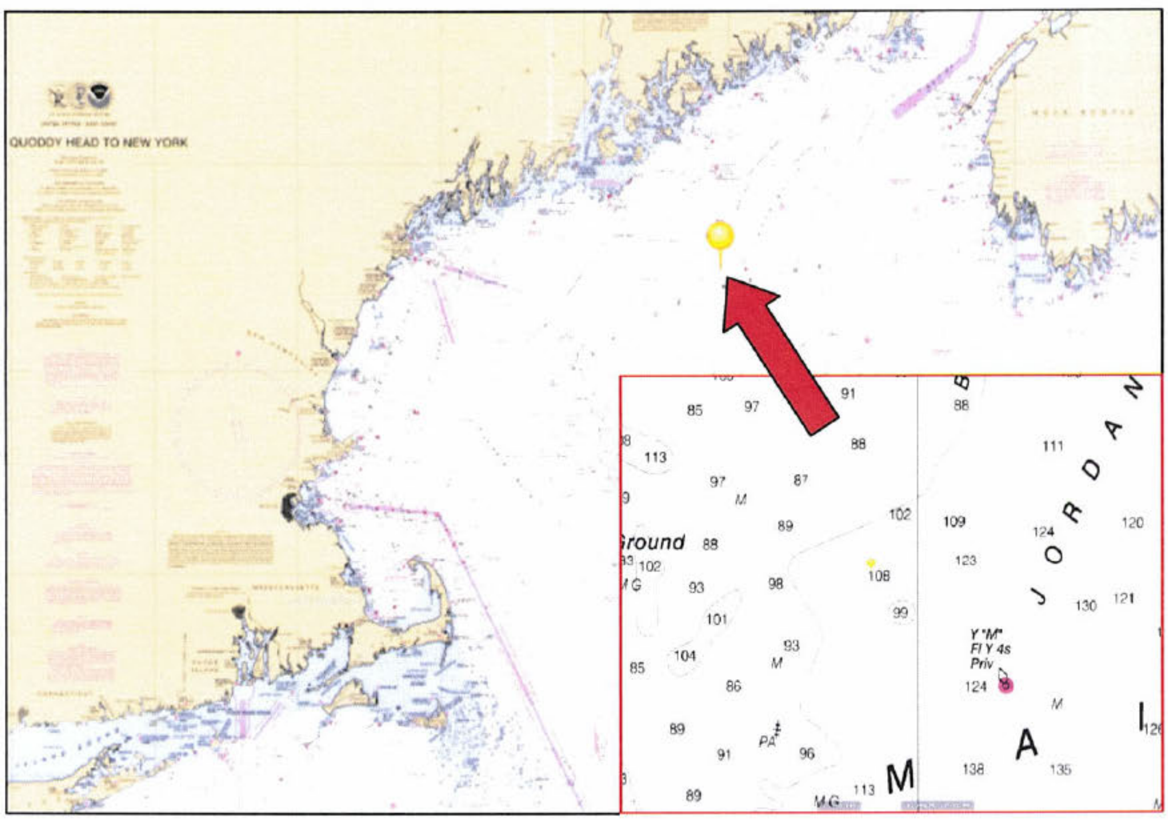

Figure 3 **– Last transmitted GPS location of LYDIA & MAYA (represented by yellow pin), broadcast through the vessel's AIS, position overlaid on NOAA Chart 13006 (West Quoddy Head to New York).**

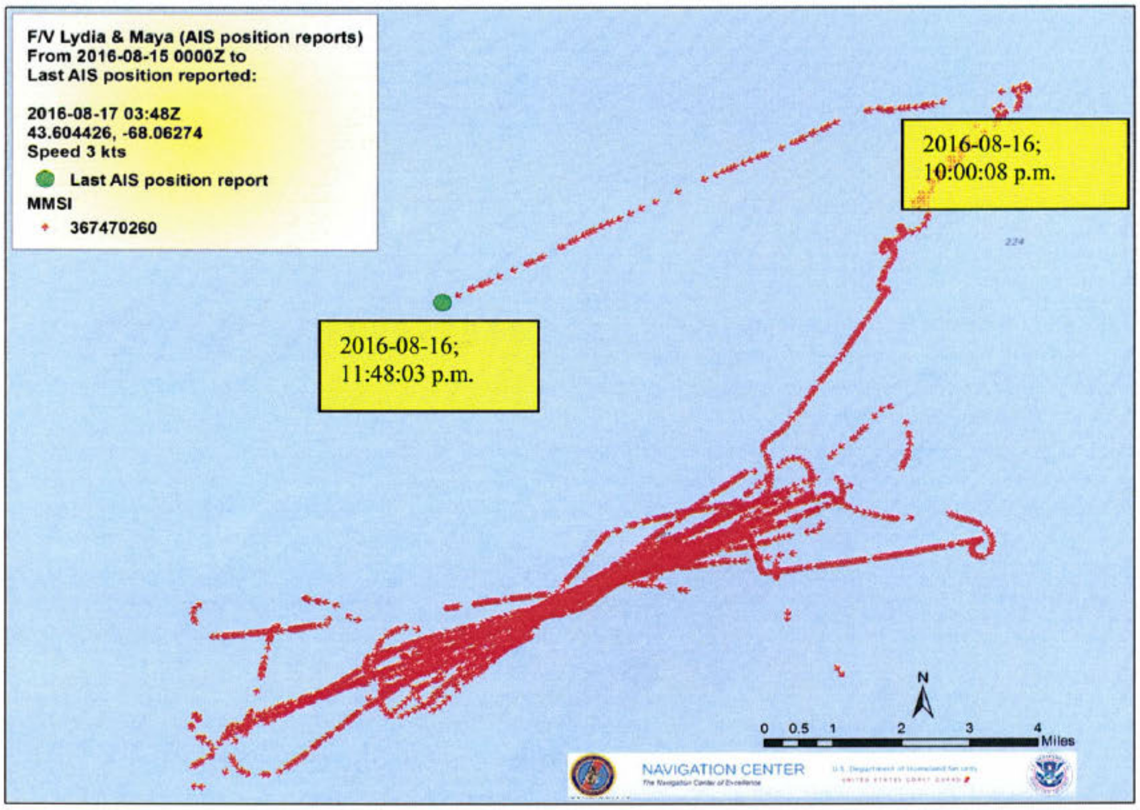

Figure 4 **– Automatic Identification System (AIS) position reports of LYDIA & MAYA illustrating track lines over the last 96 hours (represented by red arrows); the LYDIA & MAYA turned back en route for Boston at 10:00 p.m. on 16 Aug 2016; the last AIS transmission received was recorded at 11:48 p.m. on 16 Aug 2016 (courtesy of USCG NAVCEN).**

[redacted] made the decision to abandon the LYDIA & MAYA. The crew proceeded to launch the inflatable life raft, which was located on the deck aft of the pilot house on the port side (*see figure 5*). The crew experienced difficultly launching the life raft as the LYDIA & MAYA was partially submerged and suffering from an extreme starboard list. The life raft was inadvertently inflated when the crew attempted to launch it. The crew then had to board it by the starboard winch and subsequently free themselves from the sinking LYDIA & MAYA, pushing away from the net reel and going over the main wire.

[redacted] had visual contact with the LYDIA & MAYA for a short period of time while drifting in the life raft. [redacted] the vessel remained in gear and was still making way through the water before the vessel sank. On scene weather conditions consisted of 15 to 20 knot winds, with four to six foot seas. Crewmembers estimated that they spent approximately three hours in the life raft before being rescued by Coast Guard helicopter.

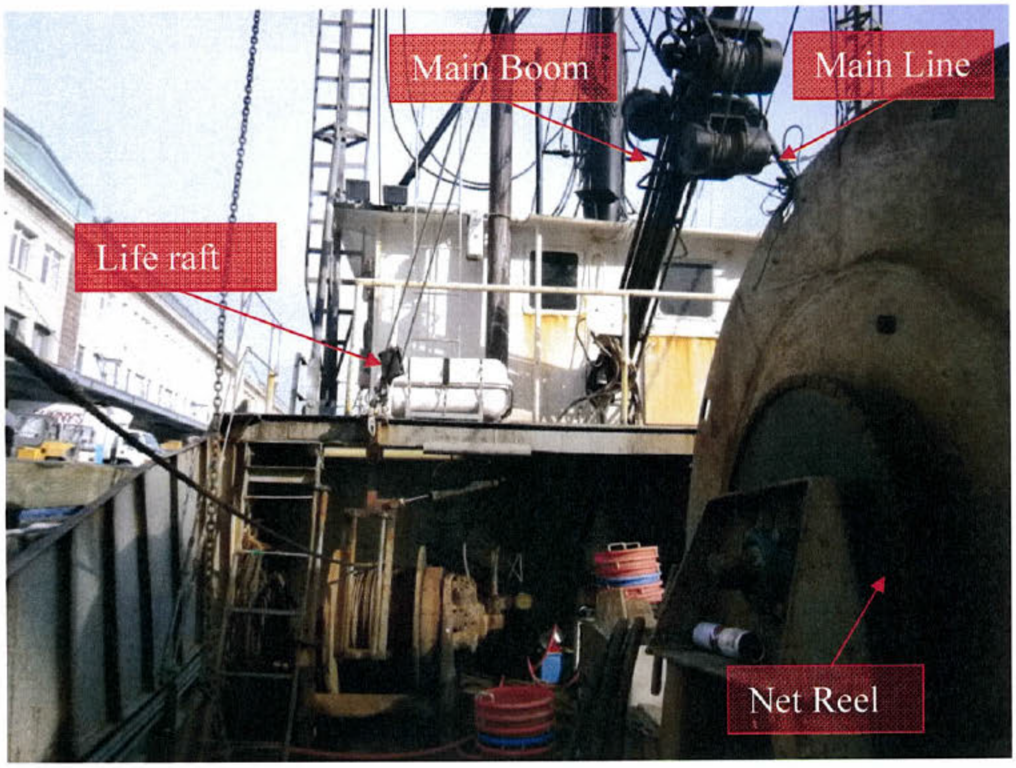

Figure 5 **– The inflatable six-person life raft was located behind the pilot house the port of centerline (courtesy of USCG Sector Boston).**

At 02:11 a.m., CGR 6026 arrived on scene with the life raft and reported observing seas of six to eight feet. At 02:19 a.m., CGR 6026 deployed a rescue swimmer to the life raft and commenced hoisting operations, bringing crewmembers up one by one with the rescue basket. At 02:50 a.m., CGR 6026 reported having all four crewmen aboard and departed the vessel en route to Bar Harbor Airport. Upon arrival to Bar Harbor Airport, crewmembers were transferred to Emergency Management Services and were transported to Maine Coast Memorial Hospital in Ellsworth, Maine, for follow on medical evaluation. Crewmembers were later released without report of injury.

The vessel's owner, [redacted] ensured his employees submitted to serious marine incident[2] post-casualty drug testing in accordance with 46 CFR §4.06.[3] The crew submitted to DOT drug testing the morning of 18 August 2016. Drug test results were [redacted] for crewmembers [redacted] Results are [redacted] but do not serve as an indication that crewmembers were intoxicated during the voyage. Alcohol testing could not be conducted in accordance with prescribed time requirements due to the period of time that had elapsed since the incident and subsequent rescue.

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[2] Loss of any self-propelled vessel constitutes a serious marine incident (SMI) as defined in 46 CFR §4.03-2(5)

[3] 46 CFR §4.06 specifies that SMI alcohol and drug testing is the responsibility of the marine employer, as well as, provides time requirements for drug and alcohol testing.

Analysis:

Stability of the Vessel:

a. Loaded state – The loaded state of the vessel (70,000 pounds of catch packed in ice) would have resulted in an increased draft, which would have decreased the righting arm[4] of the vessel, which in turn, would have decreased the righting moment.[5] The increased draft also results in a loss of freeboard, causing the deck edge to submerge at smaller heel angles.

b. Suspended catch bag – The suspended catch bag that was held above the deck by the main boom created a vertical moment that would have negatively altered the center of gravity, although to what extent is not known. When the main boom broke, the catch bag of at least 7,000 pounds may have fallen on the main deck, potentially increasing the heeling moment on the starboard side of the vessel.

c. Plugged scuppers – The plugged scuppers near the stern of the vessel presented a risk to stability as they prevented the draining of accumulating water, resulting in considerable weight on the main deck and further increasing the inclining or heeling moment.

d. Deck edge immersion & continued down flooding – Crew interviews identified deck edge immersion on the starboard side and the ingress of water into the crew spaces.

e. Presumed shifting of cargo – As the vessel was heeling to starboard in an unstable condition, it is likely that the cargo of ice and fish shifted, contributing to the capsized state of the vessel.

Other Potential Sources of Failure

As the vessel could not be recovered, it cannot be definitively stated that there were no other potential sources of failure that may have contributed to the comprised stability of the vessel. It may also be possible that a material failure occurred that compromised the vessel's watertight integrity, such as the loss of a rudder post or the failure in the shell plating of the hull.

The information collected from crew interviews, illustrate an increased likelihood that compromised stability resulted from human errors instead of a material failure, as there was no audible indication of flooding (no high water alarms heard by helmsman), there

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[4] The horizontal distance between the center of gravity and a vertical line through the center of buoyance of a ship that is displaced from the upright position.

[5] The torque which tends to restore a vessel heeled over to its upright position.

was a prolonged period of time the vessel remained afloat (intact vessel buoyancy), and the machinery space of the vessel was not believed to be compromised (evidenced by the fact that the vessel continued to make way through the water while heeled over, even after the crew abandoned the vessel).

Conclusions:

The initiating event, or first unwanted outcome for this casualty, was the loss of stability of the LYDIA & MAYA. The subsequent events included the capsizing, sinking, and loss of the vessel. Though all of the casual factors could not be determined due to the loss of the vessel, the following factors were noted:

1. Shipboard Operations

    a. The crew had left the last two scuppers plugged on both the port and starboard side of the LYDIA & MAYA, which contributed to the accumulation of water on the main deck of the vessel.

    b. The crew had a bag of catch (approximately 7,000 pounds) suspended above the deck by the main boom. This vertical moment negatively affected vessel stability by decreasing the righting arm. Furthermore, the subsequent breaking of the boom, and falling of the catch bag on the starboard side of the vessel may have further contributed to the vessel's starboard list by increasing the heeling moment.

2. Personnel:

    a. Crew interviews revealed that the LYDIA & MAYA's crew were operating the vessel in a sleep deprived state, with some crewmembers identifying having as little as three hours of sleep over the duration of the 4-day voyage.

Safety Recommendations:

1. It is recommended that the Commandant examine the benefit of establishing regulatory requirements for the commercial fishing industry regarding mandatory rest requirements for commercial fishing vessel crewmembers serving on navigational watches for voyages greater than 24 hours. Establishing mandatory rest requirements will likely help reduce fatigue and mitigate the occurence of casualties across the commercial fishing vessel industry.

Administrative Recommendations:

1. It is recommended that this marine casualty investigation be closed.

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UNITED STATES COAST GUARD

REPORT OF INVESTIGATION

INTO THE

COMMERCIAL FISHING VESSEL MARY B II

(O.N. 274604)

SINKING AND LOSS OF THE VESSEL WITH MULTIPLE LOSS OF LIFE AT THE YAQUINA BAY BAR ENTRANCE, NEWPORT, OREGON

ON JANUARY 8, 2019

MISLE ACTIVITY NUMBER: 6607968

U.S. Department of Homeland Security
United States Coast Guard

Commandant
United States Coast Guard

US Coast Guard Stop 7501
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16732/IIA # 6607968
28 December 2023

CAPSIZING AND LOSS OF LIFE OCCURRING ON THE COMMERCIAL FISHING VESSEL MARY B II (O.N. 274604) AT THE YAQUINA BAY BAR ENTRANCE NEWPORT, OREGON ON JANUARY 8, 2019

ACTION BY THE COMMANDANT

The record and the report of the investigation convened for the subject casualty have been reviewed. The record and the report, including the findings of fact, analysis, conclusions, and recommendations are approved subject to the following comments. This marine casualty investigation is closed. Safety Recommendation 5 was directed to the 13th Coast Guard District for action.

ACTION ON RECOMMENDATIONS

Recommendation 1: Recommend that the Commandant of the Coast Guard partner with the National Commercial Fishing Safety Advisory Committee (NCFSAC) to establish a working group to draft and accept a Task Statement addressing safety of Commercial Fishing Vessels of less than 200 gross tonnage (GT). The Task Statement should specifically address the issues raised by this marine casualty, the total loss with fatalities of the MARY B II, to include addressing the following items:

1) Review multi-year statistics (provided by the Coast Guard) regarding commercial fishing vessels' less than 200 gross register tonnage (GRT) accidents or losses that resulted in fatalities, injuries, or property damage. Major marine casualties such as the losses of the fishing vessels "DESTINATION," "NO LIMITS," and other fishing vessels with multiple fatalities could be reviewed as examples.
2) Propose initiatives and actions to be taken onboard commercial fishing vessels less than 200 GT to eliminate all drug and alcohol usage when operating.
3) Ensuring that commercial fishing vessels (CFVs) are maintained with rigid standards for material condition, construction, and design of the vessels that maintains seaworthiness under all operating conditions.
4) A process to review and implement commercial fishing vessel mariner fitness-for-duty for service onboard CFVs of less than 200 GT. Fitness for duty and service should include an assessment of overall health and physical fitness and contain provisions for the elimination drug and alcohol usage and management of fatigue.
5) A process to assess, document, and maintain mariner competency to operate CFVs of less than 200 GRT, including local knowledge and recency.

6) Development of a joint Industry and Coast Guard effort to complete the implementation of 2010 and 2012 legislation for commercial fishing vessels as specified in those Coast Guard Authorization Acts. These efforts should address at a minimum, enacting the provisions in the Coast Guard Authorization Act of 2010 regarding certifying CFV operators' competency.
7) Feasibility of a multi-year phase-in implementation that all CFV mariners on CFVs of less than 200 GT and operating three miles beyond the baseline in a near-coastal zone obtain and maintain a Merchant Mariner Credential (without a Transportation Worker Identification Credential (TWIC) requirement).
8) Feasibility of a multi-year phase-in implementation that all CFV mariners serving as a Master/Operator of a CFVs of less than 200 GT and operating three miles beyond the baseline in a near-coastal zone obtain and maintain an Operator of Uninspected Passenger Vessels (OUPV) Merchant Mariner Credential (without a TWIC requirement).
9) Identify steps and make recommendations to promote marine safety of CFVs less than 200 GT with all commercial entities, companies, owners, and managing operators to develop and implement a Safety Management System (SMS) for their vessels and personnel, in accordance with and as defined in 33 Code of Federal Regulations (CFR) § 96.120.
10) Develop guidance and make recommendations on fatigue limiting strategies as well as work/rest hour logging requirements.

> **Action:** I concur with the intent of this recommendation. The Coast Guard will present this case and supporting data at the next NCFSAC meeting for their consideration to determine if a Task Statement to address the identified recommended topics is appropriate.

Recommendation 2: Recommend that the Commandant of the Coast Guard obtain the legislative authority to require CFVs to undergo mandatory inspections with expanded standards beyond the limited requirements within 46 CFR § 28. The current regulatory standards for CFVs do not adequately address the seaworthiness of vessels in light of the hazards associated with fishing operations.

> **Action:** I do not concur with this recommendation. The investigation recommendation did not convey a clear reasoning that supports mandatory inspections for Commercial Fishing Vessels, or how regulatory standards do not adequately address seaworthiness associated with fishing operations. Current regulations and guidance address seaworthiness, good marine practices and recommendations. Had the operator embraced current best marine practices including those addressed in the Commercial Fishing Vessel Safety Initiatives and Best Practice Guide, Coast Guard websites, and Marine Safety Information Bulletins (MSIBs), the outcome could have been influenced without regulatory inspections.

Recommendation 3: Recommend that the Commandant of the Coast Guard request a review of the Fishing Vessel Casualty Task Force report, March 1999, with the aim of implementing all of the recommendations. In 2011, the National Transportation Safety Board (NTSB) released five safety recommendations for CFV operations which were presented to the Coast Guard. These included addressing stability, subdivision, and watertight integrity on CFVs under 79 feet.

Additionally, the NTSB recommended all owners and masters receive training and be able to demonstrate competency in stability and watertight integrity. Despite the overwhelming recognition of the hazards of commercial fishing, and the statistical data showing high rates of fatalities and vessel losses, a long list of recommended regulations and laws have not been enacted. Voluntary programs, education and dissemination of best marine practices do not stop CFV casualties and fatalities when negligent owners and operators fail to adhere to well-intentioned suggestions. Comprehensive requirements should include the following: enrollment in drug testing program, watertight integrity and subdivision requirements, requirements to not only conduct but have and keep a log of safety drills, requirements for equipment maintenance and dry dock exams to ensure the integrity of the hull and other watertight components.

> **Action:** I partially concur with this recommendation. As mentioned in the response to Recommendation 2, the Coast Guard does not believe that increased stability, subdivision, and watertight integrity standards would have changed the outcome of this incident. However, the report of investigation made a compelling case that the competency and fitness of the master in this instance was substandard. As a result, the Coast Guard compiled and reviewed past NTSB and Coast Guard safety recommendations stemming from CFV marine casualty investigations where CFV master performance of duty was a found to be a contributing factor to the incident. The review and this investigation support the need to ensure that CFV masters have the necessary competency to safely operate their vessels. The Coast Guard can address competency gaps and enhance the safety of the fishing vessel industry by requiring CFVs masters of vessels less than 200 GRT operating beyond the U.S. baseline to hold a merchant mariner credential (MMC). Prerequisite training courses could be incorporated into obtaining the CFV master MMC. The MMC would also enable the Coast Guard to hold CFV masters accountable for acts of misconduct, negligence, violations of law and regulation, and for the misuse of drugs and alcohol.
>
> As noted in Recommendation 1, I have directed NCFSAC to evaluate CFV master competencies that could support obtaining statutory authority for the credentialling of CFV masters of vessels less than 200 GRT operating beyond the U.S. baseline.

Recommendation 4: Recommend that the Commandant of the Coast Guard obtain legislative authority to require CFV operators of less than 200 GT hold a valid Coast Guard issued Merchant Mariner's Credential (MMC). In addition, legislative authority should be obtained to require crewmembers on CFVs hold crew competency certificates or Merchant Mariner's Document. This would help ensure standardized levels of competency, ensure the medical fitness of CFV operators and crew, and it would enhance crew's safety mindset. Along with medical certificates, the licensing requirements means these mariners are subject to enrollment in a mandatory drug testing program. The program includes requirements for all types of testing: pre-employment, random, periodic, reasonable suspicion testing and post-casualty. This is a much-needed tool for owners and operator to ensure a drug-free working environment on their CFVs, something which affects the safety of life and property on the waterway.

> **Action:** I partially concur with this recommendation. The benefits of a competent, accountable, and drug-free master are critical to the safe operation of a vessel. As described in the response to Recommendation 3, the Coast Guard will use this

investigation and other casualty data history to evaluate the potential need for an LCP related to credentialing of CFV masters for vessels less than 200 GRT, informed by ongoing tasking to the NCFASC.

Of note, there are concurrent international initiatives that are advancing mariner competencies with "smaller fishing vessels", indicating that there is also an international focus to enhance the safety of the fishing vessel industry.

The Coast Guard does not agree that crewmembers on CFVs should hold competency certificates or MMCs at this time.

Recommendation 6: Recommend that the Commandant of the Coast Guard in concert with District CFV Safety Program Managers collaborate with entities like the North Pacific Fishing Vessel Owner's Association (NPFVOA) and AMSEA to amend their curriculums and develop a concentrated outreach campaign as appropriate for operating areas with bars to increase visibility of the risks and dangers of bar crossings and discussion of potential courses of action including not crossing the bar under certain conditions. Working in concert with Coast Guard Districts, Commercial Fishing Vessel Programs and Small Boat Station Stations should encourage CFV owners and captains to attend trainings and workshops that go well beyond drill conductor training that may include stability, navigation, Occupational Safety and Health, fatigue reduction measures, and accentuating the importance of maintaining a drug and alcohol-free workplace on CFVs. In addition, in partnership with public industry, the Coast Guard should conduct additional and continuing public outreach programs concerning commercial fishing vessel safety as a result of this tragic accident. The goal is to expand and elaborate on communicating the risks of bar crossings and Coast Guard escort availability and procedures.

Action: I partially concur with this recommendation. I support the continued District level outreach measures that emphasize safe bar transit, including the Coast Guard 13th District MSIB 01-20, *Crossing Hazardous Bars in the Pacific Northwest*.

Prudent situational awareness is essential when considering bar crossing. Commercial Fishing Vessel owners/operators should be cognizant of crew capabilities, safe operating parameters of their vessel, and be aware of hazardous bar crossing procedures (33 CFR 165.1196 and 33 CFR 165.1325).

The following are some of the informational resources that exist to notify mariners of conditions and aid in risk decision making.

- Bar conditions and restrictions: https://www.weather.gov/pqr/AllBars
- Information for each bar along the Oregon Coast: https://www.oregon.gov/osmb/boater-info/Pages/Water-Level-and-Chart-Information.aspx
- Coast Guard 13th District Local Notice to Mariners: https://www.dco.uscg.mil/Featured-Content/Mariners/Local-Notice-to-Mariners-LNMs/District-13/

Recommendation 7: Recommend that the Commandant of the Coast Guard amend 46 CFR Part 28 to require CFV owners and captains implement shipboard policies to address crew rest, work hours, and fatigue. The shipboard policies should reflect the basic principles of the Coast

Guard's Crew Endurance Management System (CEMS) used to identify and control crew endurance risk factors. Requiring owners and captains to implement crew rest policy would give crewmembers the opportunity to reduce their risk of fatigue-related accidents and help prevent casualties.

Action: I concur with the intent of this recommendation. The investigation does not provide causal factors that clearly present a link to crew fatigue. Due to the nature of how this casualty occurred, these standards would not have prevented the casualty from occurring; however, I recognize the advantages for owners/operators to implement shipboard policies to address crew rest, work hours, and fatigue. The Coast Guard has produced and made available resource tools that detail Crew Endurance Management System (CEMS) guidance. The CEMS model has been successfully incorporated by numerous maritime industry operators (e.g., ferries, deep draft, towing industries).

The Coast Guard highly recommends the CFV owners and operators consider adopting the following available CEMS resources:

- Crew Endurance Management: https://www.dco.uscg.mil/Portals/9/DCO Documents/5p/5ps/Design and Engineering Standards/Human Element and Ship Design Division/crew endurance brochure_091814.pdf?ver=2017-06-21-102717-553
- CEMS Navigation and Vessel Inspection Circular (NVIC) 2-08: https://www.dco.uscg.mil/Portals/9/DCO%20Documents/5p/5ps/NVIC/2008/NVIC_2-08.pdf

ACTION ON ADMINISTRATIVE RECOMMENDATIONS

Administrative Recommendation 1 was directed towards Marine Safety Unit (MSU) Portland.

Administrative Recommendations 2-4 were directed toward the 13th Coast Guard District.

Administrative Recommendation 5: Recommend that Commandant of the Coast Guard accelerate the acquisition for a replacement for the 52-foot special purpose craft (SPC). Built in the mid-1950s, the four highly capable heavy displacement vessels cannot operate indefinitely and have a speed of 11 knots.

Action: I concur with this recommendation. The Office of Boat Forces has completed several of the acquisition documents and is ready to request Acquisition Decision Event 1 (ADE-1) approval once funding is identified.

Administrative Recommendation 6: Recommend that Commandant of the Coast Guard close the gap as outlined in COMDTINST M16500.7 (series) between Waterway Analysis and Management System (WAMS) reports and the more complex Port and Waterway Safety Assessment (PAWSA) and determine the appropriate and mandated interval for the risks associated with "critical waterways." The WAMS are specifically centered on aids to navigation (ATON) for the waterways and marginally explore actual waterway conditions and specific hazards. The 16 waterways that are identified as regulated navigation areas (RNAs) for hazardous bars are navigationally critical as defined in COMDTINST M16500.7 and require special attention and an expanded WAMS study. In addition, the Coast Guard 13th District

Prevention Office should examine reduction in size of the RNAs contained in 33 CFR § 165.1325 so that the RNAs actually represent the areas of risk to mariners rather than a broad geographic area. There is a gap for waterways with unique hazards such as the RNAs for hazardous bars as outlined in 33 CFR §165.1325 along the Pacific Northwest Coast. These ports do not qualify for a Port and Waterway Safety Assessment (PAWSA) due to the complexity of these studies.

Action: I do not concur with this recommendation. The Office of Navigation Systems (CG-NAV) is not aware of "gaps" between the WAMS process and the PAWSA process. They are two distinct analysis/assessment tools used to study risk and identify mitigation measures such as aids to navigation, RNAs, and routing measures.

The WAMS is a tool for managing competing interests and uses of a waterway. Some of the aspects addressed by a WAMS include, but are not limited to, ATON, waterway safety and risk management, effectiveness, efficiency and user input. The WAMS Completion Guide is a step-by-step guide for Coast Guard units to complete a WAMS report and can be found on the Aids to Navigation and Positioning, Navigation and Timing Division (CG-NAV-1) and the National Aids to Navigation (NATON) Portal Page.

District commanders must conduct initial Waterway Analysis and Management System (WAMS) analysis for all critical waterways in their respective area of responsibility. Once initial analyses are completed, each critical waterway will be scheduled for review at least once every five years. Waterways which need more frequent review due to significant user changes, waterway configuration changes, or marine accidents may be reviewed on a more frequent basis at the discretion of the District Commander.

A District Commander, Sector Commander or a Captain of the Ports (COTP) may request a PAWSA to identify major waterway safety hazards, estimate risk levels, evaluate potential mitigation measures, and set the stage for implementation of selected measures to reduce risk. Nothing precludes a PAWSA from being requested for the Yaquina Bay, or any other RNA with a hazardous bar, in the Pacific Northwest area.

The 16 Regulated Navigation Areas (RNA) along the coast of Oregon and Washington (33 CFR § 165.132) appropriately outline the geographical regions which require additional regulation due to the hazardous bar conditions to ensure the safety of life and vessels. An area larger than the bar is designated as the RNA to regulate actions of vessels transiting Yaquina Bay, ensuring caution and safe passage for vessels in these coastal bar offshore conditions. Marking of specific hazards such as the Yaquina Bay Bar, a seasonal hazard to mariners in this area, are designated on Navigational Charts, and further discussed with extreme detail in U.S. Coast Pilot 7.

Coast Guard Station Yaquina Bay also displays a heavy weather flag on the western corner of the Coast Guard station, visible to mariners from both directions to indicate that winds 48 knots and above are forecast for the area. Display of flags is from one hour before sunrise to one hour after sunset. The Coast Guard has also established Yaquina Bay Entrance Regulated Navigation Area Warning Sign (44°37'29"N., 124°03'27"W.) at the Coast Guard station on the north side of the river at Newport. The sign is 22 feet above the water and diamond-shaped and painted white with an international orange border, with the words ROUGH BAR. The sign is equipped with four quick flashing lights that will be activated by Coast Guard Station Yaquina Bay personnel when hazardous conditions exist, and the bar is restricted to recreational and uninspected passenger vessels. Vessel operators are cautioned, however, that if the lights are not flashing, it is no guarantee that sea conditions are favorable.

Administrative Recommendation 7: Recommend that the Commandant of the Coast Guard commission a workgroup to study the need for replacement of the navigation buoys placed at the entrance of hazardous bars and similar waterways that are subjected to extreme sea conditions. Recommend the findings of this work group drive the design, construction and implementation of a buoy type that can withstand extreme sea, current and mooring challenges.

Action: I concur with this recommendation. The Coast Guard is already taking actions that comply with the above recommendation.

In October 2019, the Coast Guard Research and Development Center (RDC) initiated a project to study ATON in an attempt to develop the next generation of buoys. The project examines alternatives to traditional steel buoys, including plastic and foam options. The first phase of the project consisted of market research, examining current plastic and foam buoy technology worldwide. This market research informed the buoy designs deployed for field testing, the second phase of the project. Prototype buoys were deployed in New England and on the Western Rivers, and there are plans to deploy prototypes in the Pacific Northwest. These tests will show how the alternative designs perform in a variety of environments, including in rough conditions on the Columbia River bar.

This project is expected to conclude by December 2023. The findings will be presented to Coast Guard stakeholders, who can then use the information to make any appropriate changes to the ATON program.

In addition to studying buoy design, the Coast Guard employs Automatic Identification System (AIS) aids to help mariners navigate the waterways. The Coast Guard uses synthetic AIS, which broadcasts a signal over the position of an existing aid, and virtual AIS, a signal broadcast over a position without a physical aid. AIS aids help mariners navigate waterways, while also improving the resiliency of the ATON system against environmental challenges such as those observed in Yaquina Bay, Oregon.

Administrative Recommendation 8: Recommend that the Commandant of the Coast Guard direct the Coast Guard SAR community to incorporate into guidance and standard operating procedures that the survival time determinations in the Probability of Survival Decision Aid, Probability of Survival Decision Aid (PSDA) program include the likelihood of sudden immersion shock in waters below 68°F in catastrophic and sudden vessel accidents. Cold water immersion can adversely affect the estimated functional survival time for an average person who would be wearing PVC rain gear as opposed to an immersion or survival suit. These same considerations also affected the cold-water survival time of 12.62 hours for the same individual exposed to the air and water temperature on the accident night wearing only clothing and possible rain gear.

Action: I do not concur with this recommendation. The PSDA is a search planning aid. Coast Guard SAR policy states that "the PSDA application shall be used for all cases involving persons in the water (PIW) and where persons are at risk of hypothermia or dehydration when not immersed." PSDA provides a prediction of survival times for persons subject to hypothermia and dehydration. These predictions are informed by water temperature, air temperature, other environmental conditions, PIW anthropogenic characteristics, flotation devices, and clothing. The purpose of PSDA is to provide decision makers with a general understanding of how long a person may survive in the given conditions.

PSDA does not account for cold water shock/cold water incapacitation, swim failure, injury, and starvation. PSDA assumes that people survive all non-predictable events and survival depends solely on the degree of hypothermia and/or dehydration.

Whereas the U.S. Army Research Institute for Environmental Medicine developed the PSDA, proposed improvements to the PSDA are being developed by the Office of Search and Rescue (CG-SAR) to include new insulation values for different clothing types and improving survival estimates at different water temperatures.

Administrative Recommendation 9: Recommend that the Commandant of the Coast Guard coordinate with appropriate Districts that have identified high-risk fisheries and establish an outreach and compliance program for the witnessing and increased participation in onboard drills on fishing vessels prior to the start of fishing seasons. These high-risk fisheries include the Dungeness crab fisheries and include others that have been identified through data from National Institute for Occupational Safety and Health (NIOSH) studies for fisheries with high incidents of deaths and vessel losses.

Action: I partially concur with this recommendation. Participation in onboard drills is advantageous to prepare vessel crews for emergency situations. Coast Guard Districts and Sectors should integrate novel approaches in their outreach strategies.

Coast Guard Districts facilitate outreach within their regional areas of responsibility, targeting select fisheries, unique operating conditions, vessel type, and trends. Outreach aims emphasize safe vessel operations, maintaining CFV dockside exams/safety equipment; and drills/training concepts.

Administrative Recommendation 10: Recommend that the Commandant of the Coast Guard and the National Weather Service (NWS) explore and consider incorporation of Oregon State University (OSU)'s coastal marine radar data as a tool to build a better weather and sea state picture for concerned mariners as well as for Coast Guardsmen preparing to conduct operations while they conduct risk assessment for bar escorts in adverse weather conditions. It was determined that the NWS does not utilize specially configured shore based marine radar designed to show the coastal wave spectrum to the level of granularity that is produced by OSU research facilities. Incorporation of this type of precision technology into Coast Guard risk assessment procedures and NWS products would aid mariners and Coast Guard responders in developing a better operating picture on which critical bar crossing, bar restriction, and bar closure decisions can be made.

Action: I concur with the intent of this recommendation. New weather products are integrated into the Coast Guard One View (CG1V) application via the Maritime Domain Awareness (MDA) application. Improvements to weather product delivery are in progress between the National Oceanic and Atmospheric Administration (NOAA) and the Coast Guard, specifically NOAA PORTS (Physical Oceanographic Real-Time System) data and PORT data transmission to the mariner. The recommendation to evaluate coastal marine radar data is a recommendation that could improve the NOAA weather product. It could facilitate decision makers on Bar opening/closing. This capability alone will not provide field mariners (without an AIS requirement) the ability to obtain automated weather products -- like the MARY B II incident. Alternative proposal is for the Coast Guard and NOAA to integrate weather products and publish to the mariner via current available NOAA methods (e.g., PORTS) via automated AIS transmission and web portal for public viewing.

Administrative Recommendation 11: Recommend that the Commandant of the Coast Guard have the Coast Guard Navigation Center (NAVCEN) examine and close the NAIS coverage gap that exists in the Yaquina Bay Bar, Oregon area to ensure the effectiveness of Coast Guard operations as well as national security requirements.

Action: I do not concur with this recommendation. The NAIS coverage in the area is not a contributor to this incident. The MARY B II was only 42 feet in length and did not have an AIS requirement to transmit.

[redacted]

W. R. ARGUIN
Rear Admiral, U.S. Coast Guard
Assistant Commandant for Prevention Policy

U.S. Department of Homeland Security
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16711
21 FEB 2020

MEMORANDUM

[redacted]

From: A.J. Vogt, RADM
CGD THIRTEEN (d)

To: COMDT (CG-INV)

Subj: ENDORSEMENT OF SAFETY RECOMMENDATIONS REGARDING THE SINKING OF THE MARY B II (O.N. 274604)

Ref: (a) Title 46 United States Code Chapter 63
(b) Title 46 Code of Federal Regulations Subpart 4.07
(c) Marine Safety Manual, Volume V, Part A, Ch. 6.B.4
(d) D13 memo 16732, Convening Order issued 14 Jan 2019

1. Pursuant to references (a) through (c), D13 convened a formal marine casualty investigation into the casualty as detailed in reference (d). The investigation and corresponding MISLE Activity 6607968 are forwarded for final action. The investigation confirms that the sinking of the MARY B II was a preventable accident. All three crewmembers and the vessel were lost on the north jetty tip at the entrance to Yaquina Bay, OR while the vessel was returning at night after a day of fishing for Dungeness crab. This investigation revealed various factors that led to the loss of the crew and the vessel. Factors included the vessel operator's apparent loss of situational awareness, failure to correct course to the center of the channel, and the impact of being struck by a series of large waves, capsizing and sinking the vessel. The vessel operator's lack of experience with the extreme weather conditions on the Yaquina Bay bar, and the operator's impairment caused by methamphetamine, alcohol and fatigue, all contributed to the loss of the MARY B II. I approve the findings of the investigation and recommend that the investigation be officially closed.

2. Safety Recommendations:

   a. **Safety Recommendation #1 (8.1.1): Address safety for Commercial Fishing Vessels (CFVs) less than 200GT.** Concur. I recommend that Commandant work with the Commercial Fishing Safety Advisory Committee (CFSAC) to improve safety on commercial fishing vessels less than 200 GT. The specific topics of concern are listed in the paragraphs below 8.1.1.

   b. **Safety Recommendation #2 (8.1.2) Mandatory Inspections:** Concur. I recommend that Commandant seek legislative authority to require that CFVs undergo mandatory inspections with expanded standards beyond the limited requirements within 46 CFR § 28.

c. **Safety Recommendation #3 (8.1.3). Review and implement Fishing Vessel Safety Task Force report of March 1999 and NTSB 2011 report:** Concur. I recommend that Commandant review and consider implementing the following recommendations: enrollment in drug testing programs; watertight integrity and subdivision requirements; conducting and logging safety drills; equipment maintenance requirements; and dry dock exams to ensure hull and watertight integrity.

d. **Safety Recommendation #4 (8.1.4). Merchant mariner credentials:** Partially Concur. I recommend Commandant seek legislative authority to require CFV operators of less than 200 GT hold a valid Coast Guard issued Merchant Mariner's Credential (MMC).

e. **Safety Recommendation #5 (8.1.5). Bar crossing education and outreach:** Concur. I have directed my (dpi) staff to conduct education and outreach related to hazardous bar crossings. D13 currently has bar crossing guides for each of the regulated navigation areas on the Oregon and Washington coasts. D13 will develop addendums that will target commercial fishing vessels. D13 has already released a Marine Safety Information Bulletin (MSIB) that addresses the hazards of crossing bars at night.

f. **Safety Recommendation #6 (8.1.6). Bar crossing education and outreach with local training organization:** Concur. I have directed my (dpi) staff to reach out to training organizations such as the North Pacific Fishing Vessel Owners Association (NPFVOA) and the Alaska Marine Safety Education Association (AMSEA) as well as other commercial fishing training organizations like the Washington and Oregon Sea Grant to include bar crossing hazards in their course curriculums.

g. **Safety Recommendation #7 (8.1.7). Implement Crew Endurance Management:** Concur. I recommend Commandant amend 46 CFR Part 28 to require CFV owners and operators to implement shipboard policies to address crew rest, work hours and fatigue.

3. Administrative Recommendations: I concur with all administrative recommendations and have directed my staff to provide appropriate recognition to the parties that assisted with the MARY B II response and investigation.

#

Copy: CG-CVC-3
CG PACAREA (PAC-54)
SECTOR COLUMBIA RIVER
SECTOR NORTH BEND

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United States Coast Guard

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16732
14 JAN 2019

MEMORANDUM

[redacted]

From: D. G. Throop, RADM
CGD THIRTEEN (d)

To: K. Denny, CDR
MSU Portland

Subj: FORMAL MARINE CASUALTY INVESTIGATION CONCERNING THE MARINE CASUALTY OF F/V MARY B II

1. Pursuant to the authority contained in Title 46, United States Code (U.S.C.), Section 6301 and the regulations promulgated thereunder, you are to convene a formal investigation for the marine casualty of the F/V MARY B II (O.N. 274604) that occurred on 08JAN19. In conducting your investigation, you shall follow, as closely as possible, to the policy guidance and operational procedures for the Coast Guard Marine Investigations Program, as found in the Marine Safety Manual, Volume V, COMDTINST M16000.10A.

2. Due to the scope and complexity of the investigation, I have assigned the following persons to assist you with your investigation. For purposes of this investigation, the below persons are all designated as investigating officers as defined under 46 C.F.R. § 4.03-30, and therefore, shall enjoy the powers outlined in 46 C.F.R. § 4.07-5.:

- LT [redacted] Assistant Investigating Officer
- LT [redacted] Recorder
- LT [redacted] Legal Counsel
- LCDR [redacted] Technical Advisor

3. Upon completion of the investigation, you will issue a Report of Investigation (ROI) to me with the collected evidence, the established facts, conclusions and recommendations. Conclusions and recommendations concerning commendatory actions or misconduct that would warrant further inquiry shall be referred to me, by separate correspondence for consideration and action as appropriate. A weekly summary of significant events shall be transmitted to CGD THIRTEEN (dpi) while the investigation is in formal session.

4. You will complete and submit your investigative report to me by 15JUN19. If this deadline cannot be met, you shall submit a written explanation for the delay and notice of the expected

Enclosure (1)

completion date. You are highly encouraged to submit any interim recommendations intended to prevent similar casualties, if appropriate, at any point in your investigation.

5. The National Transportation Safety Board (NTSB) is also charged with the responsibility of determining the cause or probable cause of this casualty by the Independent Safety Board Act of 1974 (49 U.S.C. § 1901, et. seq.) and may designate a representative to participate in this investigation. The NTSB representative may make recommendations regarding the scope of the inquiry, may identify and examine witnesses, and/or submit or request additional evidence.

6. CGD THIRTEEN will provide funding support and MSU Portland will provide administrative assistance to the Investigation.

7. CGD THIRTEEN will furnish such funding and technical assistance as may be required by the Investigation when deemed appropriate and within the requirements for the scope of the investigation. Your point of contact for funding and technical assistance is CDR Hsingyen Fu, CGD THIRTEEN (dpi).

#

Copy: CG-INV
PACAREA (PAC-54)
INCOE
CG Sector North Bend
CG Station Yaquina Bay

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List of Acronyms

ACOE	Army Corps of Engineers
AIS	Automatic Identification System, a vessel tracking system to enhance the safety of navigation
AHRS	Advanced Helicopter Rescue School
AMSEA	Alaska Marine Safety Education Association
ATON	Aids to Navigation
BNM	Broadcast Notice to Mariners via marine radio
BOSN	Boatswain, CG Chief Warrant Officer
CFR	Code of Federal Regulations
CFSAC	Commercial Fishing Safety Advisory Committee
CFV	Commercial Fishing Vessel
CG	Coast Guard
CG Helo 6527	CG Aircraft with aircraft ID number used as a call sign, rescue helicopter on the accident night.
CG STA	Coast Guard Station
CO	Commanding Officer
Coast Guard	Unites States Coast Guard
COMDT	Commandant of the Coast Guard
COMDTINST	Commandant Instruction, CG Communications outlining policy and direction
COTP	Captain of the Port
D13	Coast Guard Thirteenth District, comprising Washington, Oregon, Idaho and Montana
EPIRB	Emergency Position Indicating Radio Beacon
F/V	Fishing Vessel
GT	Gross Ton (Gross Registered Tons)
HP	Horsepower
IMO	International Maritime Organization
LIO	Lead Investigating Officer
LLNR	Light List Number
LNM	Local Notice to Mariners, published weekly
LT	Light (ATON)

LUC	Latent Unsafe Condition, determined by an assessment of the facts and then analysis
MISLE	Marine Information for Safety and Law Enforcement, a Coast Guard database for tracking vessel related activities
MLB	Motor Life Boat, MLB 47266
MMC	Merchant Mariner Credential, a document issued by the CG to commercial mariners
MRO	Medical Review Officer
MSIB	Marine Safety Information Bulletin
NAIS	National Automated Identification System, a Coast Guard capability for tracking vessels equipped with AIS equipment
NAVCEN	Coast Guard Navigation Center
NIOSH	National Institute of Safety and Occupational Health
NJ	New Jersey
NM	Nautical mile
NOAA	National Oceanic and Atmospheric Administration
NPFVOA	North Pacific Fishing Vessel Owner's Association
NTSB	National Transportation Safety Board
NWS	National Weather Service
O.N.	Official Number
OCMI	Officer in Charge, Marine Inspection
ODFW	Oregon Department of Fish and Wildlife
OIC	Officer in Charge
OR	Oregon
OSU	Oregon State University
PAWSA	Port and Waterway Safety Assessment
PFD	Personal Floatation Device
PII	Parties-in-Interest, people or organizations who have a statutory right or interest in the accident investigation.
PSDA	Probability of Survival Decision Aid, planning tool for search and rescue
PST	Pacific Standard Time; is 8 hours behind Coordinated Universal Time which is used on radio logs. The time offset from UTC can be written as -08:00. Casualty location switched to PST on Nov 4, 2018
RNA	Regulated Navigation Area
ROI	Report of Investigation

SAR	Search and Rescue
Sector	An operational unit that oversees a geographic segment of the maritime domain in the United States. E.g. Sector North Bend
SPC-HWX	Special Purpose Craft – Heavy Weather craft, VICTORY
TOX	Toxicology
USC	United States Code
UMIB	Urgent Marine Information Broadcast
USC	United States Code
USCG	United States Coast Guard
UTC	Coordinated Universal Time
VHF	Very High Frequency; Marine Band Radio, typically found on vessels
VMS	Vessel Movement System; NOAA Voluntary Fishing Vessel Tracking System
WAMS	Waterways Analysis and Management System, a tool used by the CG to plan and implement ATON on federally designated navigable waterways

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16732
October 1, 2019

COMMERCIAL FISHING VESSEL MARY B II (O.N. 274604)
SINKING AND LOSS OF THE VESSEL
WITH MULTIPLE LOSS OF LIFE
AT THE YAQUINA BAY BAR ENTRANCE, NEWPORT, OREGON
ON JANUARY 8, 2019

EXECUTIVE SUMMARY

In the early hours of January 8, 2019, the U.S. flagged Fishing Vessel (F/V) MARY B II (O.N. 274604) departed the Yaquina Bay harbor, near Newport, OR, with three crewmembers aboard to engage in crab harvesting. The vessel had a permit to fish for Dungeness crabs. Due to commercial pressure, certain times in this nine month season mimic "derby"[1] style crabbing. The Yaquina Bay Bar is a Regulated Navigation Area (RNA) due to its hazardous bar conditions.[2]

That day, there were a number of commercial vessels engaged in offshore crabbing. In anticipation of deteriorating weather conditions and gale warnings, local mariners began to cross the bar and return to port. The National Weather Service (NWS) and the local Yaquina Bay Coast Guard Station were advising mariners of approaching severe weather including gale warnings forecast for the outer waters beginning in the afternoon. At 4:45 p.m., the Coast Guard implemented restrictions preventing all recreational and uninspected commercial passenger vessels to cross the bar. In other words, these vessels could travel no further seaward than Yaquina Bay Channel Lighted Buoy 7, well inside the harbor.

After local fishing vessels crossed the bar, it was determined that the MARY B II was still offshore several miles south of the Bar. The Coast Guard initially had difficulty contacting the MARY B II, an issue compounded by the renaming of the vessel and a change in ownership late in 2018. At approximately 9 p.m., the Coast Guard was in communication with the MARY B II as the vessel was making way towards the Yaquina Bay Bar entrance. Noting the high risk associated with deteriorating bar conditions, Coast Guard vessels got underway and made preparations to escort the MARY B II across the bar.

[1] "Derby" or "Olympic" style fishing is described as a derby-style race for fish system where vessels compete directly with each other to maximize catch and revenues within the limitations of the guideline and fleet-wide harvest level. See Section 5.7 for a fuller explanation as it pertains to the Oregon Dungeness Crab fishery.
[2] A regulated navigation area (RNA) is defined in 33 CFR § 165.10. A RNA is a water area within a defined boundary for which regulations for vessels navigating within the area have been established under this part. 33 CFR § 165.1325 (a) (10) covers the section of the waterway where the accident took place.

Shortly before 10 p.m., the MARY B II began its approach to the Yaquina Bay Bar. The vessel was escorted by two Coast Guard boats, the VICTORY following astern and the motor life boat (MLB) 47266 identifying the center of the channel with a blue flashing light. The waterway at the bar was methodically illuminated by rocket propelled illumination flares (MK-127s) launched from the escort vessels. During the inbound transit, seas were building and breaking at heights up to 14-16 feet. At 10:04 p.m., the MARY B II slowed to approximately 2-4 knots and began to move off the center of the channel towards the dangerous seaward end of the North Jetty. Approximately two minutes later, the CG escorts observed a series of larger waves interact with the MARY B II near the North Jetty and as a result, the MARY B II capsized and sank. Search and Rescue efforts were immediately initiated, including the dispatch of a CG helicopter and local fire department assets. All three of the crew perished in the sinking and the vessel was a total loss.

This investigation determined that the initiating event occurred when the operator of the MARY B II began an uncorrected movement off the center of the channel towards the extreme dangers associated with the seaward end of the North Jetty. Subsequent events include failing to correct course back towards the safer portion of the channel,[3] the vessel being struck by a series of larger waves, the vessel's capsizing and subsequent sinking.

The primary causal factors that directly contributed to the casualty are: 1) the vessel operator's lack of experience of with the extreme winter conditions of the Yaquina Bay Bar; 2) vessel operator's impairment caused by methamphetamine, alcohol and fatigue; and, 3) the commercial pressures created by the harvesting of Dungeness crab in the Pacific Northwest.

Other causal factors include: 1) the lack of a drug and alcohol regulatory policy for the commercial fishing industry; 2) the lack of a skill assessment and credentialing or licensing of mariners operating Commercial Fishing Vessels (CFVs) under 200 GT; 3) the RNAs for Hazardous Bars permit commercial vessels, such as the MARY B II, to cross the dangerous bars even in conditions that are close to the operating limits of specially trained Coast Guard crews equipped with vessels built specifically for the extreme surf conditions found on these waterways; 4) the "Bar Crossing Plans" requirement contained in the RNA regulations is vague and inadequate in identifying a practical plan to ensure the safety of crews crossing a dangerous and breaking bar, and 5) the configuration and maintenance of aids to navigation (ATON) for Yaquina Bay.

Also contributing to the casualty was the managing owner's lack of knowledge of a vessel owner's responsibilities. Specifically, the MARY B II's managing owner: 1) failed to ensure a drug and alcohol free working environment, despite knowing the vessel's operator used cannabis; 2) was unaware of the specific dangers associated with of the vessel's operating area with respect to breaking bar conditions; and; 3) failed to select a prudent vessel operator with the appropriate level of experience in transiting dangerous bars.

[3] Failure to return close to the center of the channel limited the vessel's ability to maneuver in the breaking surf and prevented potential water rescue of the crew.

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16732
October 1, 2019

COMMERCIAL FISHING VESSEL MARY B II (O.N. 274604) SINKING AND LOSS OF THE VESSEL WITH MULTIPLE LOSS OF LIFE AT THE YAQUINA BAY BAR ENTRANCE, NEWPORT, OREGON ON JANUARY 8, 2019

INVESTIGATING OFFICER'S REPORT

1. Preliminary Statement

1.1. This marine casualty investigation was conducted and this report was submitted in accordance with 46 Code of Federal Regulations (CFR) § 4.09, and under the authority of 46 United States Code (USC) Chapter 63. Under 46 USC § 6308, no part of a report of a marine casualty investigation, including findings of fact, opinions, recommendations, deliberations, or conclusions shall be admissible as evidence or subject to discovery in any civil or administrative proceedings, other than an administrative proceeding initiated by the United States.

1.2. On January 14, 2019, the Thirteenth District (D13) Commander issued the enclosed convening order directing a District Formal Investigation to thoroughly investigate the January 8, 2019, sinking of the MARY B II and the loss of life of all three crewmembers.

1.3. The following personnel participated in the District Formal Investigation: Lead Investigating Officer (LIO) – CDR Karen Denny, Executive Officer of Marine Safety Unit (MSU) Portland, Oregon; Member – LT [redacted], Investigating Officer, MSU Portland, Oregon; Recorder – LT [redacted], D13 Inspections and Investigations branch; Legal Advisor – LT [redacted], D13 Legal; Technical Advisor – LCDR [redacted], D13 Response; Technical Advisor – Mr. [redacted], Coast Guard Investigations National Center of Expertise.

1.4. The LIO designated the vessel's owner, F/V MARY B II LLC and managing owner, Ms. [redacted] as a Party-In-Interest (PII) represented by the law office of Nicoll Black & Feig PLLC.

1.5. The investigation team held one public hearing session at the Newport City Hall in Newport, Oregon on May 13-17, 2019. Twenty-nine witnesses testified in the hearing over that five-day period. All witnesses appeared as requested, and PII representatives participated throughout the hearing. Witnesses and PII cooperated with all investigation requests.

1.6. The Coast Guard was the lead federal agency for initial evidence collection activities and led all efforts to recover additional evidence. The National Transportation Safety Board (NTSB) was contacted but did not participate in this investigation due to the impact of the 2019 lapse in government appropriations and the resultant inability to deploy investigators.

1.7. References to time in this report are listed as 12-hour and with an a.m. or p.m. to denote morning or afternoon times. All times reflect Pacific Standard Time (PST) which is Coordinated Universal Time (UTC), offset of minus 8 hours.

1.8. Throughout the investigation, helpful information was obtained from the public using the email addresses: marybii.uscg@gmail.com and accidentinfo@uscg.mil.

2. Vessel Involved in the Incident

Figure 1. Photograph of the MARY B II near the shoreward end of the jetties in Yaquina Bay, November 18, 2018. (Source – [redacted]

Vessel Name:	MARY B II (ex BESS CHET)
Official Number:	274604
Flag:	United States
Vessel Class/Type/Sub-Type:	Commercial Fishing Vessel, Displacement Hull, Near Coast Fishery
Build Year:	1957
Gross Tonnage:	23
Length:	41 ft 7 in / 41.6 ft
Beam/Width:	13.4 ft
Draft/Depth:	7.1 ft
Hull Construction:	Wood plank, fiberglass over wood topsides
Main/Primary Propulsion (Configuration/System Type, Ahead Horse Power):	Diesel Engine, Detroit Diesel, 4-71, 1974, approximately 160 HP
Owner/Managing Owner:	F/V MARY B II LLC, [redacted]
Operator:	Stephen J. Biernacki

3. Deceased, Missing, and/or Injured Persons

Name (First, MI, Last)	Sex	Relationship to Vessel	Age	Status
Stephen J. Biernacki	Male	Operator	50	Deceased
James E. Lacey	Male	Deckhand	57	Deceased
Joshua J. Porter	Male	Deckhand	50	Deceased

4. Findings of Fact

4.1. The Incident:

4.1.1. On or about January 8, 2019, between 4:00 a.m. and 6:00 a.m., Mr. Biernacki ordered bait and Mr. Lacey and Mr. Porter picked up bait from the Seawater Seafood South Beach location. Mr. Biernacki purchased 10 boxes of sardines to be loaded onto a vehicle and then transported them to the MARY B II.

4.1.2. While at the Seawater Seafood facility, Mr. Biernacki was observed by three facility employees who described his physical behavior as seemingly unusual. Witnesses observed Mr. Biernacki talking excessively quickly, cursing, and demonstrating an overall aggressive behavior. During the same interaction, facility employees asked the operator why he was going out when every other vessel was headed back to port due to forecasted inclement weather for that day and evening. Mr. Biernacki responded that he was "going to show these guys how it's done."[4] Mr. Biernacki repeatedly asked to get his bait and seemed anxious to depart.

4.1.3. On or about January 8, 2019 at approximately 6:00 a.m., the fiancée of Mr. Lacey was on board the MARY B II prior to the vessel's departure to drop off bottled water and observed Mr. Biernacki in the engine room. Mr. Biernacki was reported to be repairing a leak into the interior of the hull of the vessel.[5]

4.1.4. Sunrise for January 8, 2019 was 7:52 a.m..

4.1.5. On or about January 8, 2019 at approximately 8:00 a.m., the National Weather Service Coastal Waters Forecast for the Oregon Coast warned of a low pressure system bringing strong easterly winds on Tuesday and into Wednesday (January 8-9). A Gale Warning was in effect starting at 4:00 p.m. Tuesday, January 8, 2019 until Wednesday evening. The coastal forecast included rain, with southeast winds from 25 to 30 knots and wind gusts up to 35 knots. The forecasted sea state was combined seas of 15 feet with a dominant period of 11 seconds, building to 23 feet with a dominant period of 18 seconds.

4.1.6. Between 7:17 a.m. and 8:00 a.m., the operator, Mr. Biernacki, got the MARY B II underway to fish for Dungeness crab off the Oregon Coast. He departed port with two crewmembers, Mr. Lacey and Mr. Porter.[6]

4.1.7. At 8:03 a.m., Mr. Porter called a local diver at Ben's Diving Service indicating that the MARY B II had a line ensnared in the propeller. Mr. Biernacki also contacted the diver, Mr. [redacted] via phone at approximately 1:58 p.m. to establish the cost of having the diver remove the line that was reported to be fouled in the propeller. Arrangements were made to have the diver meet the MARY B II upon their return to port to remove the suspected line from the propeller.

4.1.8. Throughout the day of January 8, 2019, the MARY B II engaged in fishing operations at several different locations off the coast of Yaquina Bay Bar.

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[4] Preliminary interview summaries provided by Mr. [redacted] and Mr. [redacted] personnel who work at the Seawater Seafood facility.

[5] Ms. [redacted] preliminary interview summary.

[6] The MARY B II's NOAA VMS data was transmitting data under the vessel's previous name, BESS CHET. This VMS system only gives a single location data point once roughly every 60-75 minutes.

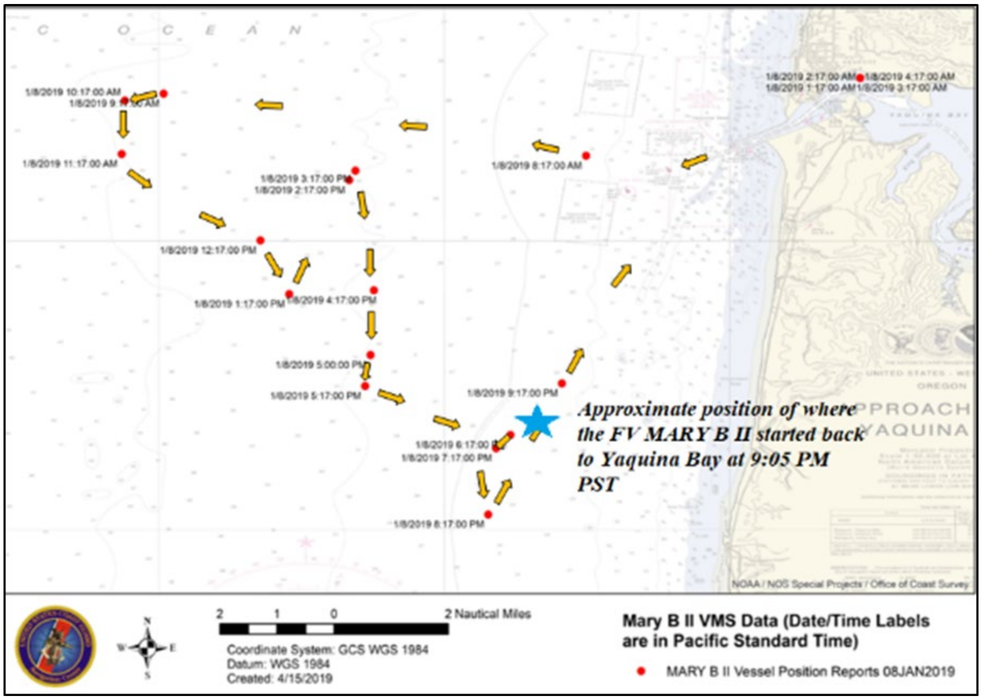


Figure 2. Chartlet showing the MARY B II's positions on January 8, 2019 based on Vessel Monitoring System (VMS) data. (Source – Created from VMS data provided by vessel owner)

4.1.9. At approximately 3:00 p.m., Coast Guard Station Yaquina Bay was monitoring the weather and number of fishing vessels waiting to cross the bar in order to return to port. Due to the inclement weather, personnel from the duty section were assessing fishing vessel traffic, evaluating the need for escorts, and standing by to assist vessels in crossing the bar. Specifically, personnel staffed three positions: a communications watchstander inside the Station's communication center; a tower watchstander located in the lookout tower; and, a mobile watchstander monitoring the bar from the hill on the north side of the jetty referred to as Mobile 1. In addition, Station Yaquina Bay had small boats on standby, including a 52 foot Special Purpose Craft – Heavy Weather (SPC-HWX) VICTORY and a 47 foot motor life boat (MLB 47266) which would participate in the bar escort and later, in the rescue attempts.

4.1.10. At approximately 4:45 p.m., the crew of Station Yaquina Bay conducted a last light bar observation and noted seas of 4 to 6 foot ebb chop at the jetty tips, 4 to 6 foot long ocean swells in the main channel, and winds were East at 10 to 15 knots. Based on these observed conditions, the Commanding Officer of Station Yaquina Bay restricted all recreational and uninspected passenger vessel traffic from crossing the bar. The Yaquina Bay Bar Report was disseminated over radio. Commercial fishing vessels like the MARY B II were not restricted from crossing the bar.

4.1.11. On January 8, 2019, sunset occurred at 4:54 p.m. and last light was at 5:26 p.m.. The moon phase for January 8, 2019 was a waxing crescent, following the new moon phase the previous night. Only about 6% of the moon was visible.

4.1.12. On January 8, 2019, both the VICTORY and the MLB 47266 were reported to be fully mission capable.

4.1.13. Over the next several hours, the F/Vs LISA MELINDA, MISS SARAH, and STAR SHADOW crossed the bar without escort and without incident. Per testimony, the operator of the LISA MELINDA reported that the last light bar report, which was being broadcasted, was inaccurate and the sea conditions were worse. As a result, Station Yaquina Bay sent the MLB 47266 to get an updated on scene assessment of the sea and weather conditions.

4.1.14. At approximately 7:19 p.m., Station Yaquina Bay Tower, Mobile 1, the VICTORY and the MLB 47266 were all in communication via radio with the F/V LAST STRAW which was still offshore. The operator of the LAST STRAW stated that they strongly desired to return to port. While the LAST STRAW did not explicitly request an escort from the Coast Guard, the operator did ask several questions regarding the sea state and wave series timing. As a result of this uncertainty, the Coast Guard made the decision to escort the LAST STRAW across the Yaquina Bay Bar and through the jetties.

4.1.15. While the Coast Guard was establishing communications with the LAST STRAW, they attempted to hail the vessel that was actively making its inbound approach to cross the bar. The vessel did not respond back, but the operator of the LAST STRAW indicated that it was the STAR SHADOW. At approximately 7:27 p.m., the STAR SHADOW successfully crossed the Yaquina Bay Bar and transited inside the jetties to Yaquina Bay Harbor.

4.1.16. The LAST STRAW waited for several minutes to assess the weather and sea conditions before attempting to cross the bar. At approximately 7:27 p.m., after discussion between the Coast Guard boats and the LAST STRAW, the LAST STRAW determined it would stay out until the Coast Guard “got a good read” on the bar conditions. Over the next several minutes, the VICTORY, the MLB 47266, Mobile 1 and the tower watchstander worked together to illuminate the bar with MK-127 illumination flares and time the series to identify the best time to facilitate the LAST STRAW’s crossing.

4.1.17. During this time, conditions were observed to be “14 foot breaks on the series, steep ebb chop throughout the main channel”… “not a lot of vis.” These conditions were conveyed to the LAST STRAW at approximately 7:31 p.m. and acknowledged by the operator of the LAST STRAW.

4.1.18. At approximately 7:32 p.m., LAST STRAW stated “I desperately want to get in…it’s building fast out there, that’s why I’m motivated to get in.”

4.1.19. At approximately 7:33 p.m., the VICTORY, located in the vicinity of South Jetty Light 4, began an outbound transit heading outside the jetty tips towards the LAST STRAW.

4.1.20. At approximately 7:39 to 7:41 p.m., the VICTORY and LAST STRAW engaged in a series of transmissions. The VICTORY stated that as the escort progressed and the LAST STRAW was in the vicinity of Lighted Entrance Buoy 3’s charted position, that Coast Guard boats would illuminate the area by activating the MK-127 illumination flares. VICTORY explained that the MLB 47266 would be located on the bar on the north side with the flashing blue light turned on. The VICTORY indicated that they would stay several hundreds of yards off of the LAST STRAW's stern to "break up anything that's coming up behind" his vessel.

4.1.21. At approximately 7:45 p.m., MLB 47266 called out to LAST STRAW to convey bar conditions the crew was observing: "two different series, uh, the larger series coming through at about every eight minutes, and the middle of that will be a little smaller series. It's about 12 foot at the tips, its [sic] not breaking, just real, real steep."[7] Then the VICTORY called out to LAST STRAW and indicated that they were in the start of the lull and it looked "like we got a good window." LAST STRAW acknowledged these transmissions.

4.1.22. At approximately 7:53 p.m., the LAST STRAW safely crossed the Yaquina Bay Bar and passed through the jetties to the protected waters inside the jetties.

4.1.23. By approximately 7:56 p.m., the LAST STRAW continued transiting into Yaquina Bay. The operator was still in communication with Coast Guard vessels. The operator of the LAST STRAW commented that it "got a little broachy there for me. I need about twice as big a rudder" and "It's kinda alarming. I got turned pretty good there didn't I?"[8] During the LAST STRAW's crossing, the vessel's operator relied on his deckhand to assist with radio communications during the escort. The vessel continuously communicated with the Coast Guard during the escort.

4.1.24. During the entire escort evolution of the LAST STRAW, there were continuous active radio communications both internally between Coast Guard boats and externally between Coast Guard boats and the LAST STRAW. Prior to and during the escort of the LAST STRAW, Coast Guard crews used numerous MK-127 flares to illuminate the area and develop a sense of the bar conditions and sea state.

4.1.25. At approximately 7:53 p.m., the MLB 47266 experienced a reduction gear temperature alarm and reported it to the Station Communications watchstander and to the VICTORY on Channel 121. The MLB 47266's coxswain indicated that they would maneuver inside the jetties to provide the engineer with a less choppy environment to enter the engine space, check on the alarm and determine the engineering plant's status. Over the next six minutes, the MLB 47266 and the VICTORY exchanged several transmissions on the status of the MLB 47266's engineering plant. The MLB 47266 indicated both engines were still online and operational. By 7:56 p.m., the MLB 47266 indicated that "they were all good now" and that the issue was a maintenance reminder.[9]

4.1.26. Throughout the escort evolution for LAST STRAW, Coast Guard vessels and watchstanders were aware of reports that one other vessel was still underway and located south of the Yaquina Bay entrance. At approximately 7:26 p.m., Coast Guard boats asked the

[7] CG Exhibit 008, Communications log provided as a transcript of radio communications. Any misspellings or typos are represented with a "[sic]"show that the word is quoted exactly as it stands in the original.
[8] CG Exhibit 008.
[9] The reduction gear alarm was for a missing temperature sensor and the MLB 47266 could not silence the alarm from the bridge of the MLB 47266. As a result, the boat engineer had to go below to verify proper operation of the equipment and silence the alarm. The boat engineer conducted a round of the space and at approximately 7:59 p.m., confirmed the round was satisfactory. It was reported that both CG boats were fully mission capable without waivers.

operator of the LAST STRAW if he knew which vessel was to the south. The operator of the LAST STRAW replied that he did not know which vessel it was. The tower watchstander attempted to call out to the vessel over marine radio with negative results. At approximately 7:33 p.m., the tower watchstander once again confirmed that he could only see one other vessel aside from the LAST STRAW operating to the south of the Bar and confirmed that he was unable to establish communications. At approximately 7:33 p.m., LAST STRAW confirmed that they, too, could see the unnamed vessel to the south/southwest because he could see the vessel's halogen lights appear and disappear. At approximately 7:38 p.m., 7:39 p.m., and 7:41 p.m., the Station communications watchstander made additional attempts to establish communications with the vessel operating approximately five miles southwest of Yaquina Bay on marine radio Channels 16, 22, and 73.

4.1.27. At approximately 7:56 p.m., the VICTORY communicated with the other Coast Guard entities regarding the unidentified fishing vessel still operating offshore. Mobile 1 reported that multiple attempts to contact the unidentified vessel had been made with negative results and that there was no Automatic Identification System (AIS) position for the vessel with amplifying information. The VICTORY directed watchstanders to contact Sector North Bend to see if they could assist in identifying the vessel.

4.1.28. At approximately 7:58 p.m., the VICTORY and MLB 47266 exchange radio transmission and discuss returning to station to moor the vessels and rest the crew. At this time, the MLB 47266 states that they have only two MK-127 flares remaining onboard and in the event additional escorts are necessary this evening, they will need to replenish. The VICTORY told the MLB 47266 to wait to return to station until further attempts to establish the identity of the final vessel offshore can be made.

4.1.29. At approximately 7:59 p.m., Mobile 1 began hailing the F/V BESS CHET over Channel 16. On working Channel 121, Mobile 1 told The VICTORY and the MLB 47266 that Sector North Bend indicated that they believed the vessel was the BESS CHET based on the vessel's last "AIS time stamp" from an hour prior.[10]

4.1.30. At approximately 8:00 p.m., the operator of the LAST STRAW called out to the Coast Guard and advised the tower watchstander to try and call the BESS CHET over Channel 73. The Coast Guard acknowledged LAST STRAW's transmission and continued to hail the BESS CHET over Channel 16 at approximately 8:01, 8:02, and 8:04 p.m. with no response.

4.1.31. Between 8:00 p.m. and 8:21 p.m., Coast Guard vessels communicated internally over Channel 121 regarding the vessel they believed was the BESS CHET. The tower watchstander indicated there were no records of the BESS CHET leaving or entering the Yaquina Bay Bar in their log after April 2018. The VICTORY directed Mobile 1 to call Station Coos Bay to find out if the BESS CHET was noted in their log in an effort to identify where this vessel came from and what their plan may be. There were discussions about

[10] This information was found based on the MARY B II's NOAA VMS data which was transmitting data under the previous vessel's name, BESS CHET.

reaching out to the Port Docks in Newport to review their logs to see if they could confirm if BESS CHET operated out of Newport, OR.

4.1.32. At approximately 8:05 p.m., the operator of the LAST STRAW heard the Coast Guard's failed attempts to reach the operator of the BESS CHET and stated that the operator of the vessel is "an East Coast feller. Been around for a year. Bought a boat. He hasn't got much experience here. Hardly any" and confirmed that the vessel operated out of Newport, OR.

4.1.33. Approximately 20 minutes later, the MLB 47266 and the VICTORY moored at Station Yaquina Bay.

4.1.34. Over the course of the next 45 minutes, Mobile 1 unit and the Tower watchstander continued to monitor the offshore vessel and noted that, from the movement of the halogen lights, the vessel seemed to be picking up crab pots. The Station Yaquina Bay Officer of the Day (OOD), a Coast Guard Petty Officer, worked to determine the identity of the unidentified vessel operating in the vicinity of Seal Rock, south of the Yaquina Bay Bar. After contacting the BESS CHET's previous owner by telephone, the Petty Officer discovered that the BESS CHET had been sold to a different operator. The OOD obtained the contact information for the new operator, Mr. Biernacki, and reached him via cellular telephone to tell him that the Coast Guard had been trying to hail him on the radio to establish radio communications and determine his intentions.

4.1.35. At approximately 8:54 p.m., a watchstander at Station Yaquina Bay broadcast a "securité"[11] transmission over Channel 22 relaying the conditions at the Yaquina Bay Bar. The conditions were detailed to be 12-14 foot swells with occasional 18-foot swells and breaks at the main channel and at the jetty tips. Visibility was noted to be 6 miles with winds being ENE at 13 knots. The bar was restricted indicating that all recreational and uninspected passenger vessels could not cross the bar because of unsafe conditions. The transmission continued that a small craft advisory, for winds and hazardous seas, was in effect through Wednesday morning and a gale warning was in effect from Wednesday morning to Wednesday evening.

4.1.36. Coast Guard resources continued to hail the BESS CHET over Channel 16 at approximately 9:03 p.m., 9:04 p.m., and 9:05 p.m. with no response.

4.1.37. At approximately 9:06 p.m., the operator of the MARY B II contacted the Coast Guard on Channel 22 and stated that a Coast Guard Petty Officer had contacted him on the phone to ensure he established radio communications with Station Yaquina Bay in preparation to cross the bar. The operator added that he was about an "hour and 15 minutes away" from the bar. The Coast Guard watchstander acknowledged MARY B II's transmission.[12]

[11] A "securité" broadcast is a radio broadcast that contains important navigational safety information.
[12] The radio transmissions indicate that at this point that Station Yaquina Bay was still trying to determine the BESS CHET (aka MARY B II) was offshore because there is an additional call out at approximately 9:08 p.m. to the BESS CHET with no response.

4.1.38. At approximately 9:11 p.m., the tower watchstander hailed the MARY B II on Channel 22 to confirm the MARY B II's location in order to verify that the MARY B II was the vessel coming from the southwest and heading towards the Yaquina Bay Bar entrance. The operator, Mr. Biernacki, confirmed the vessel's position as being "5.4 miles from the inlet."

4.1.39. At approximately 9:12 p.m., the watchstander acknowledged Mr. Biernacki's previous transmission and asked to know about number of persons on board and the speed the vessel was making. Mr. Biernacki responded that the vessel was making about 6 to 6.5 knots and had three persons on board. The watchstander acknowledged this transmission and asked the MARY B II to monitor Channel 22.

4.1.40. Though the MARY B II's operator did not request an escort, given the surf conditions, the Commanding Officer of the CG Station and experienced duty personnel met and assessed the local familiarity of the operator of the MARY B II as well as the weather forecast. In accordance with Coast Guard policy, a risk assessment was conducted. This risk assessment included the viewpoints and concerns of all the personnel that would be engaged in the upcoming escort of the MARY B II. At approximately 9:21 p.m., the MLB 47266 got underway. The crew relayed an evolution risk assessment score of medium.

4.1.41. At approximately 9:23 p.m., Mobile 1 reported that the MARY B II appeared to be about 2 miles south of the bar. At approximately 9:26 p.m., Mobile 1 reached out to MARY B II on Channel 22 and relayed that Coast Guard motor lifeboats were heading out to assess the bar conditions for the MARY B II's bar crossing. The operator of the MARY B II acknowledged Mobile 1's radio transmission and stated the vessel was approximately "3.5 miles south of the inlet." The operator repeatedly called the entrance to Yaquina Bay Bar an "inlet". Mobile 1 asked the MARY B II regarding her maximum speed to which the operator responded 7 knots. Mobile 1 acknowledged the vessel's maximum speed and indicated the Coast Guard would stand by on Channel 22 and that several Coast Guard vessels would be out on the bar to provide some illumination. MARY B II's operator acknowledged the transmission stating, "Yeah, I got you good skipper" and "roger, roger."

4.1.42. At approximately 9:25 p.m., deckhand Joshua Porter texted his wife from the MARY B II expressing frustration with the fact that they were still underway so late, given that the operator had stated that they would be in before dark. He stated that he thought the operator was "not to [sic] bright." He expressed concerns about the weather stating that "now it's really big." Mr. Porter added that he thought the rest of the crew was angry with him after he pointed out that there was a reason nobody else was out there at the time, referencing the inclement weather which had been forecasted.

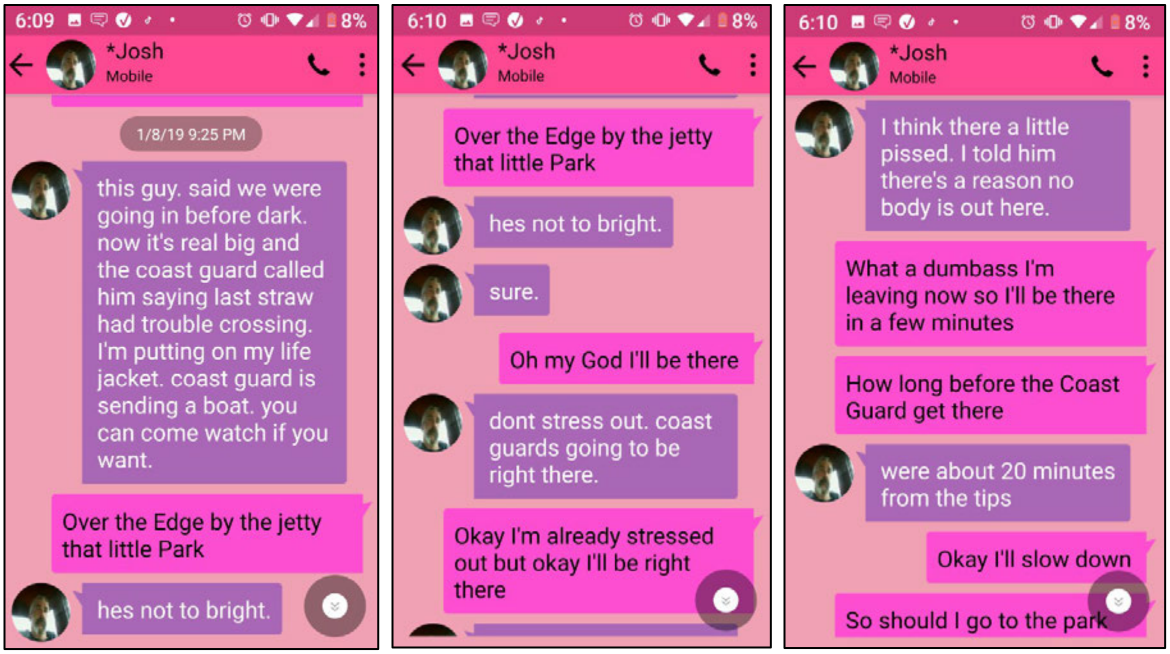


Figure 3. Screen shots of Mrs. [redacted] last text conversation with the crewmember, Mr. Porter on board the MARY B II, as the vessel was transiting back from the fishing grounds to the Yaquina Bay Bar on the evening of January 8, 2019. (Source – CG Exhibit 024)

4.1.43. The VICTORY got underway from Station Yaquina Bay for the purpose of escorting the MARY B II across the Yaquina Bay Bar. The MLB 47266 was in the center of the channel shoreward of Yaquina Bay South Jetty Light 4 relaying bar conditions, timing the series of waves, and marking the center of the navigation channel. The MLB 47266 relayed observed conditions as 10-12 feet but no breaks. Both vessels, Tower and Mobile 1 began working on timing the wave series. Coast Guard vessels observed an eight to nine minute lull. The MLB 47266 then began lighting MK-127 illumination flares to assist with observing conditions on the bar while the VICTORY pushed out past the jetty tips to better judge conditions the MARY B II would experience on the approach to Yaquina Bay.

4.1.44. At approximately 9:31 p.m., the Coast Guard called out to the MARY B II over Channel 22 to confirm the number of persons on board, to which the operator responded he had three persons. Mobile 1 acknowledged the number of persons on board and asked the operator about lifejacket availability and whether they had a bar crossing plan. The MARY B II's operator responded that they had lifejackets available and that all were "certified safety drill instructors."

4.1.45. There were no further communications to discuss the details of the MARY B II's plan to cross the bar.

4.1.46. At approximately 9:42 p.m., Mobile 1 notified MARY B II that the Coast Guard had a pair of vessels in the vicinity of the Yaquina Bay Bar, that they were timing the wave series, and that they were utilizing illumination flares to light up the area. The watchstander added that a Coast Guard unit would establish communications with MARY B II over Channel 22. Mr. Biernacki acknowledged this information and stated that he saw the flares being used to light up the bar.

4.1.47. At approximately 9:46 p.m., the VICTORY began providing information to MARY B II from its position in the vicinity of the charted location of the Yaquina Bay Entrance Lighted Buoy 3. The VICTORY notified the operator of the timing and location of waves breaking across the bar. The VICTORY added that they would stay off of MARY B II's stern during her transit across the bar, but would stay out of her way if the operator needed to abort, turn, or back up. The VICTORY reminded the operator of MARY B II that "safe navigation and operation of your vessel is your responsibility. And just because we're out here does not mean you need to cross." Mr. Biernacki acknowledged this radio transmission and stated that they would "check out a couple…of sets here before we cross." No other information was communicated to the Coast Guard about the condition of the vessel.

4.1.48. At approximately 9:47 p.m., the VICTORY advised the operator of the MARY B II that the center of the channel was the best way to go and the VICTORY highlighted the presence of the MLB 47266, who had the flashing blue lights energized and indicated that they were marking the center of the channel. The VICTORY added that both Coast Guard vessels would stay out of the MARY B II's way as the vessel transited in and crossed the bar. Mr. Biernacki acknowledged this radio transmission at approximately 9:48 p.m. with a response of "roger, roger Coast Guard. Got you good."

4.1.49. At approximately 9:50 p.m., the tower watchstander informed the VICTORY about the timing of the waves, coming as a smaller set with a larger set thereafter. At the time, the watchstander reported that the series appeared to be nine minutes in length with the lull period being four minutes long.

4.1.50. At approximately 9:51 p.m., Station Yaquina Bay watchstander asked the MLB 47266 for updated operations and position information. The MLB 47266 responded that they were in the vicinity of South Jetty Light 4 and standing by for MARY B II to make the inbound run.

4.1.51. At approximately 9:52 p.m., the VICTORY let the MARY B II know that they were going to stand by north of Entrance Lighted Gong Buoy 1. The VICTORY stated that once they saw the MARY B II start the inbound transit, the VICTORY would fall in behind her. The operator of the MARY B II acknowledged the radio transmission and stated that personnel on board the MARY B II would don their lifejackets.

4.1.52. The three persons on board the MARY B II donned automatically inflatable Type V lifejackets.

4.1.53. Between 9:52 and 9:57 p.m., there were internal Coast Guard communications between the MLB 47266, the VICTORY, and the tower watchstander discussing the timing of the series of waves. At approximately 9:57 p.m., the MLB 47266 relayed to the VICTORY that the bigger series of waves had passed and it would be a good time to begin an inbound run.

4.1.54. At approximately 9:57 p.m., the VICTORY indicated to MARY B II that it appeared that the MARY B II was beginning to make her approach to the Yaquina Bay channel and reiterated that VICTORY would be "sticking off" her stern. Mr. Biernacki acknowledged this radio transmission, saying "Yeah. Roger, roger."

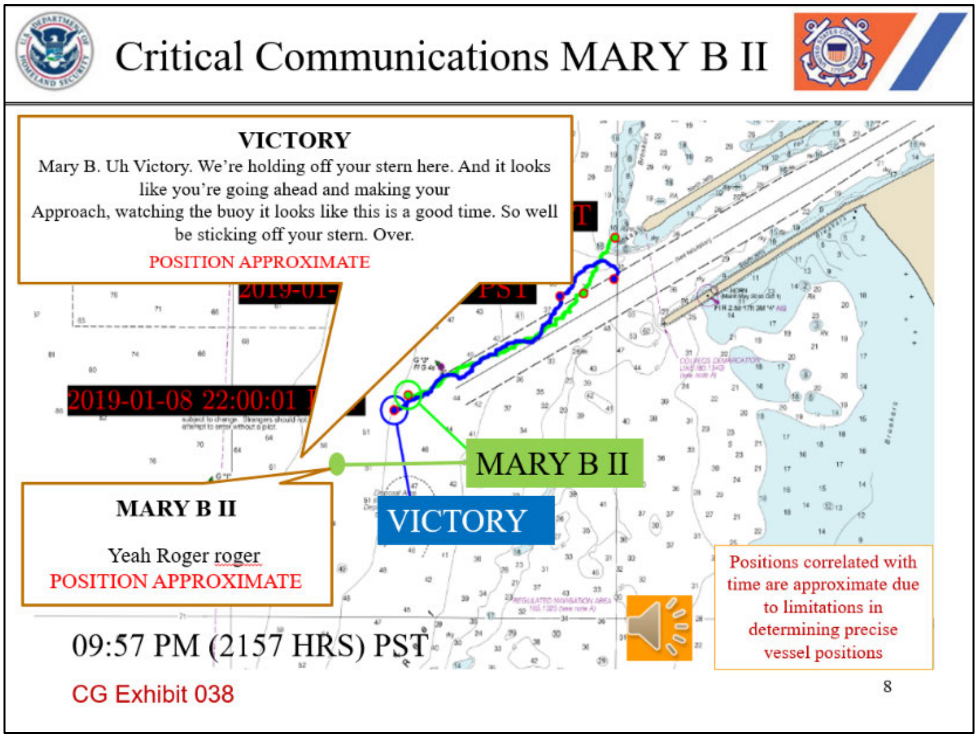


Figure 4. Time approximately 9:57 p.m., slide from Critical Communications presentation used in the public hearing. (Source – Oregon State University/Coast Guard, CG Exhibit 038)

(HYPERLINK # 1)

4.1.55. At approximately 9:58 p.m., the VICTORY had internal communications with the MLB 47266 and stated that they were transiting in behind the MARY B II. The VICTORY stated that the transit speed of the MARY B II was "slow though." The MLB 47266 asked to be notified when the MARY B II and the escorting VICTORY were past the charted location of Entrance Lighted Buoy 3 in order to light up a flare to illuminate the bar.

4.1.56. At approximately 9:58 p.m., the VICTORY directed the MLB 47266 to start putting up more illumination flares. The VICTORY also stated that the MARY B II was "not riding good in the water," appeared to be "not a very stable boat" and it had an outrigger partially out.[13] In the same transmission, the VICTORY reported that the MK-127 illumination flare they attempted to fire was "a dud" and failed.

[13] Eye witness accounts indicate that the port outrigger was partially deployed though it was unclear at what angle the outrigger was deployed or if there were any rigging lines trailing behind in the water near the stern of the MARY B II.

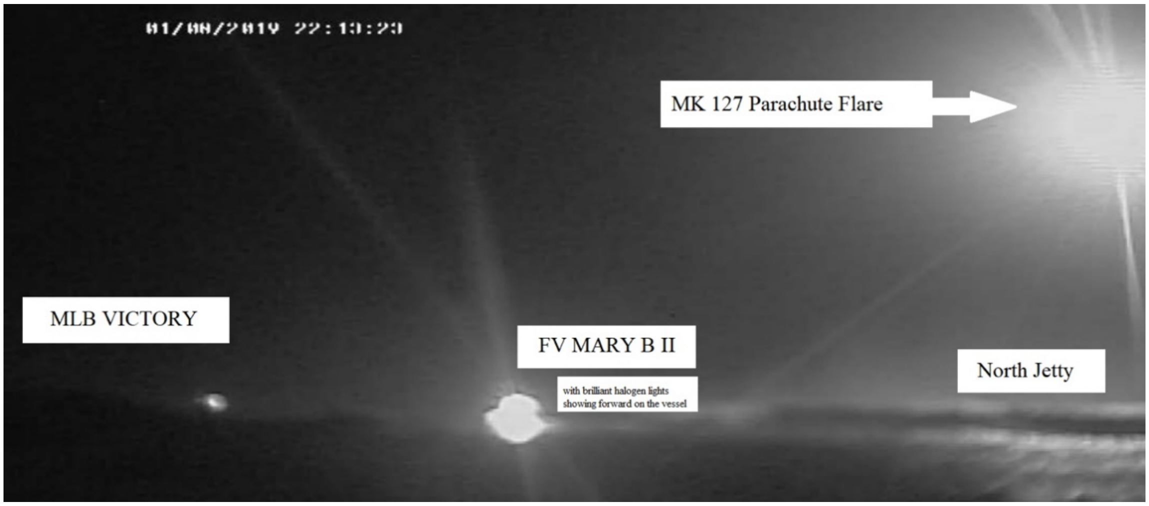


Figure 5. Screen capture from Oregon State Police closed circuit TV camera showing the illumination provided by a MK-127 parachute flare that was launched from the Coast Guard boats during the escort. (Source – Oregon State Police video, screen capture with labels from CG Exhibit 031)

4.1.57. At approximately 9:59 p.m., the MLB 47266 called out to the MARY B II on Channel 22. The MLB 47266 told the MARY B II's operator that they were located in the center of the channel. The MLB 47266 indicated that once the MARY B II got inside the jetty tips, the MLB 47266 would move to the north side of the channel. The MLB 47266 also passed that the conditions inside the jetty tips were such that when the bigger series of waves broke, it was breaking on the south side at South Jetty Light 4. In other words, the breaking waves were coming well into the channel and reaching the south side of the jetty to a position near South Jetty Light 4. The MLB 47266 advised that once the MARY B II got inside the jetty tips the operator may want to steer his vessel a little north inside the channel in order to most quickly get to safer water.

4.1.58. At approximately 10:00 p.m., the operator of the MARY B II acknowledged the MLB 47266's transmission by stating that he saw their blue light and added, "I'm working my way to the North side here now."

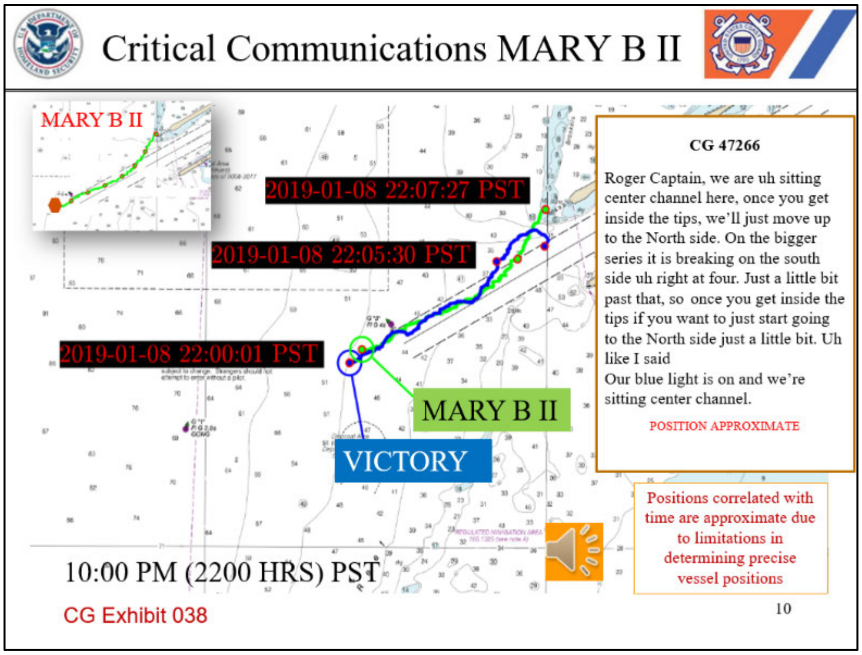


Figure 6. Time 10:00 p.m., slide from Critical Communications presentation used in the public hearing. (Source – Oregon State University/Coast Guard, CG Exhibit 038)

4.1.59. The MLB 47266 immediately responded and advised the MARY B II's operator not to come north too soon. The MLB 47266 gave additional information on the observed conditions stating the waves were starting to break on the north side off the dumping grounds and that there was also a wraparound break on the north side of the channel.

4.1.60. The operator of the MARY B II acknowledged the MLB 47266's message stating "Yeah I got you guys, alright. Lemme pay attention here, cause so many vessels here now I got AIS going off on my Plotter here. Clogging it up."

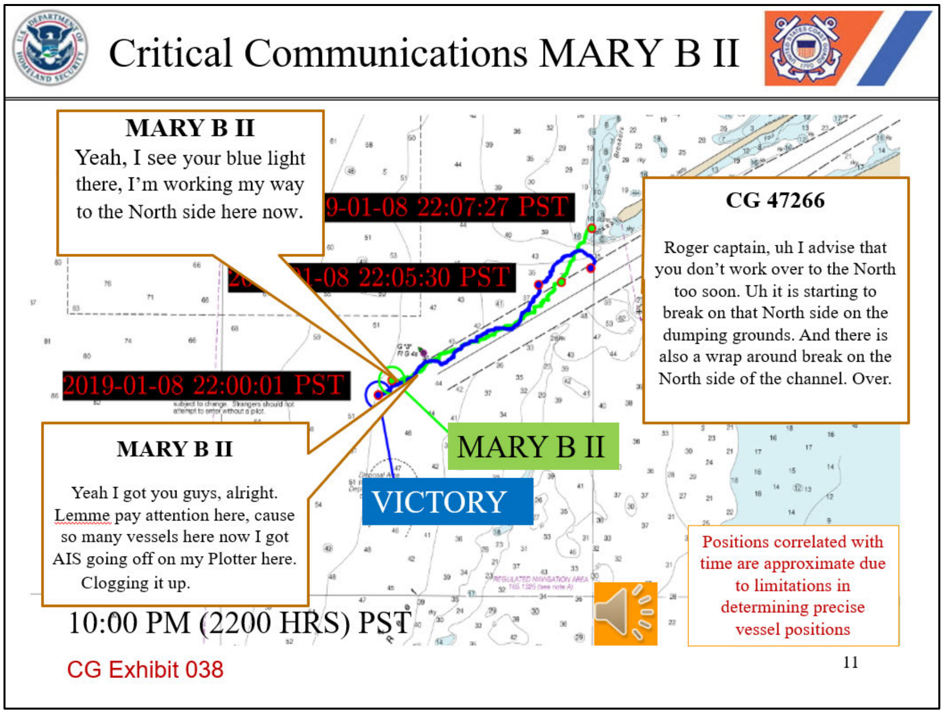


Figure 7. Subsequent 10:00 p.m. slide from Critical Communications presentation used in the public hearing. (Source – Oregon State University/Coast Guard, CG Exhibit 038)

4.1.61. At that time and in close proximity to the scene, the VICTORY, the MLB 47266, South Jetty Light 4, and Entrance Buoy “Y” were AIS equipped and transmitting.

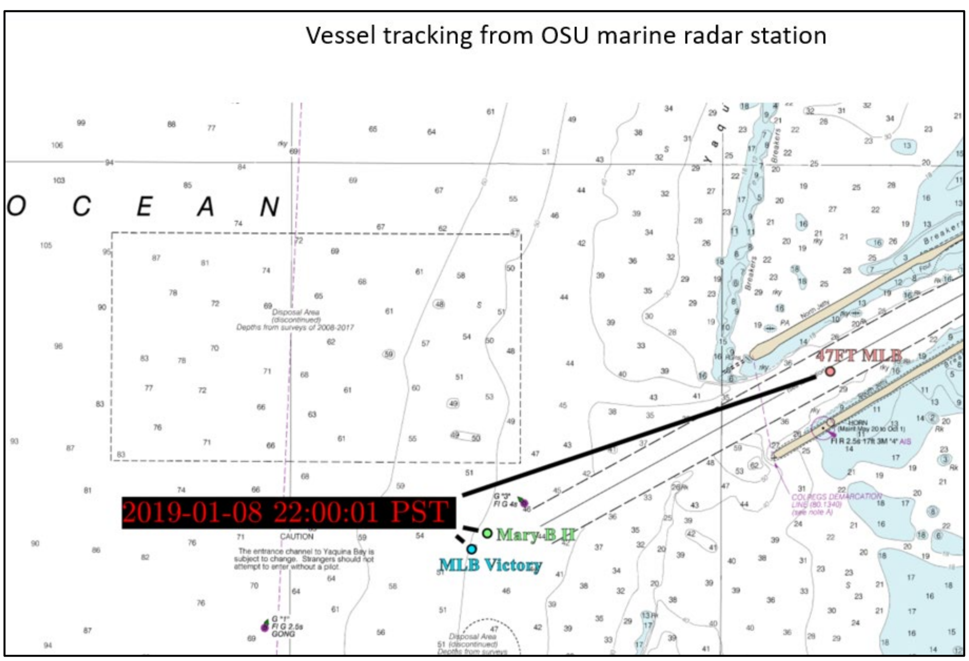


Figure 8. Positions of the vessels involved at 10:00 p.m. derived from the Oregon State University (OSU) marine radar located at Yaquina Bay. (Source – Coast Guard, CG Exhibit 071)

4.1.62. At approximately 10:01 p.m., Sector North Bend made a “securité” broadcast for Oregon Coast bar restrictions for approximately 30 seconds on Channel 22.

4.1.63. Between approximately 10:02 and 10:03 p.m., the MLB 47266 and the VICTORY engaged in a series of internal communications on Channel 121. At this time, the MLB 47266 tells the VICTORY that it appeared they were in the best part of the lull. The VICTORY reported that the MARY B II seemed to be going about as fast as it could, but that it was travelling “very slow” at about 2 knots. The VICTORY indicated the VICTORY and MARY B II’s approximate location as about “10 yards inside” Entrance Lighted Buoy 3 and that they were not making good speed.

4.1.64. The VICTORY had to back down at one point to maintain a safe distance off the stern of the MARY B II. The Coast Guard did not inquire as to the reason for the MARY B II's slow speed. The operator of the MARY B II did not provide the Coast Guard with a reason for the slow speed.

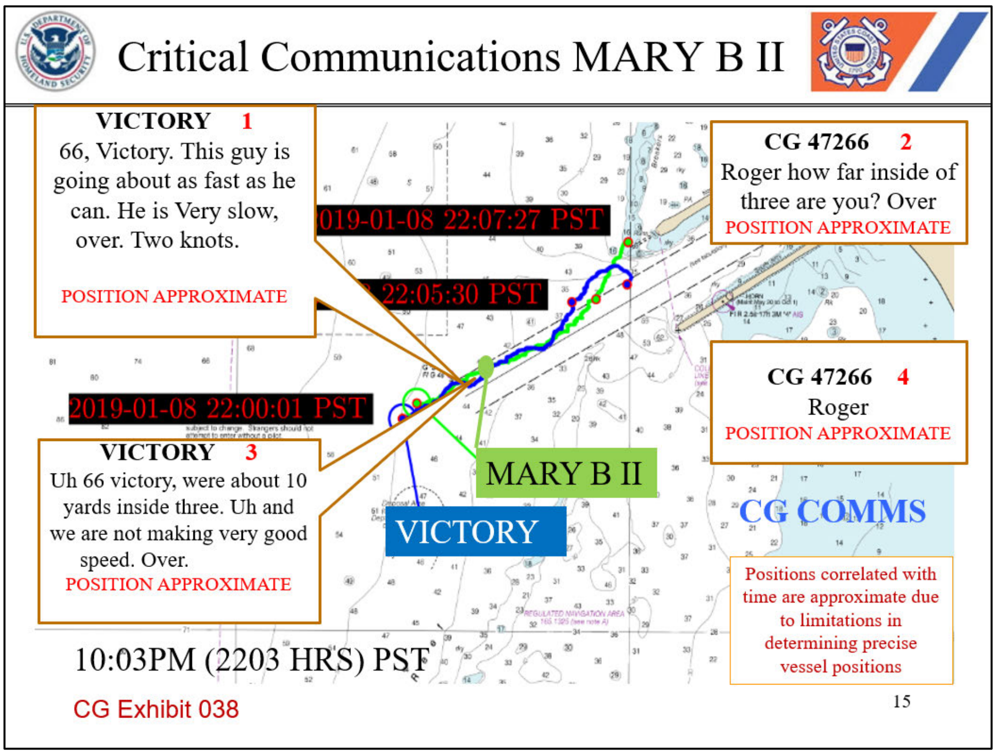


Figure 9. Time 10:03 p.m., slide from Critical Communications presentation used in the public hearing. (Source – Oregon State University/Coast Guard, CG Exhibit 038)

(HYPERLINKS # 2 and # 3)

4.1.65. At approximately 10:04 p.m., the VICTORY called the MARY B II on Channel 22 and passed “16 footer building up behind you captain.”[14] Shortly after this transmission, the MLB 47266 communicated over Channel 121 that the MLB 47266 had only one illumination flare left. The VICTORY acknowledged this transmission and directed the MLB 47266 to

[14] CG Exhibit 008.

retain this MK-127 illumination flare until the last minute when the vessels would be trying to cross the bar. The MLB 47266 acknowledged this instruction.

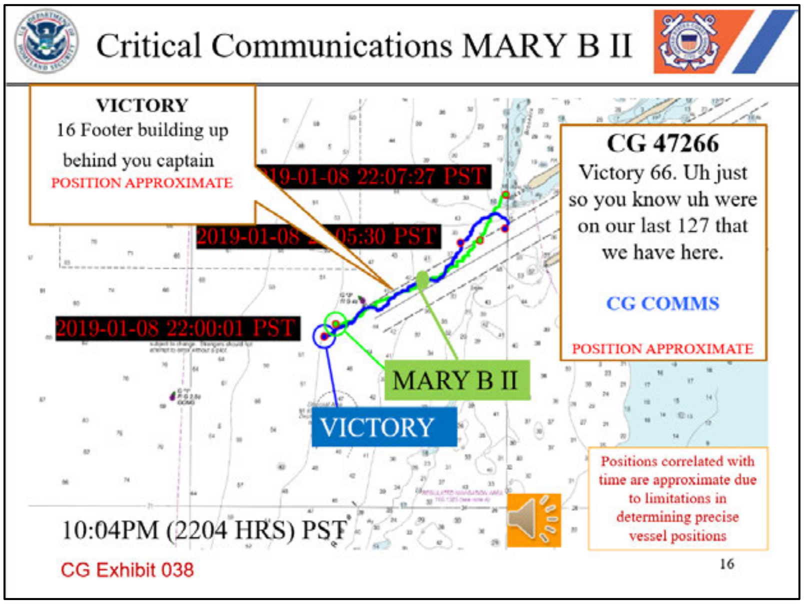


Figure 10. Time 10:04 p.m. slide, from Critical Communications presentation used in the public hearing. (Source – Oregon State University/Coast Guard, CG Exhibit 038)

4.1.66. At approximately 10:04:30 p.m., the MARY B II began to drift off the centerline of the Yaquina Bay Bar navigation channel and continued this movement towards the seaward end of the North Jetty tip.

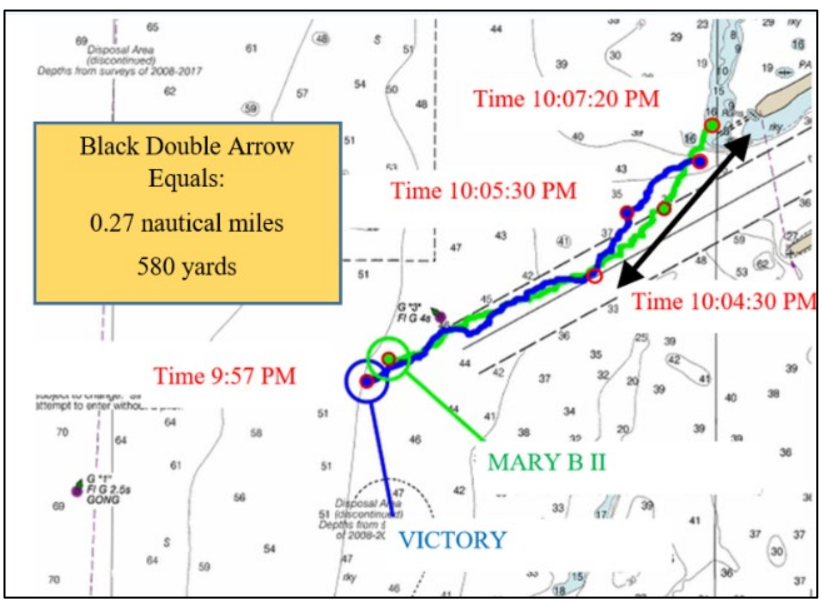


Figure 11. Slide displaying critical times along a radar track created from the OSU marine radar located in Yaquina Bay. An arrow has been placed to indicate distance from the 10:04:30 p.m. position of the MARY B II to the jetty end. (Source – Oregon State University/Coast Guard, CG Exhibit 038)

(HYPERLINK # 4)

4.1.67. At approximately 10:05 p.m., the MLB 47266 hailed the VICTORY over Channel 121 and advised that it appeared to be the end of the lull period. The MLB 47266 added that the smaller series would be coming in, that would last three to five minutes, and that the bigger series would be right after that. The MLB 47266 suggested to the VICTORY that if the MARY B II wasn't going to speed up and make it to the jetty tips, they should consider going bow in to the seas.

4.1.68. At approximately 10:05 p.m., the VICTORY called out to the MARY B II on Channel 22 and advised, "Mary B, This is the set right here. This is the set. Over." The operator of the MARY B II acknowledged the VICTORY's transmission with the statement "Yeah roger, roger. I see it."

(HYPERLINK #5)

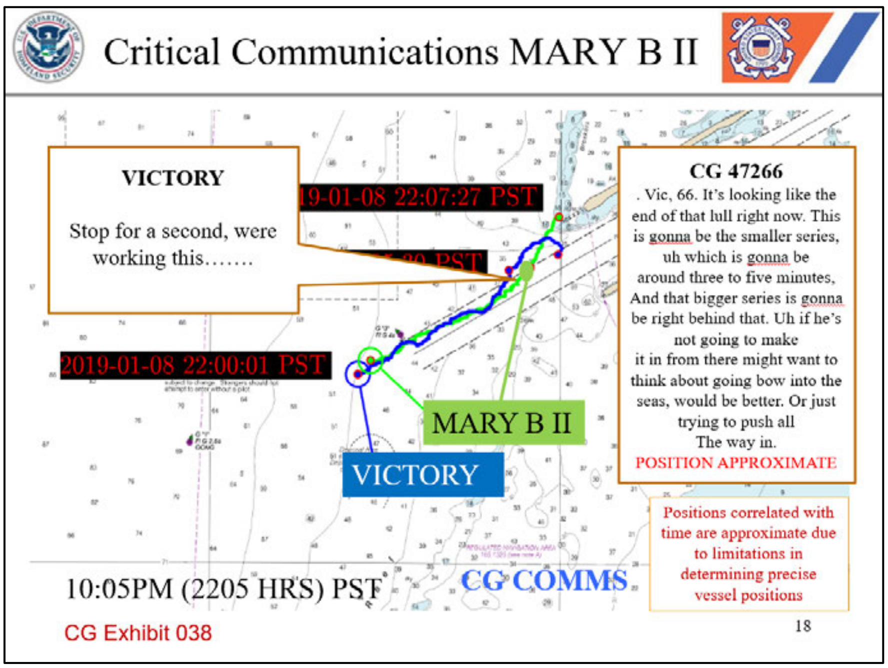


Figure 12. Time 10:05 p.m. slide from Critical Communications presentation used in the public hearing. (Source – Oregon State University/Coast Guard, CG Exhibit 038)

4.1.69. At approximately 10:06 p.m., the MLB 47266 followed up on Channel 22 that what they were experiencing the beginning of the smaller series of waves. It is unclear if the 47266's transmission was heard as VICTORY told MLB 47266 that there was "wind in the mic."

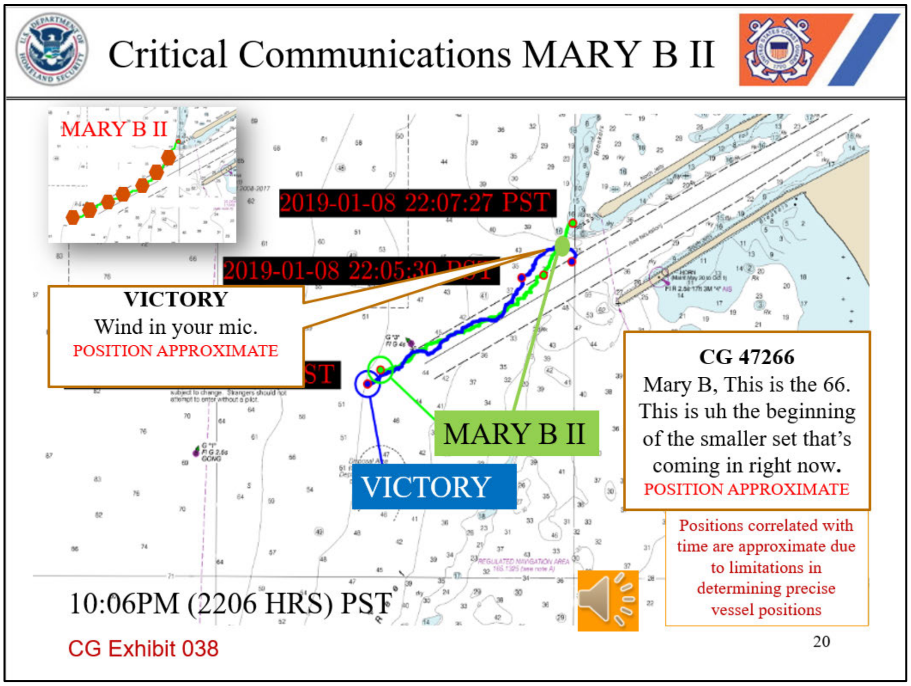


Figure 13. Time 10:06 p.m. slide from Critical Communications presentation used in the public hearing. (Source – Oregon State University/Coast Guard, CG Exhibit 038)

4.1.70. At approximately 10:06 p.m., the MLB 47266 called out to the MARY B II on Channel 22 and stated that they were "heading very, very far north right now. You might want to come south just a little bit" as the MARY B II continued to move towards the end of the North Jetty. MARY B II did not acknowledge the MLB 47266's previous transmission. The MLB 47266 reached out again asking the MARY B II if they copied the last radio transmission and the MARY B II did not respond.

4.1.71. At approximately 10:06 p.m., the VICTORY called out to MARY B II on Channel 22 with a message of: "Hard, You are 3 boards North. Over. 3 boards north! Over. Come south! Come to Starboard! Come to Starboard! MARY B, come to Starboard!"

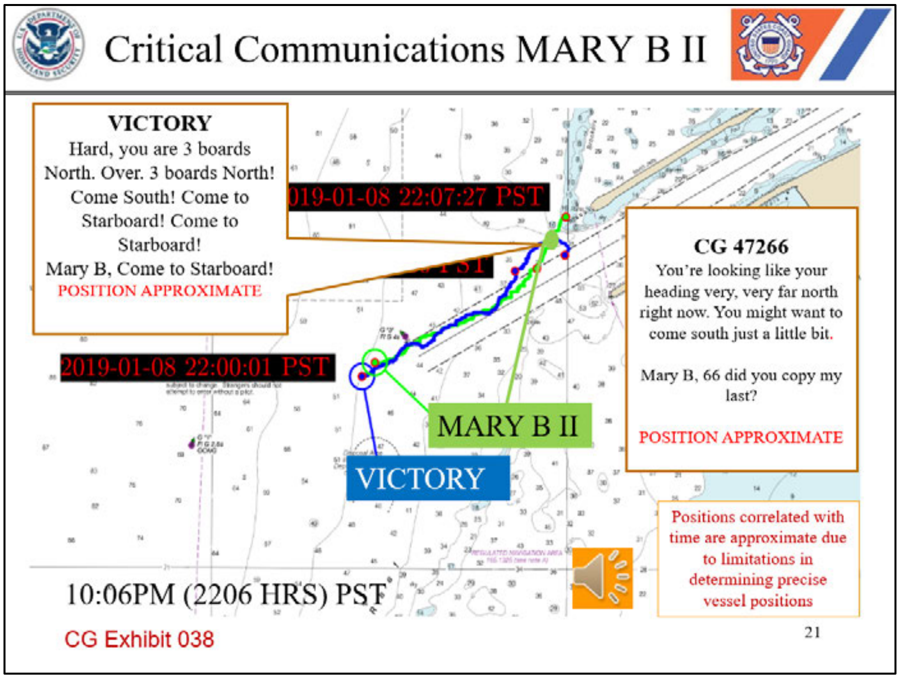


Figure 14. Time 10:06 p.m. slide from Critical Communications presentation used in the public hearing. (Source – Oregon State University/Coast Guard, CG Exhibit 038)

4.1.72. The MARY B II was observed making a turn slightly to port then to starboard, appearing to turn to south or to come to a position to have the bow face the oncoming waves.

4.1.73. At approximately 10:07 p.m., the MARY B II experienced a series of waves. The first set of waves impacted the MARY B II and went under the vessel. The MARY B II was observed by the Coast Guard boats on scene to turn about 90º and settled beam to (perpendicular to) the incoming waves. The second wave that impacted the vessel caused the MARY B II to turn its bow to (facing) the waves.

4.1.74. The largest wave of the series impacted the MARY B II, striking the vessel's bow. Based on witness observations, the wave size was estimated to be 18 feet. That caused the vessel to pitch-pole and capsize into the waters north of the Yaquina Bay North Jetty tip.[15]

[15] BOSN [redacted] hearing testimony.

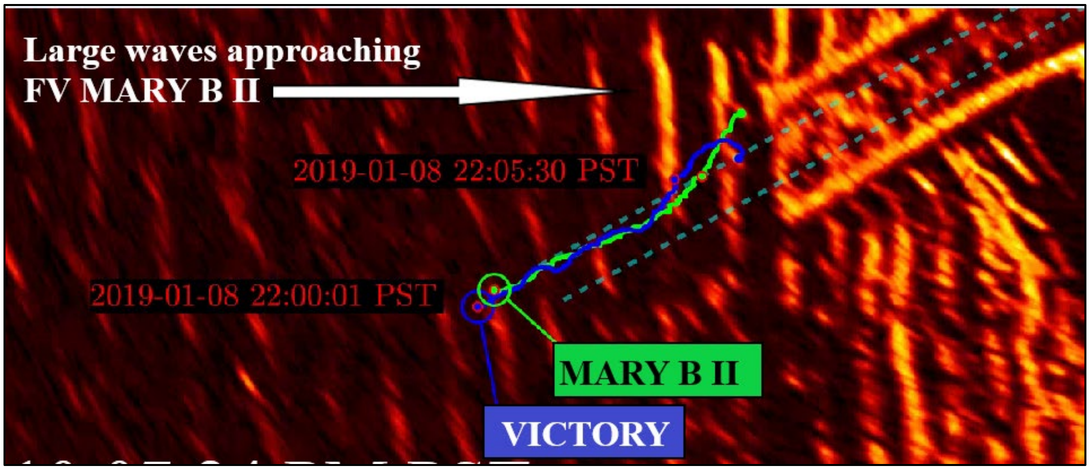


Figure 15. OSU marine radar product with notes showing the track of the MARY B II and the VICTORY moving from the start of the transit into Yaquina Bay Bar to the point of the loss of the MARY B II. Showing the series of large waves that impacted the MARY B II near the submerged end of the North Jetty Tip. (Source – Oregon State University/Coast Guard markup of still screen capture, CG Exhibit 034)

4.1.75. Crewmembers Lacey and Porter were ejected from the vessel and entered the water. The water temperature was 50.2° F and air temperature was 47.7° F.

4.1.76. At approximately 10:07:27 p.m., the MLB 47266 reported that the MARY B II had been overtaken by a wave and was on the north side of the jetty. The VICTORY called out to Sector North Bend and requested that Sector North Bend launch a helicopter to respond to possible people in the water off the Yaquina Bay Bar.

4.1.77. The evolution of Coast Guard boats escorting other vessels is classified in the "Alert" phase of Search and Rescue (SAR) operations facilitating the rapid mobilization of additional SAR resources such as the helicopter.

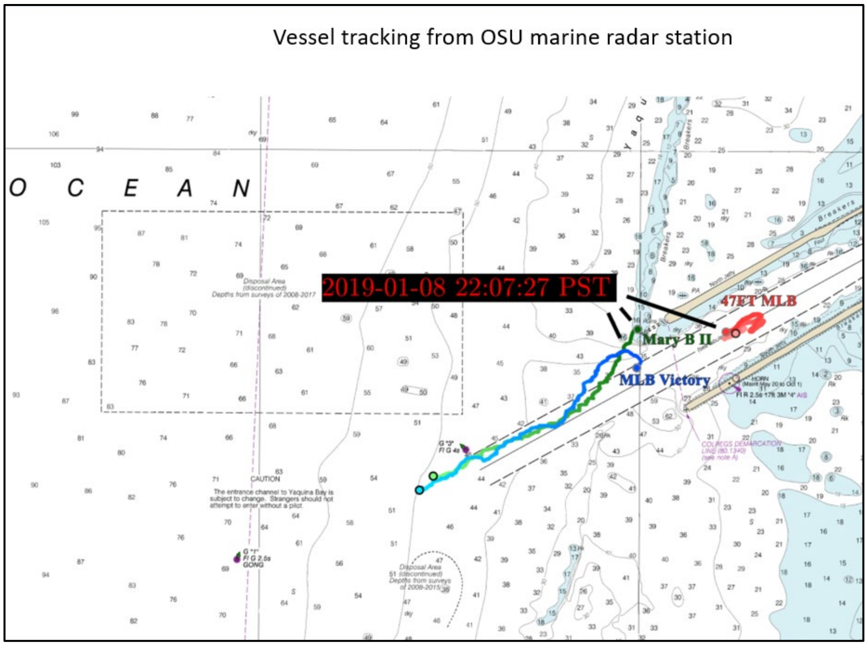


Figure 16. OSU marine radar tracking of the VICTORY, MARY B II, and the MLB 47266 with radar target trails shown in color. Displaying the locations of the vessels involved on the accident night and with small dots marking the locations of vessels at 10:07:27 p.m., the estimated time of the sinking of the MARY B II. (Source – Coast Guard, CG Exhibit 071)

(HYPERLINK # 6)

4.1.78. Sector North Bend radioed back and requested confirmation that the MARY B II capsized. The VICTORY confirmed the capsizing and stated they lost visual on the vessel in the vicinity of the tip of the North Jetty. Sector North Bend acknowledged, stating they would refrain on issuing a UMIB[16] as Coast Guard response resources were already in the vicinity but would be launching a Coast Guard helicopter from the Newport air facility.

4.1.79. At approximately 10:08 p.m., the VICTORY reported that seas on scene were between 16 to 18 foot and directed Station to recall the Executive Petty Officer, the Engineering Petty Officer and the remainder of the crew to Station Yaquina Bay to conduct the search and rescue activities.

4.1.80. Mobile 1 started heading back to Station Yaquina Bay with the intention of gathering duty personnel to man a third boat crew and launching a third Coast Guard rescue vessel to assist in the search.

4.1.81. Between approximately 10:09 and 10:10 p.m., the MLB 47266 observed two lights on the north side of the north jetty, one of which appeared to be flashing. At first, the tower watchstander was unable to see the lights because the top of the jetty was impeding the watchstander's view. At approximately 10:10 p.m., the tower watchstander confirmed he could see one light.

[16] UMIB, Urgent Marine Information Broadcast which would usually include a call for vessels in the area to participate in the response to the accident.

4.1.82. The VICTORY pushed out further offshore and to the north in an attempt to locate survivors. They sought to gain visibility of any flashing lights but were unable to see any.

4.1.83. By approximately 10:11 p.m., the VICTORY indicated that they were coming inbound as they could not search the area to the north of the North Jetty and sea conditions were continuing to build. The VICTORY stated that they were staying on the south side to see if the current would push any persons or the MARY B II into the channel. The VICTORY indicated that it was a flood tide so the vessel or persons in the water should be pushed to shore.

4.1.84. By approximately 10:14 p.m., the VICTORY and the MLB 47266 determined that beach crews should be sent to the beach north of the north jetty to aid in the search and rescue effort. The Station Yaquina Bay watchstander notified Newport Fire/Police Dispatch and reported that additional response assets would be responding to the scene.

4.1.85. Based on the wreckage location and prevailing weather conditions, rescue crews determined that the most likely location where potential survivors might drift was along the beach or inside the jetties.

4.1.86. Between approximately 9:56 p.m. and 10:15 p.m., Mrs. [redacted] arrived in the vicinity of the South Jetty to watch the MARY B II's inbound transit. She texted Mr. Porter to relay her observation of Coast Guard personnel activating illumination flares.

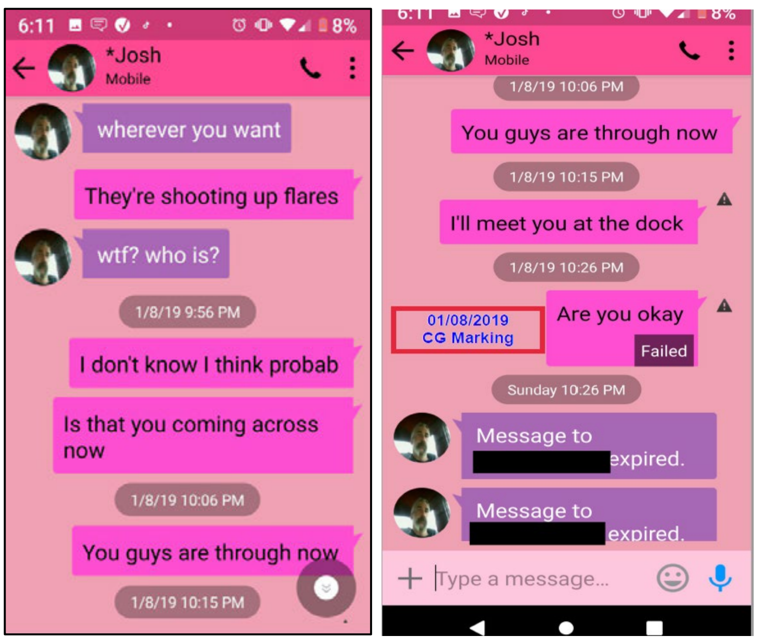


Figure 17. Screen shots of Mrs. [redacted]' last text conversation with Mr. Porter, a crewmember on board the MARY B II. (Source – CG Exhibit 024)

4.1.87. At approximately 10:16 p.m., a crewmember called out to the VICTORY from the MLB 47268. It was determined that instead of launching a third vessel, they would divert the third boat crew as a beach crew to assist with the SAR response.

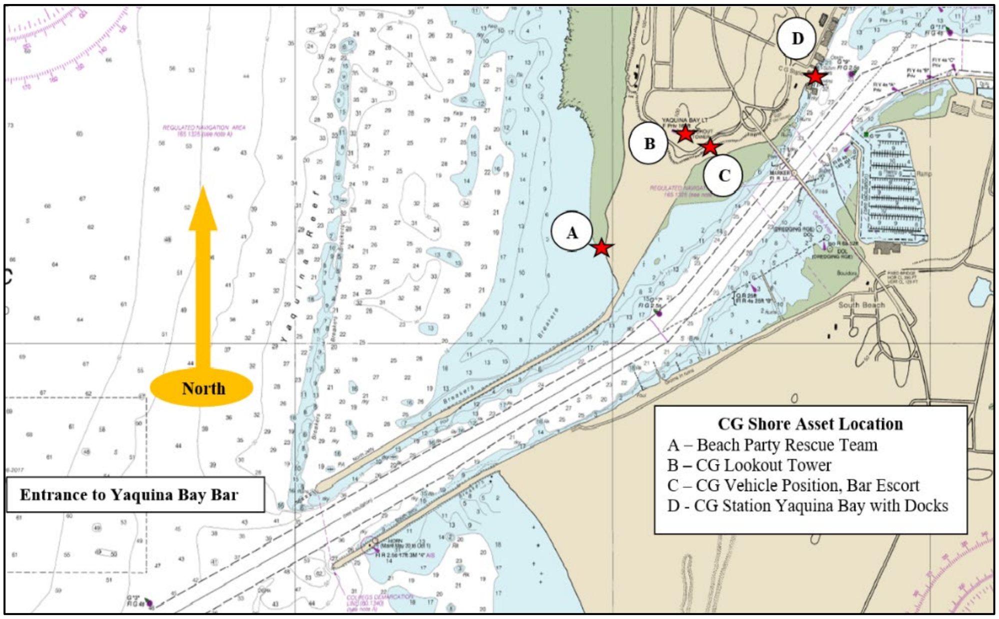


Figure 18. Approximate shore side Coast Guard asset locations. Post-accident, the MLB 47266 was patrolling the north side of the channel looking for debris or survivors. Eventually the VICTORY dropped the Commanding Officer off at the CG Station and he went to the beach to assist in the search for MARY B II's crewmembers. The rescue helicopter, CG HELO 6527, was positioned at the Air Facility in Newport, OR and took off to the accident scene and conducted search and hoist operations (not shown). (Source – Coast Guard)

4.1.88. At approximately 10:20 p.m., Sector North Bend advised Coast Guard boats and responders of the activation of the vessel's Emergency Position Indicating Radio Beacon (EPIRB).

4.1.89. The VICTORY and the MLB 47266 had a discussion about whether to have a boat head north in order to go around the reef area in proximity of the beach north of the North Jetty. The Commanding Officer decided against this due to the risks associated with sea conditions and because neither the MLB 47266 nor the VICTORY had sufficient illumination flares.

4.1.90. At approximately 10:24 p.m., the VICTORY began pushing back out to Entrance Lighted Gong Buoy 1 in an attempt to get a better picture of the beach and experienced a 20-foot break heading out. The VICTORY determined that they would need to turn around and cross the bar to the shelter of the harbor as the wave heights were observed to be near 20 feet.

4.1.91. At approximately 10:24 p.m., Coast Guard vessels, the Newport Fire Department, and Coast Guard Beach crew personnel were on the beach north of the jetty actively engaged in searching for any survivors or debris of the MARY B II.

4.1.92. At approximately 10:34 p.m., a Coast Guard helicopter (CG Helo 6527) from the Newport Air Facility was airborne and was enroute to the incident scene.

4.1.93. At approximately 10:44 p.m., the CG Helo 6527 got a visual sighting on a life raft with a strobing light.

Figure 19. Screen capture from the CG Helo 6527 camera system showing the MARY B II's cabin (circled in red) partially submerged while it was floating north of the North Jetty. (Source – Coast Guard)

4.1.94. At the same time, information was passed that the beach party identified a possible survivor in the water. Newport Fire Department personnel, Coast Guard beach crews, the MLB 47266, and CG Helo 6527 worked to guide the rescue helicopter to the location of the potential survivor in the water near the beach. A rescue swimmer from the CG Helo 6527 was lowered down and evaluated the situation. The rescue swimmer grasped the victim and, with the helicopter hovering, both swimmer and victim were moved horizontally to the responders on the beach.

Figure 20. Screen capture from the CG Helo 6527 hoist video showing rescue swimmer in the water with crewmember James Lacey. The actual helicopter is in the bottom of the image with the aircrew member stabilizing the hoist wire with his outstretched arm. (Source – Coast Guard).

4.1.95. The body of crewman James Lacey was moved to the location of the waiting responders. Mr. Lacey was wearing an inflated Personal Floatation Device (PFD).

Emergency responders attempted to render first aid and transported the crewmember to the hospital where he was pronounced deceased at approximately 10:55 p.m..

4.1.96. The body of crewman Joshua Porter was spotted further north on the beach approximately 100 yards from the Oregon State Park's parking lot entrance. Mr. Porter was wearing an inflated PFD. Beach crews, consisting of Newport Fire Department and Coast Guard personnel, rendered first aid and began transporting him to the hospital. After transfer to the ambulance and upon evaluation from EMS personnel, Mr. Porter was pronounced deceased.

4.1.97. The wheelhouse portion of the MARY B II was spotted off the beach as it slowly drifted with the waves and current drifting to the beach north of the North Jetty. The remainder of the wreckage, to include the hull, engine, rudder, and propeller, was not located or recovered and presumed sunk.

4.1.98. The wreckage of the MARY B II's wheelhouse and forward half of the main deck was set on the beach approximately 30 to 50 yards north of the North Jetty. The MARY B II's anchor had deployed which kept the remains of the vessel from drifting further onto the beach or further north. The anchoring, while unintended, helped reduce the damage from the large waves crashing on the beach.

4.1.99. The pilothouse was sunk in about 6 to 8 inches of sand. Two of the three pilothouse front windows and one of the rear windows were broken. The front port side of the pilothouse had sustained damaged which peeled off the fiberglass exposing the wood underneath. None of the side windows were broken.

Figure 21. Composite of pictures of the wreckage of the MARY B II taken January 9, 2019. Bottom left image, on the extreme left of the image, you can see the rocks of the North Jetty at Yaquina Bay Bar in the distance. (Source – Oregon State Parks, Mr. [redacted] CG Exhibit 007)

4.1.100. A two person team comprised of Coast Guard personnel who had fast water rescue training approached the wreckage. At approximately 11:10 p.m., the responders observed the operator of the vessel trapped in the wheelhouse underneath the console. The operator was deceased and was wearing a PFD. Access to the operator was blocked by debris in the cabin including portions of the cabin's door and a broken ladder.

4.1.101. The sea state, beach surf crashing on and around the cabin, and deteriorating environmental conditions impeded responders from recovering the operator's remains from the wreckage of the MARY B II.

4.1.102. On January 9, 2019, at approximately 12:26 a.m., after accounting for all personnel from the MARY B II, Sector North Bend officially ended search efforts.

4.1.103. On January 9, 2019, sunrise occurred at 7:52 a.m.. At 7:53 a.m., Newport Fire Department and Coast Guard personnel commenced recovery operations at the site of the wreckage. Responders recovered Mr. Biernacki's body from the MARY B II's wheelhouse at approximately 8:30 a.m. on January 9, 2019.

4.2. Additional/Supporting Information:

4.2.1. On or about November 7, 2016, a Marine Surveyor from Associated Marine Surveying Company, Inc. conducted a Report of Survey on the BESS CHET (O.N. 274604), later known as the MARY B II, and found the vessel to be in apparent good order, in sound condition and suitable for the intended use as a fishing vessel.

4.2.1.1. The vessel was noted to be a 23 GT, 41.6 foot long vessel of wood hull construction built in Tacoma, WA in 1957. The vessel was classed for Near Coastal Fisheries.

4.2.1.2. The survey noted that the vessel was configured to have two electric bilge pumps, one float switch and a manual bilge pump. In addition, the vessel was outfitted with high water alarm in the engine room and had audible and visual alarms to indicate the presence of excessive bilge water.

4.2.1.3. The vessel was fitted with two 200 gallon fuel tanks.

4.2.1.4. The vessel had a 5 blade, 32 inch propeller.

4.2.2. Prior to the change in ownership, the BESS CHET was owned by Mr. [redacted] for approximately two years. On or about October 9, 2018, Ms. [redacted] managing member of F/V MARY B II LLC, entered into a purchase agreement with Mr. [redacted] of Seabat, Inc..

4.2.2.1. As managing member of F/V MARY B II LLC, Ms. [redacted] indicated during hearing testimony that she purchased the vessel because it was a good business opportunity. According to Ms. [redacted] her son, Mr. Stephen Biernacki, would operate the vessel, make local decisions, and forward recommendations to her from Newport, OR.

4.2.2.2. The purchase agreement included gear and equipment including 250 38-inch Trilogy crab pots, a bait chopper, and a Trilogy crab insert designed to hold 8,000 pounds of crab catch, while keeping the catch fresh with circulating sea water.

4.2.2.3. The purchase agreement also included an Oregon crab permit for 300 pots and an Oregon salmon troll permit.

4.2.2.4. The BESS CHET was renamed the MARY B II under the ownership of F/V MARY B II LLC and was managed by [redacted]

4.2.2.5. Prior to its purchase and subsequent renaming, the BESS CHET was registered with NOAA's Vessel Monitoring System (VMS).[17] VMS is used to support law enforcement initiatives and to prevent violations of laws and regulations and is subject to strict confidentiality requirements. The Coast Guard has a data feed with NOAA VMS data and the information is used for law enforcement and SAR activities. VMS data is secured by the U.S. Coast Guard in accordance with U.S. Coast Guard regulations regarding the use and disclosure of law enforcement sensitive data. U.S. Coast Guard personnel are trained in the use of VMS and the handling and disclosure of data in accordance with U.S. Coast Guard regulations. After the vessel was purchased, this name or ownership was never updated to reflect the vessel's new title as MARY B II or the new ownership. VMS was still collecting and displaying information on the MARY B II's positions as the BESS CHET.[18]

4.2.3. Mr. Biernacki never held a Coast Guard issued merchant mariner's credential. There is no Coast Guard requirement for the operator of the MARY B II to hold a valid merchant mariner's credential.

4.2.3.1. Operators of CFVs under 200 GT are not required to hold a valid merchant mariner credentials. This requirement to hold a merchant mariner's credential, would require testing for competence, a medical review, background check for suitability and a drug testing program before the issuance of that credential.

4.2.4. On October 16, 2018, the managing owner of the MARY B II, member of the F/V MARY B II LLC, signed an application and engaged a third party broker to work with the Coast Guard to document the MARY B II. There were clerical errors which, combined with the lapse in government appropriations, delayed the documentation of the vessel. The third party broker sent an application with errors to the Coast Guard Documentation Center to rename the BESS CHET to the MARY B II. The documentation application CG-1258 (08/16) was eventually returned to the vessel title company for correction.

[17] VMS is a satellite surveillance system primarily used to monitor the location and movement of CFVs in the U.S. Exclusive Economic Zone (EEZ) and treaty areas. The system uses satellite-based communications from on-board transceiver units, which certain vessels are required to carry. The transceiver units send position reports that include vessel identification, time, date, and location, and are mapped and displayed on the end user's computer screen. Each vessel typically sends position reports once an hour, but at increased intervals when the vessel is approaching an environmentally sensitive area.

[18] The owner, F/V MARY B II LLC, gave the USCG permission to use the MARY B II VMS data and it was used to create CG Exhibit 042

4.2.5. Having a vessel insured is a practical business requirement as noted by the managing owner during testimony.

4.2.6. In October 2018, the new owner of the MARY B II attempted to obtain insurance coverage through Servco Pacific Insurance (currently Brown & Brown Insurance) and were offered a quote which the insurance company withdrew. The insurance company ultimately withdrew the offer of an insurance quote after a risk assessment was conducted. That company worked with the MARY B II to find another broker willing to insure the vessel.

4.2.6.1. Part of the insurance company's decision to withdraw the quote was based on concerns voiced by multiple fishing vessel operators from the local area regarding the level of experience of the operator of the MARY B II. The insurance company took the following factors into consideration: history and experience of owner, history and experience of the operator (considering local waters), and the fishery type.

4.2.7. On or about November 16, 2018, a Coast Guard CFV Examination was conducted on the MARY B II at Dock 7 in Newport, OR. The fishing vessel examiner, noted seven items and deficiencies to rectify including, but not limited to: 1) updating the FCC Ship Station License for the marine radio to reflect new ownership; 2) proof of first aid and CPR training, and; 3) conducting drills prior to fishing. It was also noted that the EPIRB registration was pending. At the time of the accident, the EPIRB was properly registered.

4.2.8. The noted items were considered minor deficiencies, per the current applicable regulations, which permitted the issuance of the decal. Coast Guard CFV Examiners issued a CFV Safety Decal, decal # 268533, to the MARY B II. No additional visits were required or made to the MARY B II by any CFV Examiners.

Figure 22. A sample of a CFV Safety Decal which would be issued to a vessel after it has been inspected by qualified Coast Guard Fishing Vessel Examiners and found to be in compliance with the requirements of 46 CFR § 28. (Source – Coast Guard)

4.2.9. On December 22, 2018, the U.S. Government experienced a lapse in appropriations which impacted many federal agencies, including the Coast Guard. Thousands of government employees who were not in mission critical positions were furloughed. CFV Examinations and ATON functions were adversely impacted. SAR missions such as vessel escorts and SAR response to casualties were identified as critical missions and were not affected as a result of personnel furloughs.

4.2.10. As a vessel engaged in the commercial harvesting of fish, the MARY B II was subject to federal regulatory requirements of Title 46 CFR Subchapter C – Uninspected Vessels, Part 28.

4.2.10.1. CFV Examinations by the Coast Guard are limited in scope and do not assess the material condition of vessels such as MARY B II. Condition of critical components such as integrity of the hull or other structures, steering, propulsion, navigation equipment, and vessel stability are not evaluated or inspected.

4.2.11. On December 29, 2018, the Oregon Department of Fish and Wildlife (ODFW) announced the opening of ocean commercial Dungeness crab season north of Cape Arago (43º 17' 00" N Latitude) to the Oregon and Washington border. The "pre-soak"[19] was due to start January 1, 2019 at 8:00a a.m. and the start date for pulling gear was scheduled for January 4, 2019 at 9:00 a.m..

4.2.12. The crew of the MARY B II was comprised of Mr. Biernacki as operator and Mr. Lacey and Mr. Porter as deckhands. Mr. Biernacki had little experience in West Coast bar crossings that are classified as hazardous by regulation.

4.2.13. Mr. Lacey was familiar with Mr. Biernacki and both had worked together, primarily on the East Coast.

4.2.14. Mr. Biernacki had a difficult time retaining a third crew member and had at least two other personnel employed for the position of the second deckhand but who did not stay on with the MARY B II.

4.2.15. Mr. Porter worked out of Newport, Oregon and the Yaquina Bay Bar and had extensive experience as operator and deckhand on various vessels.

4.2.16. On or about December 30, 2018, Mr. Biernacki approached Mr. Porter about employment on the MARY B II as a deckhand. Mr. Porter agreed to work on the MARY B II as a deckhand on a temporary basis as he had other employment lined up that would start later in January 2019.

4.2.17. On or about January 1, 2019, the MARY B II got underway to set crab pots. The vessel's crew consisted of the operator, Stephen Biernacki, deckhand James Lacey, and deckhand Joshua Porter.

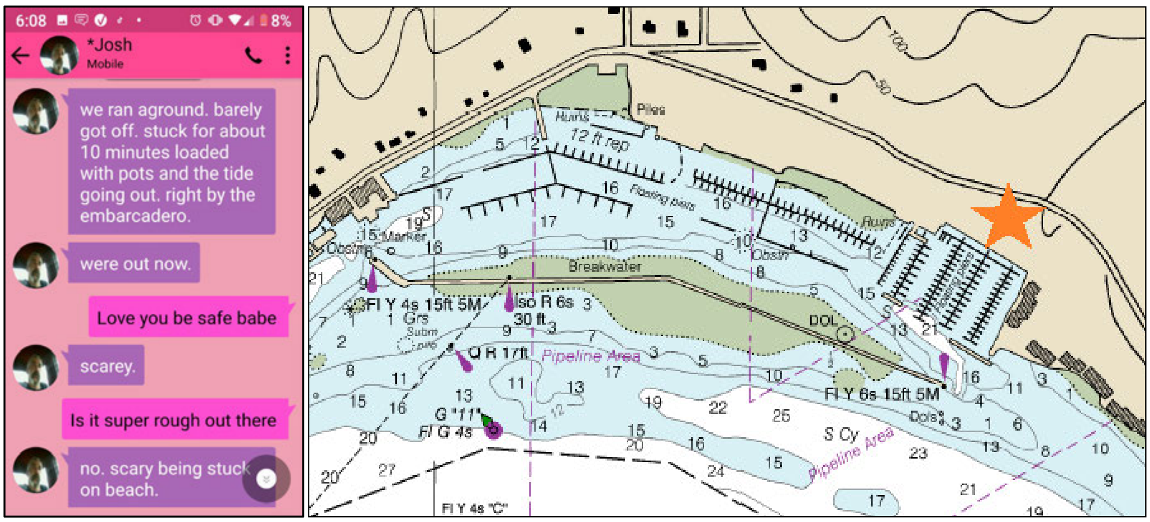
4.2.18. The operator of the MARY B II did not conduct drills with the crew prior to fishing as required by 46 CFR § 28.270 and the CFV Examination requirement from November 16, 2018.[20]

4.2.19. All three persons on board the MARY B II had attended and passed a two-day Marine Safety Instructor Training Course in Newport, OR held by the Alaska Marine Safety Education Association (AMSEA). This training fulfilled the requirements for an individual to

[19] "Pre-soak" is the time when the crab pots can be put into the water in preparation for harvesting the catch.
[20] Mrs. [redacted] hearing testimony.

conduct instruction, drills, and safety orientations as a Fishing Vessel Drill Conductor. Mr. Biernacki completed the class on November 9, 2018. Mr. Lacey completed the class on December 12, 2018 and Mr. Porter completed this training on March 30, 2011.

4.2.20. On or about January 1, 2019, Mr. Porter reported to his wife that the MARY B II had grounded on the beach in front of the Embarcadero Hotel when the vessel was loaded with pots. Mr. Porter indicated that the MARY B II was "stuck for 10 minutes" before the vessel floated free.



Figures 23. (Left). Screen shot of Mrs. [redacted] text conversation with MARY B II crewmember, Mr. Porter, regarding the grounding of the MARY B II. (Source – Coast Guard, CG Exhibit 024. (Right) Chartlet has an orange star that marks the general location of the Embarcadero Marina, Newport Harbor, OR and the grounding occurred somewhere in the light blue shaded area of the waterway, the exact position and circumstances cannot be precisely determined (Source – Coast Guard, CG Exhibit 004 marked up with star for position)

4.2.20.1. The waterways' bottom in the vicinity of the Embarcadero is mostly sand shoaling.

4.2.20.2. There was no written or verbal casualty notification report made to the Coast Guard after the MARY B II grounded and the amount of damage the vessel, if any was incurred, is unknown.

4.2.20.3. While Mr. Porter did not tell his wife that the grounding resulted in hull damage, he indicated there was "a major leak on the boat."[21]

4.2.20.4. Depending on the circumstances, groundings are reported to the Coast Guard under 46 CFR § 4.05 where a Coast Guard Prevention Officer will review the circumstances of the case and make a determination on the level of impact to the waterway and the level of investigative effort required.

4.2.20.5. Per Navigation and Vessel Inspection Circular (NVIC) 01-15, the Coast Guard will not consider an unintended grounding to be a reportable marine casualty under 46 CFR § 4.05 if the grounding can be classified as a "bump and go." "Bump and go"

[21] Mrs [redacted] hearing testimony.

groundings are occurrences where the involved vessel master or licensed mate on watch attests that the grounding (including grounded barges under the control of a towing vessel) was only momentary (e.g., reversing engines frees the grounded vessel on the first attempt, no assist vessel is needed to free the vessel, all towing connections remain intact) and that the grounding did not result in any other marine casualty criteria being met as defined in 46 CFR§ 4.05-1(a)(3) through (8). Initial notifications of "bump and go" groundings must still be made to the appropriate Coast Guard Command Center as a hazardous condition per 33 CFR § 160.216. A Coast Guard Prevention Officer shall review each reported "bump and go" grounding in order to confirm that it meets the criteria to be excluded from the grounding casualty reporting requirements under 46 CFR § 4.05. The Coast Guard response to a claim of a "bump and go" grounding is at the discretion of the cognizant Officer in Charge, Marine Inspections (OCMI) or Captain of the Port (COTP); however, a Coast Guard investigation and associated Marine Information for Safety and Law Enforcement (MISLE) activity for a reportable marine casualty should not be completed if the OCMI/COTP confirms the incident as a "bump and go." A field unit that completes an optional investigation on a confirmed "bump and go" grounding should document the activity as a non-reportable casualty in MISLE with no associated CG-2692.

Figure 24. Image of the MARY B II leaving the dock in Newport, OR with crab pots and gear on the after deck prior to the accident voyage. Date is unknown. (Source – Lincoln City Homepage)

4.2.21. On the afternoon of January 3, 2019, a crab hold inspection was conducted by ODFW as required by State Law.[22] This inspection was done on the MARY B II at the request of the operator. This inspection is limited in scope to the hold of the vessel.

4.2.21.1. No discrepancies were found during this inspection. The hold insert where catch is stored was not on board the MARY B II at the time the ODFW officer was on board.

[22] OAR-635-005-0485 discusses Dungeness crab gear prohibitions and how fishing vessels cannot have cargo in the holds prior to the fishery opener.

4.2.21.2. ODFW issued a hold inspection declaration certifying that the MARY B II had fished for Dungeness crab in Pacific Ocean waters north of Sonoma County, CA since November 30, 2018 and that the vessel intended to fish in the area north of Arago in the first 30 days after the fishery is opened.

4.2.22. On January 4, 2019, Mr. Biernacki purchased a two part epoxy caulking called "Splash Zone" from Englund Marine which can be used to repair leaks in a wooden hulled vessel.

4.2.23. On January 7, 2019, the MARY B II went out to sea to fish for Dungeness crab.

4.2.23.1. The MARY B II was scheduled to get underway sometime between 4:00 a.m. and 5:00 a.m., but was delayed. Mr. Porter told his wife the delay was because the operator did not want to leave until he could purchase alcohol for the trip.[23]

4.2.23.2. As part of its duties, the watchstander in the Yaquina Bay Station Tower documents vessels departing to sea for the purposes of ensuring the safety and accountability of vessels at sea in the event of an incident. The following information is normally recorded: type of operations, crew and estimated length of trip. MARY B II was not logged as having departed that day; however, the logs captured two vessels which did not respond to the tower watchstander's radio calls.

4.2.23.3. Other CFVs communicated with the watch tower in accordance with the reporting provisions of 33 CFR §165.1325(c)(5)(ii) for sunset to sunrise transits and responded to hails over the marine radio by the tower watch.

4.2.23.4. On or about January 7, 2019 at approximately 2:30 p.m., an Oregon State Police (OSP) Senior Trooper was conducting dock walks at Seawater Seafood in the Port of Newport. While the MARY B II was offloading catch at Seawater Seafood, the Senior Trooper checked the crew of the MARY B II to ensure they all had fishing licenses. While interacting with the operator, Mr. Biernacki, she noted that his behavior was consistent with either fatigue or alcohol consumption.

4.2.24. The Coast Guard issued the regulations for U.S. documented or state numbered uninspected fishing, fish processing, and fish tender vessels to implement provisions of the Commercial Fishing Industry Vessel Safety Act of 1988, codified in 46 USC § 4501- 4508.[24] The intent of these regulations is to improve the overall safety of CFV industry vessels, and to reduce CFV fatalities and losses. These regulations provide requirements for the equipment, design, and operations of vessels, and include provisions for lifesaving, firefighting, navigation, communication, emergency instructions, and stability which includes righting energy criteria and freeing port clearing area.[25]

4.2.25. When additional or clarifying information is necessary, the Coast Guard provides industry guidance in various forms to help assist and inform CFV operators and examiners.

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[23] Mrs [redacted] hearing testimony.

[24] The 46 CFR § 28 final rule became effective on September 15, 1991.

[25] These regulations are applicable to certain vessels based on size, type, and operations.

Guidance includes Coast Guard Navigation and Vessel Inspection Circulars (NVICs), Policy Letters, Voluntary Safety Initiative and Good Marine Practices, Safety Flyers, Safety Alerts and Regulatory Reference Guides.

4.2.26. Coast Guard guidance covers a broad range of topics, including rules of the road, safety equipment and stability. The Coast Guard posted these documents on various Coast Guard web pages, including www.homeport.uscg.mil, www.dco.uscg.mil, and www.fishsafewest.info.

4.2.27. As part of their duties, Coast Guard Commercial Fishing program managers and CFV Examiners distribute Coast Guard guidance information while attending industry association meetings, outreach events, and during dockside safety exams.

YAQUINA BAY BAR HAZARDS

BAR AND WEATHER CONDITIONS

Listen to the local broadcast on 1610 AM

CROSSING THE BAR

The bar is the area where the deep waters of the Pacific Ocean meet with the shallower waters near the mouth of the river.

Most accidents and deaths that occur on coastal bars are from capsizing.

Coastal bars may be closed to recreational boats when conditions on the bar are hazardous. Failure to comply with the closure may result in voyage termination, and civil and/or criminal penalties. The regulations are enforced by Coast Guard boarding teams.

Improper loading and/or overloading are major causes of capsizing. Improper/overloaded boats have less stability and less freeboard, which can allow seas to break into the vessel, causing the boat to become even less stable.

Boats are more likely to capsize when crossing the bar from the ocean because the seas are on the stern and the boater may have less control over the vessel.

Boaters must make sure the bar is safe prior to crossing. Check with other boaters or the Coast Guard to find out the condition of the bar.

If you are caught on a rough bar running in...

- **Make sure everybody aboard is wearing a personal flotation device.**
- **Keep the boat square before the seas.**
- **Keep the boat on the back of the swell. Ride the swell and stay clear of the following wave.**

Avoid sudden weight shifts from passengers or gear moving around in the boat. If possible, have passengers lie down as near the centerline of the boat as possible.

Do not allow the waves to catch your boat on the side (beam). This condition is called broaching, and can easily result in capsizing.

TIDES

Tides are the vertical rise and fall of the water and tidal current is the horizontal flow of the water. There are roughly four tides each day in the Pacific Northwest. Tidal movement toward the shore or upstream is the flood current. Movement away from the shore or downstream is the ebb current. The period between the two is known as slack water. Tidal currents may gain tremendous velocity, particularly when the ebb current is augmented by river runoff.

- **It is extremely dangerous to get caught on the bar during strong ebb current. Even on days that are relatively calm, fast moving ebb can create bar conditions that are too rough for small craft.**
- **Always know the stage of the tide!**
- **Avoid getting caught on the bar during an ebb tide.**

It is normally best to cross the bar during slack water or on a flood tide, when the seas are normally calmest.

ROUGH BAR

WARNING WHEN FLASHING

BAR RESTRICTIONS IN EFFECT

TUNE AM RADIO TO 1610

REGULATED NAVIGATION AREAS

The Coast Guard has established a Regulated Navigation Area if the yellow lights on this sign are flashing, indicating a restriction has been placed on recreational and uninspected passenger vessels crossing the bar. In accordance with 33 CFR 165.1325, the U.S. Coast Guard has the authority to restrict all recreational and uninspected passenger vessels from crossing the bar when hazardous conditions exist. Failing to comply with posted bar restrictions may result in a maximum civil penalty of $25,000.00.

WARNING SIGN LOCATIONS

Warning signs are posted in two locations in the port. Two white diamond shape signs with orange boarders indicating "Rough Bar" and amber flashing lights are located on a tower approximately half way between the Coast Guard moorings and the Yaquina Bay Bridge on the north bank of the river. One sign is visible to the South Beach Marine area and the second sign is facing up river toward the Port Docks and facilities. An additional warning sign is located at the South Beach boat ramp. This sign is blue in color and has amber flashing lights that read: **Warning When Flashing, Bar Restrictions in Effect, Tune to 1610 AM.** When the amber lights are flashing on any of the warning signs, hazardous conditions are present and a bar restriction is in place and mariners should tune in to listen to the restriction information.

BAR CONDITIONS AND OBSERVATION REPORTS

Observed weather and bar conditions are updated every four hours or more frequently if there is a significant change in the conditions. Marine Information Broadcasts on Channel 16 VHF FM are conducted by the Coast Guard when hazardous bar conditions and restrictions are put into place or are lifted. Mariners are strongly encouraged to monitor channel 16 VHF/FM for all notices and weather updates.

The AM radio broadcast is audible within a 4-mile radius from the Coast Guard Station in Newport. It provides a continual broadcast on radio station 1610 AM containing bar conditions, bar restrictions, and local weather.

You can also access current bar conditions and restriction on your smart phone or hand held device by going to, http://www.wrh.noaa.gov/pqr/marine/BarObs.php.

EMERGENCIES

VHF-FM Radio: Channel 16

If in distress (threatened by grave and imminent danger):

1. Make sure radio is on
2. Select Channel 16
3. Press/Hold the transmit button
4. Speak slowly, and clearly say: MAYDAY, MAYDAY, MAYDAY
5. Give the following information:
   - Vessel Name and/or Description
   - Nature of Emergency
   - Position and/or Location
   - Number of People Aboard
6. Release the Transmit Button
7. Wait for 10 seconds – If no response, repeat "Mayday" call. If not in immediate danger, switch to CH 22 and follow the same steps as above, except do not use the word "MAYDAY."

Make Sure Everyone is Wearing a Life Jacket!

Phone 911. Tell the operator that you have a marine emergency. Be ready to provide the same information required in item number 5 of the mayday call.

Coast Guard Stations:

Yaquina Bay
Newport, OR
(541) 265-5381

BOATING SAFETY TIPS

- Check Weather, Tide, and Bar Conditions – The latest Information Can Be Heard on 1610 AM
- File a Float Plan With Friends/Relatives
- Don't Overload Your Boat
- Wear Your Life Jacket
- Carry Flares and a VHF-FM Radio
- Stay Well Clear of Commercial Vessels
- Have Anchor With Adequate Line
- Boat Sober

WEAR IT OREGON!

"Within seconds of seeing the wave, the boat flipped. The fact that I had my life jacket on kept me alive."
Graden Davis
Survivor

CROSSING THE YAQUINA BAY BAR

More Boating Safety Information: www.uscgboating.org and www.boatoregon.com
Boating Class and Vessel Safety Check Information: www.uscgaux.org/~130/, www.usps.org or 1-800-336-BOAT (2628) (class information only)

CG 003 Yaquina Bar Safety Handout Page 1 of 2

Figure 25. Page 1 of the Yaquina Bay Bar Hazards handout provided to mariners. Information includes information on crossing the bar including "Boats are more likely to capsize when crossing the bar from the ocean because the seas are on the stern and the boater may have less control over the vessel" and "Do not allow the waves to catch your boat on the side (beam). This condition is called broaching, and can easily result in capsizing." (Source - Coast Guard, CG Exhibit 003)

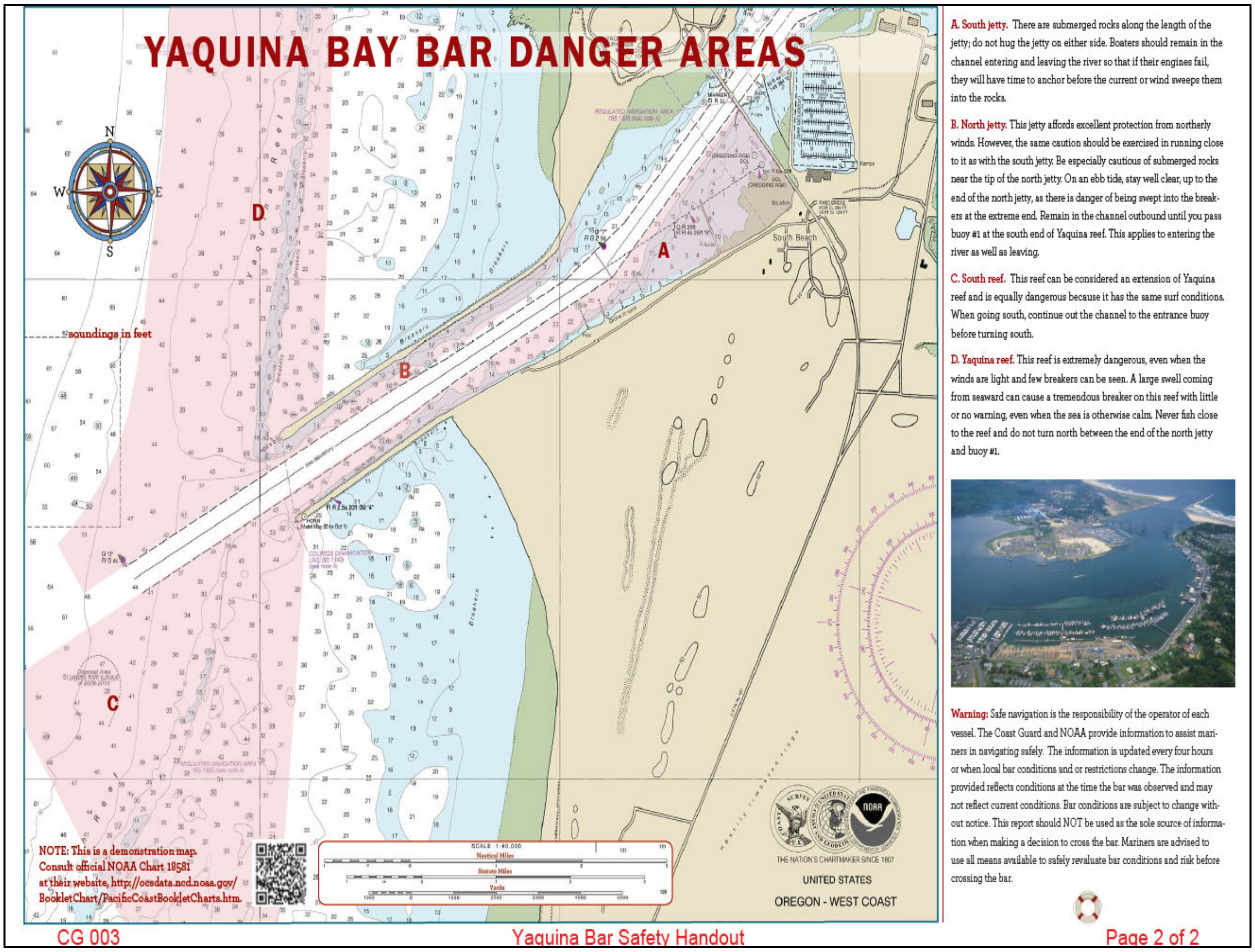

Figure 26. Page 2 of the Yaquina Bay Bar Hazards handout provided to mariners. Specific danger areas are noted. Area D, just north of the North Jetty is labeled "Yaquina Reef" and states this "bar is extremely dangerous, even when the winds are light and few breakers can be seen. A large swell coming from seaward can cause a tremendous breaker on this reef with little or no warning, even when the sea is otherwise calm. Never fish close to the reef and do not turn north between the end of the north jetty and buoy #1." (Source – Coast Guard, CG Exhibit 003)

4.2.28. The Fishing Vessel Safety Program Manager of the Coast Guard's Fishing Vessel Division of the Office of Commercial Vessel Compliance (COMDT CG-CVC-3) at Coast Guard Headquarters manages the Coast Guard's Fishing Vessel Safety Program. COMDT CVC-3 provides program oversight and guidance, interacting with all Coast Guard District Fishing Vessel Safety Coordinators and, on occasion, with the field examiners including Auxiliary personnel who are qualified to conduct dockside safety exams.

4.2.29. According to testimony provided by the Coast Guard D13 Fishing Vessel Safety Program Manager, the mission and goal of the program is to enhance safety within the commercial fishing fleet and reduce casualties associated with that industry.

4.2.29.1. The program develops or initiates regulations to implement laws, as well as drafting and issuing guidance regarding current compliance standards for both Coast Guard and industry personnel. The program also promotes awareness and training for safety initiatives, including working with the Commercial Fishing Vessel Federal

Advisory Committee and other industry partners at conferences and industry association meetings.

4.2.29.2. The program works with NOAA and National Marine Fisheries Service (NMFS) regarding fisheries permitting and National Institute for Occupational Safety and Health (NIOSH) to share and analyze casualty data and implement safety initiatives or recommendations.

4.2.30. CFV Examiners are tasked with executing the CFV Safety Program including conducting CFV Examinations and issuing safety decals when a vessel meet the applicable regulatory standards. There are three primary CFV Examiners for the Sector Columbia River area of responsibility (AOR).[26] CFV Examiners in D13 are generally Civilian Coast Guard employees. The CFV Safety Program has incorporated the use of qualified Coast Guard Auxiliarist personnel to augment the CFV Examiner work force to facilitate responsiveness to the approximately 1,600 fishing vessel fleet.

4.2.31. CFV Examiners in the D13 area of AOR work to provide maximum availability to fishermen as they prepare to go into the upcoming fishery. For the Dungeness crab fishery, the CFV Examiners make themselves available at the docks several days before the season to facilitate dockside exams and compliance.

4.2.31.1. Over the span of the Government lapse in appropriations, all of the dockside examiners that support the Sector Columbia River AOR were furloughed so when the Dungeness crab fishery opened, there were no dedicated personnel available to conduct courtesy dockside exams.

4.2.31.2. In the absence of the primary CFV Examiners, other qualified Active Duty marine inspectors worked to meet the need for CFV Examinations, but as a result of the lapse in appropriations, a significant backlog developed:

> *A lot of people wanted--they were calling in to get dockside exams. They wanted to go fishing. They wanted to have their equipment checked and they weren't able to. And so we were gone for quite a while, at 3--I think it was 3 weeks, and that's 3 weeks' worth of work that didn't get done.*[27]

4.2.32. CFV Examinations are conducted and a standardized form, the CG-5587, is used. The most recent version of this form is 06/2008 and is outdated. Marine Safety Unit Portland's CFV Examiners developed a locally produced examination form (PORMS-5587 (version 10/17)) that includes current requirements and additional local items including a note to ensure Hazardous Bars are discussed with the operator of a vessel being examined.

[26] This includes Sector North Bend for Prevention missions.
[27] Mr. [redacted] hearing testimony.

ADDITIONAL REQUIREMENTS FOR DOCUMENTED VESSELS OPERATING BEYOND THE BOUNDARY LINE OR WITH MORE THAN 16 PEOPLE ON BOARD		
Vessel Name: MARY B II	**I.D. Number:**	
46 CFR 28.265 33 CFR 165.1325(c)(5)	**Emergency Instructions** (Station Bill, MAYDAY, Donning PFD/Immersion Suits, MOB, Fire, Abandon Ship, Flooding/Rough/WX/Hazardous Bars) ☐ Required Posted Instructions or ☐ Accessible to the Crew *(<4 POB)* *MOB Plan/Device:* **Hazardous Bar Plan:* **Sunset to sunrise, operator must report to CG the vessel name, location, # POB, & destination* **On deck, PFDs must be worn; inside vessel, PFDs/immersion suits must be readily accessible*	O Yes O No O N/A
46 CFR 28.270	**Instructions, Drills, & Safety Orientation** ☐ Drills Conducted monthly ☐ Safety Orientation Provided ☐ MOB ☐ Fire ☐ Flooding ☐ Abandon Ship ☐ Master and/or Crew able to demonstrate safety equipment operation ☐ Qualified Drill Conductor Name: STEPHEN BIERNAKI Drill Course: AMSEA Date Issued: 11-9-18	NO CREW O Yes O No O N/A

Figure 27. An excerpt of the CFV Exam Form for the MARY B II with content addressing Hazardous Bar Plans. (Source – Coast Guard, CG Exhibit 019)

4.2.33. The scope of the CFV Examination is limited to mostly the safety equipment on the vessel as opposed to the material condition of the vessel. In addition, the scope of the exam precludes a CFV Examiner from assessing an operator's knowledge of the area in which he or she operates including their knowledge of the ATON in the operating area.[28]

4.2.34. The Dungeness crab fishery has been identified as the most hazardous fishery given there have been more fatalities in this particular fishery than any of the other fisheries in the Pacific Northwest.[29] In research conducted by NIOSH, in a period between 2010 and 2014, the Dungeness crab fishery has had a fatality rate of 55 deaths per 100,000 full time equivalents (FTE). This is "much greater than the rate for the average worker in the United States" though there is indication that this rate has dropped since previous reporting periods. NIOSH is able to collect and analyze data on fatalities due to a longstanding partnership between NIOSH and the Coast Guard that emphasizes data sharing between the two agencies.[30]

4.2.35. An ODFW official stated that there is commercial pressure that impacts the Dungeness crab fishery and cited that different variables influence demand including the Holiday Season, stating "people want crab for New Year's and Christmas."[31] However, factors such as the presence of a toxin called domoic acid, as well as the amount of meat in

[28] D13 CFV Program Manager, Mr. [redacted] hearing testimony.
[29] Mr. [redacted] hearing testimony.
[30] NIOSH representative, Dr. [redacted] hearing testimony.
[31] Senior Trooper [redacted] hearing testimony.

the crab will cause delays in the fishery start date which increases pressure on fishermen to harvest the crab and get it to market quickly.

4.2.36. During the course of his employment on the MARY B II, Mr. Porter expressed concern about the safety of the vessel to his wife several times.

> *We had discussions about it, and he--he said, "This guy is going to hurt somebody," and every time, like, we talked about it, it was, "Then why are you on there?" and he was like, "I got bills to pay. We need this first pick--this first and second pick and then I get on the next boat and everything will be--then we'll be okay. I just need to get through this next week and everything will be okay. We'll have--we'll have money to pay our bills." And that's the only reason he got back on that boat.*[32]

4.2.37. On the morning of January 8, 2019 at approximately 3:00 a.m., Mr. Porter expressed concerns to his wife about getting underway with Mr. Biernacki. In testimony, Mrs. [redacted] recalled:

> *"I don't want to go." I'm like, "Why?" He goes, "Because this guy doesn't know what he's doing. He hasn't checked the weather. He doesn't believe me. This is not a good time to go. We can wait another day." And I was like, "Well, why are you going?" He was like, "Got bills to pay. This is a pick." You know, it was--it would have been their second pick. And--and we did. You know, we had bills to pay. We were a month behind on everything, and he had to go. He said, "I have to go."*

4.2.38. On January 8, 2019, mid-afternoon, Mr. Porter had conversations over text and phone call with his wife where he expressed frustration. The operator had originally told the crew that the MARY B II would be in by 2:00 p.m. and no later than 4:00 p.m., but Mr. Porter indicated that they would not be coming in that afternoon as originally planned and he was concerned because the weather was getting worse. At 9:25 p.m., Mr. Porter sent his wife a text that said: "This guy said we were going to be in before dark. Now it's really big and the Coast Guard called him saying the LAST STRAW had problems crossing… I'm putting on my lifejacket. Coast Guard is sending a boat."[33]

Waterway Information

4.2.39. Access to Newport Harbor from the Pacific Ocean requires crossing the Yaquina Bay Bar and navigating between the north and south jetties. The charted depth of water around the North Jetty tip can range from 40 feet to 6 feet within the span of a few yards.

4.2.40. On January 29, 2019, the Army Corps of Engineers conducted a survey of Yaquina Bay and the bar entrance. Survey results showed an entrance channel that is 40 foot deep and 400 feet wide across at the outer bar to station 0-10; then, with dimensions reducing gradually, a channel 30 feet deep by 300 feet wide beginning at mile 0.0 to a turning basin 30

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[32] Mrs. [redacted] testimony.
[33] Mrs. [redacted] testimony.

feet deep, 900 and 1200 feet wide and 1400 feet long at mile 2.0 at McLean Point; thence, a channel 18 feet deep and 200 feet wide beginning at mile 2.4 upstream to mile 4.4 at Yaquina.

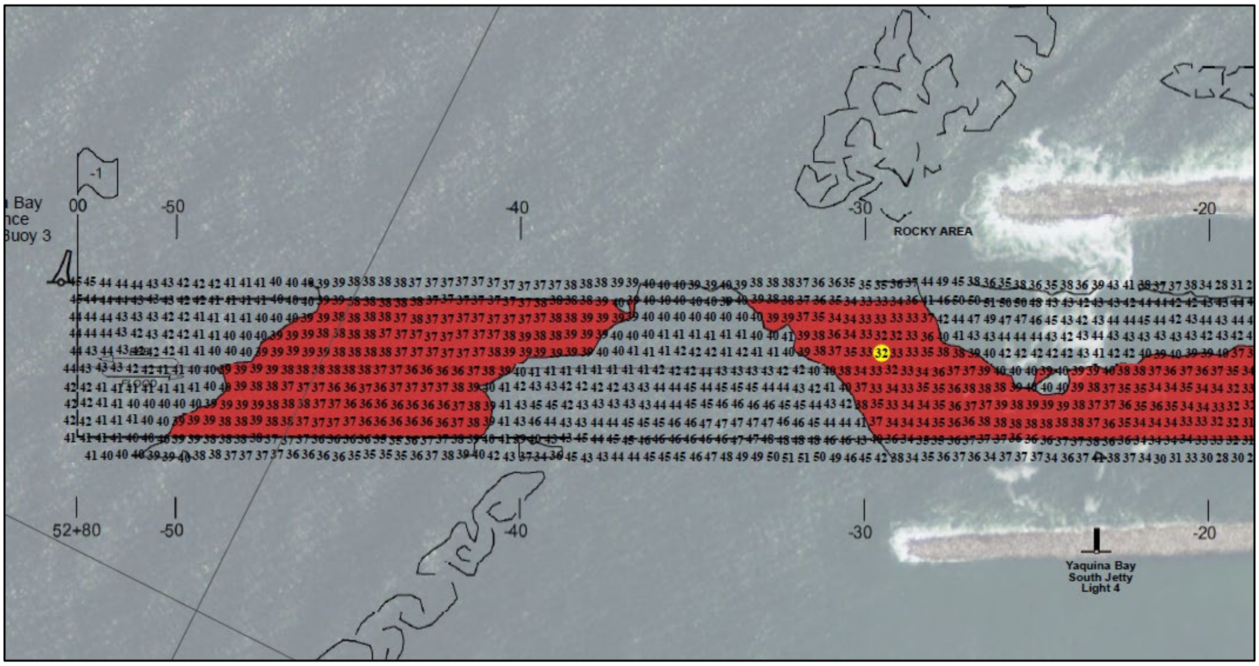

Figure 28. Section of a waterway bottom survey conducted by the U.S. Army Corps of Engineers (ACOE), post-accident. The ACOE does not survey areas outside the navigable channel but the image depicts submerged rocky areas just west of the North and South Jetties at Yaquina Bay Bar. (Source – ACOE, CG Exhibit 028)

4.2.41. D13 has established RNAs for hazardous bars as a result of a series of marine accidents that occurred in these unique geographic areas. The Yaquina Bay Bar is located within 33 CFR §165.1325(10). 33 CFR § 165.1325 contains all the provisions associated with the Hazardous Bar RNAs. There are requirements for bar crossing plans as well as communications with the Coast Guard for various vessel types.[34]

4.2.41.1. RNAs for hazardous bars only restrict or close the bar to recreational and uninspected passenger vessels. Typically, the Coast Guard will make the restrictions based on vessel size. The COTP can close hazardous bars if the conditions exceed the safe operating requirements of Coast Guard rescue vessels. CFVs, and other Coast Guard inspected commercial vessels, can still transit and cross the bar if it has been restricted per the COTP.

4.2.41.2. The Final Rule indicated that the Coast Guard received a total of 168 comments, with 122 comments coming from the 91 documents submitted to the public

[34] In February 2009, the Coast Guard issued a Notice for Proposed Rulemaking to address the risks associated with the extreme hazards of the breaking bars. The RNA for Yaquina Bay and other Oregon and Washington bars was established in October of 2009. The RNA Final Rule was later updated as an Interim Rule to eliminate confusion in the language of the rule established in 2009 and was then published as a Final Rule on April 14, 2014.

docket and 46 comments coming from the public meetings. Nine comments requested additional time to comment and/or public meetings. In response to these comments the comment period was extended until June 30, 2009 and an additional public meeting was held in Coos Bay, Oregon. Comments contained in the Federal Register / Vol. 74, No. 220 / Tuesday, November 17, 2009 / Rules and Regulations contained minimal comments regarding aids to navigation for the RNAs.

4.2.42. The Coast Guard maintains a system of ATON to mark the waterway.

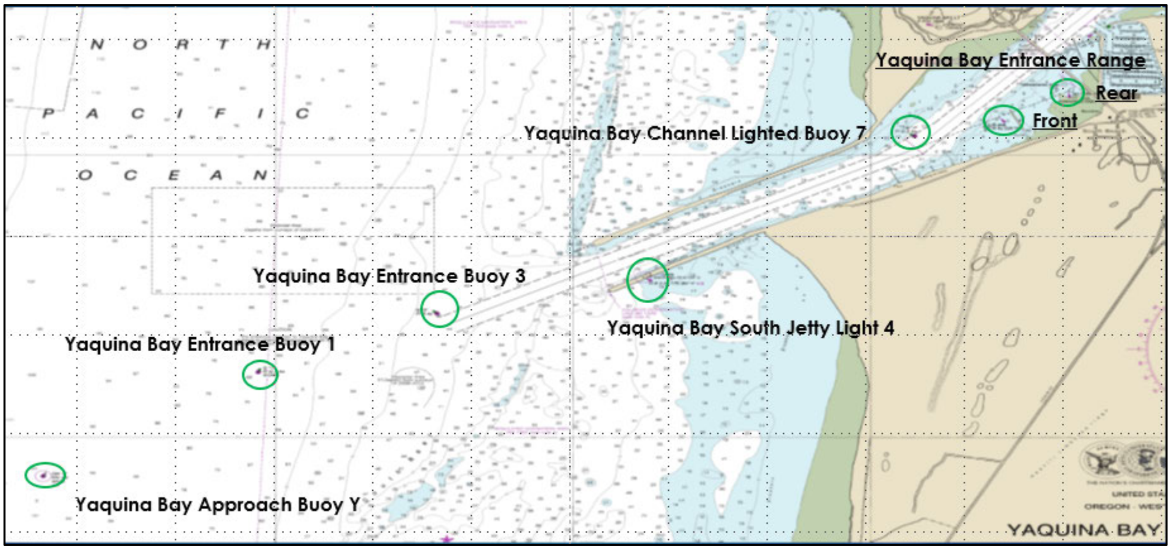

Figure 29. Image showing the location of critical aids to navigation at Yaquina Bay Bar. The USCG maintains these aids. (Source – Coast Guard, CG Exhibit 052)

4.2.42.1. Yaquina Bay Entrance Buoy 1, Yaquina Bay South Jetty Light 4, and the Yaquina Bay front and rear ranges were on station and watching properly on the night of the accident.

4.2.42.2. The Yaquina Bay Approach Buoy, or Buoy Y, was missing as was Yaquina Bay Entrance Buoy 3, which is a seasonal buoy. On the night of the accident, both buoys were sunk and were awaiting retrieval by a Coast Guard buoy tender when that vessel was available.

4.2.42.3. The Coast Guard boats referred to Entrance Lighted Buoy 3 repeatedly in reference to the charted location of that buoy. However, the buoy was seasonal and not on location, as it had actually sunk.

4.2.42.4. There were no readily available Coast Guard buoy tenders with heavy lift capabilities to maintain buoys on station in the offshore environment. The Coast Guard Cutter (CGC) ELM was the buoy tender scheduled to assume the responsibility for ATON in the D13 area but was in Baltimore, Maryland for a shipyard availability period. The extreme current and waves at the entrance to hazardous bars made it difficult to maintain the current type of Coast Guard buoys on location or retrieve sunken ATON, as was the case of lighted buoys "Y" and "3".

4.2.42.5. The Coast Guard has tools in place to periodically assess the waterway. This tool is called a Waterways Analysis Management System (WAMS). It is a survey that incorporates input from the waterway users and the public about the effectiveness of current ATON in the area and identifies areas of concern that may need further action. The designation of the waterway has some bearing on the periodicity requirement for these surveys. The last WAMS survey conducted for the Yaquina Bay area was in 1996. An abbreviated survey called a "mini-WAMS" was conducted in 2006 and focused on the Yaquina Head Lighthouse.

4.2.42.6. Despite the hazards associated with the Yaquina Bay Bar, the Coast Guard classified the waterway as "non-critical" until that designation was changed to "navigationally critical" in June 2003. There is no evidence available to indicate why Yaquina Bay's waterway designation was changed in 2003.

4.2.42.7. The manual describes the classification of "navigationally critical" as "waterways where degradation of the aids to navigation system would result in an unacceptable level of risk of a marine accident, due to the physical characteristics of a waterway, difficult navigation conditions, aid establishment difficulties, or high aid discrepancy rates." The classification of the waterway drives the attention and resources that are spent on the waterway including requiring a WAMS survey be conducted every five years as well as an increase in the prioritization of potential upgrades and maintenance of ATON in that waterway.

4.2.42.8. The North Jetty at the entrance to Yaquina Bay had a light and fog signal as an Aid to Navigation prior to 1979. In 1980, the Coast Guard disestablished that ATON and replaced it with Light 4 on the South Jetty tip. The North Jetty no longer has a light or fog signal.

4.2.43. The Coast Guard, NOAA, and the State of Oregon warn mariners of the risks associated with bar crossings by using signage and publishing information on websites and handouts. Websites show bar camera footage informing mariners of conditions at entrance bars, including the Yaquina Bay Bar.[35] Other means of disseminating information include marine and commercial AM radio band broadcasts, a live watchstander in a watch tower that makes radio calls to mariners, and broadcasting of deteriorating weather condition reports.

4.2.44. Mr. Biernacki had 30 years of experience working on and operating CFVs. He gained his experience fishing up and down the East Coast, Alaska, Hawaii, and parts of the West Coast. Mr. Biernacki moved to the Newport, OR area in the summer of 2018.

4.2.44.1. Mr. Biernacki lacked experience crossing the Yaquina Bay Bar. Aside from operating the MARY B II which was purchased in the fall of 2018, Mr. Biernacki's experience with the bar was limited to one trip as a crewman onboard the F/V MS

[35] The footage is not generally real time but is usually still shots taken periodically.

NICANI and one trip as the operator of the F/V RANGER. Both trips occurred between July and August of 2018.

4.2.45. Mr. Biernacki had been fired from various fishing vessels after incidents of negligent operations and erratic behavior. This led to Coast Guard investigations which resulted in the issuance of two civil penalty violations. Due to the fact the Mr. Biernacki was not a credentialed mariner, the Coast Guard could not take enforcement action against a credential.

4.2.45.1. In February of 1997, while operating out of the East Coast, Mr. Biernacki ran the F/V LORI L aground on the beach in Loveladies, NJ, an area five miles south of the entrance to Barnegat Inlet, NJ. Mr. Biernacki was awakened when the vessel struck an offshore sandbar prior to grounding on the beach. As the operator of the vessel, he went to sleep and failed to set a proper watch and lookout. The causes of the grounding were found to include: the operator's chronic fatigue, the operator's lack of professional training, failure to maintain a proper watch, and failure to use the installed alarm system for the vessel's radar and fathometer.

4.2.45.2. Mr. Biernacki worked on board the F/V GO FOR IT. The owner of the GO FOR IT fired Biernacki after an altercation on the vessel resulted in activation of the EPIRB and Coast Guard SAR response on September 12, 2002. Mr. Biernacki admitted to the responding Coast Guard crews that he and the rest of the crew had been drinking while transiting to the fishing grounds. One crewman did not feel safe, attempted to use the radio to hail the Coast Guard with a desire to leave the vessel but Mr. Biernacki removed the radio and took it to his cabin; therefore, the crewman activated the EPIRB, which is a distress beacon and not meant to be used for any other form of communication.

4.2.45.3. Subsequent Coast Guard message traffic on the incident response and boarding of the GO FOR IT documented the boarding team's findings that "the consumption of large amounts of alcohol in less than 12 hours left the vessel unmanned and adrift in the commercial shipping lanes off Charleston." The message traffic also noted that this was the second time in the time span of one month that the vessel had returned to port to drop off a crewmember due to a crewmember's fear for their personal safety.

4.2.45.4. Mr. Biernacki moved to the Newport, OR area on or about the summer of 2018. In Newport, OR, he was employed as a crewman onboard the MS NICANI in August 2018, and as the operator of the RANGER for one trip. On or about August 2018, while operating the RANGER in the Pacific Ocean he consumed alcohol underway and failed to answer the radio or text messages from the vessel owners. Only after the owner texted Mr. Biernacki that the Coast Guard was actively looking for him did Mr. Biernacki respond back. Mr. Biernacki intentionally headed further out to sea and did not return to port until he sobered up. He departed the vessel without engaging the owner.

(HYPERLINK # 7)

4.2.45.5. During the public hearing and throughout the course of the investigation, four previous employers attested to Mr. Biernacki's ability to catch fish. These same employers attested to his erratic behavior, arrogance, and his propensity to take unreasonable risks when it came to operating fishing vessels during heavy weather.

4.2.45.6. The operator's pattern of behavior based on previous experiences identified in this investigation continue to be shown aboard the MARY B II during the time immediately prior to the accident voyage. Specific examples of this are texts from Mr. Porter discussing the operator's unwillingness to take advice on use of the chartplotter, on the time to head into port due to impending weather, setting up crabbing gear for harvesting crab, and most importantly with respect to the extreme hazard of crossing the bar.

4.2.46. While not a previous employer, Mr. [redacted] engaged in multiple interactions with Mr. Biernacki with respect to purchasing the MARY B II (formerly the BESS CHET). Mr. [redacted] attested to Mr. Biernacki's lack of interest in any advice about operating the vessel at the Yaquina Bay Bar, and stated Mr. Biernacki was not receptive to any help or advice from mariners more experienced with the area.

4.2.47. Mr. Biernacki lacked significant experience crossing the Yaquina Bay Bar which is classed as a hazardous bar by regulation. The winter bar conditions are significantly more hazardous than at other times of the year.

4.2.48. The deckhand, Mr. James Lacey, had been fishing for over 30 years up and down the East Coast. He had previously fished with Mr. Biernacki and moved from New Jersey to Newport, OR to work on the MARY B II. He moved to Newport in December 2018 and did not have experience with the Yaquina Bay Bar. In testimony, the managing owner stated Mr. Porter was hired for his knowledge of the area.

4.2.49. Mr. Porter had over 30 years of fishing experience out of the Newport, OR area and had served as a deckhand before advancing to operating fishing vessels. Mr. Porter had been operating vessels for approximately 10 to 12 years and was known to have operated the JUDY and the NORMA M.

4.2.50. Based on testimony, Mr. Biernacki wore reading glasses, had an unknown amount of hearing loss, and wore dentures. The managing member of the F/V MARY B II LLC testified that Mr. Biernacki had trouble hearing in certain instances more than others because his eardrum had previously been "blown out" by "vibrations and loud noises that were on the boats."

4.2.51. There is no other evidence of any other medical history, conditions or use of prescriptions or over-the-counter medication for Mr. Biernacki.

4.2.52. The Lincoln County Medical Examiner (ME) examined the remains of all three crewmembers in conformance with their policy. The cause of death for all three crew persons was drowning, there were no other significant findings.

4.2.53. The Medical Examiner performed a gross examination of the bodies and took blood and urine samples for analysis in conformance with policy. There were clerical errors in the Medical Examiner's reports, in one case, date of birth.

4.2.53.1. Mr. Biernacki was found to have methamphetamine, amphetamine and alcohol in his system at the time of his death.

4.2.53.2. Mr. Lacey was found to have cannabinoids in his system at the time of his death.

4.2.53.3. The toxicology reports for Mr. Biernacki or Mr. Lacey found that neither individual had other common pharmaceuticals in their systems at the time of their deaths.

4.2.53.4. Mr. Porter was found to have no controlled substances or common pharmaceuticals in his system at the time of his death.

4.2.54. The MARY B II had all lifesaving equipment required to be onboard by the CFV regulations of 46 CFR Part 28.

Figure 30. Composite image of MARY B II's safety equipment. Showing an immersion suit, inflatable lifejacket, liferaft and an EPIRB distress device recovered after the accident. (Sources – Mr [redacted] and Oregon State Parks)

4.2.55. In testimony, the managing owner of the F/V MARY B II LLC was aware of the operator's use of marijuana which is legal in Oregon. Toxicology results for marijuana in Mr. Biernacki's sample were negative. The managing owner failed to ensure that fishing vessel operations were conducted in a drug and alcohol free environment.

4.2.55.1. There were no written policies established by the F/V MARY B II LLC for conduct on board the vessel with respect to the use of alcohol or drugs or with respect to any expectations regarding the operation of the vessel.

4.2.55.2. In testimony, the managing owner indicated that if she was made aware of or found out about alcohol use on the vessel she would have directed termination of employment, including termination of employment for her son, the operator.

4.2.55.3. CFV operations included significant amount of preparatory work, some of which is not conducted with the vessel underway. In testimony, the managing owner stated that the operator had to drive a motor vehicle to conduct supporting operations for the MARY B II. The managing owner stated that Mr. Biernacki had a valid California driver's license. After the hearing, investigators validated the status of the operator's driver's license and he was found to have a permanently suspended license in the state of California.

4.2.56. A CG-2692, Report of Marine Casualty form, which is required by regulation, was not submitted for this incident.

4.2.57. 46 CFR § 28.270 requires the master or individual in charge of each fishing vessel to ensure that the crew conducts drills and receives safety instruction at least once each month. A certified Fishing Vessel Drill Conductor must perform the drills and instruction.

4.2.58. 46 CFR § 28.270 also states that no individual may conduct or provide instructions on drills onboard CFVs without attending a drill training course. There are, however, no requirements to recertify after taking the original training. All three crewmen on board the MARY B II attended and passed the AMSEA Marine Safety Instructor Training Course.

4.2.59. There are no records retained at F/V MARY B II LLC indicating the required safety drills were performed on the vessel.

4.2.60. United States Code (USC) and federal regulations implemented in 46 USC § 8304 and 46 CFR § 15 specifically exempt fishing vessels, other than fish processing vessels, from watch, working hour (work-rest) requirements and compliance with the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), 1978. The MARY B II was not required to maintain a regulatory prescribed watch schedule, work-rest, or maintain crew competencies.

4.2.61. The owner did not have any written or verbal company policies relating to work hours to reduce the considerable safety risks associated with fatigue. The managing owner left the day-to-day operations of the vessel up to the captain.

4.2.62. The 47 foot Motor Lifeboat is designed to perform mission activities in adverse weather and sea conditions. Its primary mission is surf and heavy weather SAR, but it is designed to support multi-mission operations.

Figure 31. Image of a Coast Guard 47 foot Motor Life Boat 47266 operating in the surf. (Source – Coast Guard)

4.2.63. These vessels are self-bailing, self-righting, almost unsinkable, and have a long cruising radius for their size. The 47 foot MLB has specific operating capabilities:

CG 47266		
Length	**47.91**	**Feet**
Draft	**4.5**	**Feet**
Beam	**14**	**Feet**
HP	**2 x 435**	
Speed	**25**	**Knots**
Hull Type	**Planing**	
Accident Crew #	**4**	
Hull Construction	**Aluminum**	
Operating Restrictions		
Breaking Surf	**20**	**Feet**
Wind	**50**	**Knots**

Figure 32. Table showing operating characteristics of the 47 foot motor lifeboat. (Source – Coast Guard)

The 52 foot Special Purpose Craft-Heavy Weather (SPC-HWX) Motor Lifeboat is designed to perform mission activities in adverse weather and sea conditions. The 52 SPC-HWX exceeds the seakeeping and towing capabilities of the 47 foot MLB. The SPC-HWX design specifically, its 3 foot propeller and the hull type can maintain greater speed and maneuverability in any current due to the displacement hull and keel than the 47 foot MLB and its planning hull. This advantage minimizes exposure in the surf zone. Its primary mission is surf/heavy weather SAR and supplements the 47 foot MLB.

Figure 33. Image of a Coast Guard 52 foot Special Purpose Craft-Heavy Weather Boat VICTORY and a helicopter similar to the CG Helo 6527 conducting training in surf conditions. (Source – Coast Guard)

4.2.64. The 52 foot SPC-HWX has specific operating capabilities:

CG MLB VICTORY		
Length	**52**	**Feet**
Draft	**6**	**Feet**
Beam	**14.5**	**Feet**
HP	**2 X 165**	
Speed	**11**	**Knots**
Hull Type	**Displacement**	
Accident Crew #	**5**	
Hull Material	**Steel**	
Year Built	**1956**	
Operating Restrictions		
Breaking Surf	**25**	**Feet**
Wind	**60**	**Knots**
Seas	**35**	**Feet**

Figure 34. Table showing operating characteristics of the 52foot motor lifeboat. (Source – Coast Guard)

4.2.65. The Coast Guard's HH-65 Dolphin is a twin-engine, single main rotor, medevac-capable SAR helicopter. The Dolphin is primarily a short range recovery aircraft and its primary missions are SAR, enforcement of laws and treaties, and marine environmental protection.

Figure 35. Image of the Coast Guard HH-65 Dolphin. (Source – Coast Guard)

CG Helo R6527 (HH-65 Dolphin)		
Engines	**2**	**Gas Turbine**
Operating Environment	**All weather, day/night**	
Maximum Speed	**165**	**Knots**
Cruise Speed	**120**	**Knots**
Maximum Altitude	**10000**	**Feet**
Range	**375**	**Nautical Miles**
Accident Crew #	**4**	**Persons**
Hoist Capable	**Yes**	
Rescue Swimmer in Crew	**Yes**	
Operating Restrictions		
Aircraft was operating within operating limits on the accident night.		

Figure 36. Table showing operating characteristics of the HH 65 Helicopter. (Source – Coast Guard)

4.2.66. On the date of the accident, there was established guidance for Station Yaquina Bay's personnel when executing vessel escorts. There are several policies which encompass Coast Guard actions as they relate to escorts at breaking bars in D13. 33 CFR § 165.1325 which establishes RNAs in Washington and Oregon, the D13 SAR plan, the D13 Standard Operating Procedures, and the CG National SAR Plan Addendum.

4.2.66.1. The D13 SAR Plan (CGD13INST M16130.1A) mandates stations to man the towers during periods of increased vessel traffic and during rough bar/surf conditions. Additionally, a watchstander must be stationed in the tower while Coast Guard vessels are conducting training in the surf. This requirement applies to the following Stations: Cape Disappointment, Chetco River, Coos Bay, Gray's Harbor, Siuslaw River, Tillamook Bay, Umpqua River and Yaquina Bay. The District 13 SAR Plan specifically states that a live 24/7 watch is not necessary, but provides for the CO/Officer in Charge (OIC) to man the tower when deemed necessary in addition to the above requirements. The D13 SAR Plan also contains provisions for Non Emergent Situations such as Bar Escorts and actions for Disoriented Mariners which may include mariners crossing the bars.

4.2.66.2. 33 CFR § 165.1325, provides for two conditions, bar restrictions and bar closures. A bar restriction limits the size of vessels that are allowed to cross the bar. Bar restrictions apply only to recreational vessels and uninspected passenger vessels.

4.2.66.3. With respect to bar restrictions, there is a formula for equation which is used to estimate the appropriate size of vessel which can safely transit the bar in given conditions. This determination is seldom used as it is overly prescriptive. In addition to this formula, COs and OICs are able to apply bar restrictions based on their experience. The local Coast Guard Stations will more often use the classification for safety equipment requirements that exist in regulation as a threshold for restricting the bar. Those classifications are: less than 16 ft, vessels 16 to 26 ft, vessels 26 ft to 40 ft, and vessels 40-65 ft. Violations of the bar crossing restrictions can lead to citations and fines.

4.2.66.4. Bar closures are based on the operating limits of Coast Guard vessels. The 47 foot MLB can be safely operated in winds up to 50 knots and breaking surf of 20 feet, provided they have a surfman onboard. The 52 foot SPC-HWX (the VICTORY) can be safely operated in winds up to 60 knots and breaking surf up to 25 feet, again provided a surfman is onboard. When the winds or waves exceed these parameters, the CO/OIC will recommend closing the bar to the COTP; meaning Coast Guard vessels are not able to safely respond and will not. This measure is for the safety of the rescue crews as well as the maritime public. Coast Guard vessels are built to rigorous standards to withstand punishing seas which exceed the limitations of commercial vessels. Until the bar is closed, commercial vessels of any type, with the exception that uninspected passenger vessels (generally similar to recreational vessels), may cross the hazardous bars at will.

4.2.66.5. In practice, it can take several hours for the bar to be closed after the CO/OIC's recommendation due to many layers of communication within the CG approval process. Another consideration is that the bar closure may trap a vessel outside the bar reducing the available options for that vessel. The CG maintains the ability to grant waivers to these vessels on a case by case basis.

4.2.67. Per COMDTINST M16114.32D, specifically for rough bar and surf conditions, policy states that every time a vessel is launched for SAR, a second B-0 vessel is launched to stand by for the first vessel.[36] A CO/OIC will launch a vessel based on multiple factors. As an example, a CO may launch Coast Guard vessels based on the level of experience of the mariner or visibility.

4.2.68. Stations, including Station Yaquina Bay, will check the conditions on or around the bar every 3 hours and/or when weather conditions change to re-evaluate opening/restriction/ closure of the bar.

4.2.69. Tower watchstanders call vessels when outbound and ask how many people are onboard, but the level of engagement varies between stations.

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[36] B-0 is a reference to a Coast Guard asset readiness posture and means a vessel, helicopter, etc. must be capable of launching in 30 minutes or less.

4.2.70. Tower watchstanders actively observe the bar in an attempt to maintain a good operating picture and account for how many and which boats are going out.

4.2.71. One of the primary tools that the Coast Guard used in this escort was the MK-127 illumination flare. It is designed to illuminate the area for a period of approximately one-half minute. On the night of the accident, approximately 20 flares were used in the LAST STRAW and the MARY B II bar operations and in the ensuing rescue activities. They were also launched from the beach in the recovery efforts.

MK 127 Flare Characteristics		
Height	**600-700**	**Feet**
Burn Time	**36**	**Seconds**
Candlepower	**125,000**	**Candlepower**
Descent Rate	**10-15**	**Feet Per Second**

Figure 37. Table showing the illumination characteristics of the MK-127 illumination flare. (Source – Coast Guard)

(HYPERLINK # 8)

4.2.72. As all three crewmembers of the MARY B II were accounted for relatively quickly, Sector North Bend Command Center watchstanders did not need to use the Probability of Survival Decision Aid (PSDA) software within the SAROPS to calculate predicted survival times from the effects of hypothermia during cold-water immersion. However, using PSDA, the calculated best-case survival times for functional time was 9.72 hours and predicted survival time was 12.62 hours, assuming crewmembers were wearing a clothing ensemble of shirt, sweater, and PVC rain suit. However, the effects of sudden cold-water immersion below 68ºF can result in a respiratory reflex resulting in a rapid loss of life. The survival times in the PSDA are based on entering the water slowly in a non-catastrophic boating accident. A fall overboard or ejection from a sudden accident would likely result in a rapid death by drowning.

4.2.73. Functional Time (core temperature above 34° C or 93.2° F) is the length of time (hours) during which an individual may participate in self-rescue or take actions that will enhance survival/protection from exposure. Cold Survival Time (hours) is the time it takes for the core temperature to drop to 28° C or 82.4° F. Below that threshold, the probability of death due to hypothermia significantly increases. Death was not ruled as caused by hypothermia. Proper wearing of an immersion suit would protect the wearer from sudden immersion shock and hypothermia.

4.2.74. There is a gap in coverage for the National Automated Identification System (NAIS) system in the Newport, Oregon area. This coverage gap creates a situation where CG Command Center watchstanders were unable to see AIS positions of vessels displayed off the coast of Yaquina Bay. According to the Coast Guard, the Nationwide Automatic Identification System (NAIS) achieved full operational capability on May 24, 2018. The CG describes the system:

> *The Coast Guard's Nationwide Automatic Identification System is a communications system that transmits navigational information to ships and monitors the movement of*

maritime traffic to promote safety in U.S. waterways. NAIS is based on the Automatic Identification System, a technology sanctioned by the International Maritime Organization (IMO) as a global standard for ship-to-ship, ship-to-shore and shore to-ship communications. Under U.S. law, most ships greater than 65 feet in length and operating in U.S. waters are required to have AIS transponders installed. The transponder regularly transmits a voiceless radio signal providing the vessel's name, position, course and other vital information. NAIS is designed to give the Coast Guard a comprehensive view of AIS carrying maritime traffic in U.S. waterways.[37]

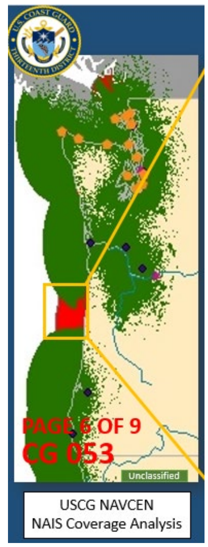

Figure 38. Map showing NAIS coverage for the coasts of Oregon and Washington. The area in red shows a NAIS coverage gap which exists in the Yaquina Bay, Oregon. (Source – Coast Guard, CG Exhibit 053)

5. **Analysis and Opinions**

5.1. Extreme Hazards Associated with Hazardous Bars on the Pacific Northwest

5.1.1. The bars formed at the mouth of rivers along the Pacific Northwest coast of the United States are known for the extreme hazards they create for any mariner. The rivers flowing to the sea and meeting the coastal underwater topography can create large breaking waves of extreme height and power as was present at Yaquina Bay Bar during the accident. The long distance that ocean waves travel in the Pacific Ocean and the prevailing weather patterns for the winds push the waves into the mouth of harbors where they interact with the changing tide and outflow from the Yaquina River which is present in this geographic area. Generally, the effects of the tide that is entering the harbor, called the flood tide, is of less significance than the tide coming out of the harbor, called the ebb tide. The ebb tide will push the river current and the tidal outflow to sea where it meets the incoming ocean swell causing the waves to gain size and steepness.

D13 has a Special Notice to Mariners which remains in force indefinitely and contains a passage that discusses the dangers of the bars:

[37] Coast Guard Navigation Safety Center website.

If you are inside the bar when rough conditions exist, remain inside! If you are trapped outside a rough bar on an ebb current, wait a few hours until the tide floods. In addition, waves build up at shallow areas such as sand spits and shoals. These areas are dangerous and should be avoided at all times. In a bar area, sea conditions can change rapidly and without warning. Always cross with caution!

NOAA produces a multi volume publication called the U.S. Coast Pilot and meant to supplement nautical charts of the waters of the United States. Coast Pilot 7 describes the following for Yaquina Bay:

The entrance to Yaquina Bay is protected by jetties 330 yards apart. ***The long north jetty, with the outer 100 yards submerged, extends out to Yaquina Reef****. A seasonal sound signal is near the seaward end of the south jetty and a light is about 200 yards inside the seaward end. A lighted whistle buoy is 1.5 miles southwest of the entrance. The channels are marked by lighted ranges, lights, and buoys. Between the jetties, numerous submerged rocks lie along the outside of the charted entrance channel limits. During the summer, when the swell is approximately parallel with the coast, the bar is comparatively smooth, being partially sheltered by Yaquina Head. In winter, however, the heavy west swell makes the bar very rough. A smooth bar and a favorable tide are necessary for large vessels leaving Yaquina Bay.*

The note (bolded for emphasis) in Coast Pilot 7 regarding the character of the seaward end of the North Jetty with the outer 100 yards of that jetty being submerged relates to the area where the MARY B II eventually capsized and sank. In testimony about the final moments of the MARY B II voyage and the sea action with respect to the North Jetty which is comprised of the careful placement of massive rocks:

A. So the series that hit the MARY B II was--is on the tip of the north jetty. I--I--when you get that close to the tip of a jetty in seas that big, you can hear the rocks moving.[38]

During testimony, the marine surveyor who had over twenty years of vessel operating experience, including operating CFVs, made the following statement:

Bar conditions at the time, 12-to-14-foot with occasional 16-foot breaks. These are very questionable conditions to be crossing a bar. Personally--and I've had made hundreds of bar crossings--when you get over 10 feet, that's where you start paying attention, and 12-to-14-foot with occasional 16-foot breaks, these are the kind of conditions you want to approach only at high water during daylight hours. Now, said that, the question came up would you cross the bar under these conditions. Well, yes and no. If you're out in the ocean and you have these conditions and there are forecasts to deteriorate, as in maybe you've got 20-knot winds with big swells, maybe it's forecast that gale warnings are coming to 60-80-100-mile-an-hour winds. You're going to do your very best to cross that bar even though there's not optimum conditions.[39]

[38] BOSN [redacted] hearing testimony.
[39] Mr [redacted] hearing testimony.

Figure 39. Image above demonstrates the danger posed by the breaking bars at the North Jetty of the Yaquina Bay Bar near the north tip. Note the large size and placement of the rocks used to form the protective jetty. The F/V CHEVELLE accident occurred in March 2012, the vessel was a total loss and all crew were recovered safely. (Photo - Mr. and Mrs. [redacted] ©)

And in further testimony, the marine surveyor stated:

> *You know, but like I said before, if you've got deteriorating weather conditions and you're--you know it's going to do nothing but get worse, then now is your best chance. But you want to do that on a flood tide as close to high water as you can, preferably during daylight hours.*[40]

The weather was forecasted to deteriorate further that night and into the next day though no evidence exists that suggests the weather conditions and hazards created were in the decision making process of the operator.

5.1.2. The accident occurred in January 2019 and the winter conditions on that accident day had both air and water temperatures in the low 50° F range. These temperatures magnified the risk of operating in this hazardous environment due to the risk of cold water exposure as discussed below. The U.S. Coast Guard Addendum to the United States National Search and Rescue Supplement, COMDTINST M16130.2F describes the effects of cold water shock:

> *Initial Immersion Cold Shock. Sudden immersion into cold water stimulates a large aspiratory gasp response (involving one to several breaths) that may be followed by hyperventilation plus substantial increase in blood pressure and heart rate. If entry into the water involves complete head-under submersion, the gasp reflex could result in immediate drowning. Subsequent hyperventilation will normally diminish within seconds to minutes but could be increased and exaggerated due to emotional stress and panic.*

[40] Mr. [redacted] hearing testimony.

Uncontrolled hyperventilation can cause numbness, muscle weakness or even fainting, leading to drowning. Either of these respiratory responses can lead to aspiration of water into the lungs; panic, with subsequent drowning. Cold shock can occur in water colder than 20°C (68° F) with symptoms increasing as water temperature decrease to freezing. Healthy individuals may succumb to cold shock through uncontrolled respiratory responses, while those with underlying cardiac disease may experience sudden death due to cardiac arrest or ventricular fibrillation (uncoordinated heart beats).[41]

When the MARY B II was struck by a series of waves and capsized, the crew was suddenly exposed to the wintry waters of the Pacific Northwest. This scenario most likely involved complete head-under submersion resulting in the gasp reflex could result in immediate drowning. Two of the deceased victims were wearing inflated life jackets and the determination was made that the cause of death was drowning. The captain, who also wore an inflated life jacket, entrapped in the partially submerged wreckage of the cabin also perished by drowning.

5.1.3. Historical Marine Accidents at Hazardous Bars

There have been a number of documented fishing vessel and small passenger vessel accidents at the mouth of the harbors with hazardous bars along the coastlines of D13, which is partially comprised of Oregon and Washington. The table below is a representative sample of significant vessel accidents that have been extracted from the Coast Guard's MISLE database starting in 1999, it does not reflect all the accidents that occurred during this period.

Date	Name OF Vessel	Location	Personnel Outcome	Vessel Outcome	Drug and Alcohol Testing	CG Interaction	Bar Restricted	RNA
08 Dec 1999	BLUE HEATHER CFV	Yaquina Bay	2 deceased 2 survivors	Total Loss	Master deceased, only alcohol test, Negative No record of drug testing or alcohol testing for crew	Escort	Yes	Yes
14 Jun 2003	TAKI TOO Small Inspected Passenger Vessel	Tillamook	11 deceased, 6 minor injuries	Total Loss	Negative test drug/alcohol	MLB at north Jetty monitoring	Yes	Yes
19 Sep 2005	SYDNEY MAE II UPV	Umpqua River	3 fatalities[1]	Total Loss	Negative test drug/alcohol	Reiterated that bar was closed, apparently no MLB onscene	Yes CLOSED	Yes
07 Feb 2006	CATHERINE M CFV	Tillamook	3 deceased	Total Loss	Cannabinoids Captain, Cannabinoids, Ethanol, Amphetamines, Methamphetamine	Flare Sighting post-accident	Yes	Yes
16 Dec 2006	ASH CFV	Chetco River[2]	4 deceased	Total Loss	Unsure of disposition of deceased, drowned	No escort, CG may not have had assets available	Yes	Yes
25 Jan 2007	STRARRIGAVAN CFV	Tillamook	Four crew, one deceased	Total Loss	Operator Methamphetamine[3] Crew drugs[4]	Last light bar report 1720 Hours, No Escort	Yes	Yes
28 Nov 2008	NETWORK CFV	Tillamook	Two deceased, one survivor	Total Loss	Negative results	MLB on the bar at first light at accident time	Yes	Yes
02 Oct 2010	DOUBLE EAGLE CFV	Tillamook	2 PIW, Rescued	Total Loss	Negative 1 of two crew[5]	CG onscene, not escorting	Yes	Yes
10 Mar 2012	CHEVELLE CFV	Yaquina Bay	All safe	Total Loss	Negative test drug/alcohol[6]	No Escort	Yes	Yes
19 Jan 2016	EAGLE III CFV	Coos Bay	3 deceased one survivor	Total Loss	Positive THC	No Escort	Yes	Yes
08 Jan 2019	MARY B II CFV	Yaquina Bay	3 deceased	Total Loss	Operator Meth/Ethanol 1 Crew THC	Escort	Yes	Yes

[1] Total POB was 5, fatalities were passengers
[2] Chetco River Bar at the time had a SARDET and other issues with CG interaction at the bar.
[3] Second-degree manslaughter and negligent homicide.
[4] Captain tested positive for amphetamines.
Crew 1 tested positive for cannabinoids/THC.
Crew 2 tested positive for cannabinoids/THC and opiates.
Crew 3 tested negative for alcohol and drugs.
[5] Deckhand could not be located to have tested
[6] Operator only tested

Figure 40. Table displaying the known commercial vessel casualties at hazardous bars along the Oregon Coast, 1999 – present, along with the impact of loss of life and vessel loss. This table does not contain all of the accidents involving commercial vessel types, some of which were not reported to the USCG. (Source – Coast Guard)

[41] Pages 3-89, section 3.7.2.1

There is no way of precisely determining the effectiveness of the bar restrictions for uninspected passenger vessels and recreational vessels in reducing deaths, injuries and vessels loses. Despite these proactive safety measures the hazardous bars still pose sudden and swift danger for mariners negotiating the bar entrances in heavy weather. The fact is the restrictions still allow the bar crossings by commercial vessels in heavy weather. Marine accidents still continue to occur with tragic results as the table in Figure 40 illustrates.

5.2. Gaps in Regulatory Framework and Policies

5.2.1. Regulated Navigation Areas

5.2.1.1 Up until the establishment of the RNAs for Hazardous Bars in 2009, the Coast Guard utilized the authority of the 33 CFR § 177 to restrict vessel transits at the hazardous bars. The hazardous bars were identified, as per 33 CFR § 177.01 and this authority extended to recreational and uninspected passenger vessels in general and relied on a Coast Guard Boarding Officer's authority to restrict vessel transit. The Coast Guard Captains of the Port still had the authority to close the bars as necessary based on the operational limitations of the Coast Guard rescue resources.

The RNA established in 2009 for the Yaquina Bay Bar was updated to eliminate confusion in the language and was published as a final rule in April of 2014. This rule also covered the fifteen other hazardous bars in the Coast Guard D13. The 16 RNAs were created for the specific geographic areas and addressed the risks in a number of ways, most notably, through restrictions on recreational vessels and small uninspected passenger vessels which restricted their movements across the bars in significant seas. The RNAs created restrictions for some vessels, but did not address restrictions for commercial vessels which are inspected or CFVs. Inspected vessels and CFVs are free to cross those bars at will even when the same waterway is restricted to recreational and uninspected passenger vessels. The provisions in the regulations include bar crossing plan requirements but did not mandate the specific actions of the Coast Guard during the crossing of hazardous bars. In particular, the regulations require:

> *The Coast Guard will notify the public of bar restrictions and bar closures via a Broadcast Notice to Mariners (BNM) on VHF–FM Channel 16 and 22A. Additionally, Coast Guard personnel may be on-scene to advise the public of any bar restrictions and/or closures*

In particular, for CFVs:

> *(5) Safety Requirements for Commercial Fishing Vessels (CFV).*
> *(i) The master or operator of any commercial fishing vessel operating in a regulated navigation area established in paragraph (a) of this section shall ensure that all persons located in any unenclosed areas of their vessel are wearing lifejackets or immersion suits and that lifejackets or immersion suits are readily accessible for/to all persons located in any enclosed spaces of their vessel.*
> *(A) When crossing the bar and a bar restriction exists for recreational vessels or uninspected passenger vessel of the same length or*

(B) Whenever their vessel is being towed or escorted across the bar by the Coast Guard.
(ii) The master or operator of any commercial fishing vessel operating in a regulated navigational area established in paragraph (a) of this section during the conditions described in paragraph (c)(5)(i)(A) of this section shall contact the Coast Guard on VHF–FM Channel 22A prior to crossing the bar between sunset and sunrise. The master or operator shall report the following:
(A) Vessel name,
(B) Vessel location or position,
(C) Number of persons onboard the vessel, and
(D) Vessel destination.
(6) All persons and vessels within the regulated navigation areas established in paragraph (a) of this section must comply with the orders of Coast Guard personnel. Coast Guard personnel include commissioned, warrant, and petty officers of the United States Coast Guard.

The morning of the accident, the Yaquina Bay Bar was restricted to recreational and uninspected passenger vessels as noted in the image below:

Restricted	1/8/2019 @ 807	Rec:16 / UPV:--	JETTY TIPS: 2-4 FOOT SWELLS. MAIN CHANNEL: 4 TO 6 FOOT SWELLS, WINDS: EAST-SOUTHEAST AT 5-10 KNOTS, VISIBILITY: 5 NAUTICAL MILES. THE BAR IS CURRENTLY RESTRICTED TO ALL RECREATIONAL VESSELS 16 FEET AND LESS IN LENGTH AT BUOY NUMBER 7.
Restricted	1/7/2019 @ 1631	Rec:40 / UPV:40	JETTY TIPS 4 TO 6 FOOT EBB CHOP. MAIN CHANNEL 4 TO 6 FOOT ROLLING SWELL, WINDS: EAST AT 10-15 KNOTS, VISIBILITY: CLEAR AND UNLIMITED, AND THE BAR IS CURRENTLY RESTRICTED TO ALL REC/UPV LESS THAN OR EQUAL TO 40 FEET IN LENGTH AT BUOY NUMBER 7.

Figure 41. Screen capture from CG Exhibit 018, Yaquina Bay bar restrictions from the night of January 7, 2019 through the morning of January 8, 2019. This screen shot notes restrictions and weather information for the bar as observed by the Coast Guard. (Source – Coast Guard, CG Exhibit 018)

The operator of the MARY B II did not communicate with the Coast Guard the particulars of vessel name, vessel location or position, number of people aboard or destination on the morning he was outbound at or before sunrise. On the morning of January 8, 2019, sunrise occurred at 7:52 a.m.. The Coast Guard stations a watchstander in a lookout tower overlooking the Yaquina Bay Bar at first light and makes bar condition observations to assist vessel traffic when the bar is restricted. Although the name of the MARY B II appears in the CG tower log, there is no way to determine how this entry came to be in this log and this was most likely entered as a correction to "no response" after the name of the MARY B II became known. There is only one entry in the tower log for January 8, 2019. The image below indicates the position of the MARY B II prior to sunrise on the morning of the accident day. The precise position of the MARY B II prior to sunrise cannot be determined.

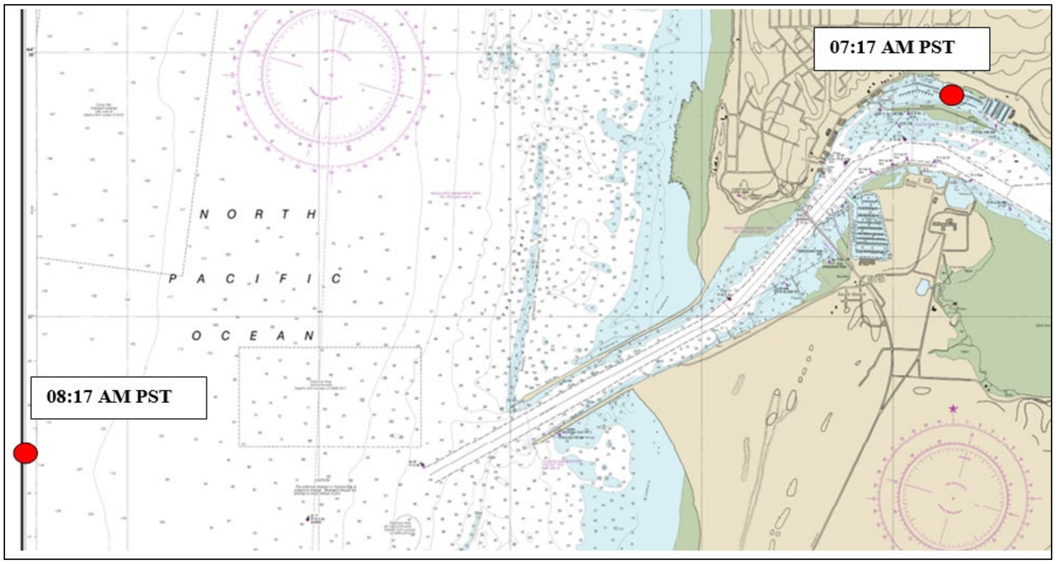

Figure 42. Two positions of the MARY B II on the morning of January 8, 2019 based on NOAA VMS data. There is no way to determine at what time the MARY B II departed the dock but the 7:17 a.m. and 8:17 a.m. positions are precise and transmitted by the VMS at intervals that are close to one hour. (Source – NOAA data, Coast Guard)

5.2.1.2. The other measure less frequently used to mitigate risks from a hazardous bar is for the Coast Guard COTP to actually close the specific bar to all vessels. This had been done when necessary before the establishment of the RNAs. The decision to close a bar is done in consideration of the capabilities of the Coast Guard rescue vessels that must operate on that particular bar. Up to that specific closure by the COTP, CFVs and most commercial vessels can cross the bar to enter or leave port at will.

To further enhance safety, there are two means to address the safety of bar crossings. One is a seldom used formula to determine if crossing the bar is safe based on the size and dimensions of a vessel and the wave height at the bar. The other more commonly used measure is based on the judgment of the representatives of the COTP at the local ports. For example, the Commanding Officer Station at Yaquina Bay, OR sets size limitations for bar restrictions based on the environmental conditions, size of vessels, availability of Coast Guard vessels and other factors. This may impose size limits for the smaller vessels such as vessels under 26 feet are restricted at the bar or at navigation Buoy 7 or the bar is restricted to all recreational or uninspected passenger vessels. The waterway conditions are constantly assessed and modified as needed and the mariners are made aware of the bar restrictions via a variety of means. Typically, bar condition reports are prepared and disseminated by Station Yaquina Bay at first and last light referring to the period of time before sunrise and then at dusk prior to full darkness. Generally, there are no bar observations during full darkness unless a Coast Guard vessel is out on the bar. On the afternoon of the accident day, the Coast Guard was broadcasting reports of the deteriorating bar conditions based on the approach of gale force conditions and the worsening conditions at the bar.

5.3. The Operator's General Experience as a Fishing Vessel Crewperson and Captain

5.3.1. Mr. Biernacki, the operator of the MARY B II, had worked as a fisherman since the age of 16. Most of his 30-plus years of experience as a fisherman were in various fisheries operating out of the Mid-Atlantic states of the East Coast. He worked in a variety of positions including crew and captain/operator. Mr. Biernacki had operated vessels out of Barnegat Inlet, New Jersey and other ports as well as on some West Coast ports including out of Alaska. The inlet at Barnegat is known for its tricky entrance in varying weather conditions.

During testimony and in the examination of evidence Barnegat Inlet and other similar inlets on the East Coast do not have Regulated Navigation Areas for Hazardous Bars similar to the RNAs on the coast of the Pacific Northwest. There are no special rules, signage, or warnings for mariners using the Barnegat Inlet waterway with the exception of storm warning flags. The East Coast of the United States and the West Coast differ in the character of the conditions encountered entering coastal inlets. Generally, on the East Coast, the mariner will experience far less extreme breaking surf when entering harbors due to the gradual shelving of the bottom and the prevailing winds blowing offshore. On the West Coast, there is a narrow continental shelf which steeply rises to the shore line. This, coupled with the prevailing winds and the long ocean distances, cause the much larger waves to build and have a more powerful force. Where rivers meet the sea, as is the case at the Yaquina Bay Bar, the tide and outflow of the river magnify the potential power and force of the breaking waves.

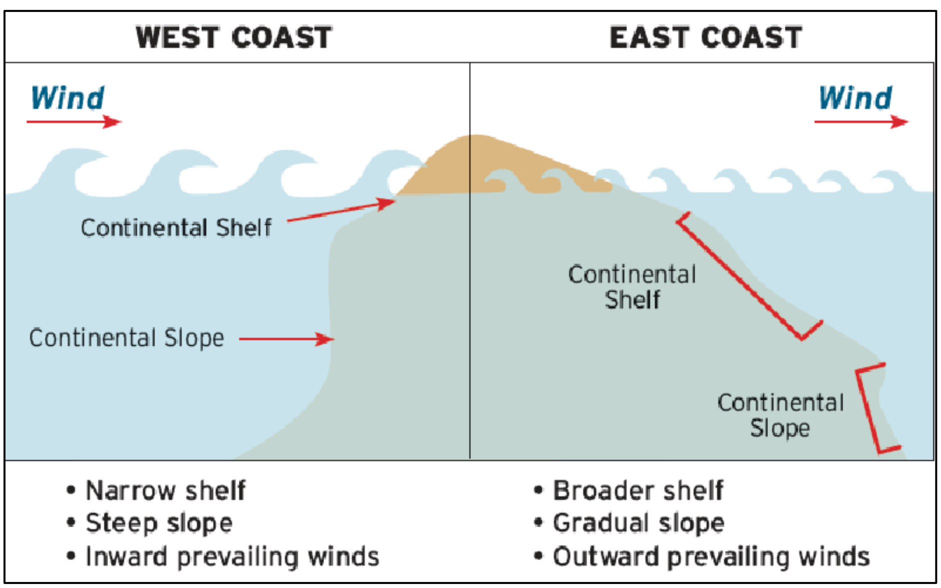

Figure 43. This figure graphically compares the interaction of the sea, wind and slope of the sea beds that make up the shoreline of the West and East Coast of the United States and how that relates to the character of the waves and swell that result. Note the larger waves caused by the prevailing winds, long ocean distance and the steep slope of the West Coast Shoreline. (Source – Used with permission, BoatU.S. Magazine)

Comparison of significant wave heights* on East and West coasts		
Buoy Location	% of time waves <3 feet	% of time waves >12 feet
~150 miles E of Cape Hatteras	7%	10%
~600 miles SW of Portland	0%	23%

*Average of biggest one-third of all waves recorded during time interval

Figure 44. This figure represents a comparison of wave heights on the East and West Coast of the United State taken from NOAA offshore weather buoys located in areas that represent significant waves along each coast. (Source – Used with permission, BoatU.S. Magazine)

During testimony, a fisherman who operated out of Barnegat Inlet made the following statement:

Q. And how frequently would you or Mr. Biernacki, to your knowledge, deal with breaking surf, 10-foot, 12-foot or----
A. I don't think--you know, a 10-or-12-foot breaking surf would be a big one in our inlet. We do get them, but we--in the wintertime, mostly. I mean, not--we do deal with that.
Q. So it's not common to get 16-to-18-foot breaking surf----
A. We never have that big here unless it's a hurricane. I'd say 10-to-12-foot would be extremely big for here.[42]

To illustrate the comparison between the accident location and the location that the Operator of the MARY B II usually fished out of the image below is provided. Typically mariners transiting into Barnegat Inlet in adverse weather enter by following the blue line on the figure below.

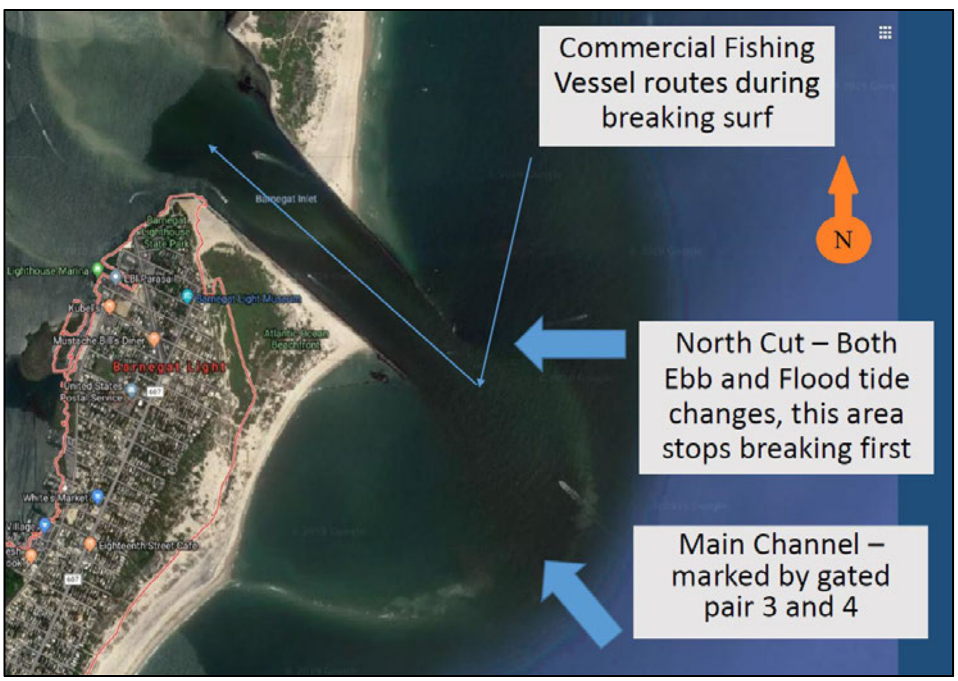

Figure 45. An aerial view of Barnegat Inlet, NJ with notes on entering the waterway and showing the route (in blue) for mariners entering the waterway where the surf is breaking. (Source – Coast Guard prepared)

[42] Mr. [redacted] hearing testimony.

The Commanding Officer of CG Station Barnegat Inlet provided the following testimony:

> *Q. The accident leading to the loss of the fishing vessel MARY B II in January of 2019 occurred in hazardous surf conditions and at night off the coast of Oregon. Station Yaquina Bay observed 12-to-14-foot seas with occasional 16-foot breaks. The forecasted weather was southeast winds, 20 to 25 knots, with gusts to 35 knots, rising to 25 to 30 knots with gusts of 40 after midnight. Combined seas were 12 feet with a dominant period of 11 seconds, building to 20 feet and a dominant period of 18 seconds. I know--I know I just threw a lot of numbers at you, but with your experience, can you give us a layman's opinion of what that would look like or what--what a mariner might experience in those kind of conditions.*
> *A. You--am I comparing that, what they would expect at Barnegat Inlet or in Newport?*
> *Q. Sure. With comparison to your experience on the East Coast and in particular out of Barnegat, are those--are those operating parameters in excess of what's normally at Barnegat, on par with those at Barnegat or below what's on Barnegat?*
> *A. I would say the forecast--what was forecasted in the scenario you gave me, I can't even imagine those numbers happening here. Twenty feet at--did you say 16 seconds?*
> *Q. Twenty feet and a dominant period of 18 seconds, BOSN.*
> *A. Yes, I can't--I can't even imagine that size of wave on the East Coast anywhere. That's something that we would see from a-- from a hurricane, probably in the category of a cat-2 or cat-3 storm.*[43]

The experience and critical decision making of the operator of the MARY B II reveals a host of serious issues with his role and responsibilities as a vessel captain. In February 1997, Mr. Biernacki was employed as the captain of the LORI L. While acting as operator of the vessel, he was involved in a marine casualty where it was put on autopilot and the entire crew went to sleep. As a result of lack of lookout and vigilance, the vessel grounded on the coast of New Jersey having missed the entrance of Barnegat Inlet, NJ. The captain, Mr. Biernacki, was awakened when the vessel hit the offshore sandbar and the vessel then ended up sideways on the beach. The catch had to be unloaded and multiple vessels used to tow the vessel back into safe water.

[43] BOSN [redacted] hearing testimony.

Figure 46. Green circle with X indicates the approximate unintended beaching position of the LORI L in February 1997 several miles south of Barnegat Inlet, per Coast Guard MISLE Incident Activity number 90591 (Source - USCG Navigation Safety Center)

In 2003, Mr. Biernacki was the operator of the GO FOR IT operating out of Charleston, SC. The Coast Guard received a signal from an emergency position radio indicating beacon (EPIRB) which is a distress signal from the vessel. The Coast Guard dispatched a helicopter to the scene and lowered a rescue swimmer to the cabin top of the GO FOR IT. The rescue swimmer found the crew sleeping and the vessel drifting in the Atlantic Ocean 40 NM east of the Charleston Harbor Entrance Buoy. Subsequent investigation would reveal that a crew person had activated the EPIRB to summon help and that the captain had removed the marine radio to prevent the crew from using it to summon help as one crew person felt unsafe and wanted to go ashore. The captain admitted to the boarding officer that the crew had drunk a case of beer and a bottle of rum and had argued. A Coast Guard Cutter escorted the vessel to safe harbor. The Commanding Officer of the Cutter stated (note USCG message abbreviations used throughout quoted section below):

> *Strongly recommend GRU of MSO CHARLESTON take follow up action w/ F/V GO FOR IT'S MSTR. This is the second time in less than a month that the vessel returned to port to drop off a crewman due to crewman fear for personal safety. The consumption of large amounts of alcohol in less than 12 hours left the vsl unmanned and adrift in the commercial shipping lanes off Charleston.*[44]

After arriving on the coast of the Pacific Northwest in 2016, Mr. Biernacki worked on fishing vessels in various capacities. In August 2018, he secured a position as captain of the RANGER operating out of Newport, OR. In late August he asked a female to crew for him on the vessel and departed offshore with two people on the vessel. In that crew's interview

[44] CG Exhibit 073, page 6.

summary,[45] she stated that Biernacki drank alcohol while underway and at one point the crew person wanted to return to shore. She communicated this to the F/V KAY via the radio and Biernacki then started getting text messages from the vessel owner about the situation. Based on the information from this crew person, the operator kept the vessel offshore before returning to Newport, OR. The operator then walked off the vessel after mooring at Newport.

In an attempt to understand the operator's awareness of the danger and understanding of the hazards of the Yaquina Bay Bar in the winter, investigators asked the MARY B II's managing owner the following during the hearing:

> *Q. Well, let's try to--we're trying to figure out if--we're trying to ascertain Mr. Biernacki's experience level, specifically on if he worked in rough weather or worked out of areas where there was a dangerous waterway like the Yaquina Bay bar. Can you talk to us about those specific experiences?*
> *A. Again, through the years it was--I cannot give you anything totally specific except for he did fish through seven hurricanes, including the "Perfect Storm".*[46]

The 2019 edition of the American Practical Navigator, Bowditch an official and widely respected navigation publication of the U.S. Government's National Geospatial – Intelligence Agency makes the following statement about hurricane avoidance. This publication has been in print and continuously updated since 1802. In the text below there is a reference to ships, smaller craft would be far more at risk in a hurricane.

> *The safest procedure with respect to tropical cyclones is to avoid them. If action is taken sufficiently early, this is simply a matter of setting a course that will take the vessel well to one side of the probable track of the storm, and then continuing to plot the positions of the storm center as given in the weather bulletins, revising the course as needed. However, this is not always possible. If the ship is found to be within the storm area, the proper action to take depends in part upon its position relative to the storm center and its direction of travel.*

and:

> *Because of their fury, and because they are predominantly oceanic, they merit special attention by mariners. The rapidity with which the weather can deteriorate with approach of the storm, and the violence of the fully developed tropical cyclone are difficult to imagine if they have not been experienced.*

The vessel incidents that occurred on the LORI L and the GO FOR IT subjected the vessel captain to civil penalties issued by the Coast Guard for the grounding and hazardous operation of the vessels. In the case of the RANGER, the Coast Guard did not investigate that action as the incident was referred to local law enforcement. If any or all of these incidents occurred and captain Biernacki was a Coast Guard licensed or credentialed mariner, the Coast Guard would have been required to examine the possibility of taking an enforcement

[45] CG Exhibit 076
[46] Ms. [redacted] hearing testimony

action against the mariner. Penalties could include suspension or revocation of the credential and other sanctions.

5.4. Adverse Effect of the Operator's Lack of Experience on Hazardous Bars

The operator had limited experience in handling the critical vessel maneuvering challenges posed by the Yaquina Bay Bar. It is not possible to put an exact number of crossings or the bar conditions at the time of the crossings of this and other bars while Mr. Biernacki was operating as captain of a vessel. The MARY B II was purchased by the F/V MARY B II LLC for the express purpose for Mr. Biernacki to operate. Mr. Biernacki was acting on behalf of the F/V MARY B II LLC during the purchase process and had interactions with the previous owner. During these interactions, the previous owner attempted to share some information with Mr. Biernacki about the bar and the operation of the vessel. In testimony, the previous owner was asked:

> *Q. Thank you, sir. Mr.* [redacted] *shifting focus now on the time frame of the sale specifically, being a fishing vessel owner and operator in this community, during your interactions with the new vessel operator, Mr. Biernacki, during that time frame of the sale, was there anything that, to you, seemed unusual about his behavior or that stood out to you?*
> *A. Noticed some erratic behavior at times, definitely, and I sensed a lack of experience and respect for local West Coast conditions in my talking with him during selling the boat to him.*
> *Q. Can you elaborate on that, what you noted as not respect, like you mentioned.*
> *A. While we were going through the boat, I could sense he didn't understand the local bars and the crossings, and so it concerned me at the time. So I tried--attempted to talk to him and give him some local experience and knowledge, but he seemed unresponsive to accepting the information.*[47]

On the days leading up the accident, Mr. Biernacki's crew comprised of himself and a fellow East Coast fisherman as well as a local Newport fisherman with extensive experience on the bar and the fishing grounds. This local fisherman served as crew on the MARY B II and in his previous experience had captained and crewed numerous vessels. His experience and competence in the local area was highly regarded.

5.5. Unsuitability of the MARY B II for the Extremes of the Hazardous Bar Crossings Encountered on the Accident Day

5.5.1. Size and propulsion of the MARY B II

5.5.1.1. The MARY B II was slightly less than 42 feet in length, with a beam of 13.4 feet and a design draft of 7.1 feet. The vessel has a 160 HP engine and a 32 inch five bladed propeller. The propulsion system was described as adequate by various witnesses.[48]

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[47] Mr. [redacted] hearing testimony.
[48] Hearing testimonies of previous owner, Mr. [redacted] and Managing Owner, Ms. [redacted]

Figure 47. Photo of the BESS CHET (later known as MARY B II)'s propeller, provided by the marine surveyor. (Source – Mr. [redacted] [redacted]

On the evening of the accident, the last vessel to cross the bar inbound before the accident occurred was the LAST STRAW, which is a 75 foot single screw steel vessel. The LAST STRAW encountered problems crossing the bar but was able to correct and safely navigate the bar without resultant incident. In conversation with the Coast Guard escort boats at 7:55 p.m., the operator of the LAST STRAW made the following statement:

> *That's the first time I've uh really broached like that. It's kinda alarming. I got turned pretty go there didn't I?*[49]

On the evening of January 8, 2019, sunset occurred at 4:54 p.m. and four CFVs, including the LAST STRAW, who routinely worked out of the Port of Newport crossed the bar in the early evening, heading into Newport Harbor to avoid the worsening weather conditions and conditions of full darkness.

FV LAST STRAW on the left (75 feet in length) in comparison to the FV MARY B II (42 feet in length). Note the high bow and lack of outriggers on the FV LAST STRAW.

Images are scaled to show the approximate size comparison and the FV MARY B II image is approximate in size.

Figure 48. Comparison of the size and characteristics of the LAST STRAW and the MARY B II. (Source: LAST STRAW – Mr. [redacted] Marine Traffic com with permission, MARY B II – Mr. [redacted]

[49] CG Exhibit 008

Over the course of the evening, the sea conditions would increase up to 14 -16 foot breaking waves at times. At 10:04 p.m., a moment before the sinking when the VICTORY told the MARY B II:

16 Footer building up behind you captain[50]

Figure 49. Illustration showing the size of the MARY B II in comparison with the static height of 14-16 foot wave. In the background are the jetty and landmass behind the jetty rocks, November 18, 2018. (Source – Mr. [redacted]

5.5.2. Potential Effects of Grounding in Newport Harbor on or about December 31, 2018
In late 2018, the MARY B II grounded in Newport Harbor vicinity of the Embarcadero. A crewman reported this event to shore via text messaging. At the time, the MARY B II was loaded with crab pots with an outgoing tide.

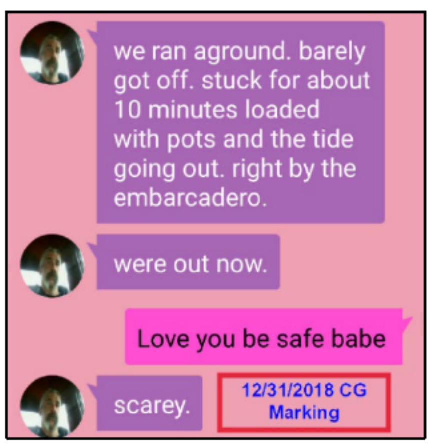

Figure 50. Screen capture of crewmember, Mr. Porter's communication ashore via text messaging from December 31, 2018 regarding the grounding of the MARY B II (Source- Coast Guard, CG Exhibit 024)

[50] CG Exhibit 008

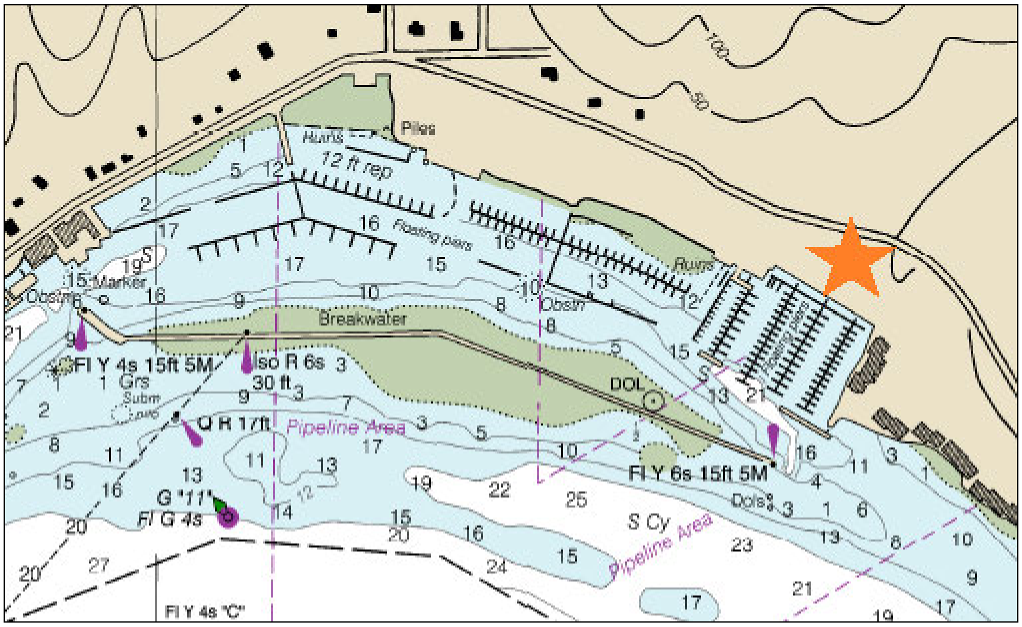

Figure 51. Orange star marks the general location of the Embarcadero Marina, Newport Harbor, OR. The grounding occurred somewhere in front of this area in the blue shaded area, the exact position and circumstances cannot be precisely determined. (Source – Coast Guard, CG Exhibit 004 marked up with star for position)

On January 4, 2019, Mr. Biernacki purchased a two-part epoxy from Englund Marine and Industrial Supply called Splash-Zone®. In testimony at the hearing, the managing owner made this exchange when questioned about the incident.

Q. Ma'am, maybe we can address this a different way. Did Captain Biernacki ever indicate to you when that leak--to your recollection, about what month was that?
A. I'm not sure if it was late December or the first day or two in January, but it was in that approximate area.
Q. So Mr.--so did Captain Biernacki tell you that he was going to make the purchase of that caulk or sealant?
A. Absolutely. He asked me if he could--no, he didn't ask me. I gave him permission to--to do whatever you need to do to repair it, and he purchased the epoxy from England Marine. And that's what--the invoice we were looking at.
Q. Did he indicate to you what needed to be repaired?
A. Yes, he said he was satisfied with the repair.
Q. No, ma'am, the question was did he tell you what needed to be repaired? What was the damage he'd indicated to you?
A. I recollect there were some slats in the wood hull that had some leaks.

The product that was purchased is a two part epoxy which the manufacturer describes in this manner:

Splash Zone is an extremely hard, abrasion and impact resistant, two-part epoxy patching compound. It applies like putty to seal, fill, patch, or re-build aluminum, wood, concrete, fiberglass, and steel. It can be applied in or out of water to repair boat hulls, *buoys, seawalls, docks, bridge abutments, and more. Splash Zone provides excellent protection against corrosion of metals and erosion and deterioration of concrete or wood. Splash Zone's rock-hard surface can be drilled, tapped, or machined. Recommended for patching and repairing damaged underwater surfaces. Not for use in potable water.*

There is no way to determine if this grounding and resultant leak were a contributing factor to the accident. There is also no way to determine if the repairs to the leaking hull planks with the two part epoxy controlled any leakage of seawater into the hull. Any seawater that accumulated in the hull could have resulted in the sloshing of water, called free surface effect which decreases stability. It could also change the vessel's stability based on the weight of the water inside the hull.

At approximately 9:58 p.m., the Coast Guard escort VICTORY stated:

Uh go ahead and start putting up a lot of them, this guy is not riding good in the water. Like he's not a very stable boat, hes [sic] got on outrigger halfway out, and we uh had a dud 127. Over.[51]

5.5.3. Outriggers

On the accident voyage the MARY B II was equipped with outriggers which were approximately 45 feet in length. The outriggers are used for various purposes. In testimony, the previous owner stated:

The outriggers that are on the vessel in the picture are not used for crab fishing. They are used in the salmon fisheries and the albacore tuna fisheries. We would not--personally, we never had them on the vessel during crab season. We would take them off to increase the stability of the vessel and create more weight up higher.

And in a follow up exchange:

Q. Okay. And so to be clear, as a vessel is preparing to enter the bar with one outrigger out or deployed, that would be typical.
A. Not on my vessels. I--I have seen it before, but personally, we've never operated that way.
Q. Can I ask why?
A. Like I said, I usually remove the outriggers for Dungeness crab fishing.
Q. In your experience, what is the normal best practice on outrigger position during transit into the bar and if that's just not to have them at all?
A. Best is not to have them at all or to have them out. You decrease stability when they are up in the rigging. It raises the center of gravity.[52]

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[51] CG Exhibit 008.
[52] Mr. [redacted] hearing testimony.

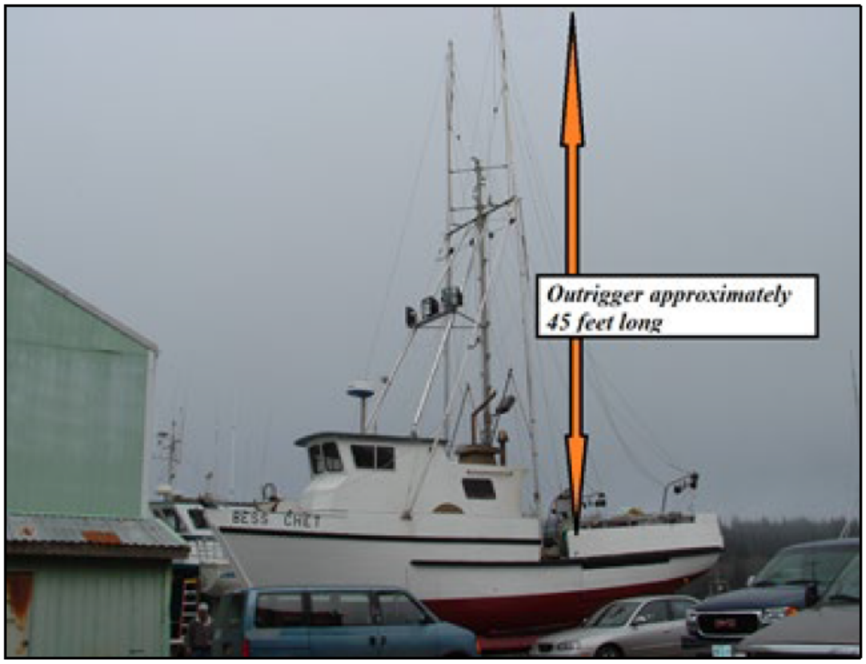

Figure 52. Source photo for the BESS CHET (later known as the MARY B II) Marine Survey report showing the outriggers onboard the vessel. (Source - Marine Surveyor, Mr. [redacted]

The following image of a Newport fishing vessel showing the vessel with and without the outriggers attached:

Figure 53. F/V TANA C at the Yaquina Bay Bar. Left with outriggers attached and on the right, the outriggers removed from the vessel. Dates of the photos unknown. (Source - Mr. and Mrs. [redacted] ©)

Figure 54. F/V NORSKEN FISHER and another unnamed fishing vessel in the foreground crossing the Yaquina Bay Bar on unknown date, both boats without outriggers. (Source - Mr. and Mrs. [redacted] ©)

On the night of the accident at approximately 9:58 p.m. while in the course of the escort into Yaquina Bay Bar, the VICTORY made a radio transmission about the fact that the port outrigger was not in the stowed position in the upper rigging of the vessel and the outrigger was halfway out. In analyzing the role of the outriggers on the MARY B II and the effects on stability, it is considered a good practice to remove the outriggers as they are not used for Dungeness crab fishing and the removal of topside weight such as the outriggers improves the seakeeping abilities and stability of a smaller fishing vessel like the MARY B II. It is not possible to come to a definitive conclusion about whether the partially deployed outrigger was a causative factor or distraction at a critical moment in the voyage. The VICTORY's observation of the port outrigger adrift was communicated to the MLB 47266 was communicated over a Coast Guard working Channel and the information would not have been heard by the MARY B II. Had this observation been discussed over a VHF Channel MARY B II was in theory monitoring, they may have taken the statement as a prompt to provide additional information that may have caused a reassessment of the operation's risk. At no point did either Coast Guard vessel ask the MARY B II if they had any material conditions or issues on board the vessel nor did they specifically ask about the one outrigger being deployed.

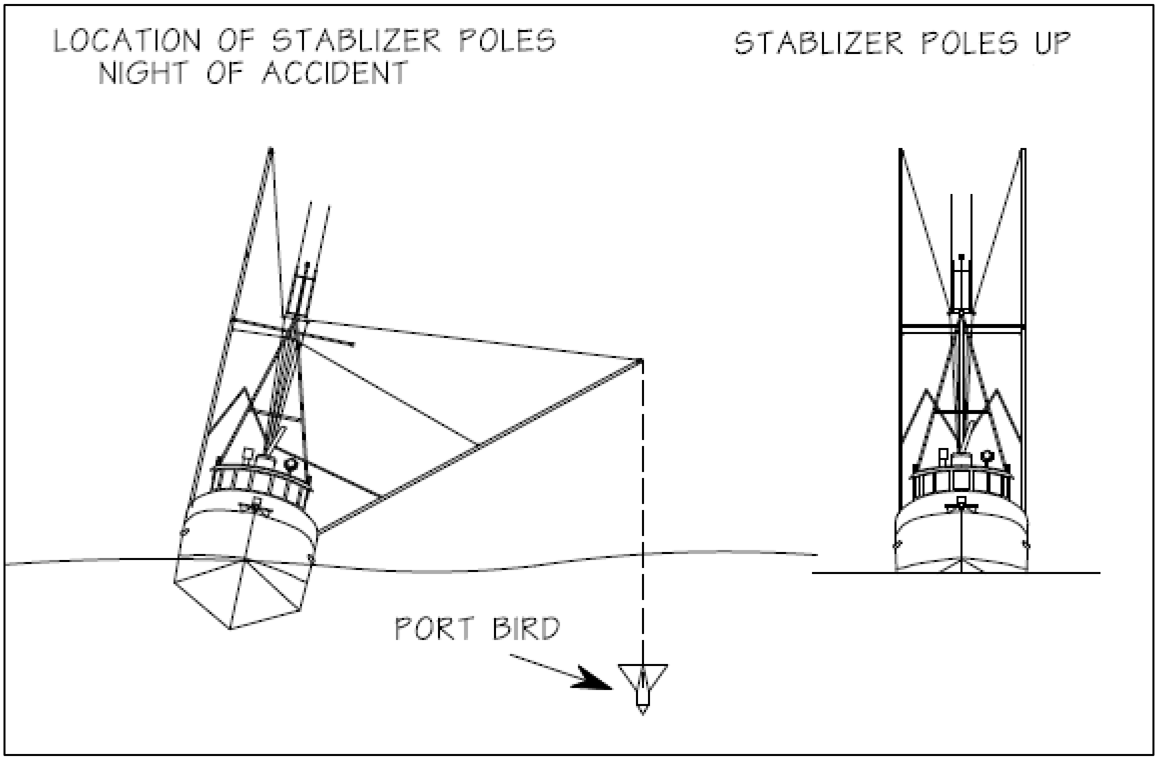

Figure 55. Line drawing of a fishing vessel with the port outrigger out while looking at the bow of the vessel. Left, during the final moments of the MARY B II inbound transit the VICTORY crew noticed the port outrigger partially out with no evidence of a stabilizer or "bird" in the water. It is unknown what the angle of the outrigger was. Dashed line is a visualization of the setup if a port "bird" or stabilizer was in the water. Right, is the stowed position of the outriggers in the upper rigging of the vessel (Source – [redacted] ©)

As evidenced in the image showing the outriggers in the marine survey report when the vessel was the BESS CHET, there is considerable rigging associated with the outriggers and this could have led to potential line entanglement when the outrigger was noted to be partially deployed during the vessel's inbound transit. No evidence was available (observations) of where the lines were trailing. The port outrigger likely had a negative effect of the vessel's stability or maneuverability in those weather and sea conditions, therefore, the fact that it was deployed may have contributed to the casualty.

5.5.4. Line entanglement in Rudder, Propeller, or Shaft

On the accident day, while offshore on the MARY B II, one crew person and the Operator called a local Newport diver with regards to a crab line or rope entangling some part of the MARY B II's underwater equipment such as the propeller, propeller shaft, or the rudder. During witness testimony, the local diver testified that it was a line in the "wheel" (propeller). Fishermen recounted that it is not uncommon to have a line foul the propeller or rudder which usually does not result in damage. In some cases, the line can cause a vibration in the vessel and in extreme cases the line can cause damage to the propeller shaft bearing or result in an inability to maneuver.

In testimony, the diver who was called to examine and remove the line on the MARY B II spoke about the implications of such a condition on vessel maneuverability. He described different ways in which lines may be wrapped around propellers and stated the condition can cause excessive shaking, leading the operator to slow down. He added that a vessel may still be able to make "good speed" but it depended on “how much he had wrapped up.”[53]

And in follow up questioning, the diver stated:

> *A. Well, the--on--especially on the boat in question, the MARY B, a lot of line could make things shake really bad or, you know, cause them to slow down, but in my experience, unless they get a crab pot all the way up to the hull, it generally doesn't-- generally boats don't break from it. You know, they can--it can bend their propellers or make it to where their steering--their rudder doesn't turn well and things like that. It can bend what they call the rudder shoe if they get a pot all the way up, but most of the time it's just line that just needs to be cut out so they can keep working.*

Arrangements were made via phone messages to have a diver visit the MARY B II when the vessel returned to port the night of January 8, 2019. During the escort briefing with the Coast Guard escort vessels, the Operator did not tell the Coast Guard about the line in the vessel’s running gear.

The MARY B II initially reported a making a speed of 6 to 6.5 knots and a maximum speed of 7 knots. At approximately 10:03 p.m., as the MARY B II proceeded into the approach to cross the Yaquina Bay Bar, the speed of the MARY B II was observed to dramatically slow to what was described as two knots without explanation. The VICTORY had to back down and the MARY B II did not communicate the intention to reduce speed. Until this point, the MARY B II had been making between 6 and 7 knots coming up to the rendezvous for the escort across the bar. Based on available evidence, it cannot be determined if this was caused by an issue with maneuverability or propulsion which distracted the crew at a critical time and caused a loss of situational awareness regarding the drift off the centerline towards the danger of the jetty end.

Figure 56. (Left) Image of crab pots and lines associated with the use of these pots, showing the general type of line that may have fouled the propeller, rudder or propeller shaft of the MARY B II to an unknown degree. (Source – Coast Guard). (Right) Underwater aft section of the

[53] Mr. [redacted] hearing testimony.

MARY B II when it was the BESS CHET during an earlier survey. The image shows potential areas where a line may have fouled. (Source - Marine Surveyor, Mr. [redacted]

Based on the fact that the underwater wreckage of the MARY B II was not located and examined and that testimony and evidence available are not conclusive on this point, there is no way to ascertain if a line in the propeller, rudder, or associated components of the MARY B II caused a reduction of maneuverability or speed as it attempted to enter Yaquina Bay Bar.

5.5.5. Personnel on the CG boats observed the MARY B II slow down. Observations from the Coxswain on the VICTORY suggest the vessel was making between 1.3 and 2.0 knots. The analysis of the vessel's transit using the OSU marine X-Band radar tool indicates the vessel's average speed during her approach at the time the vessel deviated from the centerline of the channel was 3.8 knots. Regardless of the MARY B II's actual speed, the vessel was not transiting fast enough to successfully cross the bar during the lull period.

5.6. Examination of Aids to Navigation at Yaquina Bay Bar

5.6.1. The Coast Guard is responsible for the establishment and maintenance for aids to navigation (ATON) on the waterway. The waterway was configured as indicated in the image below.

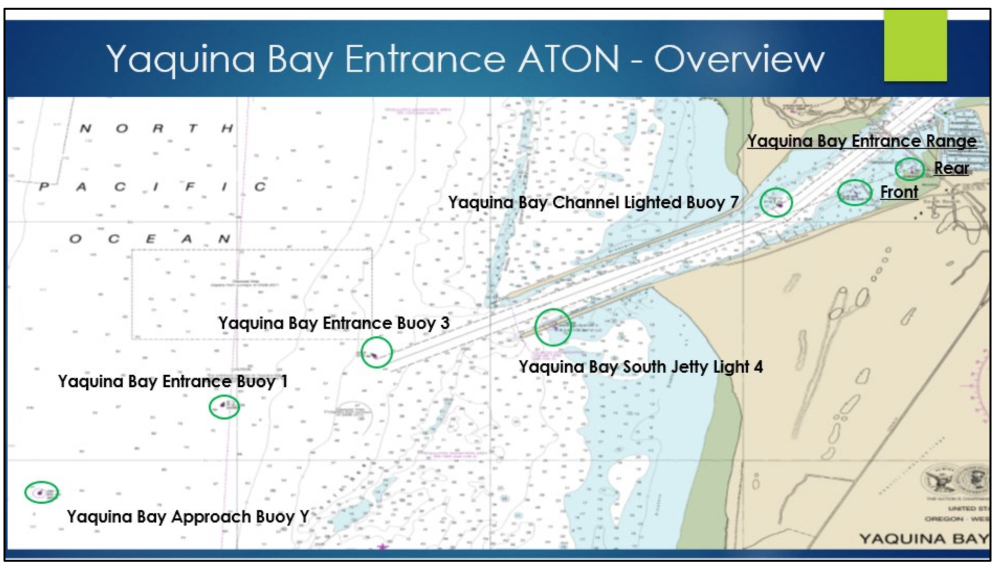

Figure 57. Aids to navigation associated with the MARY B II accident. This image depicts the total and charted aids to navigation on the Yaquina Bay Bar and channel. (Source – Coast Guard, CG Exhibit 052)

On the accident night, this was the configuration of the aids to navigation for the entrance to the waterway. As required by Coast Guard policy, a post-accident assessment of the ATON was conducted to document the aids' functional status and to ensure that the aids were working properly. All aids were examined and the image below indicates that status of the buoys, lights and ranges.

Due to the extreme sea conditions at this deep-water bar, there is difficulty in maintaining the aids on station, the ATON are susceptible to frequent damage. The International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) mandates the various schemes that are used globally to mark waterways. In the case of Yaquina Bay Bar, the IALA convention requires top marks on certain ATON and on lights. IALA describes a top mark as, “one or more relatively small objects of characteristic shape or colour (or both), placed on top of a navigation mark (or buoy) to identify it.” In the case of the floating aids to navigation offshore of Yaquina Bay there are no top marks on the top of the buoys.

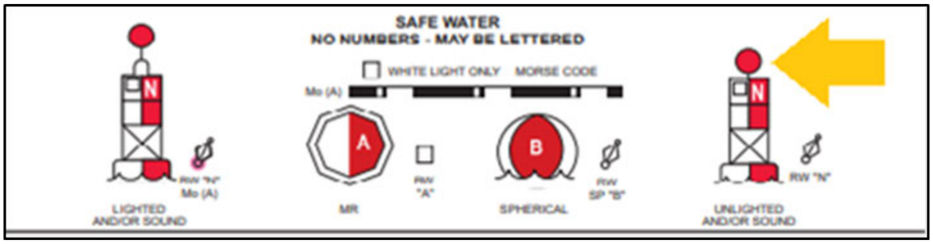

Figure 58. Image from a screen capture from the Coast Guard Light List showing a top mark (yellow arrow) which is a component of a buoy. Under normal conditions the furthest offshore buoy, “Y” buoy and others large buoys at Yaquina Bay would be equipped with a top mark. (Source – Coast Guard)

In the case of Yaquina Bay, the top marks on two of the offshore aids and the dayboards on South Jetty Light 4 were not installed and this was noted in the Coast Guard Light List, Volume VI, Pacific Coast and Pacific Islands. The Light List is updated anytime there are changes to the ATON such as discrepancies and changes to the ATON on the waterways. The image below indicates the notations about the principal ATON for Yaquina Bay Bar.

Yaquina Bay

9575 645	- *Approach Lighted Whistle Buoy Y*	44-35-51.761N 124-06-46.811W	Mo (A) W		5	Red and white stripes.	AIS: MMSI 993692047 (21). No topmark will be shown on this aid as required by IALA standards due to weather.
9580	- ENTRANCE RANGE FRONT LIGHT	44-37-08.018N 124-03-34.052W	Q R	25		KRB on multi-pile structure. On same structure as Yaquina Bay Channel Light 8.	Visible 1.5° each side of rangeline.
9585	- ENTRANCE RANGE REAR LIGHT 386 yards, 061° from front light.	44-37-13.566N 124-03-20.038W	Iso R 6s	52		KRB on skeleton tower on multi-pile structure.	Visible 1.5° each side of rangeline.
9590	- *Entrance Lighted Gong Buoy 1*	44-36-13.871N 124-06-03.359W	Fl G 2.5s		4	Green.	
9600	- *Entrance Lighted Buoy 3*	44-36-26.310N 124-05-27.408W	Fl G 4s		4	Green.	Maintained from May 1 to Oct. 1.
9605	- SOUTH JETTY LIGHT 4	44-36-33.906N 124-04-45.834W	Fl R 2.5s	17	4	Triangular skeleton tower on jetty.	AIS: MMSI 993692048 (21). Due to heavy weather conditions, the dayboards have been permanently removed from this aid.

Figure 59. Extract of Coast Guard Light List VI for Yaquina Bay Bar showing the characteristic of the ATON for the waterway and various notations about the top mark and day board removal. (Source – Coast Guard)

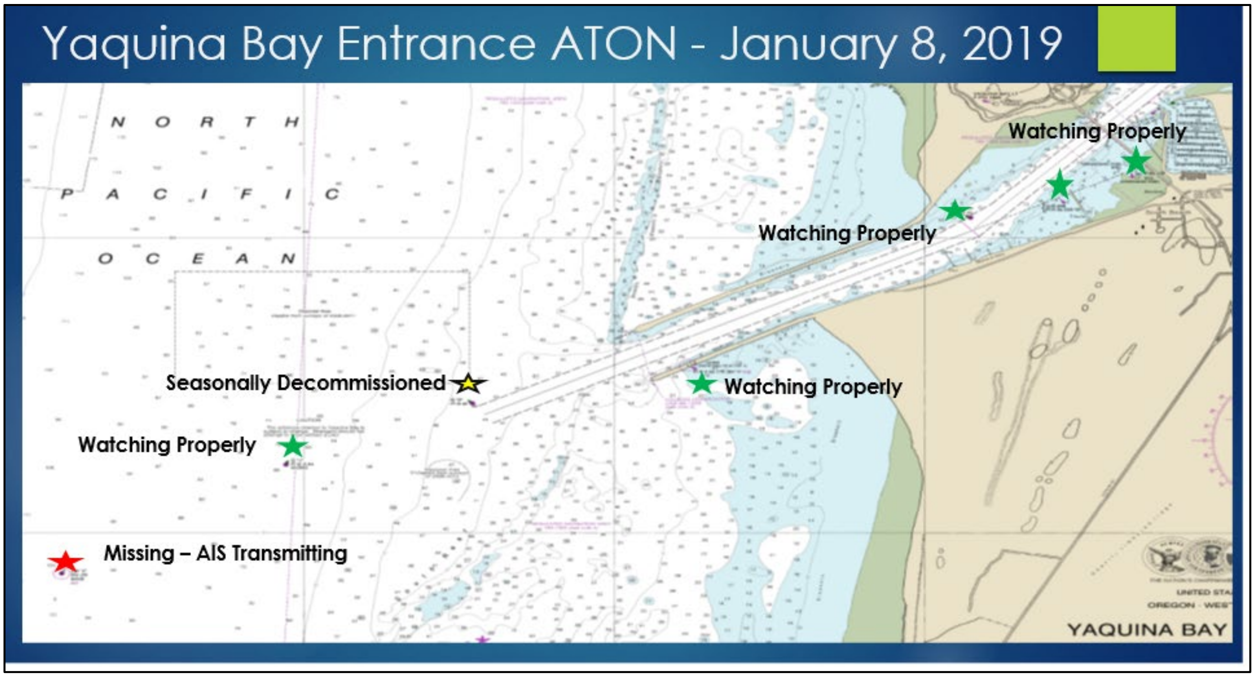

Figure 60. The status of ATON on the accident night. Note, lighted channel buoy 3 although listed as "seasonally decommissioned" the buoy had sunk and was reported missing in August 2018 and could not be recovered as of the accident date. Buoy "Y" was also sunk. (Source – Coast Guard, CG Exhibit 052)

Examining hearing testimony and the Coast Guard records maintained for these ATON, there is considerable difficulty in maintaining the floating aids on station. Multiple ATON have sunk. In the case of Approach Lighted Whistle Buoy "Y," the physical aid was sunk at the time of the accident although there was an electronic aid to navigation called virtual AIS for the approach buoy.[54,55] Entrance Lighted Buoy 3 is designated as a seasonal buoy and based on schedule would have been maintained from May 1 until October 1 of any given year.[56] Entrance Lighted Buoy 3 sank in August 2018. After it sank, the Buoy was not reestablished because of the lack of Buoy Tender resources with the appropriate heavy lift capabilities.

5.6.2. Both Buoys "Y" and "3" were documented as missing, located on the bottom, but were not hazards to navigation. There is one Coast Guard heavy lift buoy tender in the D13

[54] Aids to Navigation (ATON) may be enhanced by the use of an automatic identification system (AIS). AIS is a protocol for the broadcast or exchange of navigation information between vessels, aircraft, and shore stations. AIS ATON can autonomously, and at fixed intervals, broadcast the name, position, dimensions, type, characteristics, and status from or concerning an aid to navigation. AIS ATON are either physical (AIS-ATON messages are broadcast from a transmitter located on the buoy or beacon), synthetic (AIS-ATON messages are remotely broadcast, typically from shore, to the assigned position that corresponds with an existing buoy or beacon), or virtual (AIS-ATON messages are remotely broadcast, typically from shore, to an assigned position that has no corresponding physical buoy, or beacon).
[55] On February 5, 2019, "Station Yaquina Bay reported buoy sinking on December 10, 2018" was entered by District 13. A different entry December 2, 2016 by District 13 that stated "Installed AIS transmitter for electronic synthetic signal for Yaquina Bay Approach Lighted Whistle Buoy "Y"."
[56] In examining the Aid's historical documentation, Buoy "3" was established in June 19, 2018 by the CGC FIR. An entry was noted to state, the buoy was reported missing August 20, 2018. A NOAA vessel scanned for this ATON and found it located on station but on the ocean's bottom.

area of operation. That vessel, the Coast Guard Cutter FIR, was undergoing extensive maintenance on the East Coast and there was no vessel available to locate, grapple, and hoist the sunken buoys for refurbishment. Re-establishment of the Approach Lighted Buoy "Y" and the recovery of Entrance Lighted Buoy "3" were projects that had to wait until a heavy lift buoy tender from another District and replacement hulls for the buoys were available or the Cutter replacing the Cutter FIR arrived. During the periods where these ATON were discrepant, mariners were made aware of these discrepancies through BNM and local notice to mariners (LNM) that would be updated when the ATON discrepancies were corrected or the conditions changed.

There is an extensive list of discrepancies for the floating ATON in the Yaquina Bay and other coastal bar offshore environments caused by that extreme weather and sea conditions and the operation of vessels in that area. Testimony indicated that there are no buoy types in the Coast Guard inventory that are specifically designed to withstand the large seas and breaking surf found at the bars along the coast and available for this purpose.

Yaquina Bay is not unique regarding the difficulty in maintaining ATON in these extreme environments. To illustrate this, one of two critical navigation buoys marking the approach to Depoe Bay, OR (Lighted Whistle Buoy 2) sank on January 4, 2019. In addition to a flashing red light, the buoy is equipped with a bell to assist mariners in periods of reduced visibility. There is a set of ranges marking the approach to the harbor but this buoy marks the edge of a rock shoal. Depoe Bay is also a RNA due to a hazardous bar and a narrow rock bounded entrance. This buoy is not a seasonal buoy and was reported missing and at the time of the May 2019 MARY B II Public Hearing it was still missing as there was no heavy lift buoy tender to raise and replace this buoy back on station.

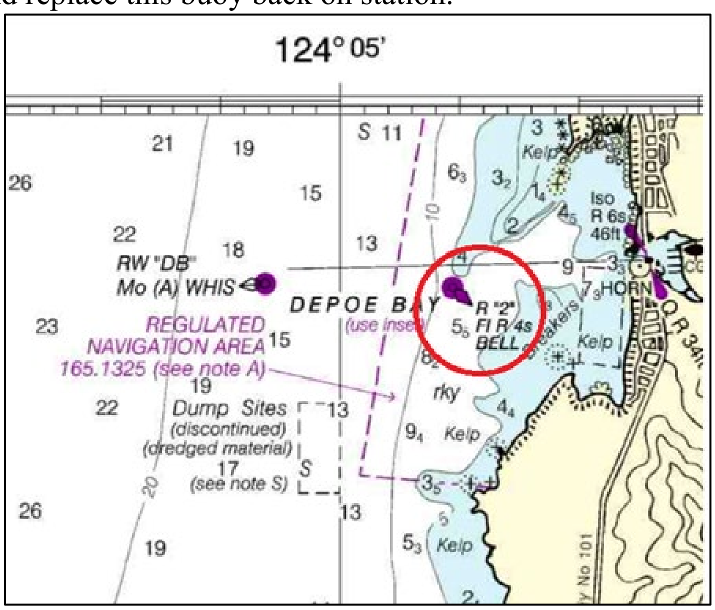

Figure 61. Depoe Bay approach buoys, the lighted buoy circled in red sank on January 4, 2019. Note the navigation ranges as magenta tear drop shapes in the right side of the image in the light yellow landmass. (Source – NOAA Chart 18561)

In the communications between the two escort vessels and in communications between the Coast Guard and the MARY B II, Entrance Lighted Buoy 3 is repeatedly referenced as a position or a marked reference point despite Buoy "3" not physically being present, as it was seasonal, and in actuality it was sunk. Throughout the course of the escort communications, any reference to Buoy “3” was based on the knowledge of where the buoy was supposed to be located or by looking at a chart. That buoy, if present, was described as useful for determining distance to the jetty ends.

Entrance Lighted Buoy 3 was identified as a seasonal aid due to the fact that it had been so difficult to maintain on station. The buoy had been sunk repeatedly over the years either due to environmental action or vessel collisions. From 1964 until 1973, it was a continuous year-round buoy but there was a considerable discrepancy history with the buoy. In those 9 years, there were 19 discrepancies of various types. Buoys of this type are expected to be serviced annually. In 2006, there was another attempt to make it permanent after upgrading the lighting. In testimony, a variety of experienced local witnesses were asked about the importance of this ATON.

> *Q. In your opinion, does not having buoy 3 on station affect the safe navigation as a vessel prepares to enter the bar?*
> *A. Yes, it is very advantageous to have it on location. It helps you pinpoint your position relative to the bar as you get closer.*[57]

One witness indicated that, in winter conditions, crab fishermen may have problems with Entrance Lighted Buoy 3 being on station due to it potentially being in the way during transits. The Commanding Officer at Station Yaquina Bay, an experienced Coast Guard vessel operator who has been in the area for 10 years, stated that it is very advantageous to have a physical Buoy 3 on station. In his opinion, it provides a visual reference and helps mariners pinpoint their position as they approach the bar.

The lack of the physical buoy at the charted location, in combination with numerous references from Coast Guard personnel and with the operator’s lack of experience with the Yaquina Bay Bar may have impacted the operator’s understanding of the MARY B II’s proximity to the hazards of the jetty tip.

5.6.3. South Jetty Light 4 located on the South Jetty is also vulnerable to the pounding of the breaking surf at Yaquina Bay.[58] At one time, there was a light on the North Jetty, designated as North Jetty Light 5. This light was removed in later 1980 due to the deteriorating condition of the rocks providing the foundation for the light structure, so the Jetty Light was relocated and established as South Jetty Light 4.[59] On the night of the accident, there was no light marking the North Jetty, providing visual reference to that hazard similar to the light on a tower located on the South Jetty which is also equipped with an AIS transmitter. To contrast the waterways between Yaquina Bay Bar and Barnegat Inlet, NJ, the frequent waterway used by the Operator of the MARY B II, both the rock jetties in Barnegat

[57] Mr. [redacted] hearing testimony.
[58] Since 2016, this Aid was destroyed by inclement weather and sea state three times. The permanent aid has been reestablished on multiple occasions.
[59] Yaquina Bay North Jetty Light disestablishment records, CDR Harris hearing testimony.

Inlet were equipped with Coast Guard maintained lights, referred to as a gated pair of ATON on the jetties.

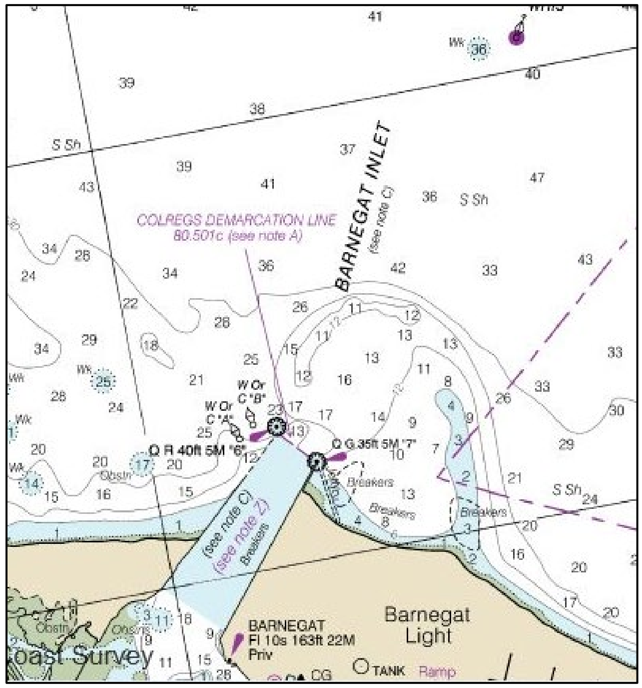

Figure 62. Screen capture of NOAA Nautical Chart 12323, Barnegat Light entrance, showing the pair of ATON lights with the magenta teardrop symbol that marks the jetties. (Source – NOAA Chart 12324)

However, the ATON structure of Barnegat Inlet differs significantly from Yaquina Bay. The extreme conditions of the Pacific Northwest, particularly the strong surf, prohibit the establishment and sustainability of ATON at the tips of the jetties. Whereas, on the East Coast, Barnegat Inlet is able to maintain lighted ATON on the jetty. In describing the lighting of the jetties in the Pacific Northwest, the Coast Guard Waterways Management witness stated:

Yeah, so we have 13 jetties up and down the Pacific Northwest in Washington and Oregon. Of those 13, nine have--are lit jetties, and all nine only have one jetty lit.[60]

Due to the operator's past experience, the absence of a light to mark the North Jetty may have contributed to confusion about how close he was to the unlit jetty. Instead, Yaquina Bay relies on a navigation range to mark the middle of the channel.

5.6.4. Lighted Navigation Ranges

During the escort and transit of the MARY B II into Yaquina Bay Bar, there was no discussion of using the ranges during darkness and reduced visibility. The lighted beacons that are specifically designed to mark the center of the channel. The ranges incorporate visual

[60] CDR Harris hearing testimony.

panels as seen below to let the mariner know if they are on the centerline of the channel or if they are right or left of centerline.

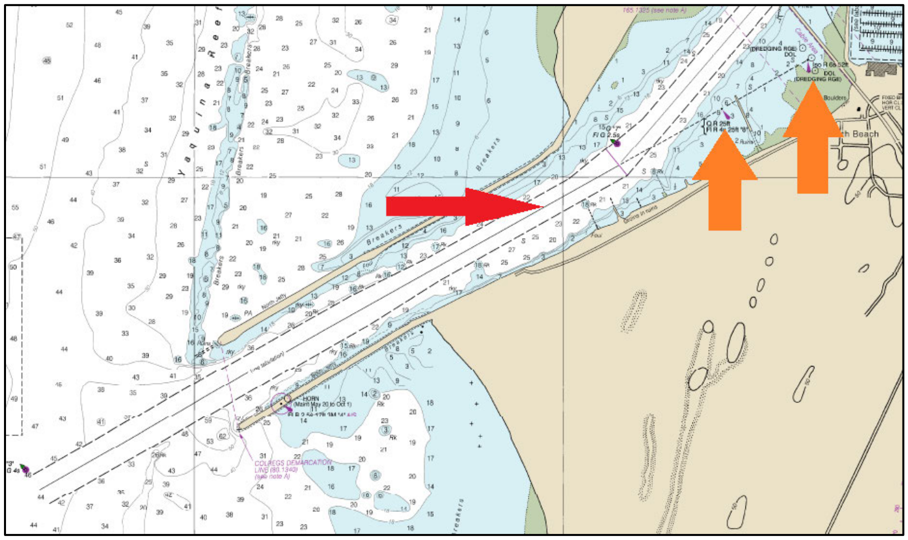

Figure 63. Screen capture of Chart 18581 showing the ranges lights (orange arrows) and the centerline of the navigation channel (red darker arrow) determined. (Source – Coast Guard, CG Exhibit 004 marked up with arrows for emphasis)

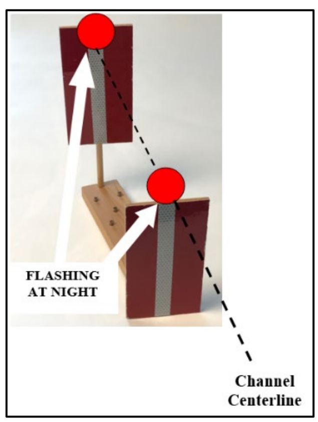

Figure 64. Coast Guard exhibit, range marker training aid. Showing the use of colored boards with vertical strips mounted on towers inside the harbor. If these two shapes were lined up as shown one on top of the other, the mariner would be on the centerline of the navigation channel. In this image if aligned with this page, the mariner would be to the left of the channel centerline and would need to steer to the right to realign the boards. (Source – Coast Guard, CG Exhibit 054, modified)

At night the mariner would rely on the range lights which flash a red light. In the case of the front range, it would show a quick flashing[61] red and the rear range ISO[62] 6 second red light. Testimony indicated that the color of range lights is determined by the need to differentiate the ranges if there is a conflict with background lighting.

[61] Quick flashing means 50 flashes per minute +/- 10 flashes. Goal is 60 flashes per minute.

[62] Isophase means a rhythmic light in which all durations of light and darkness are equal. In other words, the light is on as much as it is off.

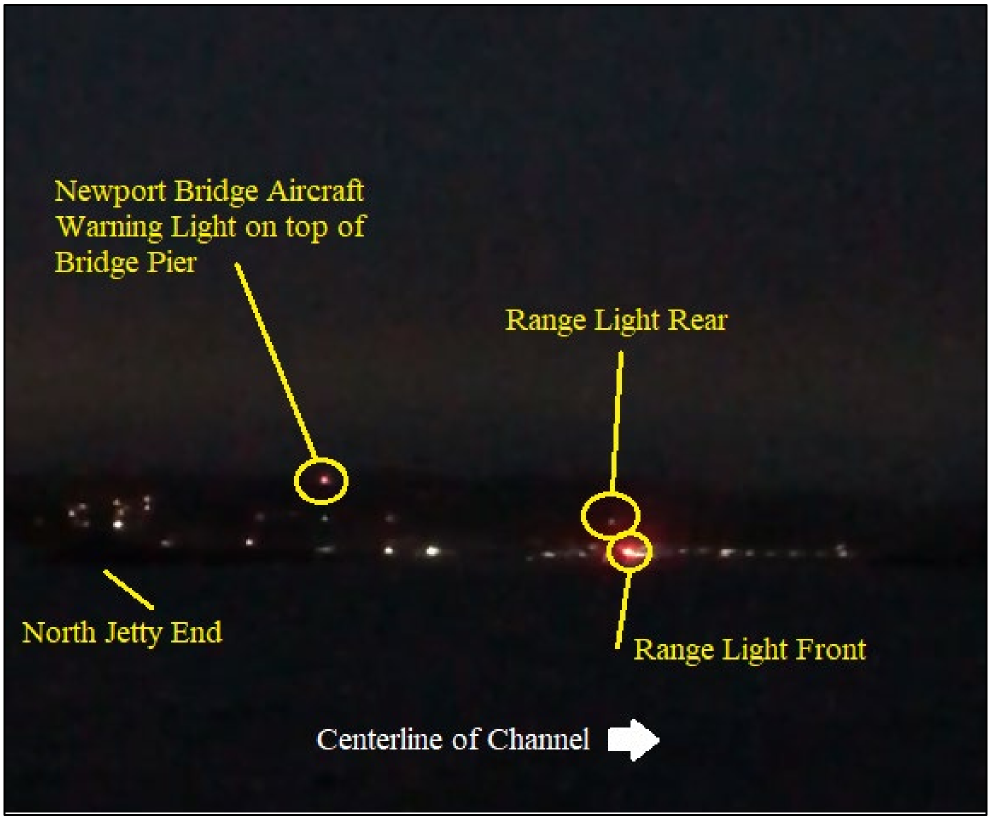

Figure 65. Cell phone image, post-accident at dawn prior to sunrise showing the entrance to Yaquina Bay Bar from near the North Jetty end and looking into the harbor approach. (Source – Coast Guard)

There is the possibility that the operator of the MARY B II experienced perceptual confusion on the red centerline navigation ranges marking the center of the channel and the center of the point between the two jetties. In the image above, the centerline of the channel is to the right of the white arrow in Figure 65. In the distance, the front range light is flashing red and slightly above that light and circled is the rear range light. To the left of the range lights, the Newport Bridge Aircraft Warning Light is also a flashing red light. When viewed from seaward, the front range and the red aircraft warning light on the top of the Newport Bridge pier form a range. The established rear range light for the range is much lower and of less intensity. The rear range light is visible but to those with limited local night transit experience this may cause conflicting information at a critical time. The location of the seaward end of the North Jetty in the photograph is indicated in the image.

(HYPERLINK # 9)

5.6.5. Waterway Assessment in Light of Particular Hazards Associated with the Bars

The Coast Guard conducts various surveys to periodically assess waterways in terms of the adequacy of ATON. This analysis, officially known as a Waterways Analysis and Management System (WAMS) study. WAMS studies often lead to adding or removing aids or alterations of technical aspects of the aids in order to meet changing needs of the waterway users. Critical waterways must be surveyed every 5 years; other waterways must have a survey on file and be updated as needed.[63] A WAMS study was conducted in late 1995 for Yaquina Bay. A "mini" WAMS study was conducted in 2006 to examine the decommissioning of an aid to navigation in the area near Yaquina Bay, Yaquina Head Lighthouse. As the Coast Guard moved to enact the rulemaking for the RNAs they conducted meetings with waterway users and solicited public comment on the establishment of those RNAs. These outreach activities coupled with the solicitation for comments were more focused on management of the waterway user and did not seek to address all the comprehensive issues related to the regulated portion of the waterway at Yaquina Bay or the other RNAs. The ATON for the waterway were not examined to determine if those aids were adequate for the unique risks associated with the hazards of bar crossings.

The Coast Guard uses another tool to evaluate the risks associated with waterways. This is called a Port and Waterways Safety Assessment (PAWSA) and it is a risk assessment process to identify major waterway safety hazards, estimate risk levels, evaluate potential mitigation measures, and set the stage for implementation of selected measures to reduce risk. The process involves convening a select group of waterway users and stakeholders and conducting a two-day structured workshop to meet these objectives. A sponsor (for example, a Captain of the Port) is required to initiate and manage the workshop, however, the process must be a joint effort involving waterway users, stakeholders, and the agencies/entities responsible for implementing selected risk mitigation measures.

In the 1996[64] WAMS, the waterway was categorized as "non-critical." This classification was changed in 2003 to "navigationally critical" though, while not required, no WAMS study was conducted to assess the conditions of the waterway in relation to Aids to Navigation and other considerations at the time of re-designation. When the RNA for hazardous bars was established, it was because these waterways required additional regulation to ensure safety of life. In 2009, the Coast Guard recognized the risks of that area and took action to mitigate the risks to waterway users by establishing RNAs for hazardous bars. Identification of this risk at this point did not prompt the Coast Guard to conduct a WAMS survey to reassess the adequacy of the existing ATON configuration. The waterway classified as "navigationally critical" would prompt the Coast Guard to examine the effectiveness of the Aids to Navigation in the waterway and it would slightly increase the priority to respond to Aids to Navigation outages and other related issues that affect navigation.

There is no interim assessment tool that has been used to determine if the Coast Guard is comprehensively managing the waterway to reduce the risks associated with the hazards of the bars. There is no harbor safety committee for the port of Newport, Oregon.

5.7. Effects of the Commercial Pressure on Fishing Operations and in Particular the Dungeness Crab Fishery

Commercial pressure in fishing, in general, is divided into two distinct areas of adverse effects. The first is the existing commercial environment related to season lengths, start dates, vessel

[63] Coast Guard Commandant Instruction M16001.1.
[64] The WAMS was conducted in late 1995. Testimony indicated that the survey was labeled as the Yaquina Bay WAMS Study 1996.

overhead costs, regulations, price for the catch and other factors. The other area is the effect of commercial pressure on vessel operations. A vessel operator must fish efficiently to make money. In the case of the Dungeness crab fishery, the operator of a vessel must know how to rig traps, position and haul traps and understand the challenges of the bar crossings and the hazardous winter Pacific Northwest weather. Both of these areas of commercial pressure were to have an effect on the MARY B II, competing against the safety needs of the operation.

Dungeness crab fishing is a highly competitive business. NOAA defines "derby" fishing as a fishery of brief duration during which fishermen race to take as much catch as they can before the fishery closes.[65] The Washington, Oregon, and California Dungeness crab fisheries do not neatly fit into this definition as it is a fishery that is often open for nine months of the year, however, parts of the fishery take on "derby" like qualities. Since 1995, the fishery in Oregon has operated under a limited entry permit system which capped the number of vessels allowed to participate. In 2006, pot limits were implemented as another control measure for the fishery, which designated the amount of gear each permitted vessel could use. Both policies were designed and implemented to reduce overcapitalization in the fishery. However, the fishermen compete for the catch and the best possible market price.[66] At the start of the crabbing season, Dungeness crabbing operations are highly competitive due to the demand for the product. Nearly all crabbing vessels head to sea in the early part of the season to compete for crab and maximize profits through long hours of gear preparation, tending traps, and harvesting catch. The season start is regulated and the season usually starts before the winter holidays and New Year to allow fishermen to for Holiday demand and higher crab prices for the first boats unloading at the docks. Crabbing remains competitive through the remainder of the season. The equally dangerous Bearing Sea crabbing operation has reduced the competitive aspect of this operation by instituting "quota" crabbing. In some types of fisheries, such as some of the crab rationalization for harvesting crab in Alaska,[67] commercial pressure is somewhat alleviated by assigning each entity a quota. This is not the case in the Oregon Dungeness crab industry. The opening of the season and the harvesting of crabs can be influenced by a toxin in the crabs. Biologists monitor the crabs for this toxin. Once the toxin level is safe for the public then the State will identify the start of the season and crabbers are authorized to set their crab gear 72 hours before the start of the season. The season started late in 2018-2019.

The fish holds of the vessels are examined to ensure there is no catch aboard the vessels prior to the approved fishery opening. A hold inspection surge operation was conducted for the industry in Newport starting at noon on January 3, 2019, and the MARY B II was one of the vessels whose hold was examined. When questioned about commercial pressure in the industry, an Oregon official explained about the fair start provisions in guidance from the State of Oregon for the crab fisheries:

> *Q. Based on your experience, do those delays impact commercial pressure on vessel operators to get out there?*
> *A. Yes.*
> *Q. Can you expand on that?*

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[65] *Olympic Fishing, Race-to-Fish*
[66] Oregon Department of Fish and Wildlife, https://www.dfw.state.or.us/MRP/shellfish/commercial/crab/index.asp
[67] USCG F/V DESTINATION Report of Investigation

A. The fishermen are crabbing to make money. So the later in the season, they're losing money. There's also some concern with the holiday seasons. People want crab for New Year's and Christmas. So if the fleet can't get out and fish, you know, for crab during that time, that could affect the price of the crab and the demand for crab. So that was a concern this year for the fleet, for sure, because they were missing out on the Christmas market.

Figure 66. Crew (Mr. Porter on deck with arms extended) of the MARY B II unloading crab catch at a commercial fish processing dock. Taken January 2019. (Source – Newport News Times)

The MARY B II could fish 300 pots and there is no evidence that any pots were aboard the vessel at the time of the accident, though the precise number is unknown. Prior to the MARY B II's transit from the fishing grounds to the Yaquina Bay Bar on January 8, 2019, the vessel was going from pot to pot, and the crew would have been harvesting crabs and rebaiting traps. They would then transit to shore to sell their catch, get bait and refuel as necessary to continue fishing the traps that were located on the crabbing grounds.

Examining the potential impact of commercial pressure onboard the MARY B II, testimony[68] indicated that the captain was new to this particular crabbing industry and had rigged the buoy lines to the crab buoys backwards. The witness asked the MARY B II local crewman who was aboard when the pots were put overboard, why this situation was not resolved. During testimony, she said the crewman stated that there was not enough time to correct the gear for each pot. Failing to fish efficiently and rig gear properly would lead to a longer time on the fishing grounds than the experienced local boats that had retreated to the safety of the harbor as the gale conditions built offshore.

5.8. Weather Forecasting and Actual Conditions Encountered at the Yaquina Bay Bar

On the night of the accident, there was only about 6% of the moon visible. The minimal illumination provided by the moon that night, in its waxing crescent phase, combined with overcast skies to create an environment of poor visibility.

[68] Ms. [redacted] Hearing testimony.

The weather was deteriorating as the accident day progressed towards the time when the inbound voyage of the MARY B II commenced. The forecasted weather was aligned with the weather that was observed and the required warnings to mariner were issued by marine radio, weather radio broadcasts, bar condition reports. A gale warning was in effect for the outer waters offshore with increased winds 25-35 knots with 45 knot gusts and building seas. As the conditions changed, the Coast Guard began broadcasting radio reports warning of the deteriorating bar conditions. There was an exception to the accuracy of observations at the bar near the last period of daylight on the accident day. In hearing testimony, the Commanding Officer of Station Yaquina Bay stated:

> *The first vessel across was the LISA MELINDA. And as they were crossing, they called us and told us that our bar report was not accurate. So we got underway immediately to get an accurate bar report.*[69]

The bar report which was reported as not being accurate by the LISA MELINDA is below and the Coast Guard send boats to observe the bar and update the observed bar conditions.

> *JETTY TIPS: 4-6 FOOT EBB CHOP. MAIN CHANNEL: 4-6 FOOT LONG OCEAN SWELLS, WINDS: EAST AT 10-15 KNOTS, VISIBILITY: CLEAR AND UNLIMITED. THE BAR IS CURRENTLY RESTRICTED TO ALL RECREATIONAL AND UNINSPECTED COMMERICAL PASSENGER VESSELS AT BUOY #7.*[70]

The weather for that area was forecasted and communicated to mariners in a variety of ways. Furthermore, the weather was observed as deteriorating by other mariners who made decisions to come in earlier with more favorable sea state and wind conditions. Commercial pressure at the start of the Dungeness crab season was applied equally to all the fishermen in the area yet they recognized the dangers associated with this hazardous bar in combination with the forecasted weather conditions. Based on the available evidence, the operator of the MARY B II either had difficulty with the crabbing equipment, in effect taking longer to harvest his catch or he failed to fully take advantage of the forecasted warnings for the deteriorating weather. The MARY B II was the only vessel remaining offshore after the local operated vessel LAST STRAW crossed the bar shortly after dark.

5.9. Oversight and Regulation of the Commercial Fishing Industry

5.9.1. Credentialing and Licensing

The commercial fishing industry operates thousands of vessels on the waterways of the United States as well as the offshore waters. These vessels operate on the nation's critical waterways alongside tankers carrying hazardous cargoes, high capacity cruise ships, towing vessels and in close proximity to critical infrastructure such as bridges, locks and other infrastructure. The table below shows the requirement for some level of credential or

[69] BOSN [redacted] hearing testimony.
[70] CG Exhibit 018.

certification to operate a vessel. The state requirement for Oregon is also included for recreational vessels as the accident occurred in Oregon.

Requirements for Vessel Types as of January 2019

	Recreational Vessel	Uninspected Passenger Vessel	Small Inspected Passenger Vessel	Towing Vessel	Commercial Fishing Vessel Less Than 200 GRT	Commercial Fishing Vessel Greater Than 200 GRT
USCG Credential or License for Competency[1]	No	✓	✓	✓		✓
Operator's License from State of OREGON	Yes, Oregon (see footnote 2)	N/A	N/A	N/A	N/A	N/A
Medical Examination for Medical Fitness	No	✓	✓	✓		✓
Drug and Alcohol Testing	No	✓	✓	✓	[2]	✓
Suitability Background Check	No	✓	✓	✓		✓
Minimum Age	[3]	18	18	19,21[4]	None	21

[1] written examination and First Aid/CPR training is required (with possible exceptions)

[2] If any crew has USCG credential or license

[3] **OREGON LEGISTLATION 830.088 Operation of motorboat by person 12 to 15 years of age.** A person 12 to 15 years of age with a boating safety certificate may operate a motorboat with an engine of 10 horsepower or less. In addition, a person 12 to 15 years of age with a boating safety certificate may operate a motorboat with an engine greater than 10 horsepower if accompanied by and under the direct supervision of a parent, guardian or responsible person 16 years of age or older who possesses a boating safety certificate. [1999 c.716 §5

Note: See note under 830.082 **830.090 Operation of motorboat by person 16 years of age or older.** A person may operate a motorboat with an engine greater than 10 horsepower if the person:
(1)(a) Is at least 16 years of age; and
(b) Obtains a boating safety certificate pursuant to ORS 830.086; or
(2) Is accompanied by and under the direct supervision of a person 16 years of age or older who has obtained a boating safety certificate pursuant to ORS 830.086. [1999 c.716 §6]

[4] For mate of towing vessels it is 19, and for mate or master of fishing industry vessels, master of towing vessels, and master 100 GRT, it is 21. See 46 CFR 11.201(e).

Figure 67. Table showing the requirements for mariner to operate various vessel types. (Source – Coast Guard)

The maneuverability, navigation, seamanship, and safety concerns associated with CFVs are the same as those for other vessels listed in the above table. Depending on the type of fishery, these concerns are actually heightened for CFVs compared to passenger vessels, for example. Yet, there is no requirement for licensing of personnel operating or forming part of the crew on CFVs.

Other vessels in commercial service such as small passenger vessels, tugs, tankers, container ships all require certain types of mariners with Coast Guard issued credentials. A requirement to hold a Coast Guard issued merchant mariner credential (MMC) involves medical certifications and minimum age requirements. The credentialing process also requires a person to undergo a suitability assessment to determine if the individual has any issues that under federal law and regulations would prevent the issuing of a credential, for example driving under the influence, drug convictions, or certain criminal activities. The goal of this program is to ensure that commercial mariners do not pose a threat to the nation's waterway and shore side infrastructure in the operation of a vessel. There is no similar requirement for CFVs under 200 GT.

There are no requirements for a minimum age in the operation of a CFV. During the public hearing, witnesses attested to having started their careers at a young age, as early as eight and 16 years old. Having operators and crewmembers who are that young on vessels involved in such high risk and hazardous fisheries is a monumental safety risk. The negative effects of this lack of age restrictions have not been measured because occupational safety experts are not allowed, by law, to include minors in their studies. Hearing testimony from a NIOSH representative highlighted the seriousness of this issue.[71]

5.9.2. Training Requirements for CFV Operators

The Coast Guard Authorization Act of 2010 (Public Law 111-281) added a subsection in 46 USC § 4502 that requires an individual in charge of a CFV that operates three nautical miles beyond the territorial sea baseline to pass a training program and hold a certificate issued under that program. The training program must address certain topical areas and it must be based on professional knowledge, skills, and competencies that includes, but are not limited to: training in seamanship, stability, collision prevention, navigation, firefighting and prevention, damage control, personal survival, emergency medical care, emergency drills, and weather; require an individual to demonstrate ability to communicate in an emergency situation and understand information found in navigation publications. The proposed training program also must recognize and give credit to the individual seeking this certification for recent past experience in fishing vessel operation.

Enacting the provisions in 46 USC§ 4502 and seeking fishing industry input on that effort would create a process to document the competency of the people that operate the smaller commercial fishing vessel on our busy and congested waterways. It would also create a pathway to professionalize the marine operations of the commercial fishing industry. Establishing a training certificate that would be valid for 5 years after which some form of refresher training will be required to keep the certificate of competency current.

As an example, the existing safety equipment requirements call for Coast Guard Light Lists and the Coast Pilots. Both documents contain important and updated information for mariners. At this point, there is no requirement to determine if a commercial fishing vessel operator knows how to use and extract information from those tools. The establishment of operator competency outlined in the Authorization Act may have closed the gaps that contributed to this casualty such as seamanship, familiarity with the waterways, understanding navigational information in publications, and the significance of maritime weather's impact on the risks to vessel operations.

The regulations, policies, and procedures to put this training requirement and resultant certification in place have not been established.

[71] Dr. [redacted] hearing testimony.

5.9.3. Dockside Safety Examination Program

The Coast Guard conducts dockside safety exams which examine safety and lifesaving equipment and other critical systems. The Coast Guard supports and requires that certain crew have safety and survival training and the crews conduct safety drills.

The MARY B II was constructed of wood and built in 1957. There is no requirement at present for the inspection of the material condition of CFVs, like the MARY B II. These vessels may have commercial marine surveys periodically but these surveys do not typically examine the material condition of the vessel's hull, engine and other critical equipment unless an observation is made in the course of the survey and the surveyor brings that condition to the attention of the owner in the survey report. There are no regulations for a vessel such as the MARY B II for modifications in design, construction materials, and stability. Another area where the CFV Examinations lack rigor is the absence of a requirement to verify whether drills were conducted with the crew, in other words, there's no requirement to log the drills so nothing the examiner can review to ensure the requirement is met.

Additionally, there is no adequate or practical requirement for lookout and standing a proper watch. During hearing testimony, the CFV Examiner highlighted this issue stating that fishing vessels need a proper lookout, but can be underway for days without restriction and the operator can be the sole person onboard. When asked how a vessel can maintain a proper lookout when the vessel is underway for three days straight with only one operator onboard, the witness agreed that it could not be done.[72]

At Yaquina Bay, uninspected passenger vessels and recreational vessels are subject to restrictions based on the conditions at the bar. It is important to note that the majority of these vessels are given hull identification numbers. In the case of recreational vessels, those vessels are subject to federal regulations in a host of design considerations such as transom height, weight restrictions, flame arrestors, etc.

Taken as a whole, the lack of regulation and oversight of the commercial fishing industry results as a latent unsafe condition (LUC) to the crews of these fishing vessels and in countless Coast Guard and other agency interactions to search for, tow, rescue and respond to fishing vessel accidents. These accidents endanger the rescue crews and result in the tragedy of missing, dead and injured fishermen.

5.10. Loss of Situational Awareness Aboard the MARY B II

5.10.1. At approximately 9:57 p.m., the MARY B II began the approach to the Yaquina Bay Bar with the VICTORY following astern and the CG 47266 inside the jetty tips marking the approximate center of the channel. Based on the OSU marine X-Band radar plot, the MARY B II was slightly to the left of the center of the channel. At approximately 10:04:30 p.m., the MARY B II began a slow movement towards the North Jetty tips and the submerged jetty tip. The cumulative effects of the wind, seas and the north setting coastal current would influence

[72] Mr. [redacted] hearing testimony.

the movement of the vessel. OSU prepared a chart[73] showing the effects of the current and the general set of the current is to the north or north-northwest at approximately 0.5 knots. From 10:04:30 p.m. until the time that the MARY B II was observed to capsize shortly after 10:07 p.m., the vessel moved slowly off the centerline of the channel to the northeast and the end of the North Jetty.

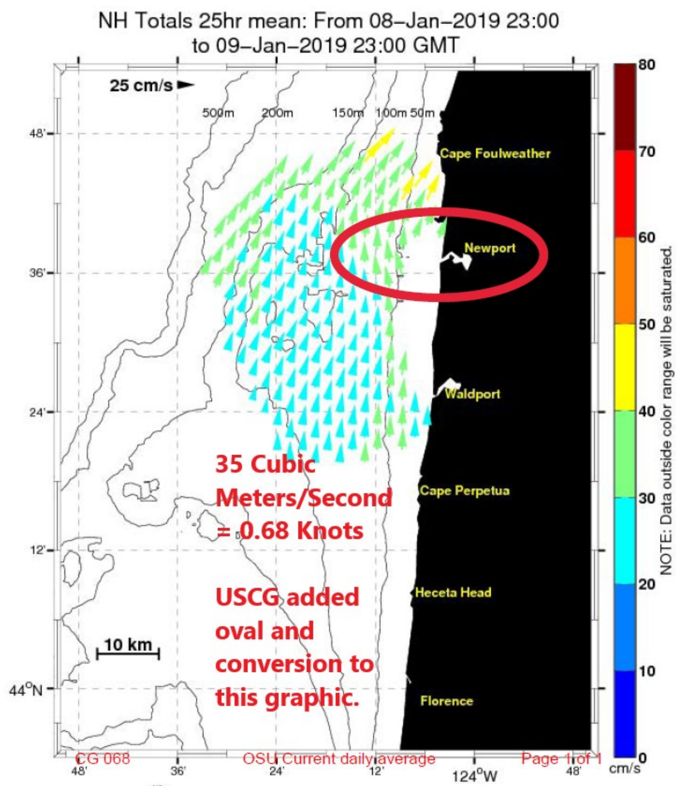

Figure 68. Image showing the current velocity and generally northward direction off the Oregon Coast on the night of the accident. Red circle highlights the Yaquina Bay Bar. (Source – Coast Guard, CG Exhibit 068 with CG labels)

Critical events along the transit track for the MARY B II were:

Both VICTORY and MARY B II are slightly left of the centerline of the YAQUINA BAY BAR channel.

09:57 PM MARY B II begins inbound run to Yaquina Bay Bar
09:58 PM VICTORY tells CG 47266 ".....this guy is not riding good in the water. Like he's not a very stable boat, hes [sic] got on outrigger halfway out,…"
10:00 PM MARY B II "Yeah, I see your blue light there, I'm working my way to the North side here now."
CG 47266 "Roger captain, uh I advise that you don't work over to the North too soon. Uh it is starting to break on that North side on the dumping grounds. And there is also a wrap around break on the North side of the channel. Over."

[73] CG 068 OSU Current Daily Averages 08 Jan 2019.

MARY B II "Yeah I got you guys, alright. Lemme pay attention here, cause so many vessels here now I got AIS going off on my Plotter here. Clogging it up."
10:03 PM VICTORY identifies speed as "two knots"
10:04 PM VICTORY warns MARY B II that there is a 16-footer building "behind you"

MARY B II having moved to the center of the channel starts moving off the center of the channel and towards the submerged portion of the North Jetty

10:05 PM CG 47266 communicates sea state to VICTORY and suggests that MARY B II might want to go bow in and stem the seas or push all the way in.
VICTORY calls out that "This is the set right here" twice and the MARY B II acknowledges "Yeah roger, roger, I see it"
10:06 PM CG 47266 "You're looking like your heading very, very far north right now. You might want to come south just a little bit." VICTORY calls out danger and tells the MARY B II to come to starboard twice.

As the MARY B II started the inbound run in the Yaquina Bay Bar channel, the seas were breaking at heights up to 14-16 feet and in a manner that was dangerous. During the preliminary radio communications with the CG escort boats the only communications to the CG was that first there were lifejackets available and then as the inbound transit began the Operator said the crew was putting on lifejackets. There was no communication to the CG escorts about how the MARY B II would make the transit, station a lookout, speeds for the transit or any indications about problems that might restrict the speed of the vessel like the potential for line entanglement in the propeller or rudder.

5.10.2. Lookout Onboard the MARY B II Observing Following Seas

It is a good marine practice that while crossing a bar, operators of CFVs will station a crew person at a rear facing position to watch the breaking waves and relay information about the timing, character and speed, or force, to the person steering the vessel. There is no evidence available to confirm whether a lookout was posted on board the MARY B II on the night of the accident. VICTORY was several hundred yards astern of the MARY B II and was essentially acting as a lookout and giving information on incoming sets over the radio during inclement weather.

The physical location of the crewmen of the MARY B II leading up to and at the time of the capsizing is uncertain. CG witness observations indicated that no persons could be seen on the MARY B II's deck during the escort evolution. There was also testimony the CG personnel could not see inside the MARY B II's wheelhouse. It is probable, given the weather conditions, both of the crew were inside the wheelhouse with the operator. The operator of the MARY B II might have reasoned that there was no need for a lookout given that the CG was present and providing sea condition observations and an escort. It is also possible that one or both of the crew were located near the only door to the wheelhouse, acting as a lookout.

5.10.3. Crewmembers Entered the Water

Alternate possibilities exist for the reason the two crew entered the water and this investigation was unable to determine how this occurred with the available evidence. The door may have been slightly open as a crewmember was standing inside the cabin while calling out wave information. Their proximity to the door could be a reason the two crew were washed out of the cabin and into ocean. There is a possibility that the crew could have attempted to jump from the vessel as the MARY B II was in extremis and the impending series of large waves was about to impact the vessel. The crewmen could have been washed out of the MARY B II if the door to the wheelhouse was closed at the time of the capsizing but the forces acting on the wheelhouse as it rolled in the water caused the door to wrench open and the crewmembers were swept out of the wheel house and into the water.

5.10.4. Port Outrigger Partially Deployed

At 9:58 p.m., the VICTORY noted that one of the MARY B II’s 45-foot long outriggers was partially out and testimony indicated that the Coast Guard crews did not observe a stabilizer vane or “bird” in or near the water. There is no way to determine if the crew saw the outrigger partially out and this caused a distraction or a reduction to maneuverability during the critical portion of the inbound transit.

5.10.5. AIS Targets Clogging the MARY B II Chartplotter

Following an examination of the available evidence, the investigation has concluded that the MARY B II had an electronic chartplotter that was capable of displaying AIS vessel targets on an electronic chart screen in the vessel’s wheelhouse. The MARY B II was not capable of transmitting an AIS signals. The captain had ordered an ICOM® marine radio that was also capable of receiving AIS transponder information and along with that equipment he ordered a VHF/AIS antenna and a Garmin® NMEA 2000 interface cable which would connect the ICOM® marine radio with the AIS capability to the 10 inch color chartplotter. As the MARY B II was approaching the bar, the display unit most likely would have displayed several AIS targets on the electronic chart. Depending on the display settings and chart scale for the navigation chart being utilized on the screen, the VICTORY, CG 47266 and South Jetty Light 4, which was equipped with virtual AIS ATON would be displayed. Entrance Lighted Buoy Y’s position would have displayed on the chartplotter depending on the scale settings because a virtual AIS signal was being transmitted to electronically mark the location of the entrance buoy.

The marine radio that was equipped with an AIS receiver was purchased on December 4, 2018. It is not known when the equipment was installed on the vessel and connected to the existing chartplotter. As a result of the installation of this new equipment the operator would have to familiarize himself with the details of the operation of that new equipment.

5.10.6. Coast Guard Vessels’ Impact on the MARY B II Through Use of MK-127 Illumination Parachute Flares

The VICTORY communicator who is the Commanding Officer of CG Station Yaquina Bay made the following statement during questioning at the hearing:

And then once an escort begins, it's best to keep the communication to a minimum other than us reporting the series, talking about lighting off flares. And the reason we do that is because you could easily distract someone as they're trying to cross the bar.[74]

During the inbound transit of the vessels both Coast Guard vessels fired night illumination into the night sky. There was virtually no ambient light to illuminate the hazards along the transit on this accident night. Prior to the transit starting at 9:47 p.m., the VICTORY told the MARY B II crew that they would be putting up the flares. The flares are launched near vertically and provide bright, intense white light that lasts approximately 36 seconds as the flare descends under a small parachute. Although the launching of the flares might be viewed as distracting the flares were an essential tool to provide illumination on an overcast night with little moonlight.

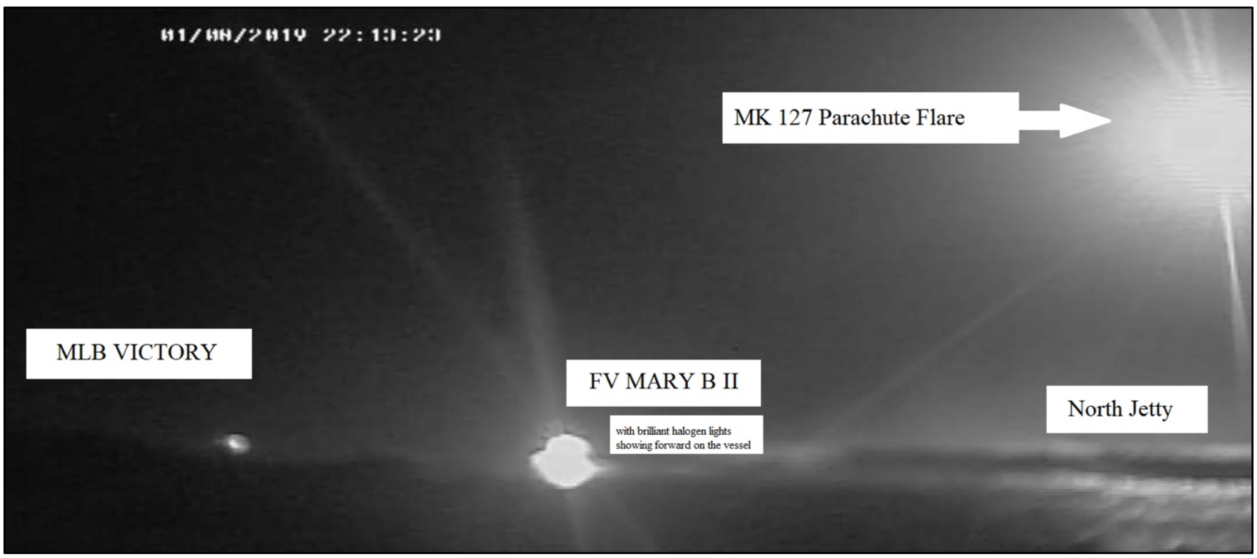

Figure 69. Screen capture from Oregon State Police closed circuit TV camera located in the vicinity of the South Jetty showing the illumination provided by the descending flares. To the right you can see the visible portion of the North Jetty (Source – Coast Guard, CG Exhibit 032 screen capture)

At approximately 10:00 p.m., the captain of the MARY B II made the following statement below and as a result the Coast Guard vessels sought to reduce communications to prevent distracting the operation of the vessel during the critical phase of the inbound transit.

"Yeah I got you guys, alright. Lemme pay attention here, cause so many vessels here now I got AIS going off on my Plotter here. Clogging it up."

5.10.7. Incapacitation of the Crew

At approximately 10:05 p.m., the VICTORY called out to the MARY B II on the radio "this is the set right here" twice and the MARY B II answered, "Yeah roger, roger, I see it."[75] The managing owner identified the speaker in these radio calls to be captain Biernacki. There

[74] BOSN [redacted] hearing testimony.
[75] CG Exhibit 008.

were no other communications from the vessel made by other personnel. In the post mortem medical examination of the captain, the attending physician noted a laceration on the scalp and in the hearing testimony noted:

> *The scalp laceration showed no swelling. It didn't show any opening or underlying spread of tissue. It was bleeding minimally, and scalp lacerations typically bleed more in people that are actively pumping. It was my opinion that was a postmortem scalp laceration.*[76]

There were not significant findings that would be associated with an incapacitating injury for the captain of the MARY B II.

During the escort, Coast Guard personnel did not see anyone on the deck of the vessel and could not see into the vessel's wheelhouse. There is no way to determine if there was any action that caused incapacitation of one or more of the crew.

5.11. Impairment of the MARY B II [redacted]

5.11.1. The commercial marine industry as a whole subjects the persons who operate those vessels on America's busy and congested critical waterways to drug and alcohol programs intended to insure that drugs and alcohol are not used while operating those vessels. This is not the case for CFVs. Mariners on other commercial platforms are generally subjected to pre-employment, random, post-casualty and reasonable cause testing for drugs and, in the case of alcohol, post-casualty and reasonable cause. There are serious enforcement penalties for the use of drugs and alcohol onboard commercial vessels. In the 2014 case of the F/V NO LIMITS, the captain of the NO LIMITS was charged with Seaman's Manslaughter and pleaded guilty to drinking alcohol, smoking marijuana and then taking Oxycontin® which he purchased from street dealers. Had this drug been legally prescribed the patient information warning for this drug would have stated:

> *OXYCONTIN® may impair the mental or physical abilities needed to perform potentially hazardous activities such as driving a car or operating machinery. Warn patients not to drive or operate dangerous machinery unless they are tolerant to the effects of OXYCONTIN® and know how they will react to the medication.*"

The accident resulted in the death of the two crewmembers on that fishing vessel in New England waters in November 2014.

In typical commercial marine operations, Coast Guard policy[77] for mariners discusses the use of prescription drugs or misuse of these prescriptions and the adverse effects on performance of common over-the-counter medications. An example of these over-the-counter medications would be sleep-inducing aids. The Coast Guard's posture on all forms of medications is:

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[76] Dr. [redacted] hearing testimony.

[77] USCG Navigation and Inspections Circular 04-08, Enclosure (4) Medications.

The nature of shipboard life and shipboard operations is such that mariners may be subject to unexpected or emergency response duties associated with vessel, crew, or passenger safety, prevention of pollution and maritime security at any time while aboard a vessel.

The CFV industry is not broadly subjected to drug and alcohol testing as a preventative safety measure. There is nothing that would prevent a fishing vessel owner from using drug and alcohol testing as a means to reduce the risks of accidents caused by the use of drugs and/or alcohol onboard their vessels. CFVs over 200 GT require Coast Guard credentialed mariners in certain positions such as masters, mates, and chief engineers and those vessels are required to have a drug and alcohol testing program in place. Required drug testing would include pre-employment, random testing of the crew, post casualty and reasonable cause. That safeguard is in place to mitigate the risks of drugs and alcohol onboard a vessel. This is not required on vessels less than 200 GT so this was not the case onboard the MARY B II.

5.11.2. After a marine casualty such as a sinking or grounding marine employers of commercial vessels are required to conduct drug and alcohol testing. Had the crew of the MARY B II survived, post-accident testing would have been required.

During the hearing, the Medical Review Officer (MRO) and impairment expert was asked:

Q. Based on your experience, are the navigation, seamanship and operational control duties or functions for a commercial vessel-- fishing vessel any different than they are for let's say a tugboat or a ferryboat or large passenger vessel?
A. No, they should be the same.

The safe operation of any vessel is dependent upon an alert operator who is able to make timely and critical decisions. Whether that vessel is a CFV or a passenger ferry, the standards for operating safely should be uniformly applied, as the negative consequences of an operator's impairment may be devastating.

To ensure the safety of personnel and vessels in this dangerous industry some owners require the crew to sign a crew contract and crew contracts which have provisions or clauses that require that crew persons not use drugs or alcohol while aboard the vessel.

In the case of the MARY B II, the medical examiner conducted a gross examination the bodies of the deceased and drew toxicology samples in accordance with the protocols and procedures in place at the time. The chain of custody for the samples was maintained and the samples went to the accredited Department of State Police Forensic Laboratory for analysis.

Post mortem toxicology results for the three deceased crew are indicated in the graphic below:

Crew Toxicology Post Mortem Results

Captain Stephen Biernacki

Alcohol - Ethanol 0:033 g/dL (+/- 0.002 g/dL) , Acetone – Not Detected

Amphetamine 0.17 mg/L (± 0.02 mg/L)
Methamphetamine 0.50 mg/L (+/- 0.05 mg/L)

Crew James Lacey

Alcohol –- Ethanol - Not Detected, Acetone – Not Detected
Cannabinoids

Crew Joshua Porter

Alcohol - Ethanol - Not Detected, Acetone – Not Detected
Toxicological examination fails to confirm the presence of controlled substances or common pharmaceuticals.

Figure 70. Extract of Public Hearing introductory presentation, CG Exhibit 001, page 5 showing the toxicology results for the crew. (Source – Coast Guard, CG Exhibit 001)

Scientific literature[78] indicates that there is a potential for raising of the levels of post mortem methamphetamine and the associated amphetamine levels based redistribution of those substances post mortem and the location and type of specimen draw. This scientific literature does not dispute the finding that the operator of the MARY B II tested positive for methamphetamine, an illegal and dangerous drug. Methamphetamine is classified by the U.S. Drug Enforcement Administration as a Schedule II drug, which makes it available only through a non-refillable prescription. This drug can be medically indicated for the treatment of attention deficit hyperactivity disorder (ADHD) for which prescriptions are rarely written. The street version of this illegal drug is usually acquired through illicit street sales which are illegal. This would subject the seller and the buyer, and in the case of the MARY B II's operator, to arrest and punitive sanction, if convicted.

The effects of methamphetamine on the critical decisions of the operator are profound. The issue of impairment was further explored during the public hearing. A MRO was asked what actions would be taken if this substance was detected in a credentialed mariner on a commercial vessel and stated:

> *Q. So looking at these results[79], let's say that they come from someone who is on a 68-foot commercial small passenger vessel that operates under a merchant's mariner credential let's say out of Newport, Oregon. What would happen to that mariner based on these results?*
> *A. As a medical review officer, reviewing these documents, a mariner in that situation, I would term this mariner not fit for duty and certainly not what I would call seaworthy.*
> *Q. Would the mariner be allowed to continue to operate having had the results you see on pages--14?*
> *A. Absolutely not.*

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[78] CG Exhibit 069 Antemortem and Postmortem Methamphetamine Blood Concentrations: Three Case Reports Iain M. McIntyre, Craig L. Nelson, Bethann Schaber and Catherine E. Hamm.
[79] Figure 70 – Slide from CG Exhibit 001.

Q. Sir, why is that?
A. A mariner with the presence of methamphetamine specifically--potentially also included amphetamine is--in my opinion, would be considered impaired.
Q. Based on these testing results, then, sir, what would you do?
A. I would issue effectively a stand-down order. My first call would be to the designated employee representative, which is who I'm instructed to call as a medical review officer. I would tell them that they have a mariner on board, identify the mariner, who must immediately be taken off duty. If they happen to be offshore, I would have someone inform the boat that he has to be taken off duty and return to shore at the soonest time possible.

The operation of a vessel while underway on a waterway under any conditions is an operation similar in nature and difficulty to the operation of a motor vehicle. Dr. [redacted], a forensic toxicologist is a researcher examining the effects of methamphetamine on human performance and he produced a scientific paper entitled "Methamphetamine and Driving Impairment," published in the Journal of Forensic Sciences, JFSCA, Vol. 41, No.3, May 1996, pp. 457-464. The abstract for this paper makes the following statement about operating a motor vehicle under the effects of methamphetamine.

ABSTRACT: Following a review of the effects of methamphetamine on human performance, actual driving and behavior were evaluated in 28 cases in which drivers arrested or killed in traffic accidents had tested positive for methamphetamine. The circumstances surrounding the arrest or accident were examined, together with any observations by the arresting officer regarding behavioral irregularities. The investigators also made a determination of culpability. Most of the arrests resulted from accidents in which the driver was determined to be culpable. Typical driving behaviors included drifting out of the lane of travel, erratic driving, weaving, speeding, drifting off the road, and high speed collisions. Behavioral manifestations of methamphetamine use in arrestees included rapid or confused speech, rapid pulse, agitation, paranoia, dilated pupils, violent or aggressive attitude. Combined alcohol and methamphetamine use was uncommon, however use of marijuana was evident in about one third of the cases. In addition to impairing judgment and increasing risk taking, the effects of withdrawal from methamphetamine use including fatigue, hypersomnolence[80], and depression are likely contributors to many of these accidents. A consideration of the literature and the cases discussed here, leads to the conclusion that methamphetamine at any concentration is likely to produce symptoms that are inconsistent with safe driving.

The effects of the combination of alcohol that was detected in the post mortem sampling and methamphetamine cannot be determined. The image below graphically depicts the effects of methamphetamine at low and high dose based on blood concentrations of the drug. Initially, the stimulant effect provides improved focus and reaction time.

[80] Condition where a person experiences significant periods of sleepiness.

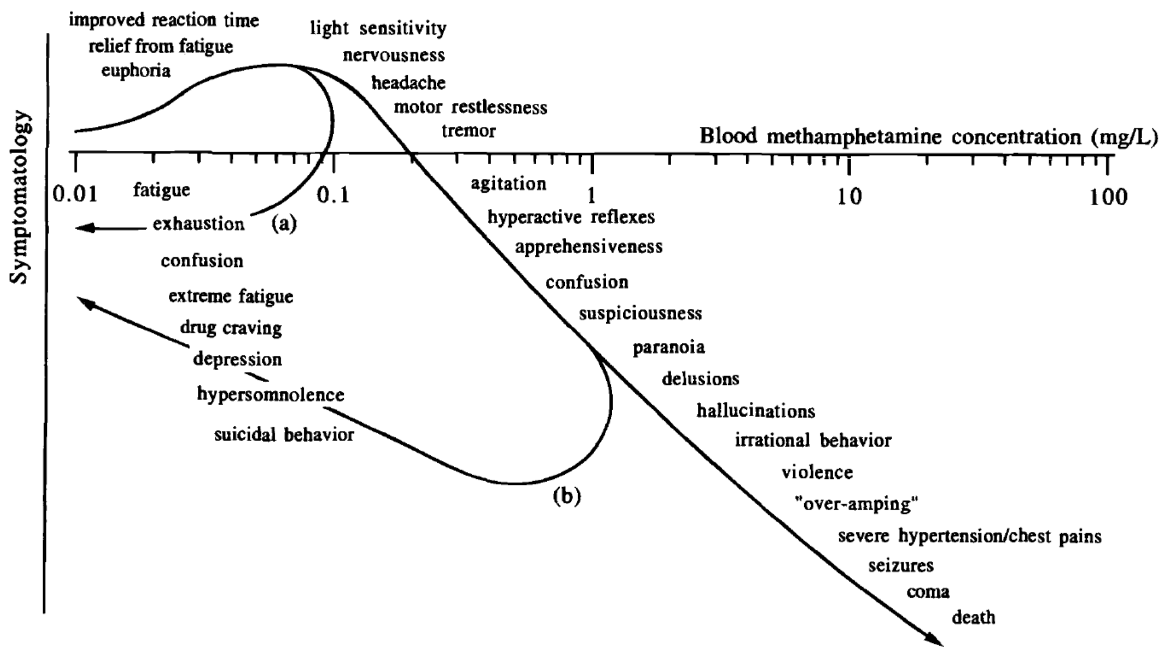

Figure 71. Hysteresis plot showing effects of methamphetamine that impact driving performance with respect to blood methamphetamine concentration (mg/L). The figure shows examples of withdrawal effects from (a) low dose and (b) high dose drug use. (Source – [redacted] "Methamphetamine and Driving Impairment," Journal of Forensic Sciences, JFSCA, Vol. 41, No.3, May 1996, pp. 457-464)

One of the crew of the MARY B II post mortem tested positive for cannabinoids the most notable being THC, the primary psychoactive compound in marijuana. This testing result was from the initial drug screen and further testing was not conducted based on the protocols and testing regimen specified by the Medical Examiner. Despite the fact that the State of Oregon legalized marijuana for medicinal and recreational use, use of this impairing drug is not permitted by persons operating watercraft of any type. Additionally, persons operating vessels on states or U.S. navigable waters are not allowed to use drugs or alcohol while operating a vessel if it leads to impairment as defined by specific blood alcohol levels (BAC) or similar test results for drugs. The threshold levels for impairment vary and are defined by State or Federal statutes. In testimony the MRO stated that if he was notified that a mariner was using methamphetamine or marijuana that person would be immediately taken off duty. A reasonable cause test for the use of alcohol would result in testing for the use of alcohol and removal from duty if that substance was detected.

The captain of the vessel did not test positive for cannabinoids, however, the managing owner of the vessel knew he used marijuana which can also have an impairing effect on the operation of a vessel.

5.11.3. Speaking to the accidents that occur in the CFV community at large, the tables below indicates the overall casualty statistics for the U.S. fleet.

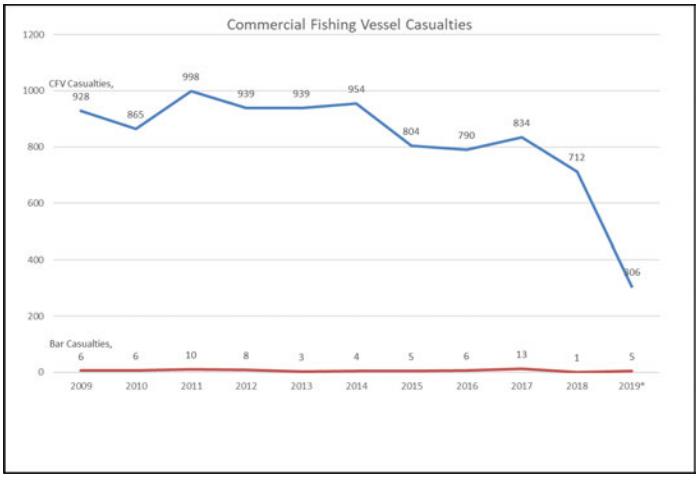

Figure 72. The statistics contained in this table are derived from the USCG MISLE database that reflects the overall operational and non-operational commercial fishing vessel accidents for the displayed period. At the bottom of the page, in red is the plot indicating the reported accidents that occur in areas described as "bars." (Source – Coast Guard)

The second table represents a breakdown of the various types of personnel casualties. Personnel cases are cases that the Coast Guard is aware of that include death, injury, missing, and casualties that lead to the classification of Serious Marine Incidents that require post casualty testing for drugs and alcohol within a required timeframe.

The final table in this section show the relationship between drug and alcohol testing and positive test results identified as a result of required testing. These tables reflect data from the year 1999 up to July 2019. There is anecdotal evidence that suggests that accidents involving accidents for CFVs are underreported and to what precise extent is not known.

	All Commercial Fishing Vessels*					
Calendar Year	Casualties	CFV Lost	Deaths	Missing**	Injured	SMI ***
2009	928	87	44	11	100	120
2010	865	83	30	7	85	107
2011	998	93	49	4	101	124
2012	939	83	36	8	107	122
2013	939	67	38	8	112	125
2014	954	58	37	4	94	102
2015	804	74	29	1	68	103
2016	790	67	30		82	107
2017	834	64	35	12	105	147
2018	712	53	29	3	107	141
2019*	306	17	10		32	46
Subtotals	**9,069**	**746**	**367**	**58**	**993**	**1,244**

Figure 73. The statistics contained in this table are derived from the USCG MISLE database that reflects the personnel casualty associated with commercial fishing vessel accidents. The notes indicate additional information about the sources and contents of the table. The footnotes for this table are located at the bottom of the page.[81] (Source – Coast Guard)

[81] * These statistics are based on extractions of data from MISLE via the CGBI cube system on July 22, 2019. The above statistics are based on investigations with Involvement criteria of Marine Casualty: Reportable or Not Reportable or Discharge of Oil. A data pull from MISLE Vessel Events, Substances Spilled Vessels and Personnel.

	All Commercial Fishing Vessels Post Casualty Drug and Alcohol Tests					
Calendar Year	Drug Positive Test Results	Total Drug Tests	Alcohol Detected (BAC Provided)	Alcohol Detected (BAC Not Provided)	Total Alcohol Tests	Activities with Any PositiveTests
2009	30	138	5		57	21
2010	12	104	6		61	14
2011	31	141	11		128	27
2012	23	104	2		85	21
2013	16	142	10		90	22
2014	10	121	2		84	11
2015	21	83	3		77	14
2016	15	70	1		64	8
2017	16	89	2	3	91	13
2018	17	115	2		69	14
2019*	6	24		1	17	4
Subtotals	**197**	**1,131**	**44**	**4**	**823**	**169**

Figure 74. The statistics contained in this table are derived from the USCG MISLE database that reflects the personnel cases where drug and alcohol testing was required. The highlighted columns indicate positive test results. The footnote indicate additional information about the sources and contents of the table. The footnotes for this table are located at the bottom of the page.[82] (Source – Coast Guard)

5.12. Human Factors Associated with Operation of the MARY B II

5.12.1. Fatigue

A law enforcement officer who observed the operator of the MARY B II the day before the accident voyage testified that he was either very tired or impaired. The impairment, according to the witness, may have been due to chemicals or fatigue.

And later in testimony, the same witness was asked to expound on her observations to tease out whether she believed the operator's behavior was due to fatigue or chemical impairment:

> *A. You know, I didn't know. I see fishermen at all stages. Prior to the season everybody is pretty----pretty awake and perky, but as the season goes on, you can see folks get tired, a lot of different things. So I wasn't--I wasn't able to say why-- what impairment he could have had at that time.*[83]

Casualties where the records involved Commercial Fishing Vessels. These records were then joined to Incident Investigation Activities for one record per investigation involving a fishing vessel.
Vessel losses include operational as well as non-operational casualties. Personnel Casualties include all dead, missing and injury records based on vessel operation, loss, or occupational safety, as well as those not relating to or prevented by marine safety regulations, policy or guidance. This includes those records associated with misconduct, are self-inflicted, sickness, medical conditions or existing diseases, diving for harvesting a regulated species or food poisoning. All of these situations may require post casualty testing.
** In most cases the classification of missing indicates that the victim is deceased.
*** SMI is a classification of a marine accident as "Serious Marine Incident," which requires drug and alcohol testing within a required timeframe.
[82] Drug and Alcohol tests are based on data extractions from the CGBI cubes MISLE Investigation Drug and MISLE Investigation Alcohol. The statistics are summarized by Activity Id and joined to Incident Investigation Activities. These statistics include Post Mortem determinations, as found in a review of TimeLine entries on Autopsy findings.
*** Total Drug Tests is a combination of Post Casualty Drug Tests Taken and Postmortem positive drug findings by a Medical Examiner.
[83] Senior Trooper [redacted] hearing testimony.

The managing owner of the vessel was questioned about the responsibility to provide a safe working environment and reduce the risks associated with fatigue:

> *Q. What steps did you take to make sure that the crew was well rested and that fatigue did not impact the safety of operations?*
> *A. I was not there personally. I can't answer that.*
> *Q. So you had no hand in ensuring that fatigue was not a problem or that was just left to the operator; is that correct?*
> *A. Everybody has, you know, requirements for their own being, like I can get along with 5 hours' sleep sometimes or 8 hours' sleep, sometimes no sleep. I--I can't really answer that.*[84]

At present, there are no work/rest regulations applicable to CFVs less than 200 GTs. As noted the operation of the MARY B II and other commercial marine vessels is similar in nature in terms of maneuvering, navigation and basic seamanship. Similarly, fatigue impacts mariners on any platform the same way.

The International Maritime Organization (IMO), which governs international maritime shipping, makes the following statement describing fatigue:

> *A state of physical and/or mental impairment resulting from factors such as inadequate sleep, extended wakefulness, work/rest requirements out of sync with circadian rhythms and physical, mental or emotional exertion that can impair alertness and the ability to safely operate a ship or perform safety-related duties.* [85]

Furthermore, the IMO states:

> *Fatigue is a hazard because it may affect a seafarer's ability to do their job effectively and safely. Importantly, fatigue affects everyone regardless of skill, knowledge and training. The effects of fatigue can be particularly dangerous in the transportation sector, including the shipping industry. All stakeholders should be alert to the factors which may contribute to fatigue, and make efforts to mitigate and manage the risks posed by fatigue.*

The managing owner of the MARY B II failed to carry out the owner's responsibilities of reducing and managing the effects of fatigue in the vessel crew.

The effects of the use of methamphetamine, alcohol and combined with the observations of fatigue cannot be precisely determined but taken together would have resulted in an impairment of the critical decision making during the especially hazardous bar crossing and is a contributing factor to the marine casualty.

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[84] Managing Owner hearing testimony.
[85] IMO Circular MSC.1/Circ. 1598 Guidelines on Fatigue.

5.12.2. Medical Conditions

Commercial mariners, other than those operating on fishing vessels less than 200 GT are required to have a detailed physical to enable them to hold a credential or license. The physical entails a medical examination, medical history and listing of all prescribed medications as well as over-the-counter medications and supplements. There can also be a testing of physical ability to perform the duties of the rating or license. The frequency of these determinations is prior to issuance and subsequently at the most a frequency of every five years on renewal of the credential. Medical conditions that pose a risk to operations such as cardiac conditions, epilepsy and other serious conditions are closely scrutinized and a determination is made if that mariner can safely work on a vessel and waivers and special conditions may be imposed. As an example, in the case of a mariner with poor eyesight and prescribed eyeglasses, the waiver may require carrying a second pair of those glasses when onboard a vessel. Prescribed medications that impair functioning are carefully scrutinized. The Coast Guard will then issue the appropriate medical certificate to the mariner.[86]

The only known medical conditions for the captain of the vessel were that he wore reading glasses, had some hearing issues and wore dentures. The managing owner stated that she had no knowledge of the operator being prescribed any medications, nor was she familiar with his medical history. She added that the operator was "not a doctor-goer."

The managing owner was not aware of any medical conditions for the remainder of the crew of the vessel.

Without a determination of medical fitness for service there is no way of determining if an unknown medical condition, use of over-the-counter medications or supplements may have contributed to the accident.

5.12.3. Operator's Interactions with Crewmembers and Other Fishing Industry Persons.

The operator's contentious attitude toward other personnel within the fishing industry and crewmembers hindered the development of a safety culture onboard and prevented him from learning from other industry professionals. He was unwilling to learn, ask for, or receive advice about the Yaquina Bay Bar from mariners who had extensive experience operating CFVs in the area. Even the operator who owned the MARY B II prior to Mr. Biernacki stated that he wanted to offer advice on the waterway, the bay, and the treacherous bar crossing but Mr. Biernacki was not receptive.

There is evidence of multiple instances where Mr. Biernacki took unreasonable risks while operating CFVs and made former crewmembers feel unsafe. This highlights a foundational impediment in establishing a safety culture onboard. Reports of the operator preventing crewmembers from calling the Coast Guard and crews having to activate EPIRBs in order to call for help have been discussed in detail. Documented cases involving the operator and witness testimony suggest that Mr. Biernacki behaved toward others in a manner that created discord and inhibited effective communication between crewmembers and the operator.

[86] 46 CFR § 10.301.

Communication is critical to safety in the hazardous conditions attributed to the fishing vessel industry. Although crewmember James Lacey had worked with Mr. Biernacki in the past, there is evidence to support that Mr. Biernacki was difficult to work with and was unable to keep crewmembers working for him.

In addition, Servco Pacific Insurance (currently Brown & Brown Insurance) withdrew a quote to provide insurance to the MARY B II after they conducted a risk assessment and after local fishing vessel operators voiced concerns about Mr. Biernacki's experience. Multiple witnesses attested to Mr. Biernacki's dismissive attitude toward inclement weather forecasts and unwillingness to accept advice, as he claimed he would teach everyone how to fish as he did in the East Coast.

The contentious personality traits would likely add an additional level of stress and distraction into an already stressful and arduous operation on commercial fishing vessels. This would likely prevent the establishment of a safety mindset. The lack of safety mindset was likely present on the MARY B II the night of the accident and may have contributed to actions, inactions, or distractions that resulted in the casualty.

5.13. Coast Guard Bar Escort Procedures at Yaquina Bay Bar

5.13.1. During the hearing, the Coast Guard was asked about procedures or policies used to conduct bar monitoring and escorts at Station Yaquina Bay. Following the Public Hearing and after further investigation, it was determined that a unit instruction was under development to address and document the specific bar escort procedures at Yaquina Bay. While the training program is robust, there was no signed procedure in the form of a formal unit instruction in place for bar operations on the night of the accident.

During the course of the investigation, only the operations of Yaquina Bay were examined and this investigation narrowly focused on the MARY B II accident. The other 15 RNAs were not examined to determine how the Coast Guard reports bar conditions, monitors vessel movements, restricts the bars, disseminates safety information for the hazardous bars or conducts bar escorts.

After the last bar observation at 4:45 p.m., three vessels crossed the bar without escort. One of the three vessels reported that the bar observations were no longer accurate. Due to the time of the year, it was nearly sunset, and the watchstander would not be able to accurately gauge the bar conditions from land. As such, the MLB 47266 got underway to reevaluate the bar conditions. In keeping with the standards common across the surf community, the MLB 47266 took station inside of the jetty tips and energized their law enforcement blue lights to mark the center of the channel and enhance visibility using the MK-127 illumination flares. At approximately 7:34 p.m., the VICTORY pushed out past the jetty tips to conduct the escort as the VICTORY is the better asset to handle breaking/plunging waves from any angle.

At 7:33 p.m., the 75-foot, steel hull LAST STRAW tells the Coast Guard on VHF radio Channel 22:

I desperately want to get in, but um, 30 minutes here see what happens, there's also, its building fast out there, Thats [sic] why I'm motivated to get in, okay?[87]

When the LAST STRAW explained his desire to get across the bar as soon as possible, the two Coast Guard vessels were already discussing timing and lulls with the operator in preparation for the vessel's crossing.

During the LAST STRAW's crossing, there were extensive radio communications with the LAST STRAW covering timing and character of the waves as well as how the LAST STRAW was going to cross the bar and enter the channel. Other than the MARY B II, the LAST STRAW was the last vessel to return to port. The LAST STRAW and the other CFVs considered it prudent to return to port in light of the weather forecast and building seas.

As noted in testimony, some mariners are more comfortable with the Coast Guard and discussing bar crossing plans over the radio, whereas others will acknowledge the Coast Guard hailing them on the radio and then transit without much conversation.

During hearing testimony, BOSN [redacted] said he passes only pertinent safety information such as the timing of the series, but then allows the captains to focus on the complex task at hand. He indicates during the bar crossing brief that CG vessels will stay out their way and the safe navigation of their vessels is ultimately their decision and responsibility. Additionally, as is detailed in the regulatory language of the RNA, Coast Guard crews tell the fishing vessel operators that the "safe navigation is the responsibility of the captain" and they should feel no pressure to enter just because the Coast Guard is standing by.

Shortly after 7:53 p.m., the LAST STRAW safely crossed the bar the following exchange took place on the radio:[88]

LAST STRAW - Thanks for your help
VICTORY - LAST STRAW, VICTORY. Say again captain.
LAST STRAW - I said we're slowing down. And uh just appreciate the escort. Thanks for all your help.
VICTORY -Absolutely captain. Any time.
LAST STRAW - Uh it got a little broachy there for me. I need about twice a [sic] big a rudder.
LAST STRAW - That's the first time I've uh really broached like that. It's kinda alarming. I got turned pretty go there didn't I?
VICTORY - You did great captain. Glad you're inside safe.
LAST STRAW -Yeah, you ever see guys turn that much?
VICTORY - Oh absolutely captain, we've uh, uh we've seen them turn a couple circles, but glad you're inside.

Broaching is described as the following condition, a broach is "to slew around on a wave front." Another source says it is "extremely dangerous" and likens it to turning broadside and

[87] CG Exhibit 008 and the following entries are taken from this exhibit.
[88] Some CG to CG boat radio communications are omitted for clarity.

losing control in following seas, so as to present the ship's side to oncoming large waves. In that event, the ship may "trip" on its keel or bow (pitch-pole), roll, capsize. In the altered image below red arrows has been added to show the potential for the fishing vessel to broach to port, cause a loss of control, and expose the vessel to possible capsize.

Figure 75. Labeled image of the F/V NORSKEN FISHER entering Yaquina Bay Bar in surf on an unknown date. The red arrows, which have been placed on the image, indicates the dangerous potential for movement of the vessel. Than can lead to broaching if there is a loss of control or an overpowering by the following wave without sufficient power and control to swiftly counteract this momentum. This broaching would result in the vessel laying sideways in the trough of the wave, which most likely lead to a capsizing of the vessel. (Source - Mr. and Mrs. [redacted] ©)

During this time, the Coast Guard was having difficulty identifying and communicating with what was the last vessel offshore, the MARY B II. The identification was compounded by the vessel not responding to repeated hailings of VHF made by the Coast Guard. Eventually, the Coast Guard Command Center at Sector North Bend was able to identify the vessel utilizing NOAA VMS tracking by the vessel's former name, BESS CHET. The new owner did not register the VMS system with the vessel's new name. Shortly after 9 p.m., the Coast Guard reached the vessel's operator by cell phone and then established radio communication with the captain of the MARY B II. At this time, the operator of the vessel states on the radio that his speed is between 6 and 7 knots. The Coast Guard would later rely on the declared max speed in advising the operator of the MARY B II during her attempted bar crossing.

5.13.2. Dynamic Surf Conditions at the Bar

5.13.2.1. Throughout the late afternoon and into the night the sea, tidal and weather conditions combined to create an ever worsening breaking bar. As the weather worsened, the Coast Guard observed and re-evaluated the conditions using all means available, including the considerable experience of the CG crews. Based on experience and the forecast, the expectation was that the bar conditions were going to get worse. Coast Guard Station Yaquina Bay crewmembers continually checked forecast models and weather instruments, such as offshore buoys, to maintain awareness of the worsening conditions. When Coast Guard boats are on scene for an escort they report observations on the location of the breaking waves, height, period, and lulls. The day of the accident, these conditions were carefully observed and passed to the operators on the vessels. In the case of the MARY B II, the VICTORY called out the size of the waves coming astern of the MARY B II, at one point noting they were 16 feet.

While Coast Guard crews can monitor and report on wave sets and lulls, they cannot predict the size or power of individual waves. OSU captures the reflected energy of ocean waves using marine band radar. The height and steepness of an ocean wave are characterized in colors and in the figure below you see the large ocean swells heading to the entrance of Yaquina Bay Bar. In general, you see they are red in color and move in a parallel series of waves towards the jetty ends. A bright yellow radar reflection would indicate waves that are significantly steeper and taller in height than the waves that are less bright. Near the time of the capsizing of the MARY B II, this convergence of waves began to occur and build in size.

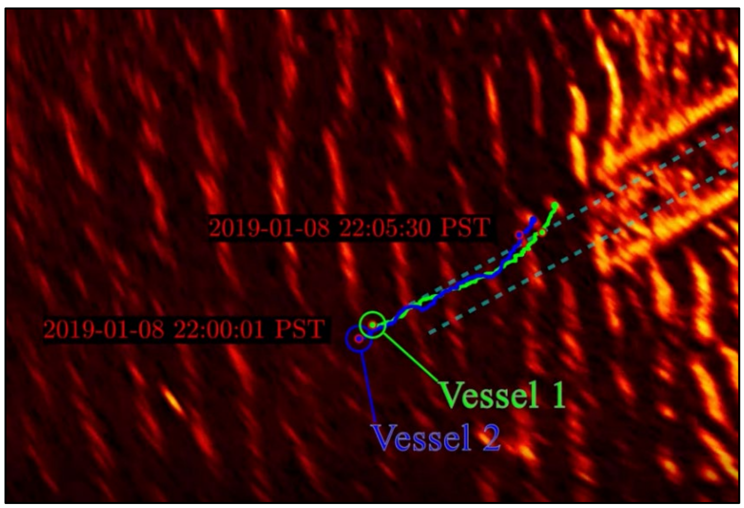

Figure 76. Screen shot of OSU radar video showing the MARY B II (VESSEL 1) and VICTORY (VESSEL 2) nearing the North Jetty End. (Source – Oregon State University, CG Exhibit 034)

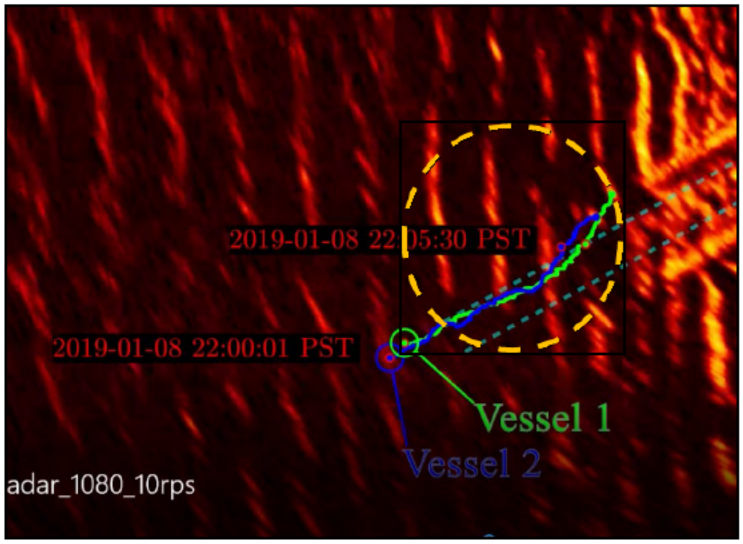

Figure 77. Screen shot of OSU radar video showing the MARY B II (VESSEL 1) and VICTORY (VESSEL 2) nearing the North Jetty End and larger waves are forming to the seaward of the vessels, these larger waves are circled for identification (Source – Oregon State University, CG Exhibit 034)

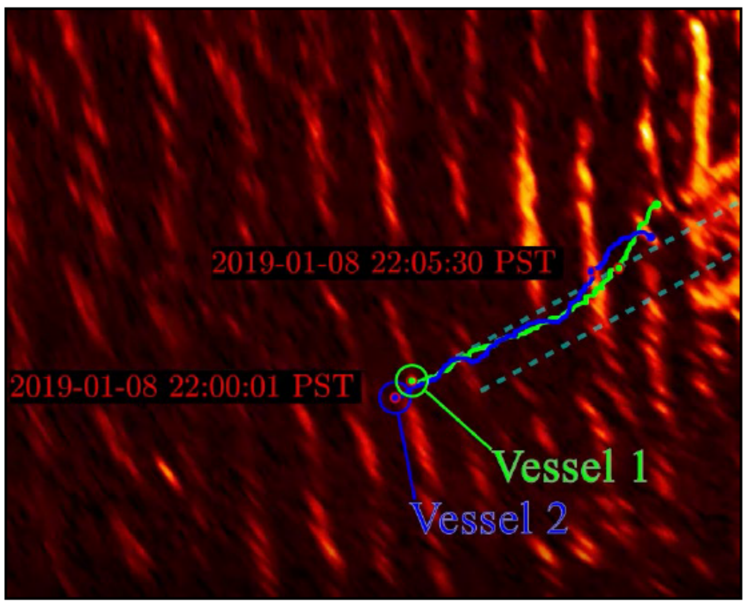

Figure 78. Screen shot of OSU radar video showing the MARY B II (VESSEL 1) and VICTORY (VESSEL 2) nearing the North Jetty End and larger waves are forming to the seaward of the vessels, these larger waves are growing in vertical height and steepness reflecting more radar energy (Source – Oregon State University, CG Exhibit 034)

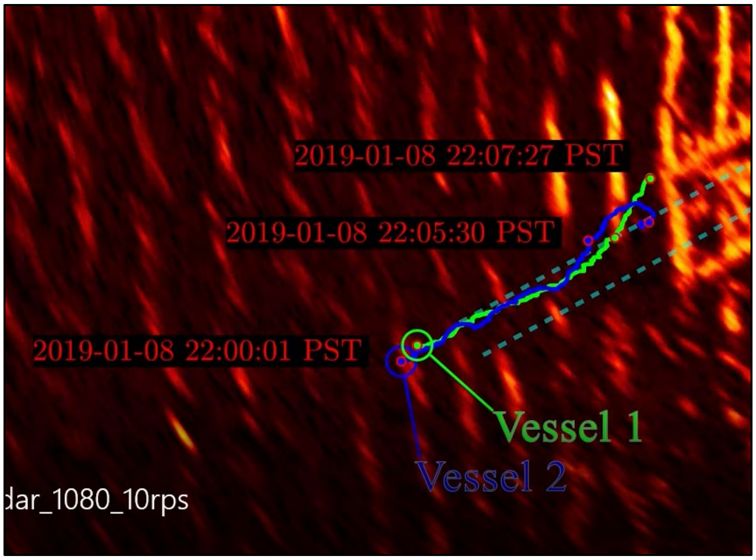

Figure 79. MARY B II indicated by the small green circle at 10:27:27 p.m., the approximate time where the vessel struggled after getting hit by a wave and then capsizing by reverse pitch poling and sinking. (Source – Oregon State University, CG Exhibit 034)

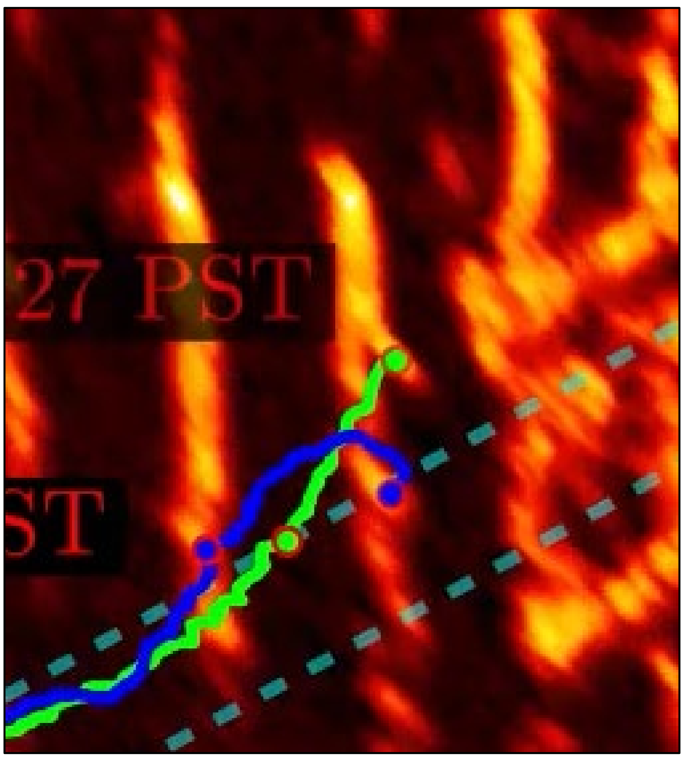

Figure 80. Screen shot of OSU radar video showing the MARY B II (VESSEL 1) and VICTORY (VESSEL 2) nearing the submerged rock portion of the North Jetty, the first large wave, reported to be 16 feet passed the MARY B II and engulfs the jetty tip. The second is about to strike the MARY B II. In this image you can make out the radar reflected energy of the vessel just ahead of the wave front. The VICTORY is turning away from the danger of the underwater portion of the jetty and the jetty tip. (Source – Oregon State University, CG Exhibit 034)

On the day of the accident, Coast Guard crews properly anticipated a generally deteriorating and hazardous bar and took measures to reduce the risks at the bar.

5.13.2.2. In examining the likelihood of survivability, the position of the MARY B II's capsizing appears to be a critical factor. When contrasted with the March 2012 wreck of the F/V CHEVELLE, the critical difference is the location of the accident. The CHEVELLE grounded roughly 50 yards inside the North Jetty after being set by sea state and surf conditions. While both accidents happened in the dark of night, the CHEVELLE was able to cross the bar and get passed the jetty tips. This position provided the crew an opportunity to don immersion suits and put out a distress message to the Coast Guard, ultimately allowing the all three crew members to be saved.

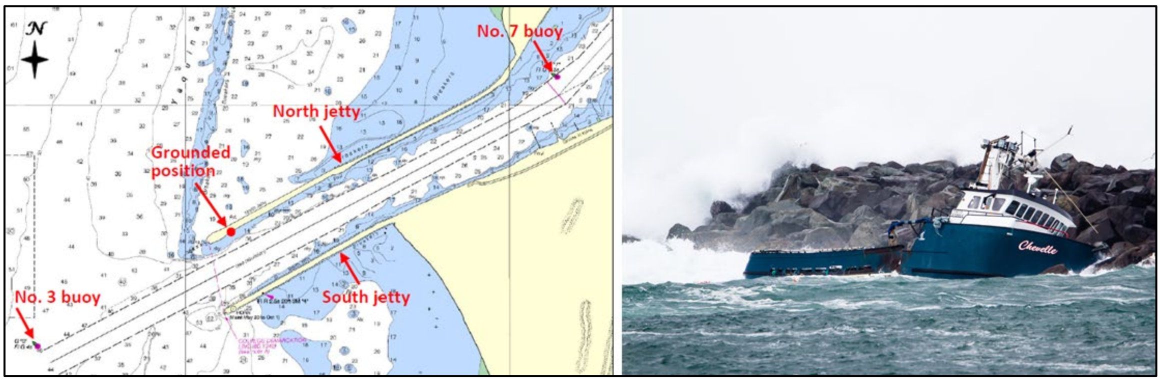

Figure 81. The F/V CHEVELLE accident occurred in March 2012 where the vessel was set onto the south side of the North Jetty. While the vessel was a total loss, all crew were recovered safely by the Coast Guard. (Source - Chart, NTSB Marine Accident Report MAIB DCA12-ML-011, CHEVELLE Photo - Mr. and Mrs. [redacted]©)

Had the MARY B II remained in or near the center of the channel during the capsizing, it might have been possible for Coast Guard vessels to effect a rescue. However, because the MARY B II capsized outside the channel near the dangerous area known as the dumping grounds, it was impossible for the MLB 47266 and the VICTORY to safely engage in any rescue attempt.

5.13.3. Use of Navigational Ranges Marking the Centerline of the Channel

Of all the aids to navigation in Yaquina Bay, one of the most important is the range boards. The range helps approaching vessels identify the center of the channel, and is one of the most reliable aids as the high height helps prevent it from being obstructed. The VICTORY communicator, the Commanding Officer of CG STA Yaquina Bay was asked:

Q. Thank you. Could there have been other vessels or obstructions blocking the clear view of the entrance range lights, do you think?
A. No. I was using those to navigate.[89]

At no time during the escort were the use of the lighted ranges discussed until the vessel was in extremis. In the case of the LAST STRAW, at 7:42 p.m. the following discussion took place earlier in the evening:

[89] BOSN [redacted] hearing testimony.

LAST STRAW - Stay south of center, is that correct?
CG 47266 - LAST STRAW, coast guard 66, yeah im [sic] the inside boat here captain. Yeah were seeing uh every probably third or fourth wave on the series, um will tip uh just south of center channel. Uh 2 or 3 hundred yards out breaking towards the tips.
LAST STRAW - Okay then you recommend stay on the range then right?
VICTORY - That's affirmative, stay on the range.
VICTORY - That's affirmative captain, stay on the range. Also how many POB do you have?[90]

5.13.4. Communications During the Escort

Crossing a hazardous and breaking bar during darkness is an extremely dynamic and challenging experience imparting stress and anxiety even the most experienced mariners. The following elements of the escort were examined, in some cases with the benefit of hindsight which was not available at the time of the accident.

The crew at Station Yaquina Bay is made up of professional mariners who receive extensive training on evaluating and understanding the causes and effects of the local bar. They specifically receive training on how to speak about and communicate the nuanced aspects of the sea state. To mariners and persons unfamiliar with bar conditions on the West Coast, this parlance may be confusing and opaque. During the escort, the individual aids were referenced but there was no discussion about these aids with respect to navigation with the operator of the MARY B II prior to the start of the transit. It was understood that the operator was not a local fisherman. While no instruction concerning Bar Escorts was officially promulgated the night of the accident, the Station Commanding Officer and Executive Petty Officer both testified that a draft instruction encapsulated Station policy at the time. This draft instruction required an escort to verify the operator crossing the bar "understands the local ATON." Had the escort verified this information, the operator might have understood the availability and purpose of the navigation aids designed to guide the mariner into this challenging harbor. Below are examples of the language used to describe conditions of the Yaquina Bay bar:

9:46 p.m. Mary B, Victory - Roger captain, uh yeah we just passed over the series, right around where buoy 3 should be it was uh 16 foot, inside of us it broke across the channel. Uh now were starting to time the series. So in between the series it's a good run,……

9:47 p.m. Victory Mary B, - Uh victory. Roger we'll inform you the timing sop the hill has got a timing, we'll be calling the sets to them on 22 alpha. Well [sic] be putting up more illumination flares, just as we cross the bar. Uh, it was breaking pretty heavily into the channel from the south pinnacle, so the south side of the channel sop earlier when we were coming back in right and up the middle of the channel seems to be the best bet.

At 10:00 p.m., the CG 47266 hails the MARY B II on Channel 16 and says

[90] CG Exhibit 008 (errors are in keeping with the document as provided to the investigation team).

Roger captain, uh I advise that you don't work over to the North too soon. Uh it is starting to break on that north side on the dumping grounds. And there is also a wrap around break on the North side of the channel. Over.
Mary B II - Yeah I got you guys

The captain of the MARY B II had limited West Coast bar crossing experience and little or no experience being escorted and communicating with CG escort vessels in hazardous bar conditions. While rough weather does occur on the East Coast, specifically in Barnegat Inlet, where the captain was previously engaged in fishing, the characteristics of the waves, specifically timing between swells as well as the raw power of East versus West Coast surf may have led the operator to underestimate the importance of crossing the bar earlier in the day or why the Coast Guard was feeding him certain information. The captain's reticence to accept advice from the previous owner on bar crossings and unique bar conditions did not allow him to comprehend the unique considerations at the dynamic and hazardous bar. There is no evidence that he understood some of the critical information that was being conveyed to him such as the characteristics of the sea conditions and the particular hazards associated with them.

Communications via marine radio are vital to the success of bar escorts. Preliminary communications include the plan for the crossing. The minimum legal requirement for a small passenger vessels is to have an approved bar crossing plan (also referred to as a "Go/No Go plan"). The purpose of the bar crossing plan is to guide a vessel's operations on and in the vicinity of the bar. An approved bar plan creates an awareness by the captain and the crew of the unique hazardous conditions associated with regulated bars. Fishing vessels are not required to have a bar crossing plan.

In the case of the MARY B II, that operator communicated that the crew had life jackets available and that the crew were drill conductors. He also communicated the speed his vessel could make on the trip up to the entrance of the bar and the number of people aboard the vessel. At 9:47 p.m., the operator said that they would hang outside and watch a couple of sets. At 9:52 p.m., the MARY B II reported that they were putting their life jackets on. The operator of the MARY B II did not communicate any concerns with making the previously stated speed of 6 to 7 knots nor did he inform the Coast Guard of any reduction in speed. The operator of the MARY B II failed to let the Coast Guard vessels know that he had started the MARY B II on the inbound transit to cross the bar. The CG crews observed the MARY B II start into the transit and the VICTORY followed astern.

The regulations for RNAs require a bar crossing plan for small passenger vessels but not for CFVs. The bar restrictions for uninspected passenger vessels and recreational vessels significantly reduces risks to those vessel types. Had the regulations for a well thought out bar crossing plan when the bar is restricted been applied to all commercial vessels, the operator's planning for bar crossings would manage the risks of the crossings. Elements of the bar crossing plan may include the posting of an aft facing lookout calling out the waves, briefing to the fishing vessel crew about what to do if things go wrong, contacting the Coast Guard to provide updated bar condition reports or requesting an escort into port under the appropriate conditions such as when a vessel has compromised maneuverability or under extreme bar conditions.

At approximately 10:00 p.m., the MLB 47266 passed information to the operator describing how the seas were breaking at and recommended that he shift slightly to the north once he got inside the jetty tips, the MARY B II acknowledged hearing the transmission and notified the escorts that:

> *Yeah, I see your blue light there, I'm working my way to the North side here now.*[91]

CG 47266 immediately responded:

> *Roger captain, uh I advise that you don't work over to the North too soon. Uh it is starting to break on that North side on the dumping grounds. And there is also a wrap around break on the North side of the channel. Over.*

The MARY B II responded:

> *Yeah I got you guys, alright. Lemme pay attention here, cause so many vessels here now I got AIS going off on my Plotter here. Clogging it up.*

Following the request of the operator, the Coast Guard minimized communications so as not to distract the operation of the MARY B II; the CG vessels continued to monitor the transit and make warnings when necessary. The CG escorts observed the vessel had slowed to approximately two knots with no explanation from the MARY B II about the reduction in speed or any future maneuvering, however, neither did the Coast Guard ask the MARY B II or prompt the operator for more information.

A former commercial fisherman with extensive bar crossing experience made this statement about crossing the bar:

> *A. No, no, if--if the ocean conditions are good, you--you're metal--pedal to the metal to get the hell out of there because that's one of--it's where you don't want to be. Sooner--least amount of time you can spend there, the better.*[92]

A highly experienced CG Surfman with extensive Yaquina Bay Bar experience made the following statement during hearing testimony about crossing the bar:

> *A. Well, I would say from my experience, a typical speed of a commercial boat is between 6 to 10 knots depending on what they typically do. And throughout--in the early stages of the bar escort, we're going to ask them, you know, "Sir, what's your normal cruising speed?" or, "What--how fast can you make--like make?" you know. "You pour the coals to her, what's your top--what's the best speed we're going to get?" They're going to provide that information. They know their vessel better than what we do. But if I--if I hear a speed of less than 5 knots, it makes me a little wary just because I know that you're not going to be able to outrun the sets of waves that are coming through or time them. At some point you will get caught by the next series or the next set of waves. So I would say*

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[91] CG Exhibit 008.
[92] Mr. [redacted] hearing testimony.

that 5-knot threshold for myself would be something that I would pay--I'd be hypervigilant to somebody telling me that.[93]

At 10:04 p.m., the VICTORY called the MARY B II to make them aware of a wave building from astern,

16 Footer building up behind you captain.

A minute later,

Victory- Mary B, This is the set right here. This is the set. Over
Mary B II - Yeah roger roger, I see it.
47266- Mary B, This is the 66. This is uh the beginning of the smaller set that's coming in right now.
Victory -Wind in your mic.[94]

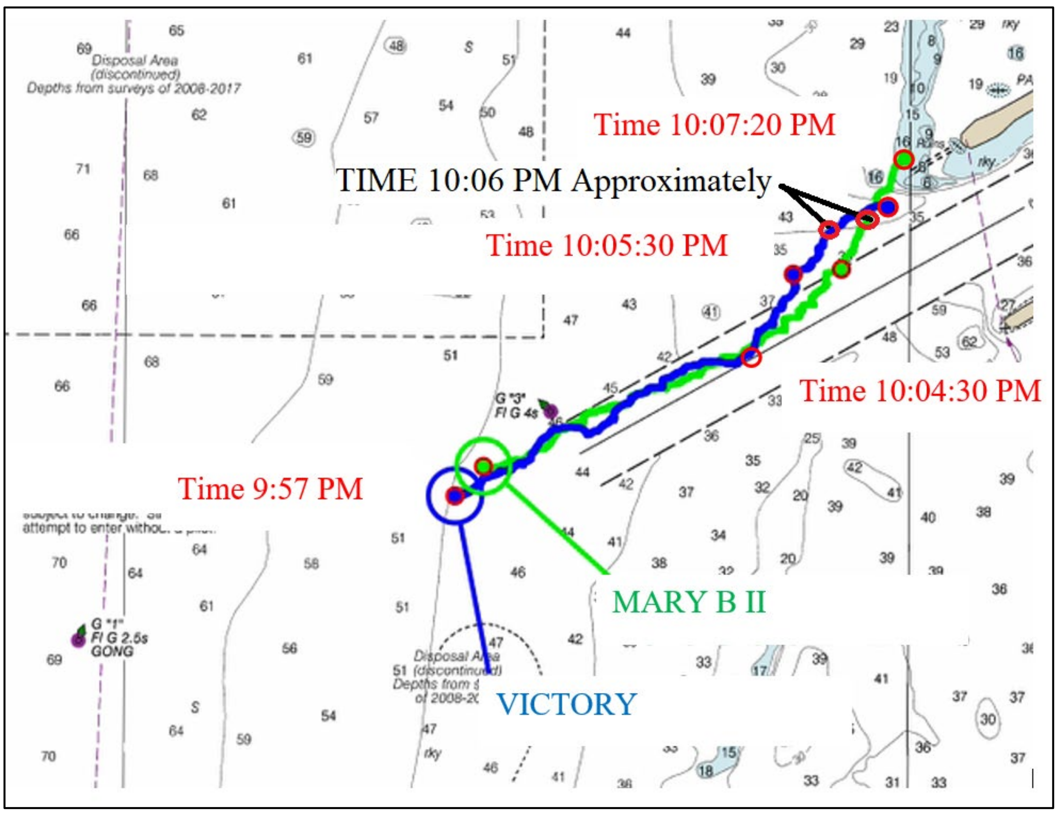

Figure 82. Positions of vessels throughout the escort. The approximate position of the final calls to the MARY B II are indicated for the time of 10:06 p.m. (Source – Oregon State University, CG Exhibit 071)

[93] CG STA Yaquina Bay Executive Petty Officer hearing testimony.
[94] Wind in your mic – indicating a transmission of the radio distorted by the ambient wind being captured by the transmitter's microphone.

And then a moment later:

> *47266 -You're looking like your heading very, very far north right now. You might want to come south just a little bit.*
> *47266 - Mary B, 66 did you copy my last?*
> *Victory - Hard, you are 3 boards North. Over. 3 boards North! Come South! Come to Starboard! Come to Starboard! Mary B, Come to Starboard!*[95]

The admonition "You're looking like your heading very, very far north right now. You might want to come south just a little bit." and "Hard, you are 3 boards North. Over. 3 boards North! Come South! Come to Starboard! Come to Starboard!" contained the elements of a warning. The captain of the MARY B II may not have understood the warnings about "Three boards North" and this may have created a distraction at a critical time because the operator may have had to process the unfamiliar terminology that was voiced powerfully. However, the warning of "come to starboard" could be clearly understood even without navigation tools such as a steering compass. These warnings were given approximately a minute before the loss of the MARY B II. With the benefit of hindsight, the last communications from the Coast Guard vessels to the MARY B II could have been more assertive. There is nothing to have prevented the Coast Guard vessels from making a statement such as "MARY B II you are standing into danger" once the deviation from the channel centerline towards the North Jetty tip had been understood and confirmed. The admonition to come south clearly demonstrated the Coast Guard crews were fully engaged in monitoring the evolution and were aware that it was devolving. The transmission to come south "just a little bit" was not assertive enough given the situation. The callout regarding the reference to three boards north might not have any significance to the mariner operating the MARY B II whose main experience was on the East Coast and on the usual waterway of Barnegat Inlet which lacks a navigation range and the associated range boards. While Coast Guard policy prohibits the passing of compass directions to vessels, this prohibition is waived in emergent situations. In such cases, the Coast Guard is permitted to provide simple directions to mariners in extremis or imminent danger.

Shortly after the last communication, the MARY B II was seen capsizing and the lights of the vessel were extinguished.

The fact that a bar escort is considered a SAR "alert" phase enables a rapid response if there is any difficulty encountered in an escort. In the case of this escort, as soon as the MARY B II was observed to capsize, the SAR phase shifted to "distress" and the full search and rescue resources of the Coast Guard were brought into the emergency. That included the Coast Guard resources that actually worked on the emergency response as well as additional Coast Guard resources that were available on standby such as supporting personnel and a helicopter.

On scene, the VICTORY with Station Yaquina Bay's Commanding Officer aboard, immediately assessed the situation and called for a CG helicopter to be dispatched from the

[95] CG Exhibit 008.

CG air facility at the local Newport, OR airport. Station Yaquina Bay immediately recalled all remaining personnel to assist in the distress phase.

Analysis of Elements of the Accident that were not a Direct Cause of the Accident

5.14. Adequacy of the MARY B II Lifesaving Equipment

The outfitting of the MARY B II with safety and lifesaving equipment met or exceeded requirements. The owner followed the recommendations of captain Biernacki and spent significant funds to purchase safety equipment after the acquisition of the vessel.[96] A new EPIRB was purchased and properly registered. As previously discussed, the water and air temperatures were near 50 degrees which can induce cold water shock. The vessel did have immersion suits onboard to insulate the wearer and protect the wearer from loss of body core temperature, called hypothermia. The crew had attended safety training. The operator and one crew member had attended the course within the previous two months and were certified to conduct drills. The other crew person had previously attended training.

There was no way to determine if safety drills had been conducted onboard the MARY B II under the supervision of a qualified person.

While cold water survivability calculations executed and noted in a SAR case study those times are predicated on a non-catastrophic event such as a gradual immersion into the cold water, not an event similar to the capsizing where personnel are ejected into the water suddenly. While cold water immersion is not a causal factor directly attributable to the initial event, the sudden immersion shock would have contributed to the drowning of the two crewmembers who were ejected or able to escape the wheelhouse of the MARY B II but still perished despite being found well within the time frame in the Coast Guard tool used to determine survivability in the water.

5.15. Responsibility of the Managing Owner of the MARY B II

F/V MARY B II LLC was a limited liability corporation that owned one vessel, the MARY B II. The managing owner of that LLC was not a commercial fishing industry professional, rather she was the mother of captain Biernacki. After the vessel was purchased, significant money was spent to upgrade the vessel's safety and lifesaving equipment as well as the routine equipment associated with the coming crabbing operations. In testimony, the managing owner explained that she relied on the recommendations of the captain of the vessel, Mr. Biernacki, as to suggestions for the maintenance and outfitting of the vessel. During the public hearing, the marine surveyor who conducted the most recent survey of the vessel stated his impressions of the vessel:

Q. And, sir, what was your overall opinion of the vessel's condition?
A. I hadn't been involved with this vessel before. I had seen it from a distance, never been aboard it. The--the vessel--I was actually impressed with--with the vessel. I mean, it was in much better shape than I had--what do I want to say--viewing the vessel from a distance and I've seen it over a number of years, it wasn't really a cosmetically pleasing vessel. So you

[96] CG Exhibit 040.

would think that, you know, it's a backyard-built type of builder or something like that, but once I got aboard it, I was actually impressed. I did not go through the whole vessel. It was mostly limited to the engine spaces, but I did notice the cabin and the interior and they were quite nice. I mean, the vessel was nicely maintained, although like I said, I did not do a survey on it and I did not do a complete vessel inspection.[97]

Examining the owner's responsibility for the safety equipment that was located in the workplace, in other words on the vessel, the owner purchased significant safety equipment such as immersion suits, an EPIRB, life jackets and had the liferaft serviced among other things.

As to ensuring that the vessel was not operated with personnel under the influence of drugs and alcohol, the managing owner stated that she had expectations that there would be no use of drugs and alcohol on the MARY B II. When asked if her expectations were outlined or incorporated into policy in some way, for example in crew contracts for the crew, she stated that there were contracts in place for Mr. Biernacki and Mr. Lacey, but not Mr. Porter due to the short duration of his employment, approximately one week. She stated that the crew contracts were lost when the vessel sank. There is no evidence that the crew contracts stipulated that the use of alcohol or drugs were prohibited during operation of the vessel. Further, there is no evidence that the contracts specifically addressed the use of marijuana,[98] a drug that was regularly consumed by captain Biernacki, as detailed by the owner. As the managing owner, she knew that alcohol test kits had been purchased for the vessel but did not know the purpose or their intended use and the requirement for post casualty drug and alcohol testing.

In testimony, the managing owner could not identify if any health conditions existed for the crew, other than readily observed conditions for the captain. These conditions were that the operator wore reading glasses, had hearing issues and wore dentures. As to the crew of the MARY B II she made the following statement in response to a related question:

Q. Turning to the physical condition of the crew, how were you assured as to any latent medical conditions for the crew that might suddenly impact the safety of the crew at a critical time, for example, epilepsy, heart conditions or a host of adverse crew medical conditions?
A. I was aware of no conditions to preclude work.
Q. And that's both for Mr. Biernacki and the rest of the crew?
A. I don't know anything about the crew.[99]

When asked if the managing owner instituted any guidelines for the management of fatigue, she stated that she was not physically present at the vessel location and could not answer that question.

As to the operation of the vessel or policies or instructions for the crew:

Q. I understand, but my question was did you create or distribute any instructions or policies or procedures?

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[97] Mr. [redacted] hearing testimony.
[98] Marijuana is legal in the state of Oregon despite being listed as a Schedule IV Drug by the Federal Government.
[99] Managing Owner hearing testimony.

A. No.
Q. Did you write down any expectations that you had for the operation of the MARY B II?
A. No.
Q. Does that include your expectation for drug and alcohol--for your drug and alcohol policy?
A. I didn't write anything down for expectations. This just was unfolding.[100]

The managing owner had been in the Newport area visiting with the operator for several weeks in December and was available to observe the shore side operations in preparation for the fishery opener. The managing owner did state that she left shortly before the Dungeness crab fishery opened.

Following the accident, the managing owner did not submit a CG-2692 (OMB 1625-0001), Report of Marine Casualty, Commercial Diving Casualty or OCS Related Casualty within five days as required by federal law. The accident was a marine casualty as described in 46 CFR § 4.05-10(a).

5.16. Coast Guard Search and Rescue Response

As the escort of the MARY B II commenced, the mission was in the "alert" phase, in conformance with policy. Once the vessel capsized, the classification shifted immediately to the "distress" phase. Two CG vessels were on the scene and the MLB 47266 was directed to search the area on the south side of the North Jetty in an attempt to locate any potential persons in the water. Personnel were recalled to the Station as the VICTORY remained off the bar and conducted search efforts. Visible wreckage of the MARY B II was seen on the north side of the North Jetty in water which was too dangerous for CG boats to enter and search. The MLB 47266 searched inside the jetties to see if the ocean current had carried any potential survivors into that safer water. A CG helicopter was immediately dispatched from the Newport airport where these helicopters are staged for rapid response to effect search and rescue. At 10:20 p.m., Coast Guard Sector North Bend notified the on scene units that the MARY B II's EPIRB had been activated in the capsizing. EPIRBS are designed to automatically begin transmitting once dislodging from their bracket or after submersion in water; in this case, after the capsizing. That beacon would have provided the Coast Guard with vessel specific details but most importantly an accurate position of the distressed vessel. In this case, the location of the accident had been identified. At 10:23 p.m., the first personnel began to arrive at the beach and begin a shoreline search. This would grow to include rescue personnel from the local area as well as CG teams. At 10:34 p.m., the CG Helo 6527 took off from Newport air facility headed to the scene. This helicopter had a powerful searchlight, hoisting capabilities and a rescue swimmer to add to the search teams and equipment at the accident scene. Beach parties were launching MK-127 illumination flares to attempt to locate survivors. There were difficulties initially in the radio communications between the shore teams, boats and the helicopter during this phase of the rescue as multiple radio frequencies were being used and local fire rescue assets were also participating. At 10:51 p.m., all rescue communications were shifted to radio Channel 21A and those communications issues were resolved.

[100] Managing Owner hearing testimony.

The rescue helicopter arrived and located some wreckage at 10:40 p.m. and began to determine the possibility of locating any survivors. Shortly after that the VICTORY headed in to the dock to assist in the shore search for survivors. The CG Helo 6527 located a victim and lowered a rescue swimmer into hazardous conditions and moved the victim to the beach so EMS could attempt resuscitation. Another victim was located in the MARY B II wreckage of the cabin which had drifted ashore to the north side of the North Jetty. It was too hazardous to remove that victim until first light the following morning. The third victim was located in the water near the shoreline on the beach north of the North Jetty.

5.17. Survivability Factors

5.17.1. Crew's inability and limited time to deploy lifesaving equipment

After the vessel was turned to the seas by the second wave, the vessel was unable to recover and capsized as the third wave rolled in over it. The crew had very little time, if any, to react. Due to the small size of the MARY B II and the location of the liferaft the crew could not make the liferaft ready for deployment. The liferaft inflated and floated free as designed and washed up, inflated on the beach.

It would be a challenge for any operator, crewmember, or fisherman to don a survival/ immersion suit and deploy the liferaft in the limited time available. The Coast Guard boats operating nearby had the MARY B II under direct observation for the entire time up until the vessel's capsize.

During SAR and recovery operations, the Coast Guard located all three crewmembers wearing inflated Type V lifejackets. Later, Oregon State Parks personnel found four immersion suits and the liferaft.

5.17.2. Crew's limited survival time without immediate rescue

Coast Guard vessels were on scene at the time of the accident but were limited in their ability to respond because of the location of the MARY B II's capsize, north of the North Jetty. In order to respond, the MLB 47266 and the VICTORY would have had to transit nearly a mile to the north to "jump off joe" point to avoid charted reef areas to approach the search area in deteriorating conditions and high beach surf. Interview summaries, witness testimony, and communications transcripts support that neither Coast Guard vessel had sufficient MK-127 illumination flares to safely conduct this transit and subsequent search and rescue effort and would have put further lives and boats in danger. The Commanding Officer conducted an operational risk assessment and determined that the risk was too high to put Coast Guard vessels in the waters north of the north jetty.

The investigation determined the Coast Guard's inability to enter the search area north of the North Jetty after the capsizing was not a contributing factor in the loss of life to the MARY B II's crew. Due to the instantaneous and catastrophic nature of the vessel's sinking, the vessel's crew did not have enough time to abandon the vessel in immersion suits or enter a liferaft which would have increased the crew's chances of rescue or survival.

6. **Conclusions**

6.1. Cause of the Casualty

6.1.1. The initiating event for this casualty occurred when the MARY B II deviated from the centerline of the entrance channel for Yaquina Bay Bar at approximately 10:04:30 p.m. and began a general movement towards the submerged end of the North Jetty in breaking surf and near gale conditions.

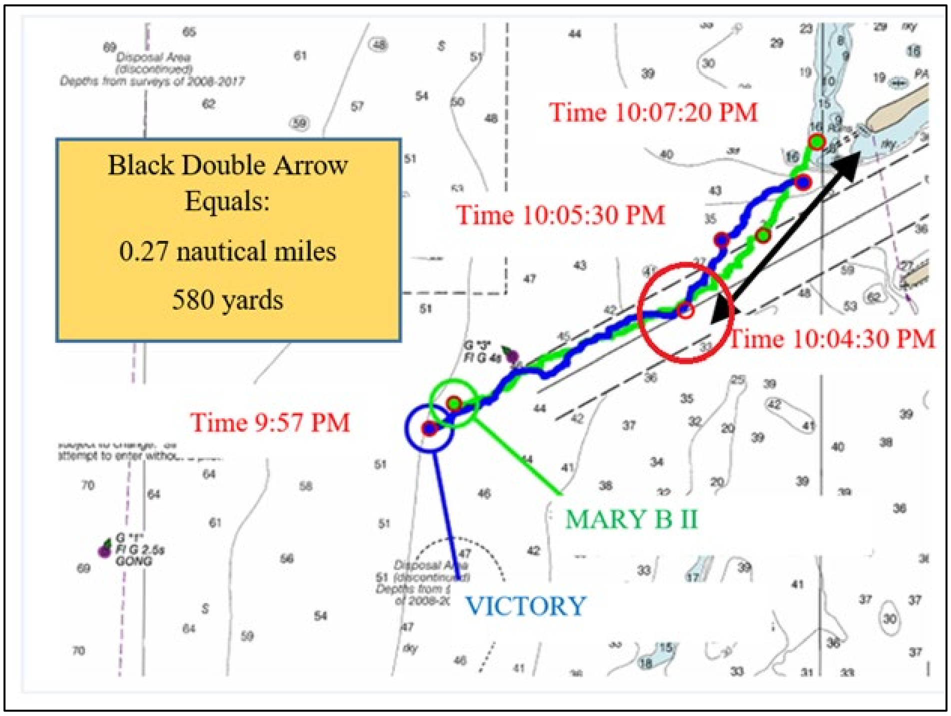

Figure 83. Large red circle indicates the start of the initiating event, the deviation from the centerline of the Yaquina Bay Bar channel. Time 10:04:30 p.m., January 8, 2019. (Source – Coast Guard)

All of the actions and conditions that caused the MARY B II to leave the center of the channel cannot be precisely determined as the crew are deceased. Based on the available evidence, the causal factors were:

6.1.1.1. All available evidence indicates the captain of the vessel did not have experience on the Yaquina Bay Bar in extreme winter conditions with significant breaking surf. Additionally, the captain did not appear to accept earlier advice from local fishermen who attempted to share their knowledge of the danger associated with rough bar conditions, including the crewman he hired to for his local knowledge of the area.

6.1.1.2. Unlike other more prudent mariners, the captain of the MARY B II did not attempt to return to the safety of Yaquina Bay until later in the evening after the breaking seas increased in severity with a gale warning in effect. Every other fisherman brought their vessels in earlier because of the forecasted weather conditions. Weather forecasting was accurate and available through a wide variety of sources. Based on this forecast, the local and experienced crew person had expectations the MARY B II would be in port by mid-afternoon.

6.1.1.3. Scientific evidence indicates that the impairing effects of methamphetamine, alcohol, and fatigue impact critical split-second decision-making and higher level cognitive functions. The captain of the MARY B II had methamphetamine in his system while operating the vessel. Considering the dynamic environment of the Yaquina Bay Bar on January 8, 2019, impairment, of any type, carried inherent and unjustifiable risk on the vessel operations and the bar crossing.

6.1.1.4. The observed reduction of the MARY B II's speed to, at times, two knots or less caused the MARY B II to move off the center of the channel and towards the North Jetty tip. It is unclear whether the shift in heading was caused by the operator, the combined weather elements, or an amalgam of both.

6.1.1.5. As observed by the OSU marine radar plot of the surface current, the force of a coastal current on the date of the accident contributed to the MARY B II setting too far north of center channel and into the vicinity of the jetty tip.

6.1.1.6. There is a possibility that a line had become entangled in the propeller and may have reduced maneuverability of the MARY B II at a crucial time. In addition, if the MARY B II's maneuverability was limited, the captain's failure to inform the Coast Guard escorts of this critical information may have resulted in the assumption that the MARY B II was fully capable of maneuvering. The port outrigger which was partially deployed may have had rigging that, if trailed aft, may have fouled the propeller or rudder.

6.1.1.7. It cannot be determined if a medical issue, injury, or incapacitation of any of the crew played a part in this deviation towards the danger posed by the North Jetty tip.

6.1.1.8. The existing ATON configuration at the entrance of the Yaquina Bay Bar did not optimally facilitate the navigation of the MARY B II on the accident night. The lack of a physical Entrance Lighted Buoy 3, potential confusion between the range lights and the bridge tower light, and the lack of light on the North Jetty tip may have been contributing factors to the operator deviating from the main channel.

6.1.1.9. The Coast Guard did not undertake a reassessment of the Yaquina Bay waterway after the implementation of the RNAs for Hazardous Bars in 2009. The 1996 Yaquina Bay WAMS classified the waterway as "non-critical" though the waterway was re-designated as "navigationally critical" in 2003. Although the waterway did not change, the risks associated with the waterway had been identified with the designation as an RNA with hazardous bars. The reassessment of this particular risk would encompass an examination to determine if the Aids to Navigation were effective to mitigate or reduce those risks. The overarching policy for the conduct of WAMS assessment is contained in the Aids to Navigation Manual, COMDTINST 16500.7A. At the time of the accident, there were issues with the missing Lighted Approach Buoy "Y", the inability of Lighted Buoy 3 to be maintained year round, the inability to put a light on the North Jetty and the potential confusion with the rear range and the aircraft warning light on the Yaquina Bay Bridge. Another significant issue is the lack of availability of heavy lift capable buoy tenders to maintain certain critical aids.

6.1.2. A subsequent event after the deviation from the center of the channel was that the MARY B II continued to move to the northeast and toward the extreme hazard of the North Jetty tip. The operator directed or allowed his vessel to continue moving northeast despite the efforts of the Coast Guard escort vessels to illuminate the bar and surrounding area and communicate warnings. These warnings included observations about incoming series of breaking waves that potentially posed a danger to the vessel and about not moving to the north until the vessel had safely crossed inside the jetty tips. Causal factors contributing to the continued northeastern movement were:

6.1.2.1. The captain of the vessel failed to fully appreciate the risks of bar crossing or lost situational awareness of the vessel's position in proximity to hazards such as the North Jetty tips and the north reef.

6.1.2.2. The captain of the MARY B II's preoccupation with AIS targets that were "clogging up" his vessel's chartplotter. There is no way to determine what he was viewing with precision, however, he may have been distracted by the presence of the VICTORY, MLB 47266 and South Jetty Light 4 and the virtual AIS ATON equipped signal from Entrance Lighted Buoy "Y." Based on the captain's request, the Coast Guard significantly reduced their communications with him as to not provide a distraction during a critical moment in the transit.

6.1.2.3. The captain of the MARY B II appeared to not utilize all available navigation aids to discern his position on the bar nor did he heed the advice from Coast Guard vessels. This was either due to lack of knowledge of those navigation aids or inability to visually identify and/or interpret or understand those navigation aids. Neither the captain nor the Coast Guard discussed the use of the navigation ranges marking the center of the channel nor South Jetty Light 4 as a reference. The Coast Guard marked the approximate position of the center of the channel with the MLB 47266 stationed near the centerline with a flashing blue light.

6.1.2.4. Notwithstanding the points raised in 6.1.1.6, there is no indication that the captain of the MARY B II used the maximum speed capabilities of the vessel (6.5-7 knots), when warranted, to transit the bar in the lull between significant wave sets and to minimize exposure of the vessel to the breaking 14-16 foot waves. The captain of the vessel did not notify the Coast Guard escorts that he was going to reduce speed.

6.1.2.5. Had the MARY B II stayed on course or shifted course back towards the center of the channel sooner and still capsized the two Coast Guard rescue vessels could have immediately attempted to affect the rescue of the crew of the MARY B II. A capsizing occurring closer to the center of the channel would have allowed for more maneuvering room for the Coast Guard crews to perform a water rescue and increased the probability of survival for the crew.

6.1.3. Subsequently, the MARY B II was struck by a series of large, 16 to 18 foot waves, as it approached the submerged rock ends of the North Jetty tip. The first series of large waves cause the MARY B II to broach and take another wave on the starboard bow area resulting the capsizing. More effective communication by the operator of the MARY B II and the Coast Guard may have prevented subsequent events. Had it been clear that the MARY B II was unable to make 6 to 7 knots and that the vessel would miss the lull period, both the Coast Guard and the vessel operator could have discussed alternative plans to not continue with the transit, and make a second attempt at crossing the bar at a later time. Causal factors leading to the impact of the waves include:

6.1.3.1. The reduction in speed by the MARY B II caused them to miss the critical period of a lull which would have minimized exposure of the vessel to the breaking 14-16 foot waves.

6.1.3.2. The operator allowed his vessel to continue moving towards the extreme hazard of the North Jetty tip despite the efforts of the Coast Guard escorting vessel to illuminate the bar and surrounding area and communicate warnings.

6.1.3.3. Prior to the series of larger waves approaching the MARY B II's position, Coast Guard escort vessels did not assertively communicate final warnings that were effective or in time to influence the operator in directing the movement of his vessel to avert disaster.

6.1.3.4. There are no Federal restrictions in place to prevent CFVs from crossing the hazardous Yaquina Bay Bar during the inclement weather conditions that night. The restrictions placed on recreational and uninspected passenger vessels, restricting those from crossing the bar that night, were not applicable to the MARY B II. This allowed the vessel to cross the bar that night under sea conditions that exceeded the vessel's capabilities, which contributed to the casualty.

6.1.4. After being struck by a series of large waves, the MARY B II capsized as it approached the submerged rock ends of the North Jetty tip. Causal factors associated with the capsizing were:

6.1.4.1. The loss of situational awareness by the operator of the MARY B II resulted in the vessel being positioned in close proximity to the North Jetty tips, leading to the waves pushing the vessel onto the rocks which contributed to the capsizing.

6.1.4.2. External wave action further reduced the vessel's righting energy. Proximity to the reflected wave energy of the rock face of the North Jetty tip meeting the incoming large breaking waves caused confused seas with the dominant power of the breaking waves continuing to come in from the Pacific Ocean.

6.1.4.3. The size and design characteristics of the MARY B II were such that the vessel itself could not cope with the extreme breaking seas. The 42 foot wood vessel with relatively high freeboard and cabin was vulnerable to the breaking seas. The force of the wave caused the vessel to pitch pole and capsize.

6.1.4.4. The decreasing distance to the submerged portion of the North Jetty tip and the breaking face of the powerful surf wave created a situation where an attempt to maneuver out of the danger would require the MARY B II to turn rapidly to face the waves perpendicularly to lessen the destructive force of the breaking sea or to maneuver back towards the center of the channel away from the hazard of the jetty tip which would cause the vessel to run more parallel to the breaking sea which would broach the vessel resulting in another form of capsizing.

6.1.4.5. The vessel's stability was potentially decreased by the outriggers affixed to the vessel, particularly the port outrigger that was halfway out, may have affected the vessel's motion and control in the large breaking seas.

6.1.4.6. There is no evidence that the captain of the MARY B II directed a crew person to stand at the rear-facing door to the cabin to call out the wave series and recommended actions. This is a practice of a prudent mariner in the Yaquina Bay Bar area.

6.1.4.7. The late December grounding may have caused damage, not known to be properly repaired, that allowed for seawater leakage into the vessel's bilges further decreasing stability at a critical moment in the inbound voyage.

6.1.5. Following the capsizing of the vessel, the three person crew perished by drowning and the vessel was lost by sinking. It cannot be determined which of these events occurred before the other or if they occurred simultaneously. The causal factors contributing to these subsequent events were:

6.1.5.1. The violent capsizing of the vessel resulted in two crew persons being ejected from the vessel at some point and the captain becoming entrapped in the cabin wreckage. It cannot be determined if the sole door to the wheelhouse was open and the two crew persons used that in an attempt to abandon the vessel or if they had washed out of the vessel wreckage.

6.1.5.2. The operator was trapped inside the cabin and the inability to egress led to his drowning. The operator was not wearing an immersion suit; however, this gear would not have been effective if he was not able to escape from inside the cabin.

6.1.5.3. The operator failed to conduct safety drills with the crew. Participation in realistic drills could have helped the crew to be better prepared in reacting to an emergency situation, enabling to take earlier steps to don immersion suits, or plan other contingencies such as abandoning ship.

6.1.5.4. With two Coast Guard rescue vessels on the scene, and the MARY B II in a hazardous location, there was still limited time and ability to take emergency action including donning immersion/survival suits and/or deploying and entering the liferaft.

6.1.5.5. Immersion suits were located in the wreckage and floating free in the surrounding waters, no victim was wearing an immersion suit designed to protect the wearer from hypothermia. In this case, there is no evidence that hypothermia played a role in the crew's deaths. The immersion suits would have protected the victims from the sudden immersion shock leading to drowning.

6.1.5.6. The approximate water temperature was 51.6° F and air temperature was 54° F. This water temperature can lead to cold water shock. Cold water is described as water less than 68° F. Two of the crewmen who were found free of the vessel wreckage drowned despite wearing a fully inflated Type V lifejacket. Sudden gasp reflex associated with cold water shock most likely contributed to the death. The captain's entrapment in the partially submerged wreckage led to death by drowning.

6.1.5.7. All three crew were wearing inflatable personal flotation devices which were found to have automatically inflated. While providing comfort and mobility while working, the life jackets worn by the three crew did not provide maximum buoyancy, right the victim to face up in minimum time and protect from sudden immersion shock and sudden gasp reflex in the frigid waters and breaking surf.

6.1.5.8. One crew person was recovered in the water by a Coast Guard rescue swimmer and hoisted to the beach where EMS responders were unsuccessful with resuscitation efforts. One crew person washed ashore and was recovered. The captain was trapped in the cabin wreckage on the beach north of the North Jetty.

6.1.5.9. The vessel broke apart after striking the North Jetty or the submerged portion of that jetty. The cabin and a significant portion of the deck washed ashore on the beach north of the North Jetty after being battered by surf. Wreckage of some portion of the MARY B II washed up on the beach for a period of time following the accident and this included the liferaft and EPIRB along with immersion suits.

6.1.5.10. The remainder of the vessel including the hull, engine, rudder, propeller and other components were not located.

6.2. Violations of Law by Credentialed Mariners: There were no credentialed or licensed mariners working on the MARY B II at the time of the accident, thus, there were no acts of misconduct, incompetence, negligence, unskillfulness, or willful violation of law by a credentialed mariner that contributed to the casualty.

Had a requirement been in place for the operator to be credentialed and had the operator survived, there would have been evidence of negligence and misconduct. The operator of the MARY B II was not fit for duty due to impairment by drug and alcohol use.

6.3. Violations by Members of the Coast Guard or other federal, state or local agencies: There were no acts of misconduct, incompetence, negligence, unskillfulness, or willful violation of law by members of the Coast Guard or other federal, state or local agencies that contributed to the casualty.

6.4. Violations Subjecting Parties to a Civil Penalty:

6.4.1. There is evidence that the MARY B II's operator was in violation of 46 USC § 2302(c)(1) by operating a vessel while being under the influence of an intoxicant or dangerous drug.

6.4.2. There is evidence that Mr. Biernacki’s conduct constitutes a violation of 46 USC 2302(a), in that he operated the MARY B II in a negligent manner when he failed to account for: the forecasted weather warnings; the inherent dangers of the Yaquina Bay Bar; and, the limiting size and construction of the MARY B II. As the operator of a vessel, Mr. Biernacki had a duty to plan and execute a safe bar passage; his failure to take into account critical factors constitutes a breach of that duty; there was a resultant loss of life and property; and, that Mr. Biernacki’s actions were the proximate cause of that damage.

6.4.3. There is evidence that the MARY B II’s managing owner was in violation of 46 CFR § 4.05-10, by failing to timely submit a marine casualty report, Form CG-2692.

6.4.4. There is evidence that the MARY B II’s managing owner was in violation of 46 USC § 2302(a) by acting in a negligent manner when she failed to ensure the safety of operations on the fishing vessel which she owned. She lacked knowledge of Coast Guard requirements regarding both owner and operator responsibilities per 46 CFR § 4 and 46 CFR § 28. Furthermore, she hired an operator who she knew not to be familiar with the notoriously hazardous waterway and entrance bar on which the vessel would be operated. The managing owner of a CFV, or any other vessel, is ultimately responsible for its safe operation.

6.5. Violations of Criminal Law: This investigation did identify violations of criminal law.

There is evidence that the MARY B II's operator was in violation of 46 USC § 2302(c)(2) by operating a vessel while being under the influence of an intoxicant or dangerous drug.

There is evidence that the MARY B II's operator was in violation of 18 USC § 1115, by negligently operating a vessel and contributing to the death of his two crewmembers.

The actions of the operator of the MARY B II, by operating the vessel impaired by drugs and alcohol and in a negligent manner, endangered the vessel, the lives of everyone onboard, the environment and the safety of the Coast Guard and other first responders. Had the operator of the MARY B II survived, this investigation would have made this referral to the Department of Justice.

6.6. Need for New or Amended Laws/Regulations:

This marine casualty confirms the need to create the following:

6.6.1. The Coast Guard should accelerate shaping and implementing the policies, procedures and guidance outlined in the Coast Guard Authorization Act of 2010 (Public Law 111-281), which added a subsection in 46 USC § 4502 that requires the individual in charge of a CFV, that operates three nautical miles beyond the territorial sea baseline, to pass a training program and hold a certificate issued under that program. The program must address certain topical areas and it must be based on professional knowledge, skills, and competencies that includes, but is not limited to: training in seamanship, stability, collision prevention, navigation, firefighting and prevention, damage control, personal survival, emergency medical care, emergency drills, and weather; require an individual to demonstrate ability to communicate in an emergency situation and understand information found in navigation publications. The program also must recognize and give credit to the individual for recent past experience in fishing vessel operation. The training certificate will be valid for 5 years after which refresher training will be required to keep the certificate current.

6.6.2. The incidents of drug and alcohol use during the operation of CFVs threatens the safety and security of the vessel crews, vessels, environment and the nation's waterways. The Coast Guard should enact regulations that, at a minimum, require the persons operating state and federally documented vessels in navigable waters and on the high seas to be part of a drug and alcohol testing program that is found in all other sectors of the commercial marine industry. That includes pre-employment, random, and reasonable cause testing while maintaining existing the post casualty testing requirements.

6.6.3. The Coast Guard has not established merchant mariner credentialing requirements for personnel working on CFVs to bring those vessel requirements into alignment with other segments of the commercial marine industry. This effort would have ensured a standardized competency level, medical fitness certification, and mandatory enrollment in drug testing program with pre-employment, random, periodic and reasonable suspicion testing for the marine industry. There are no requirements related to medical fitness, eliminating the potential for workplace impairment by drugs and alcohol, and an in-depth examination of mariner competency for someone to work on a commercial fishing vessel of less than 200 GT. At this point in time, post-casualty drug and alcohol testing is an investigation tool and it is not a deterrent that creates a drug and alcohol free workplace.

While effective, voluntary stability requirements, safety classes and safety requirements have provided an improvement in the only certain areas of the safety of vessel operations.

Despite the vessel owners and operators commitment to safe vessel operations and sending safe vessels to sea, there are no mandated material inspection or construction standards for the fishing fleet of smaller fishing vessels which are not inspected by a regulatory authority. A vessel may be constructed with any material and be inadvertently designed with operational limitations such as high sail area, limited propulsion power and ballast capability and a host of other limitations. With older vessels, a detailed examination of the material condition of the hull and internal components is even more critical. At this point, there is no requirement for either safety initiative, credentialing of operators or inspection of the vessels they operate.

6.6.4. The current examination standards on CFVs do not adequately address the hazards associated with fishing operations. The Coast Guard should require CFVs to undergo mandatory inspections with expanded standards beyond the limited requirements of 46 CFR § 28. These comprehensive requirements should include the following: enrollment in drug testing program, watertight integrity and subdivision requirements, requirements to not only conduct drills but to maintain a record of safety drills, requirements for equipment maintenance and dry dock exams to ensure the integrity of the hull and other watertight components.

6.6.5. The current regulatory requirements for a bar crossing plan also known as a Go/No-Go Plan only apply to small passenger vessels, not CFVs or other commercial vessels with the exception of uninspected vessels. If the bar crossing plans have been reviewed and approved by the Coast Guard OCMI then these vessels are exempt from certain provisions outlined in the RNA's regulations for hazardous bars. The Coast Guard should amend current regulations to require CFVs and other commercial vessel to have a bar crossing plan. Working with fishing industry stakeholders to provide guidance to Coast Guard personnel who review and approve those plans as to what are the elements should be included in the contents of the bar crossing or go/no-go plans.

6.7. Unsafe Actions and Conditions which, although not directly Causal Factors, Cannot Be Eliminated as Potential Contributing Factors:

6.7.1. The managing owner of the MARY B II failed to ensure that her employees, the crewmembers, abstained from drugs and alcohol when operating the vessel. Evidence supports both drugs (methamphetamine, amphetamines, and cannabinoids (marijuana)) and alcohol were present in the systems of two of three of the crew while operating the vessel.

6.7.2. The managing owner of the MARY B II failed to address the serious issue of workplace fatigue or mitigate the attendant consequences on the crewmember's critical decision-making.

6.7.3. The Coast Guard boat crews communicated information describing bar conditions related to wave characteristics such as period, set, breaks, geographic location, and distance from the ranges. Some of these communications used terms which mariners not familiar with the Yaquina Bay Bar would not have recognized or fully understood. Furthermore, communications from the Coast Guard to the MARY B II regarding vessel speed and warnings about avoiding the North Jetty tip were not stated with enough urgency or sufficiently early in the escort to avoid the vessel going into extremis.

6.7.4. On the night of the accident, and for about four months before, the Coast Guard effectively had no available buoy tenders with heavy lift capabilities in the accident area of operations. [101] A buoy tender with heavy lift capabilities is one that has the capability to lift, moor, and reposition critical aids to navigation at deep-water bars. The CGC FIR left the AOR in June 2018 to go into an extended dry dock period. The CGC ELM was identified as the replacement vessel for the CGC FIR which was not scheduled to arrive in the AOR until August 2019.[102] D13 assumed an approximate 16-month gap in heavy lift buoy tending capabilities.

6.7.5. The consideration to make and sustain critical floating aids to navigation year round aids is not possible without enhanced buoy types, moorings and the vessels to service them when needed. Sustaining the other floating aids to navigation in these hazardous bar areas is also adversely impacted by a lack of other heavy lift buoy tenders.

6.7.6. After the MARY B II capsized the Coast Guard and other agencies began conducting SAR. Initially, there were communication challenges between all of the vessels, shore parties, and the CG helicopter. The CG boats, beach crews, the CG helicopter and local Fire Department and Law Enforcement resources were communicating on different channels. Once Sector North Bend Command Center informed all personnel to switch to Channel 21 Alpha, the communication issues were resolved. These were ultimately resolved before the suspension of the search activities resulting in the location of all of the victims.

6.7.7. The bar safety handouts, which are a two-sided color handout containing critical safety information for marine interests for each particular hazardous bar, do not contain warnings about the seasonal nature of some aids and the potential for lack of reliability of the aids to navigation in these hazardous areas.

6.7.8. There is a gap in NAIS coverage in the Newport, Oregon area of operation that affected the ability of the Coast Guard to monitor and identify vessel positions using AIS transponders on vessels that are equipped with these units. Coast Guard Command Centers, using the tracking capability of AIS, identify vessels and can dispatch SAR boats, Cutters and aircraft accurately and without delay with this capability.

7. **Actions Taken Since the Accident**

7.1 Coast Guard Search and Rescue including Bar Escorts

[101] There is another Coast Guard buoy tender within the D13 operations area, the CGC HENRY BLAKE, homeported in the Puget Sound area. This buoy tender could have handled some of the ATON in the vicinity of Yaquina Bay but the HENRY BLAKE is limited by sea conditions as well as buoy size characteristics. At the time the discrepancies with Lighted Whistle Buoy Y and Entrance Lighted Buoy 3 were observed, the HENRY BLAKE would not have been able to transit to Newport, OR to correct the discrepancies.

[102] The gaps in buoy tender availability was/is being assumed across the country with the entire buoy tender fleet.

7.1.1. As a result of this incident, and consistent with COMDTINST M16130.2F, Commander Thirteenth Coast Guard District directed a SAR Case Study to examine the SAR aspects of the emergency phase of the MARY B II case. This included the alert and distress phases of the accident. The recommendations of this report will be made available to Coast Guard senior leadership as a means to enhance and improve Coast Guard operations.

7.1.2. A work group was established via charter with taskers directly taken from the Thirteenth District Commander's Final Action Memo. Taskers include a look at bar illumination, Advanced Helicopter Rescue School (AHRS) training review, communication to commercial fishing vessel fleets, and a WAMS at Yaquina Bay.

7.1.3. Station Yaquina Bay has created a unit instruction outlining the procedures to be used for bar escorts and restrictions which includes a decision making flow chart.

7.2. Coast Guard D13 Prevention

7.2.1. In accordance with policy, a timely examination of the existing ATON in the accident area was conducted to determine if the aids to navigation were on station and watching properly as prescribed.

7.2.2. The Coast Guard established virtual AIS aids to navigation on a number of buoys and established a virtual AIS ATON on the North Jetty. These are now charted and available for use with vessels equipped with AIS to enhance navigation on this waterway. The Coast Guard has also begun installation of virtual AIS ATON at other hazardous bars in D13.

7.2.3. D13 Waterways Management initiated a WAMS study. The WAMS is being conducted for Yaquina Bay with an estimated completion date of November 1, 2019. A WAMS study was conducted for Tillamook Bay and there is a plan to update the ATON for that waterway.

7.2.4. D13 Waterways Management coordinated having the Coast Guard Cutter ASPEN, with sufficient heavy lift capabilities, transit up from San Francisco, CA in August 2019 to clear some of the backlog of ATON discrepancies.

7.2.5. D13 Inspections and Investigations developed a Marine Safety Information Bulletin (MSIB). This MSIB is under development highlighting immediate notification to the maritime community regarding bar operations.

7.2.6. Much the MARY B II's remains were found on the beach and collected by Oregon State Parks. However, the submerged portion of the wreckage of the MARY B II was not searched for or located because of the dangerous location in which the accident occurred.

7.2.7. After the lapse in appropriations was over, the Coast Guard reassessed its classification of personnel previously designated as non-essential. In D13, several personnel were reclassified as essential personnel including a civilian Coast Guard investigator and several CFV Examiners. In the event of future lapses in appropriations, these personnel will be available to conduct Coast Guard operations in the areas of CFV Examinations and marine casualty investigations.

7.3. Alleged RANGER incident. During the public hearing, two witnesses testified about a previous assault involving Mr. Biernacki and another crewmember on board the RANGER on or about August 2018. This allegation was outside the scope of this investigation and any information received during and after the board has been referred to the Commander of Sector North Bend for disposition.

8. Recommendations

8.1. Safety Recommendations

8.1.1. Recommend that the Commandant of the Coast Guard partner with the Commercial Fishing Safety Advisory Committee (CFSAC) to establish a working group to draft and accept a Task Statement addressing safety of Commercial Fishing Vessels of less than 200 GT. The Task Statement should specifically address the issues raised by this marine casualty, the total loss with fatalities of the MARY B II, to include addressing the following items:

8.1.1.1. Review multi-year statistics (provided by the Coast Guard) regarding commercial fishing vessels' less than 200 GRT accidents or losses that resulted in fatalities, injuries, or property damage. Major marine casualties such as the losses of F/V "DESTINATION," "NO LIMITS" and other fishing vessels with multiple fatalities could be reviewed as examples.

8.1.1.2. Propose initiatives and actions to be taken onboard commercial fishing vessels less than 200 GT to eliminate all drug and alcohol usage when operating.

8.1.1.3. Ensuring that CFVs are maintained with rigid standards for material condition, construction, and design of the vessels that maintains seaworthiness under all operating conditions.

8.1.1.4. A process to review and implement commercial fishing vessel mariner fitness-for-duty for service onboard CFVs of less than 200 GT. Fitness for duty and service should include an assessment of overall health and physical fitness and contain provisions for the elimination drug and alcohol usage and management of fatigue.

8.1.1.5. A process to assess, document and maintain mariner competency to operate CFVs of less than 200 GRT, including local knowledge and recency.

8.1.1.6. Development of a joint Industry and Coast Guard effort to complete the implementation of 2010 and 2012 legislation for commercial fishing vessels as specified in those Coast Guard Authorization Acts. These efforts should address at a minimum, enacting the provisions in the CG Authorization Act of 2010 regarding certifying CFV operators' competency.

8.1.1.7. Feasibility of a multi-year phase-in implementation that all CFV mariners on CFVs of less than 200 GT and operating three miles beyond the baseline in a near-coastal zone obtain and maintain a Merchant Mariner Credential (without TWIC requirement).

8.1.1.8. Feasibility of a multi-year phase-in implementation that all CFV mariners serving as a Master/Operator of a CFVs of less than 200 GT and operating three miles beyond the baseline in a near-coastal zone obtain and maintain an Operator of Uninspected Passenger Vessels (OUPV) Merchant Mariner Credential (without TWIC requirement).

8.1.1.9. Identify steps and make recommendations to promote marine safety of CFVs less than 200 GT with all commercial entities, companies, owners, and managing operators to develop and implement a Safety Management System (SMS) for their vessels and personnel, in accordance with and as defined in 33 CFR § 96.120.

8.1.1.10. Develop guidance and make recommendations on fatigue limiting strategies as well as work/rest hour logging requirements.

8.1.2. Recommend that the Commandant of the Coast Guard should obtain the legislative authority to require CFVs to undergo mandatory inspections with expanded standards beyond the limited requirements within 46 CFR § 28. The current regulatory standards for CFVs do not adequately address the seaworthiness of vessels in light of the hazards associated with fishing operations.

8.1.3. Recommend that the Commandant of the Coast Guard request a review of the Fishing Vessel Casualty Task Force report, March 1999, with the aim of implementing all of the recommendations. In 2011, the NTSB released five safety recommendations for CFV operations which were presented to the Coast Guard. These included addressing stability, subdivision and watertight integrity on CFVs under 79 feet. Additionally, NTSB recommended all owners and masters receive training and be able to demonstrate competency in stability and watertight integrity. Despite the overwhelming recognition of the hazards of commercial fishing, and the statistical data showing high rates of fatalities and vessel losses, a long list of recommended regulations and laws have not been enacted. Voluntary programs, education and dissemination of best marine practices do not stop CFV casualties and fatalities when negligent owners and operators fail to adhere to well-intentioned suggestions. Comprehensive requirements should include the following: enrollment in drug testing program, watertight integrity and subdivision requirements, requirements to not only conduct but have and keep a log of safety drills, requirements for equipment maintenance and dry dock exams to ensure the integrity of the hull and other watertight components.

8.1.4. Recommend that the Commandant of the Coast Guard obtain legislative authority to require CFV operators of less than 200 GT hold a valid Coast Guard issued Merchant Mariner's Credential (MMC). In addition, legislative authority should be obtained to require crewmembers on CFVs hold crew competency certificates or Merchant Mariner's Document. This would help ensure standardized levels of competency, ensure the medical fitness of CFV operators and crew, and it would enhance crew's safety mindset. Along with medical certificates, the licensing requirements means these mariners are subject to enrollment in a mandatory drug testing program. The program includes requirements for all types of testing: pre-employment, random, periodic, reasonable suspicion testing and post-casualty. This is a much needed tool for owners and operator to ensure a drug-free working environment on their CFVs, something which affects the safety of life and property on the waterway.

8.1.5. Recommend that Commander Thirteenth Coast Guard District should work with District Eleven to conduct education and outreach to promote awareness, compliance, and training opportunities with hazardous bars, bar crossing plans, and prudent practices such as stationing an aft lookout. Education and outreach can include developing safety alerts, attending industry workshops or hosting industry days with local CFV owners, operators, and crew.

8.1.6. Recommend that the Commandant of the Coast Guard in concert with District CFV Safety Program Managers collaborate with entities like the North Pacific Fishing Vessel Owner's Association (NPFVOA) and AMSEA to amend their curriculums and develop a concentrated outreach campaign as appropriate for operating areas with bars to increase visibility of the risks and dangers of bar crossings and discussion of potential courses of action including not crossing the bar under certain conditions. Working in concert with Coast Guard Districts, Commercial Fishing Vessel Programs and Small Boat Station Stations should encourage CFV owners and captains to attend trainings and workshops that go well beyond drill conductor training that may include stability, navigation, Occupational Safety and Health, fatigue reduction measures, and accentuating the importance of maintaining a drug and alcohol free workplace on CFVs. In addition, in partnership with public industry, the Coast Guard should conduct additional and continuing public outreach programs concerning commercial fishing vessel safety as a result of this tragic accident. The goal is to expand and elaborate on communicating the risks of bar crossings and Coast Guard escort availability and procedures.

8.1.7. Recommend that the Commandant of the Coast Guard amend 46 CFR Part 28 to require CFV owners and captains implement shipboard policies to address crew rest, work hours and fatigue. The shipboard policies should reflect the basic principles of the Coast Guard's Crew Endurance Management System (CEMS) used to identify and control crew endurance risk factors. Requiring owners and captains to implement crew rest policy would give crewmembers the opportunity to reduce their risk of fatigue-related accidents and help prevent casualties.

8.2. Administrative Recommendations:

8.2.1. Recommend that Sector Columbia River who holds the Officer in Charge, Marine Inspection authority for Civil Penalty proceedings initiate civil penalty action against the MARY B II's owner for alleged violations of 46 CFR § 4.05-10 and 46 USC § 2302 via Marine Safety Unit Portland.

8.2.2. Recommend that Commander Thirteenth Coast Guard District commission a Coast Guard Bar Observation, Escort and Critical Bar Condition Information Dissemination study of the 16 waterways with hazardous bars as defined in 33 CFR § 165.1325. Even though these waterways may have similarities and differences, they are classified as hazardous bars. This study should include the perspective of mariners who may not be familiar with a particular waterway. To ensure that Coast Guard bar operations related to these areas take into effect the best practices contained in the Station Yaquina Bay Instruction (STAYBINST 3100.B) dated February 13, 2019[103], guidance from the Coast Guard National Motor Lifeboat School, and the Office of Boat Forces (CG-731). For consistency of operations for the waterways users in these hazardous waterways, Coast Guard D13 and D11 should collaborate on areas of common concerns and practices for waterway users at the hazardous bars in their areas of responsibility. In addition, the District Commander should review and promulgate Commander's Intent clarifying expectations for the application of bar closures under 33 CFR § 165.1325. The detailed examination of the other RNAs within D13 were outside the scope of this investigation.

8.2.3. Recommend that Commander Thirteenth Coast Guard District specifically address the issues raised by this marine casualty, to include addressing the following:

8.2.3.1. Direct a review of all D13 waterways and reclassify hazardous waterways as navigationally critical. This classification relates to the hazard of the waterway as well as the difficulty in maintaining ATON in these unique areas. This recommendation should be shared with the Waterways Division at D11 for consideration based on the classifications outlined in the CG Aids to Navigation Manual.

8.2.3.2. Designate Entrance Lighted Channel Buoy 3 a year round ATON if supported by the recently commissioned Yaquina Bay Bar WAMS and including the opinions and suggestions of the Coxswains and Surfmen at CG Station Yaquina Bay

8.2.3.3. Develop and promulgate warnings about the reliability of aids to navigation be included as a warning to mariners in the Bar Safety Handouts disseminated to marine interests. Recommend this be communicated to the Commander Eleventh Coast Guard District for consideration for inclusion in any similar products that they may produce for marine interests.

8.2.4. Recommend that Commander Thirteenth Coast Guard District initiate a workgroup to review and implement Coast Guard response communications plans, procedures, and

[103] CG Exhibit 067.

compatible equipment to ensure that communications are as effective as possible in emergent search and rescue situations.

8.2.5. Recommend that Commandant of the Coast Guard accelerate the acquisition for a replacement for the 52 foot special purpose craft (SPC). Built in the mid-1950s, the four highly capable heavy displacement vessels cannot operate indefinitely and have a speed of 11 knots.

8.2.6. Recommend that Commandant of the Coast Guard close the gap as outlined in COMDTINST M16500.7 (series) between WAMS reports and the more complex Port and Waterway Safety Assessment (PAWSA) and determine the appropriate and mandated interval for the risks associated with "critical waterways." The WAMS are specifically centered on ATON for the waterways and marginally explore actual waterway conditions and specific hazards. The 16 waterways that are identified as RNAs for hazardous bars are navigationally critical as defined in COMDTINST M16500.7 and require special attention and an expanded WAMS study. In addition, D13 Prevention should examine reduction in size of the Regulated Navigation Areas contained in 33CFR § 165.1325 so that the RNAs actually represent the areas of risk to mariners rather than a broad geographic area. There is a gap for waterways with unique hazards such as the RNAs for hazardous bars as outlined in 33 CFR §165.1325 along the Pacific Northwest Coast. These ports do not qualify for a Port and Waterway Safety Assessment (PAWSA) due to the complexity of these studies.

8.2.7. Recommend that the Commandant of the Coast Guard commission a workgroup to study the need for replacement of the navigation buoys placed at the entrance of hazardous bars and similar waterways that are subjected to extreme sea conditions. Recommend the findings of this work group drive the design, construction and implementation of a buoy type that can withstand extreme sea, current and mooring challenges.

8.2.8. Recommend that the Commandant of the Coast Guard direct the Coast Guard SAR community to incorporate into guidance and standard operating procedures that the survival time determinations in the Probability of Survival Decision Aid, PSDA program include the likelihood of sudden immersion shock in waters below 68° F in catastrophic and sudden vessel accidents. Cold water immersion can adversely affect the estimated functional survival time for an average person who would be wearing PVC rain gear as opposed to an immersion or survival suit. These same considerations also affected the cold water survival time of 12.62 hours for the same individual exposed to the air and water temperature on the accident night wearing only clothing and possible rain gear.

8.2.9. Recommend that the Commandant of the Coast Guard coordinate with appropriate Districts that have identified high-risk fisheries and establish an outreach and compliance program for the witnessing and increased participation in onboard drills on fishing vessels prior to the start of fishing seasons. These high-risk fisheries include the Dungeness crab fisheries and include others that have been identified through data from NIOSH studies for fisheries with high incidents of deaths and vessel losses.

8.2.10. Recommend that the Commandant of the Coast Guard and the NWS explore and consider incorporation of OSU's coastal marine radar data as a tool to build a better weather and sea state picture for concerned mariners as well as for Coast Guardsmen preparing to conduct operations while they conduct risk assessment for bar escorts in adverse weather conditions. It was determined that the NWS does not utilize specially configured shore based marine radar designed to show the coastal wave spectrum to the level of granularity that is produced by OSU research facilities. Incorporation of this type of precision technology into Coast Guard risk assessment procedures and NWS products would aid mariners and Coast Guard responders in developing a better operating picture on which critical bar crossing, bar restriction, and bar closure decisions can be made.

8.2.11. Recommend that the Commandant of the Coast Guard have the Coast Guard Navigation Center (NAVCEN) examine and close the NAIS coverage gap that exists in the Yaquina Bay Bar, Oregon area to ensure the effectiveness of Coast Guard operations as well as national security requirements.

8.2.12. Recommend that the Commandant of the Coast Guard provide a copy of this report to the next-of-kin of the MARY B II's crew, the NTSB, and PII counsel.

8.2.13. Recommend that the Commandant of the Coast Guard provide widest dissemination of this report throughout the CFV industry community including Coast Guard District Fishing Vessel Coordinators, NPFVOA, AMSEA, NIOSH, major fishing vessel associations in the Pacific Northwest, and the Fisherman's Wives Association.

8.2.14. It is recommended that this investigation be closed.

[redacted]

KAREN DENNY
Commander, U.S. Coast Guard
Lead Investigating Officer

Enclosures: (1) Formal Marine Casualty Investigation Convening Order
(2) MARY B II Public Hearing Witness List
(3) Hyperlink List

Witness List F/V MARY B II Formal Hearing 13-17 May 2019, Newport, OR

Witness #	Testimony Date	Name	Position or Association
1	13 May 2019	Mr. [redacted]	Previous vessel owner
2	13 May 2019	Mr. [redacted]	Marine Surveyor
3	13 May 2019	Senior Trooper [redacted]	Oregon State Patrol
4	13 May 2019	Mr. [redacted]	NOAA Meteorologist
5	13 May 2019	CDR Brendan Harris USCG	D13 Waterways Management Branch Chief
6	14 May 2019	Dr. [redacted]	Oregon State University Crab Fishing expert
7	14 May 2019	BMC [redacted] USCG	Executive Petty Officer Station Yaquina Bay
8	14 May 2019	BM2 [redacted] USCG	USCG Station Yaquina Bay
9	14 May 2019	Mr [redacted]	Commercial Diver
10	14 May 2019	Mr. [redacted]	Previous employer of Mr. Biernacki
11	15 May 2019	Mr. [redacted]	Previous employer of Mr. Biernacki
12	15 May 2019	Mr. [redacted]	Previous employer of Mr. Biernacki
13	15 May 2019	BOSN [redacted] USCG	Commanding Officer Station Barnegat Light
14	15 May 2019	Mr. [redacted]	Former colleague of Mr. Porter
15	15 May 2019	Mrs. [redacted]	Spouse of Mr. Porter, Crew
16	15 May 2019	Dr. [redacted] Medical Examiner & Mr. [redacted] & Mr. [redacted]	Medical Examiner and Oregon State Forensics Lab Technicians
17	15 May 2019	Dr. [redacted] (*)	Toxicology Expert West Jefferson Industrial Medicine
18	15 May 2019	Mr. [redacted]	Previous employer of Mr. Biernacki
19	15 May 2019	Mrs. [redacted]	Spouse of Mr. Porter, testimony continues
20	16 May 2019	Dr. [redacted]	Oregon State University, Coastal Wave Study
21	16 May 2019	Mr. [redacted] USCG	CG D13 Fishing Vessel Coordinator
22	16 May 2019	BMC [redacted] USCG	Executive Petty Officer Station Yaquina Bay, testimony continues
23	16 May 2019	Mr. [redacted] USCG	Fishing Vessel Examiner CG Marine Safety Unit Portland
24	16 May 2019	BM2 [redacted] USCG	USCG Station Yaquina Bay, testimony continues
25	16 May 2019	BOSN [redacted] USCG	Commanding Officer Station Yaquina Bay
26	17 May 2019	Mr. [redacted] USCG	CG D13 Command Center
27	17 May 2019	LCDR [redacted] USCG	CG D13 Regulated Navigation Area Spokesperson
28	17 May 2019	BOSN [redacted] USCG	Commanding Officer Station Yaquina Bay, testimony continues
29	17 May 2019	Ms. [redacted]	Managing Member of MARY B II LLC/ Vessel Owner, CFV MARY B II
30	17 May 2019	Ms. [redacted] & Dr. [redacted]	National Institute for Occupational Safety and Health (NIOSH)

(*) = Appeared at testimony remotely via SKYPE

MARY B II ROI Hyperlinks and Short URL's
Enclosure 3

(The Hyperlinks will open in another window and there will be a standard anti-virus message, you can click "OK")

#	Description	Short URL
1	This hyperlink will take the online reader to a composite movie with sound, CG Exhibit 38 entitled Critical Communications contains slides showing the positions of CG vessels and the MARY B II on a nautical chart with recordings of critical radio communications and the times of these activities. ***NOTE: This is a large file and takes a considerable amount of time to load.***	CG 038 Critical Comms.mp4
2	This hyperlink will take the online reader to CG Exhibit 011, which is an audio recording of radio communications between the Coast Guard and the MARY B II in the later stages of the inbound transit and during the rescue activities.	CG 011_Audio_CG Communications Audio Recording_Part 2 of 2.wav
3	This hyperlink will take the online reader to CG Exhibit 008, which is the transcript of radio communications between the vessels operating offshore of Yaquina Bay Oregon as well as Coast Guard shore side personnel from the time leading up to the accident and up to and including rescue operations.	CG 008 CG Station YB Comms Transcript_Redacted.pdf
4	This hyperlink will take the online reader to CG Exhibit 035, which is a short movie of the Oregon State University radar track of the VICTORY and MARY B II overlaid on a nautical chart showing the movement of these two vessels in reference to the accident site. Vessel 1 is the MARY B II and Vessel 2 is the USCG MLB Victory.	CG 035 OSU Product snap_event_navChart_1080_10rps mp4
5	This hyperlink will take the online reader to CG Exhibit 034, which is a short movie of the Oregon State University radar track of the VICTORY and MARY B II showing the wave patterns captured on the Oregon State University marine band radar with the bright yellow colored waves being steeper and larger than the other waves, which are maroon in color. Vessel 1 is the MARY B II and Vessel 2 is the USCG MLB Victory.	CG 034 OSU Product snap_event_radar_1080_10rps mp4
6	This hyperlink will take the online reader to a document showing the track of the MARY B II and CG escorts derived from the Oregon State University marine radar and plotted on a navigation chart. The document shows the position and tracks of the MARY B II, VICTORY and the CG 47266 at representative times. Derived from CG Exhibit 071.	CG 071 OSU Radar Track CG 47266 VICTORY MARY B II.pdf
7	This hyperlink will take the online reader to CG Exhibit 073 and CG Exhibit 076 (Combined), which are exhibits with details relating to the MARY B II's captain while operating vessels on the East Coast on the United States which resulted in an interaction with the Coast Guard.	Combined Exhibit 073 and 076.pdf
8	This hyperlink will take the online reader to a short video extracted from the Oregon State Police CCTV on the accident night showing the illumination provided by a MK 127 night illumination flare.	Flare.mp4
9	This hyperlink will take the online reader to a short video showing the range lights and the Yaquina Bay Bridge bridge aircraft warning lights at night when entering Yaquina Bay. The USCG took this video following the accident prior to dawn to illustrate these aids to navigation shot this video.	YBB Ranges.mp4

If you have any difficulties with any of these hyperlinks please contact: INCOE@uscg.mil

UNITED STATES COAST GUARD

REPORT OF INVESTIGATION INTO THE CIRCUMSTANCES SURROUNDING THE INCIDENT INVOLVING
CFV MAVERICK / CFV VIKING STORM COLLISION/DEATH

ON 09/28/2012

MISLE ACTIVITY NUMBER: 4452622
ORIGINATING UNIT: SECTOR PUGET SOUND
MISLE ACTIVITY OWNER: SECTOR PUGET SOUND
MISLE ACTIVITY CONTROLLER: SECTOR PUGET SOUND
MISLE CASE NUMBER: 615096

U.S. Department of Homeland Security
United States Coast Guard

Commandant
United States Coast Guard

US Coast Guard Stop 7501
2703 Martin Luther King Jr. Ave. SE
Washington, DC 20593-7501
Staff Symbol: CG-INV
Phone: (202) 372-1032
Fax: (202) 372-1904

16732/IIA #4452622
15 February 2022

THE COLLISION BETWEEN COMMERCIAL FISHING VESSELS MAVERICK AND VIKING STORM RESULTING IN THE SINKING OF MAVERICK AND SUBSEQUENT LOSS OF LIFE 30 MILES WEST OF LA PUSH, WA ON SEPTEMBER 28, 2012

ACTION BY THE COMMANDANT

The record and the report of the investigation convened for the subject casualty have been reviewed. The record and the report, including the findings of fact, analysis, and conclusions are approved. The safety recommendations remain under review and any resulting actions will be documented separately. This marine casualty investigation is closed.

[redacted]

[redacted]. D. NEUBAUER
Captain, U.S. Coast Guard
Chief, Office of Investigations & Casualty Analysis (CG-INV)

U.S. Department of Homeland Security
United States Coast Guard

United States Coast Guard
Sector Puget Sound

1519 Alaskan Way South
Seattle, WA 98134
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16671
09June2015

MEMORANDUM

From: [redacted]
Marine Investigator [redacted]

To: M.W. Raymond, CAPT [redacted]
CG SECTOR Puget Sound

Subj: COLLISION / DEATH INVOLVING THE U.S. CFV MAVERICK (O.N. 549879) AND THE CANADIAN CFV VIKING STORM (O.N. 800025) ON SEPT 28, 2012

Ref: (a) USCG Marine Safety Manual, COMDTINST M16000.10A, Volume V
(b) COMDT (CG-545) memo 16732 of 17 Mar 11

Preliminary Statement:

In accordance with references (a) and (b), an investigation was conducted into the collision of the U. S. flagged Commercial Fishing Vessel (CFV) MAVERICK (O.N. 549879) and the inspected Canadian flagged CFV VIKING STORM (O. N. 800025) on September 28, 2012. The subsequent sinking of the CFV MAVERICK resulted in the loss of one crewmember, who was never recovered.

Factual evidence was collected in order to conduct a thorough analysis of the incident. All times are approximate and reflect local Pacific Standard Time. The MISLE Activity number for this investigation is 4452622.

Executive Summary:

On September 28, 2012, the Canadian CFV VIKING STORM was transiting southbound from Canadian waters enroute to Westport, Washington in dense fog. At approximately 0430, the CFV VIKING STORM collided into the port side of the drifting U.S. CFV MAVERICK approximately 30 nautical miles (NM), west of La Push, Washington. The CFV MAVERICK immediately heeled to starboard, flooded with water, capsized, and sank. Three of the four crew members on board the CFV MAVERICK were rescued by the CFV VIKING STORM. The fourth crew member was unable to be found and on September 29, 2012, the search and rescue operations were suspended and the missing crew member was presumed to have drowned.

U.S. CFV MAVERICK Vessel Data:

Photo 1: CFV MAVERICK time and date unknown

Name:	MAVERICK
Official Number:	549879
Service:	Commercial Fishing Vessel
Year Built	1973
Built By:	Unknown
Gross Tons:	27
Net Tons:	Unknown
Length:	40 FT
Propulsion	1 diesel engine,160 brake horse power, Single fixed-pitch propeller
Cargo Onboard	Sablefish (Black cod) (815 lbs)
Owner & Operator:	[redacted]

Personnel Data:

Name	Position	Sex	Age	Status
[redacted]	Operator	Male	[redacted]	Witness
[redacted]	Crew member #1	Male	[redacted]	Witness
[redacted]	Crew member #2	Male	[redacted]	Witness
Kelly Dickerson	Crew member #3	Male	[redacted]	Lost at Sea/Presumed dead

Canadian CFV VIKING STORM Vessel Data:

Photo 2: Canadian CFV VIKING STORM time and date unknown

Name:	VIKING STORM (Former name: GAIL BERNICE)
Official Number:	800025
Service:	Fishing Vessel
Year Built	1981
Built By:	Benson Brothers Shipbuilding CO.
Gross Tons:	246
Net Tons:	115
Length:	90 Ft
Breadth	27 Ft
Depth	10.4 Ft
Propulsion	1 diesel engine, 940 brake horse power, single fixed-pitch propeller
Cargo Onboard	Pacific Whiting (Hake Fish) (260,145 lbs)
Owner & Operator:	Viking Storm Holdings Inc.(Clackamas Oregon) 63 shares Leader Fishing LTD (British Columbia Canada) 1 share

Personnel Data:

Name	Position	Sex	Age	Status
[redacted]	Master	Male	[redacted]	Witness
[redacted]	Deck hand #1	Male		Witness Subject of Investigation
[redacted]	Deck hand #2	Male		Witness

Weather:

Winds:	Light approx 5 knots
Waterway:	Calm
Visibility	Thick fog
Air temperature	Approx. 60° F

1. **Findings of Fact:**

a. The CFV MAVERICK was a fishing vessel with a welded steel hull and deck house. At the time of the occurrence, the vessel was outfitted for long lining. The deckhouse was located forward of amidships and contained the conning station, galley, and master's accommodation. The navigation and communication equipment was located near the conning station and included radar, depth sounder, very high frequency (VHF) radiotelephone, autopilot, chart plotter, and global positioning system (GPS).

b. The CFV VIKING STORM is a large fishing vessel outfitted for trawling. It has a welded steel hull and an aluminum deckhouse located forward of amidships. The deckhouse contains the galley, accommodations for 11 people, an engine room entrance, and stairs to the wheel house. The wheel house is equipped with navigation and communication equipment including radars, depth sounders, sonars, VHF radiotelephones, autopilot, an automatic identification system (AIS), chart plotter, GPS and satellite phone. Fitted atop the vessel's deckhouse are four 1000 watt high pressure sodium (HPS) floodlights. All navigation, communications, and fishing electronics are located around the seated conning position on the starboard side of the wheelhouse.

c. CFV VIKING STORM: On the morning of 23 September 2012, the CFV VIKING STORM returned to Ucluelet, British Columbia from a fishing trip with a complement of 4 crew members, as per its Manning Certificate. One of the two deck hands informed the master of his intention to not participate in the next trip and left the vessel after helping to unload the catch; he was not replaced prior to the vessel departing. The same day, the master also left for scheduled personal reasons and one of the deck hands fleeted up to the master position. Due to the ship losing two workers, another deck hand was hired and reported to the vessel to assist. This put the crew complement at three members. At approximately 1500, the vessel departed Ucluelet for their fishing grounds with the new master and two deck hands board. The vessel fished on 24 September 2012 and then drifted and jogged overnight with just one crew member on watch. At 1000 on 25 September 2012, the vessel travelled to Ucluelet to unload its catch.

d. CFV MAVERICK: On 25 September 2012 at 1745, the CFV MAVERICK left La Push, Washington for an estimated four day trip to fish for black cod from the fishing grounds off the Washington coast. The operator and three crew members were on board. The first three days of the fishing trip were uneventful. From approximately 0630 to 1900, the crew conducted fishing operations and for the duration of the night all of the crew slept while the vessel drifted with no one on watch.

e. CFV VIKING STORM: The morning of 26 September 2012, the CFV VIKING STORM got back underway from its homeport in Ucluelet, B.C., again the vessel departed with only three of the four required crew.

f. CFV MAVERICK: On the evening of 27 September 2012, the operator prepared to set the vessel up to drift throughout the night. In doing so the deck was set up to drift by leaving two small aft deckhouse lights, the anchor light, and the navigation lights left on. The plotter, VHF radio, and radar were also left on, and the main engine was left running at idling speed.

g. It is industry common practice for fishing vessels in the vicinity of the collision (30 NM off La Push Washington) to drift at night leaving no one awake to stand a look out; however, 33 Code of Federal Regulations (CFR) 83.05 (Navigation Rule 5) requires all vessels to have a lookout at all times while underway.

h. CFV MAVERICK: At approximately 1930, two crew members retired to the crew accommodations. Approximately 15 minutes later, the operator smoked marijuana and then retired for the night. Before retiring, the operator noticed two stationary targets on the radar. They were confirmed to be other fishing vessels in the vicinity that were drifting overnight as well.

i. CFV VIKING STORM: On 27 September 2012 at 2200, the vessel completed fishing operations and departed for Ucluelet to unload its catch. At the beginning of the transit, the master set up the communication and navigational equipment in preparation for a restricted visibility situation that was expected to arise at some point during the voyage. One of the radars was set to 6 NM range, and the other was left on standby. The vessel's 4 HPS floodlights were left on; two were pointed directly towards the bow of the vessel and two were illuminating the vessel's aft deck. The AIS was displayed on both of the vessel's plotters.

j. CFV VIKING STORM: Shortly after the vessel was enroute to for Ucluelet, B.C., the company dispatcher contacted the master with instructions to change the vessel's offload location to Westport, Washington, extending the total voyage distance by more than 200 NM. The master complied with the instructions and altered course for Westport, Washington.

k. CFV VIKING STORM: At 2300, the master requested that deck hand #1 and #2 split the seven hour wheel watch and wake him up at 0600. He and deck hand #1 retired to bed leaving only deck hand #2 to stand lookout and operate the vessel. The master did not leave any standing orders because it was his understanding that he would be advised if conditions changed during the voyage. Deck hand #2 took the first watch, during which the visibility became restricted and four targets were noticed on the operating radar. Deck hand #2 made no adjustments to the navigational equipment.

l. CFV VIKING STORM: On 28 September 2012 at 0200, the deck hand #2 left the wheelhouse temporarily unattended while he went to the accommodations to wake deck hand #1.

Deck hand #2 then returned to the wheelhouse while deck hand #1 attended to some engineering duties.

m. CFV VIKING STORM: At 0230, deck hand #1 took over the bridge watch. He checked the radar and ensured it was tuned for the foggy conditions. He also checked the AIS display to confirm that no long range targets were posing a risk of collision. Deck hand #1 stated he saw intermittent targets on the displays of the radar but nothing permanent.

n. CFV VIKING STORM: At 0351, deck hand #1 reported to Marine Communications and Traffic Services (MCTS) of Canada on VHF channel 74 that the vessel was crossing latitude 48° N and was leaving their guard. The VIKING STORM then contacted the Canada/U.S. Cooperative Vessel Traffic Service (CVTS) indicating they were entering U.S. Waters, all while on autopilot and making approximately 7.5 knots. Deck hand #1 checked the radar and identified an intermittent target that was 4 to 5 NM almost directly ahead of the vessel; however, this contact did not appear on AIS. He then continued to focus on the AIS for detection of long range opposing targets.

o. CFV VIKING STORM: At approximately 0427, deck hand #1 conducted a visual sweep, checked the AIS and radar before temporarily leaving the wheelhouse unattended while he went to the galley to get some food.

p. CFV MAVERICK: At approximately 0427, crew member #1 on the CFV MAVERICK woke up and saw a bright light illuminating the fog through the deckhouse windows. He attempted to identify the source of the light for approximately a minute, but was not able to see much due to the brightness of the light. As the CFV VIKING STORM's bow wake became visible, crew member #1 realized that a collision was imminent and shouted a warning to the operator.

q. CFV VIKING STORM: Within a couple minutes, deck hand #1 on watch returned from the galley and saw the CFV MAVERICK less than 30 meters directly ahead. He immediately placed the main engine controls to full astern and placed the tiller control hard to starboard.

r. CFV MAVERICK: The operator had heard the crew member's warning but had no time to take evasive action. Within seconds, at 0429 the CFV VIKING STORM's bow struck the CFV MAVERICK's port side at almost a perpendicular angle. The collision occurred approximately 30 NM west of La Push, Washington in position 47°57.05'N, 125°19.47'W.

s. CFV VIKING STORM: The master and deck hand #2 got up immediately, after the collision and went to the wheelhouse where the master took control of the helm and turned the vessel around to search for the CFV MAVERICK. Both deck hands prepared to rescue the survivors from the CFV MAVERICK.

t. CFV MAVERICK: The impact pushed the CFV MAVERICK through the water and rolled the vessel onto its starboard side, at which point it began down flooding. While the deck house was filling with water, crew member #2 swam under water to attempt to open the aft door to escape. After several attempts he stopped due to exhaustion. Crew member #1 attempted several times and finally got the aft door to open, swam out of the CFV MAVERICK accommodation space. He then climbed on top of the wheelhouse and with his bare foot kicked out a window and pulled the operator and crew member #2 from the window as the CFV MAVERICK slipped under the water and sank.

u. CFV MAVERICK: The operator held on to a floating bladder, crew member #2 held on to a hatch cover, and crew member #1 swam directly towards the CFV VIKING STORM. Crew member #3 was never found and is presumed to have drowned.

v. At 0442, Coast Guard District 13 was notified that a 121.5 EPIRB signal was going off in the vicinity of the collision.

w. At 0447, Coast Guard Sector Puget Sound made radio call outs to the CFV MAVERICK and VIKING STORM.

x. CFV VIKING STORM: At approximately 0449 after rescuing the three crew members, the master called United States Coast Guard (USCG) Sector Puget Sound to report the collision.

y. At 0510, the USCG dispatched a 47 ft Motor Life Boat (MLB) from Coast Guard Station Quillayute River, the USCGC ALERT, and a helicopter from Air Station Sector Field Office Port Angeles to the scene.

z. The master on the CFV VIKING STORM continued to search for the missing crew member until the USCGC ALERT arrived at approximately 0700.

aa. At approximately 0800, the rescued crew members from the CFV MAVERICK were then transferred from the CFV VIKING STORM to the CG 47 ft MLB.

bb. USCG personnel from the USCGC ALERT boarded the CFV VIKING STORM and requested post casualty chemical testing to be completed through the Canadian government. After the master and two deck hands were tested, the CFV VIKING STORM departed the scene enroute to Canadian waters and unloaded their catch in Ucluelet, British Columbia.

cc. Chemical testing results for the personnel on the CFV VIKING STORM later indicated that deck hand #1, who was on watch at the time of the collision, had a [redacted] The master tested [redacted] Deck hand #2 had tested [redacted]

dd. At 1658 the 47ft MLB and the crew of the CFV MAVERICK arrived in La Push, Washington. Awaiting their arrival was the marine casualty investigator from Sector Puget Sound and the Officer in Charge from CG Station Quillayute River.

ee. On September 29, 2012 at 1436 the operator of the CFV MAVERICK was chemically tested at Olympic Memorial Hospital in Port Angeles Washington. His sample was subsequently found to be [redacted]

2. Post Casualty Drug and Alcohol Testing

a. Post Casualty/ SMI chemical testing was not conducted on the crew of the CFV MAVERICK. However the operator was tested at a local hospital after the 32 hour testing requirement. The CFV MAVERICK was not required to be a part of a chemical testing program and due to time of arrival, stress, and exhaustion the crew had endured, they were unable to complete the chemical testing. Through interviews it was verbally stated by the crew that they all participated in smoking marijuana regularly. It was confirmed later that the operator's chemical test was [redacted]

b. Post Casualty/ SMI chemical testing was conducted on the crew of the CFV VIKING STORM by the USCGC ALERT medical corpsman. The chemical testing results identified that the deck hand operating the vessel at the time of the incident had [redacted]

3. **Analysis:**

a. *Physical Condition:* CFV MAVERICK - The operator and two of his crewmembers were asleep; one of the crewmembers had awoken to use the restroom. It was common practice for the crew to be resting at this time of the early morning.

The crew of the CFV MAVERICK also verbally stated that they participated in smoking marijuana regularly which may have significantly impaired the judgment, motor coordination, and reaction in preventing this marine casualty.

CFV VIKING STORM - The master and a deckhand were sleeping while the other deckhand had recently returned to the bridge from making a sandwich in the vessel's galley, leaving the bridge unattended for a few minutes. Both vessels crew had been working long hours with minimal rest, the VIKING STORM was undermanned causing even more fatigue to each member of its crew.

The deck hand that was operating the CFV VIKING STORM and the master were under the influence of marijuana. This could significantly impair their judgment, motor coordination, and reaction in preventing this marine casualty.

b. *Environmental Conditions:* The incident occurred in the early morning hours, there were light winds and low to moderate swells, heavy fog, and near zero visibility.

c. *Vessel Operation:* CFV MAVERICK- The vessel was drifting with all navigational lights illuminated, engines running, and navigational equipment energized. CFV VIKING STORM- The vessel was underway, making way southbound enroute to Westport Washington to off load its catch.

d. *Vessel Condition:* CFV MAVERICK- The vessel was a documented commercial fishing vessel. The operator was unlicensed and did not require a US Merchant Mariners Credential to operate. CFV VIKING STORM- The vessel was a documented inspected Canadian fishing vessel. The entire crew onboard had the required, current Canadian fishing credentials at the time of the incident.

4. Conclusions:

a. In accordance with Marine Safety Manual, Volume V, the initiating event (or the first unwanted outcome) that led to the sinking and one presumed death was the collision between the two vessels.

b. The causal factors that led to this casualty are as follows:

i. Human Error: There were four human error causal factors identified.

(a). The CFV VIKING STORM had been operating without one of the required crew onboard. [Finding of fact: c, d]

(b). There was only one person standing watch on the bridge of the CFV VIKING STORM at the time of the incident. Minutes before the collision, he left the bridge unattended to make something to eat in the galley. [Finding of fact: l, m, n, o]

(c). The entire crew from the CFV MAVERICK was asleep and no one was standing a look out watch while the vessel was drifting. [Finding of fact: f, g, h]

(d). The crewmen on both vessels were operating with a minimal amount of rest and were fatigued. [Finding of fact: c, d, e, f, g, h]

ii. Environment: There were two environmental causal factors identified:

(a). The vessels were operating in heavy dense fog with nearly zero visibility. [Finding of fact: i, k, m]

(b). The incident occurred in the early morning, hours before sunrise. [Finding of fact: p, q, r, s, t, u, v, w]

c. The investigation revealed the following:

i. No acts of misconduct, incompetence, negligence, unskillfullness, or willful violation of law committed by any Coast Guard personnel, including an officer or employee, contributed to the cause of the incident.

ii. The evidence indicated that several offenses had been committed that were subject to civil penalty under the laws of the United States:

(a). The VIKING STORM was and had been operating underway for several days with less than the number of crew required on the vessel's manning certificate.

(b). Both vessels were underway operating without proper lookouts at the time of the collision.

(c). The VIKING STORM deckhand on watch at the time of the collision was found to have [redacted]

(d). The entire crew of the VIKING STORM was found to have [redacted]

(e). The operator of the CFV MAVERICK was found to have [redacted]

(f). Both vessels did not use the proper sound producing signals while in heavy fog (restricted visibility).

d. There was no evidence that a criminal act under the laws of United States has been committed.

5. **Safety Recommendations:**

a. **Safety Recommendation 9556 - Watch Standing Schedule Requirements and Fatigue Standards for Commercial Fishing Vessels:**

Currently, 46 CFR Subchapter C, does not establish appropriate and adequate watch standing schedule requirements or fatigue standards for commercial fishermen.

This investigation revealed a latent unsafe condition (LUC) with regard to both vessels' crews, who had been working in the commercial fishing industry for most of their adult life and had grown accustomed to working and operating vessels while fatigued. Because they had become accustom in this culture, they thought that they could operate their vessels safely with minimal sleep. A requirement establishing watch standing schedules and fatigue standards may reduce the occurrence of this LUC on all U. S. commercial fishing vessels. The existence of a regulation mandating watch schedules would break down the culture for commercial fisherman to work, fish, stand watches, and operate vessels safely beyond what they are physiologically capable of doing. This regulation would instead mandate that all mariners aboard commercial fishing vessels meet a minimum rest standard.

RECOMMEND that the Coast Guard amend 46 CFR Subchapter C to include language that requires vessel owners, operators, agent, masters, and persons in-charge, to implement crew endurance management policies and practices.

b. **Safety Recommendation 9557- Fatigue Mitigation and Crew Endurance Training:**

Currently, 46 CFR Part 28, does not establish appropriate and adequate watch standing schedule requirements or fatigue standards for commercial fishermen.

This investigation revealed a latent unsafe condition (LUC) with regard to both vessels' crews who had been working in the commercial fishing industry for their entire adult life had grown accustomed to working and operating vessels while fatigued. Because they had grown accustom in this culture, they thought they could operate their vessels safely with minimal sleep. They were not aware and had not been trained on crew endurance management, nor the impact a crew endurance management system could have on fishing operations and the safe operation of his vessel.

RECOMMEND that the Officer in Charge of Marine Inspection offer fatigue mitigation and crew endurance management training to all commercial fishing vessel operators in his area of responsibility.

c. **Safety Recommendation 9605 - Chemical testing program requirement regardless of tonnage and licensing requirements:**

On September 28, 2012 at approximately 0430PST, the CFV MAVERICK and CFV VIKING STORM collided. During the post casualty interview, all of the CFV MAVERICK crew admitted that they participated in smoking marijuana regularly.

The current regulations do not require a chemical testing program for vessels not required to be operated by a licensed individual.

Recommend: Commandant amend the chemical testing regulations in 46 CFR Part 16 to include all commercial vessels regardless of tonnage and licensing requirements.

The amended regulations would require all marine employers to conduct pre-employment testing and enroll employees in a chemical testing program. This will minimize the use of intoxicants by merchant marine personnel and to promote a drug free and safe work environment.

6. Enforcement Actions:

a. No U.S. Coast Guard enforcement action was taken regarding either party:

i. The crew of the CFV MAVERICK was all asleep minutes prior to the incident and had no way to avoid the collision at the time. No enforcement action was taken against the owner/operator for not having a proper lookout as required by 33 CFR 83.05 since the vessel was lost.

ii. The CFV MAVERICK was not required to be subject to a chemical testing program. However, the operator of the vessel did get chemically tested after the 32 hour requirement. [redacted] Being the operator was unlicensed, the National Maritime Center was notified of the [redacted] test in case of future attempts to obtain a U.S. merchant mariners credential.

iii. The CFV VIKING STORM's crew was all Canadian and the vessel was registered in Canada. Once the investigation was complete the vessel was already in its homeport. The U.S. Coast Guard does not have jurisdictional authority to issue civil penalty actions against the crew or vessel ownership since the incident occurred 30 NM offshore, outside of U.S. jurisdictional waters, by a foreign crew. The operator at the time of the incident was found to have [redacted] Transportation Safety Board of Canada was notified of the CFV VIKING STORM crew's drug testing results and the case has been referred to them for enforcement actions.

7. Administrative Recommendations:

a. I recommend this investigation be closed.

#

U.S. Department of Homeland Security
United States Coast Guard

Commandant
United States Coast Guard

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16732/IIA#3877897
05 May 2022

THE CAPSIZING AND SUBSEQUENT LOSS OF LIFE ON THE COMMERCIAL FISHING VESSEL MISS ALBERTA 4 NAUTICAL MILES EAST OF AMELIA ISLAND NEAR JACKSONVILLE, FL ON OCTOBER 25, 2010

ACTION BY THE COMMANDANT

The record and the report of the investigation convened for the subject casualty have been reviewed. The record and the report, including the findings of fact, analysis, and conclusions are hereby closed.

The investigation's safety recommendation will remain under review and consideration by the responsible program office(s). The response to the recommendations and any resultant actions will be documented separately.

[redacted]

R. S. WADDINGTON
Commander, U.S. Coast Guard
Acting Chief, Office of Investigations & Casualty Analysis (CG-INV)

U.S. Department of Homeland Security
United States Coast Guard

Commander
United States Coast Guard
Sector Jacksonville

4200 Ocean St.
Atlantic Beach, FL 32233-2416
Phone: 904-564-7656
[redacted]

16732
21 Mar 2011

MEMORANDUM

From: [redacted] LTJG
[redacted] Jacksonville (spv)

To: [redacted]
CG SECTOR Jacksonville (OCMI/sp)

Subj: CAPSIZING AND SINKING OF F/V MISS ALBERTA ON OCTOBER 25, 2010 WITH LOSS OF LIFE

Ref: (a) Marine Safety Manual Volume V, COMDTINST M16000.10A

Executive Summary:

On October 25, 2010, at approximately 1430, while engaged in commercial shrimping, F/V MISS ALBERTA (O.N. 593455) began taking on water .5 NM off the coast of Amelia Island, FL with two persons onboard (Captain and deckhand). The wind was blowing between 10-15 knots from the southeast and the seas were 4-5 feet. At approximately 1355, while prepping shrimp, the crew heard a "POP" sound from the aft end of the vessel. Soon after, the Captain noticed the vessel sitting low in the water. The Captain and deckhand began checking all compartments and found that the aft-most compartment had filled half way with water. The Captain of the vessel removed an electric bilge pump from the engine compartment and reconnected it in the aft compartment to assist with dewatering, but the flooding became out of control. The next compartment checked for flooding was the ice hold, and it too was filling with water. According to the Captain, this compartment was always dry under normal conditions. Once flooding became progressive and uncontrollable, both crewmembers proceeded to the wheelhouse. Water then poured through open doors and windows into the wheelhouse pushing both crewmembers to the front of the wheelhouse. Both crewmembers were able to escape the sinking vessel. Upon receiving a distress call from F/V MISS ALBERTA, nearby F/V JOEBIP (O.N. 593303) and F/V BIG JOHN (O.N. 695044) proceeded to the scene to assist. Both crewmembers were in the water for approximately 20-25 minutes before assistance arrived. Mr. Bruce Christ, the deckhand, is presumed to have drowned while in the water. The autopsy report confirmed the deckhand's cause of death to be drowning. Crewmembers from F/V JOEBIP recovered the Captain and deceased deckhand. MISS ALBERTA sank to the bottom and is considered a total constructive loss. The Captain and deckhand subsequently tested [redacted] for drugs. The basis of this investigation is derived from interviews conducted with the sole survivor of this marine casualty, the Captain, Mr. [redacted] The MISLE Activity number is 3877897.

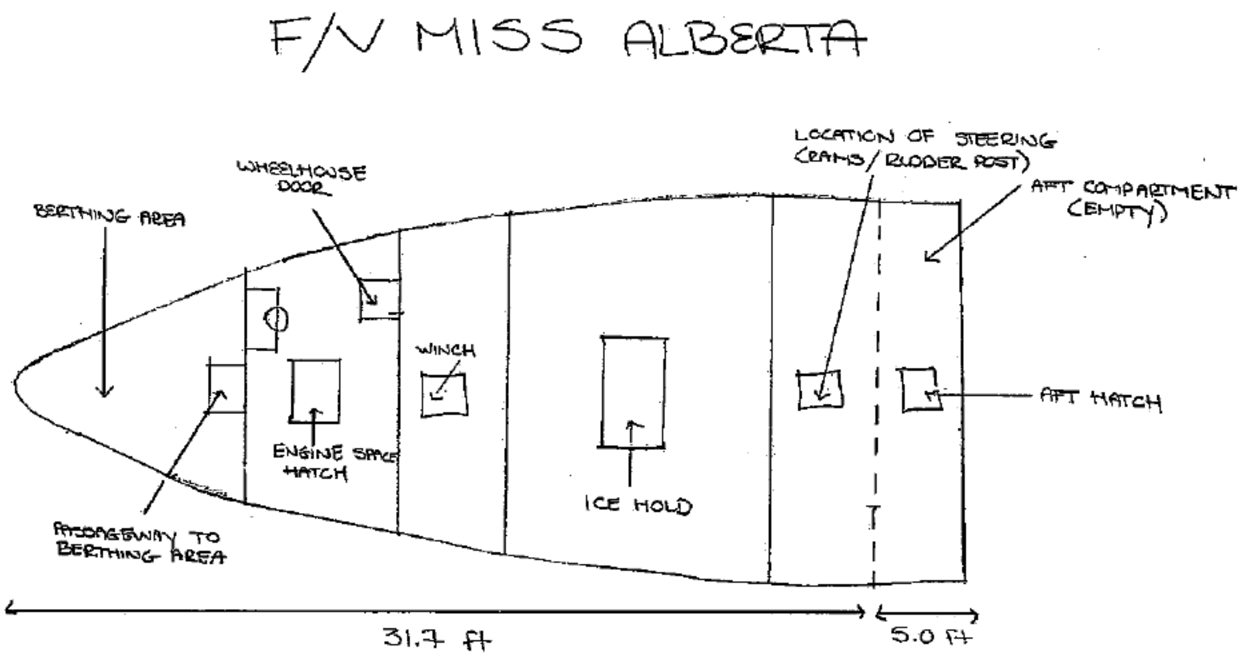
Vessel Data:

F/V MISS ALBERTA	
Name:	MISS ALBERTA
Official Number:	593455
Service:	Commercial Fishing
Year Built:	1978 / Hull Material - Fiberglass

Built By:	Offshore 30 Inc.
Gross Tons:	15
Net Tons:	10
Length:	31.7 feet*
Breadth:	13.2 feet
Depth:	5.7 feet
Propulsion:	Diesel Reduction
Horsepower:	Between 450-600
Owner:	Chance Enterprises, LLC.
Operator:	Chance Enterprises, LLC.

***Note:** The U.S. Coast Guard (USCG) Certificate of Documentation issued on March 8, 2010 to MISS ALBERTA reflects the vessel length as 31.7 feet. According to the Captain, a five foot extension was added after initial construction (date unknown). Multiple attempts were made to contact the owner/operator, Mr. [redacted] of Chance Enterprises LLC., regarding this issue however no response was received. The USCG National Vessel Documentation Center has no record of change in vessel length. According to Title 46, Code of Federal Regulations (CFR) Part 67.167(c)(1), the USCG Certificate of Documentation becomes invalid when the gross or net tonnages or dimensions of the vessel change.

Vessel Diagram:



***Note:** Vessel diagram not drawn to scale. Diagram is based on interview notes and fishing vessels of similar construction/layout.

Personnel Data:

Deceased	Age	Position	Next of Kin
Bruce Richard Christ	57	Deckhand	[redacted]

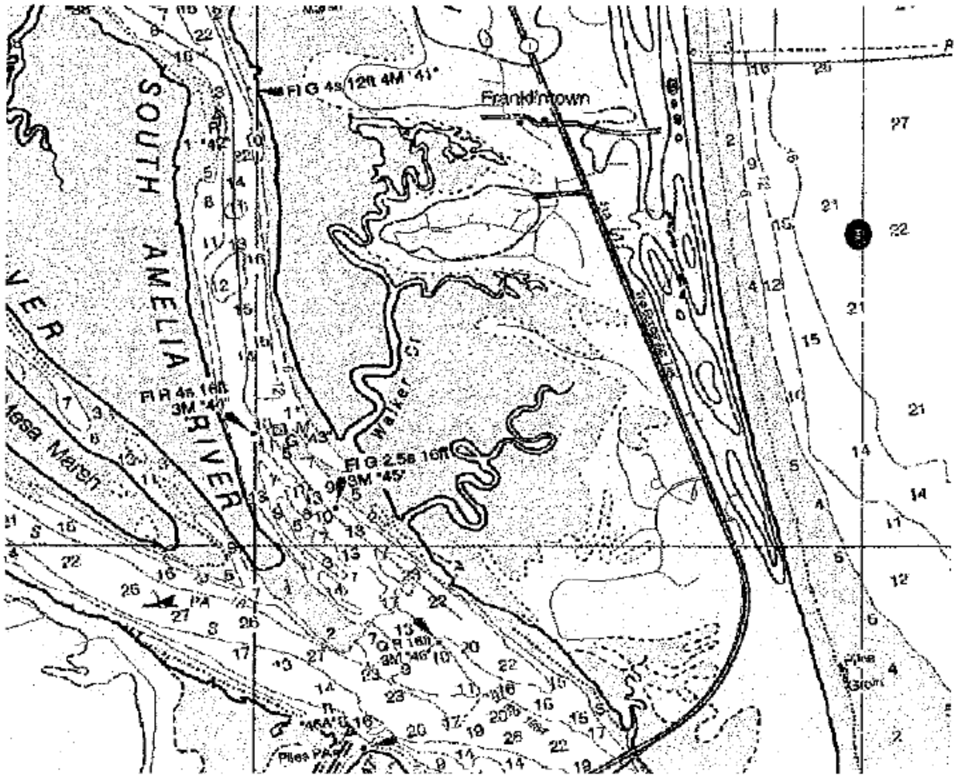
Survivor	Age	Position
[redacted]	[redacted]	Captain

Crewmember	Total Sea Experience	MISS ALBERTA Experience
[redacted]	37	3 months
Bruce Richard Christ	10 years	3 weeks

Crewmember	Alcohol Test Results	Drug Test Results
[redacted]	Not Obtained*	[redacted]
Bruce Richard Christ	Not Obtained	

***Note:** Timeframe to obtain an alcohol sample was exceeded due to search and rescue operations and initial investigation by Coast Guard, state, and local authorities.

Chart of Area:



Vessel sank at approx. position:
30-33.0 N
081-26.0 W

Position marked with red dot on chart to left.

Findings of Fact:

1. The F/V MISS ALBERTA is an uninspected commercial fishing vessel built in 1978. The regulations that govern MISS ALBERTA are found in Title 46 CFR, Subchapter C – Uninspected Vessels.

2. On October 25, 2010, at approximately 0630 MISS ALBERTA departed the Mayport, FL docks with three personnel onboard, Captain [redacted] deckhand Mr. Bruce Christ, and Mr. [redacted] Mr. [redacted] was a crewmember from F/V JOEBIP and had missed JOEBIP's departure earlier that morning. The Captain of MISS ALBERTA agreed to drop Mr. [redacted] off at JOEBIP once offshore. Prior to the personnel drop off, MISS ALBERTA had rendezvoused with F/V BIG JOHN in order to drop off a battery charger that had been requested by F/V BIG JOHN.

3. At approximately 0830, MISS ALBERTA arrived at the location where they would set their nets overboard and begin to drag for shrimp. They initially experienced net problems but were able to resolve them. The shrimp nets were set overboard and MISS ALBERTA began dragging for shrimp at approximately 0950.

4. The Captain and deckhand began de-heading and icing down shrimp that had been caught the previous weekend. At approximately 1355 the crewmembers heard a "POP" sound from the aft end of the vessel. Due to choppy seas and other typical noises made by the vessel, not much attention was paid to the sound by both crewmembers. Both crewmembers continued de-heading and icing shrimp.

5. Approximately twenty minutes later, both crewmembers noticed the vessel sitting low in the water and they began checking all compartments. The aft compartment was filled halfway with water and they began to manually bail out the water using buckets. The Captain then disconnected an electronic bilge pump from the engine compartment and reconnected it in the aft compartment.

6. While checking compartments, both crewmembers noticed that the ice hold had some water in it. According to the Captain, this particular compartment is always dry under normal conditions. Both crewmembers checked the aft compartment for the second time and at this point it had completely flooded.

7. At approximately 1425, the Captain determined that the flooding was out of control and proceeded to the wheelhouse to begin distress calls. The Captain called the nearby JOEBIP via cell phone and informed them that MISS ALBERTA may be sinking and requested help. The Captain then contacted BIG JOHN via VHF Ch. 88 and Coast Guard Sector Jacksonville via VHF Ch. 16. All three calls were effective. Both JOEBIP and BIG JOHN proceeded to the scene. A 47 ft. Coast Guard Motor Lifeboat (CG47293) was dispatched from Coast Guard Station Mayport.

8. Approximately five minutes after distress calls were made, with both crewmembers in the wheelhouse, water began pouring through the wheelhouse hatches and windows at a rapid rate. The crewmembers were pushed to the front of the wheelhouse with windows being the only means of escape.

Findings of Fact (cont.):

9. MISS ALBERTA capsized at approximately 1433. Both the Captain and deckhand were able to escape the capsizing vessel and entered the water without personal floatation devices. The vessel subsequently sank minutes later. The Captain was able to use a drifting board as a flotation device while supporting Mr. Christ. It is unknown if Mr. Christ was able to swim however Mr. Christ stopped responding a few minutes after entering the water. The autopsy report determined Mr. Christ's cause of death to be drowning.

10. According to the National Oceanographic Data Center, the water temperature on this date was approximately 72 degrees Fahrenheit. According to the National Climatic Data Center, the air temperature on this date was approximately 79 degrees Fahrenheit.

11. At approximately 1455, BIG JOHN arrived on scene and located both the Captain and Mr. Christ (unresponsive) in the water. A life ring was thrown and used as floatation by the Captain as he continued to support Mr. Christ. Due to BIG JOHN's high freeboard, the crew of BIG JOHN was unable to pull them onboard. JOEBIP arrived on scene at approximately 1457 and its crew was able to recover Mr. [redacted] and Mr. Christ (unresponsive). Mr. [redacted] attempted to perform CPR on Mr. Christ once onboard the BIG JOHN but was unable to resuscitate him. After the personnel recovery, JOEBIP and BIG JOHN, escorted by CG47293, proceeded to the dock at Mayport, FL.

12. At approximately 1700, JOEBIP and BIG JOHN safely moored at Mayport Docks. The deceased crewmember was transferred to the Florida District III/IV Medical Examiner's Office.

13. On the morning of October 26, 2010, Mr. [redacted] the Captain of MISS ALBERTA, submitted a urine sample at Solantic Baptist Urgent Care in Neptune Beach, FL for a post accident drug test as required by Title 46 CFR, Part16. The sample was tested by Laboratory Corporation of America and the results were confirmed by Medical Review Officer Dr. [redacted] of American MRO. The testing, recording and reporting of the chemical tests were done in accordance with Title 49 CFR, Part 40. The specimen subsequently tested [redacted]

14. During the course of performing an autopsy on Mr. Christ, the Florida District III/IV Medical Examiner's Office obtained blood and urine samples for toxicology analysis. Analysis of the blood sample revealed [redacted]. Analysis of the urine sample revealed the presence of [redacted].

Causal Analysis:

The F/V MISS ALBERTA was not salvaged following the sinking, therefore an examination of the vessel was not possible and the exact cause of the marine casualty is unable to be determined. Multiple interviews were conducted with the Captain (survivor) of MISS ALBERTA to determine a possible or likely cause of the casualty. During the initial interview by a Coast Guard investigating officer, the Captain stated that the vessel's co-owner, Mr. [redacted] had mentioned a possible crack in the shaft log. According to the Captain, due to the location of the initial flooding and the progression of flooding that took place, water intrusion through the shaft log should be ruled out as a causal factor. Had the source of water intrusion originated from a cracked shaft log, the flooding would have most likely initiated in the steering compartment. According to the Captain, a more

Causal Analysis (cont.):

likely cause may have been a failure in the hull where a five foot extension had been added. The flooding began in the aft end (specific location unknown) of the vessel and progressed forward. Manual bailing and electric bilge pumps were unable to keep up with the flow of water, subsequently causing a loss of stability, capsizing and eventual sinking. No final conclusions as to the exact cause of the marine casualty can be made due to lack of constructive evidence. All findings of fact are based solely on interviews with Mr. [redacted] the captain of MISS ALBERTA.

Conclusions:

1. In accordance with reference (a), the initiating event for this casualty was the "POP" sound that was heard by the crewmembers in the aft section of the vessel. This event triggered a chain of subsequent events leading to the loss of stability, capsizing, and sinking.

2. The deckhand, Mr. Christ, drowned as a result of the MISS ALBERTA capsizing. The Captain and Mr. Christ did not don lifejackets at any time prior to the capsizing of MISS ALBERTA. According to the Captain, multiple life jackets were onboard the vessel and stored in the forward berthing area. The decision to not don life jackets was a potential contributing factor to the drowning of Mr. Christ.

3. [redacted] Drugs may have been a contributing factor during the detection and subsequent reaction to the rapid flooding of MISS ALBERTA.

Safety Recommendations:

Current licensing regulations do not require captains of commercial fishing vessels less than 200 gross tons to hold a USCG Merchant Mariner Credential. The Captain of MISS ALBERTA had [redacted]. If there was a licensing requirement he would have to have pre-employment drug testing and be enrolled in random drug testing.

Recommendation:

1. That USCG Headquarters initiate the promulgation of regulations requiring, at a minimum, a lower level Masters License for operators/captains of commercial fishing vessels. The desired result of this safety recommendation is to place mariners that are enrolled in a drug and alcohol program at the helm of commercial fishing vessels less than 200 gross tons. This action will potentially reduce the risk of a mariner under the influence of drugs and/or alcohol of being in charge of a commercial fishing vessel less than 200 gross tons.

Recommendations:

1. It is recommended that this casualty investigation be closed.

#

United States Coast Guard

MISLE Incident Investigation Report For

F/V NEAHKAHNIE GROUNDING

On 03Jun2013 20:00:00 EDT

MISLE Activity Number: 4619487
MISLE Case Number: 639063

I. PRELIMINARY INVESTIGATION – GENERAL INFORMATION

I.I EXCEPTIONS

Marine Casualty Investigation: No

Criteria Met:

Pollution Investigation: NA

Criteria Met:

Personnel Investigation: NA

Criteria Met:

I.II DETAILS

Incident Involves: Marine Casualty, Reportable; Non-USCG Credentialed Mariner, Alleged Drug Use

Level Of Investigation: Informal

IMO Classification: Routine

US Classification: Routine

Serious Marine Incident: No

Was a Marine Board convened by Commandant? No

I.III LOCATIONS

Description	Latitude	Longitude
PUGET SOUND Admiralty Inlet	48°08.9 N	122°43.8 W
Whidbey Island, Admiralty Inlet	48°05.1 N	122°36.6 W

I.IV INVOLVED PERSONNEL

I.V INVOLVED TEAM

I.VI INVOLVED SUBJECTS

Involved Vessels

Name:	NEAHKAHNIE
Flag:	UNITED STATES
Primary VIN:	599534
Call Sign:	WDE7967
Damage Status:	Undamaged
Role:	Involved in a Marine Casualty
Classification, Type, Subtype:	Fishing Vessel, Fishing Support Vessel, Fishing Tender
Gross Tonnage:	
Net Tonnage:	
Dead Wt. Tonnage:	
Length:	97.2
Home/Hailing Port:	
Keel Laid Date:	
Delivery Date:	
Place of Construction:	FORT GEORGE ISLAND, Florida, UNITED STATES
Builder Name:	

Propulsion Type: Diesel Reduction
Ahead HP: 1000
Master:
Classification Society:
Owner:
Operator: [redacted]
Inspection Subchapter:
Most Recent Vessel Inspection Activity:

Involved Persons

[redacted]
Status: Not at Risk
Role: Other
Gender: Male
Age: [redacted]
SSN:
Birth Date: [redacted]
Email Address:
Phone Number (Daytime Phone): [redacted]
Address (Mailing): [redacted]
Comments: primary language is english

[redacted]
Status: Not at Risk
Role: Other
Gender: Male
Age: [redacted]
SSN:
Birth Date: [redacted]
Email Address:
Phone Number (Daytime Phone): [redacted]
Address (Mailing): [redacted]
Comments: primary language is english

[redacted]
Status: Not at Risk
Role: Subject of Investigation
Gender: Male
Age:
SSN:
Birth Date:
Email Address:
Phone Number (Daytime Phone): [redacted]
Address (Primary): [redacted]
Comments: primary language is english

Drug and Alcohol Testing. The following people have been determined by the Coast Guard, Law Enforcement Personnel, and/or the Marine Employer to have been directly involved in a Serious Marine Incident as defined in 46 CFR 4.03-2:

Involved Organizations: None

Involved Facilities

Facility Name: Associated Behavioral Health - North Sea
Type: Approved Equipment Laboratory
Status: Undamaged - Operational
Role: Site of Investigation
Contact Phone:

Location: Latitude:
Longitude:

Involved Waterways: None

Involved Other Subjects: None

II. INCIDENT INVESTIGATION – GENERAL INFORMATION

On 06/04/13 at 0304T, the commercial fishing vessel NEAHKAHNIE (ON: 4619487) ran aground on Whidbey Island. The vessel was in the southbound traffic lane in Admiralty Inlet when the Vessel Traffic Center to hail the vessel several times with no response from the vessel. Drug and alcohol testing were conducted. There was pollution, injuries, or damage to the vessel stemming from this incident.

Personnel Casualty Summary

Total Missing = 0

Total Dead = 0

Total Injured = 0

Total At Risk, Not Injured = 0

Total People At Risk = 3

Vessel(s) Status Summary

Actual Total Loss = 0

Total Constructive Loss Salvaged = 0

Total Constructive Loss Unsalvaged = 0

Damaged = 0

Undamaged = 1

Property Damage Summary

Vessel(s) = $ 0

Cargo = $ 0

Facility(s) = $ 0

Other = $ 0

* Includes estimates

II.I LOCATIONS

Description	Latitude	Longitude
Whidbey Island, Admiralty Inlet	48°05.1 N	122°36.6 W
PUGET SOUND Admiralty Inlet	48°08.9 N	122°43.8 W
Associated Behavioral Health - collection site	10°00.0 N	100°00.0 W
Whidbey Island, Admiralty Inlet	48°05.1 N	122°36.6 W

II.II INVOLVED PERSONNEL

II.III INVOLVED TEAM

II.IV INVOLVED SUBJECTS

Involved Vessels

Name:	NEAHKAHNIE
Flag:	UNITED STATES
Primary VIN:	599534
Call Sign:	WDE7967
Damage Status:	Undamaged
Role:	Involved in a Marine Casualty
Classification, Type, Subtype:	Fishing Vessel, Fishing Support Vessel, Fishing Tender
Gross Tonnage:	
Net Tonnage:	
Dead Wt. Tonnage:	
Length:	97.2
Home/Hailing Port:	
Keel Laid Date:	
Delivery Date:	
Place of Construction:	FORT GEORGE ISLAND, Florida, UNITED STATES
Builder Name:	
Propulsion Type:	Diesel Reduction
Ahead HP:	1000
Master:	[redacted]
Classification Society:	
Owner:	
Operator:	[redacted]
Inspection Subchapter:	C
Most Recent Vessel Inspection Activity:	

Involved Persons

[redacted]

Status:	Not at Risk
Role:	Other
Gender:	Male
Age:	[redacted]
SSN:	
Birth Date:	[redacted]
Email Address:	
Phone Number (Daytime Phone):	[redacted]
Address (Mailing):	[redacted]
Comments:	primary language is english

[redacted]

Status:	Not at Risk
Role:	Other
Gender:	Male
Age:	[redacted]
SSN:	
Birth Date:	[redacted]
Email Address:	
Phone Number (Daytime Phone):	[redacted]
Address (Mailing):	[redacted]
Comments:	primary language is english

[redacted]

Status:	Not at Risk
Role:	Subject of Investigation
Gender:	Male

Age:
SSN:
Birth Date:
Email Address:
Phone Number (Daytime Phone): [redacted]
Address (Primary): [redacted]
Comments: primary language is english

Drug and Alcohol Testing. The following people have been determined by the Coast Guard, Law Enforcement Personnel, and/or the Marine Employer to have been directly involved in a Serious Marine Incident as defined in 46 CFR 4.03-2:

Involved Organizations: None

Involved Facilities

Facility Name:	Associated Behavioral Health - North Sea
Type:	Approved Equipment Laboratory
Status:	Undamaged - Operational
Role:	Site of Investigation
Contact Phone:	
Location:	Latitude: Longitude:

Involved Waterways

PUGET SOUND

Role:	Location
Description:	Whidbey Island, Admiralty Inlet

Involved Other Subjects: None

II.V EVIDENCE

Control Number: 4619487 01 PRS
Description: 2692 FV NEAHKAHNIE
Evidence Type: Standard

Collection Information

Date/Time:	04Jun2013 08:57:00 EDT
Location:	Location Not Specified
Collected By:	[redacted] LT; SEC PgtSnd, SEC PgtSnd

Attachments

2692 FV NEAHKAHNIE; Legacy - Unknown;
10Sep2015 17:17:57 EDT; No

Control Number: 4619487 02 PRS
Description: Crewman Statements
Evidence Type: Standard

Collection Information
Date/Time: 04Jun2013 08:59:00 EDT
Location: Location Not Specified
Collected By: [redacted] LT; SEC PgtSnd, SEC PgtSnd

Attachments

Crewman Statements; Legacy - Unknown;
10Sep2015 17:17:57 EDT; No

Control Number: 4619487 03 PRS
Description: Work rest hist
Evidence Type: Standard

Collection Information
Date/Time: 13Jun2013 10:56:00 EDT
Location: Location Not Specified
Collected By: [redacted] LT; SEC PgtSnd, SEC PgtSnd

Attachments

#3 workrest history [redacted]; Legacy - Unknown;
10Sep2015 17:17:57 EDT; No

Control Number: 4619487 04 PRS
Description: Crewman IDs
Evidence Type: Standard

Collection Information
Date/Time: 04Jun2013 09:05:00 EDT
Location: Location Not Specified
Collected By: [redacted] LT; SEC PgtSnd, SEC PgtSnd

Attachments

Crewman IDs; Legacy - Unknown;
10Sep2015 17:17:57 EDT; No

Control Number: 4619487 05 PRS
Description: [redacted] UA
Evidence Type: Standard

Collection Information
Date/Time: 12Jun2013 09:12:00 EDT
Location: Location Not Specified
Collected By: [redacted] LT; SEC PgtSnd, SEC PgtSnd

Attachments

[redacted] UA results; Legacy - Unknown;
10Sep2015 17:17:57 EDT; No

Control Number: 4619487 06 PRS
Description: Photo log
Evidence Type: Standard

Collection Information
Date/Time: 04Jun2013 09:18:00 EDT
Location: Location Not Specified
Collected By: [redacted] LT; SEC PgtSnd, SEC PgtSnd

Attachments

Photo Log FV NEAHKAHNIE; Legacy - Unknown;
10Sep2015 17:17:57 EDT; No

Control Number: 4619487 07 PRS
Description: [redacted] UA results
Evidence Type: Standard

Collection Information
Date/Time: 04Jun2013 09:19:00 EDT
Location: Location Not Specified
Collected By: [redacted] LT; SEC PgtSnd, SEC PgtSnd

Attachments

[redacted] UA results; Legacy - Unknown;
10Sep2015 17:17:57 EDT; No

Control Number: 4619487 08 PRS
Description: Ship log
Evidence Type: Standard

Collection Information
Date/Time: 04Jun2013 09:20:00 EDT
Location: Location Not Specified
Collected By: [redacted] LT; SEC PgtSnd, SEC PgtSnd

Attachments

#8 Log #1; Legacy - Unknown;
10Sep2015 17:17:57 EDT; No

#9 Log #2; Legacy - Unknown;
10Sep2015 17:17:57 EDT; No

Control Number: 4619487 09 PRS
Description: [redacted] UA results
Evidence Type: Standard

Collection Information
Date/Time: 04Jun2013 09:21:00 EDT
Location: Location Not Specified
Collected By: [redacted] LT; SEC PgtSnd, SEC PgtSnd

Attachments

[redacted] UA results; Legacy - Unknown;
10Sep2015 17:17:57 EDT; No

Control Number: 4619487 10 PRS
Description: VTS screen shots
Evidence Type: Standard

Collection Information
Date/Time: 13Jun2013 09:22:00 EDT
Location: Location Not Specified
Collected By: [redacted] LT; SEC PgtSnd, SEC PgtSnd

Attachments

Document; Legacy - Unknown;
10Sep2015 17:17:57 EDT; No

Control Number: 4619487 11 PRS
Description: VTS Comms
Evidence Type: Standard

Collection Information
Date/Time: 13Jun2013 09:24:00 EDT
Location: Location Not Specified
Collected By: [redacted] LT; SEC PgtSnd, SEC PgtSnd

Attachments

VTS Comms recordings; Legacy - Unknown;
10Sep2015 17:17:57 EDT; No

Control Number: 4619487-MISLE-001
Description: MISLE Notification #584675 for report of incident received by .
Evidence Type: Standard

Collection Information
Date/Time: 04Jun2013 05:57:00 EDT
Location: Sector Puget Sound
Collected By: [redacted]; SEC PgtSnd, Sector Puget Sound

Attachments

II.VI TIMELINE

03Jun2013 22:00:00 EDT to 03Jun2013 22:00:01 EDT (Estimated): Vessel was transiting from Salmon farm in Anacortes, WA to Seattle fish processor.

Timeline Type: Condition
Timeline Subtype: Facility - Material/Equipment Condition
Location: Known

Primary Location: Yes
Description: PUGET SOUND Admiralty Inlet

Latitude: 48°08.9 N Longitude: 122°43.8 W

Subject(s) and Details

Name	Type	Status	Role
NEAHKAHNIE	Vessel	Undamaged	Involved in a Marine Casualty

System:
Subsystem:
Component:
Cite:
Involves CG Approved Equipment: No
Security Violation: No
Deficiency: No

03Jun2013 22:59:00 EDT to 03Jun2013 22:59:01 EDT (Estimated): Weather conditions

Timeline Type: Condition
Timeline Subtype: Environment - Weather Conditions
Location: Known

Primary Location: Yes
Description: PUGET SOUND Admiralty Inlet

Latitude: 48°08.9 N Longitude: 122°43.8 W

Subject(s) and Details

03Jun2013 23:00:00 EDT to 03Jun2013 23:00:01 EDT (Estimated): The Helmsman had minimal training and ship familiarization.

Timeline Type: Condition
Timeline Subtype: Person - Person Condition
Location: Known

Primary Location: Yes
Description: PUGET SOUND Admiralty Inlet

Latitude: 48°08.9 N Longitude: 122°43.8 W

Subject(s) and Details

Name	Type	Status	Role
[redacted]	Person	Not at Risk	Subject of Investigation

System:

Subsystem:

Component:

Cite:

Involves CG Approved Equipment: No

Security Violation: No

Deficiency: No

03Jun2013 23:04:00 EDT to 03Jun2013 23:04:01 EDT (Estimated): Work rest history supported theory of extreme fatigue.

Timeline Type: Condition
Timeline Subtype: Person - Person Condition
Location: Known

Primary Location: Yes
Description: PUGET SOUND Admiralty Inlet

Latitude: 48°08.9 N Longitude: 122°43.8 W

Subject(s) and Details

Name	Type	Status	Role
[redacted]	Person	Not at Risk	Subject of Investigation

System:

Subsystem:

Component:

Cite:

Involves CG Approved Equipment: No

Security Violation: No

Deficiency: No

03Jun2013 23:04:00 EDT to 03Jun2013 23:04:01 EDT (Estimated): Work rest history supported theory of extreme fatigue being a major contributing factor to the grounding of the vessel.

Timeline Type: Condition
Timeline Subtype: Person - Person Condition
Location: Known

Primary Location: Yes
Description: PUGET SOUND Admiralty Inlet

Latitude: 48°08.9 N Longitude: 122°43.8 W

Subject(s) and Details

Name	Type	Status	Role

System:

Subsystem:

Component:

Cite:

Involves CG Approved Equipment: No

Security Violation: No

Deficiency: No

03Jun2013 23:04:00 EDT to 03Jun2013 23:04:01 EDT (Estimated): Helmsman did not take necessary precautions to stay awake/set watch alarm.

Timeline Type: Action
Timeline Subtype: Bridge Operations - Visual Monitoring and Lookout
Location: Known

Primary Location: Yes
Description: PUGET SOUND Admiralty Inlet

Latitude: 48°08.9 N Longitude: 122°43.8 W

Subject(s) and Details

Name	Type	Status	Role
[redacted]	Person	Not at Risk	Subject of Investigation

03Jun2013 23:04:00 EDT to 03Jun2013 23:04:02 EDT (Estimated): Helmsman fell asleep.

Timeline Type: Action
Timeline Subtype: Bridge Operations - Visual Monitoring and Lookout
Location: Known

Primary Location: Yes
Description: PUGET SOUND Admiralty Inlet

Latitude: 48°08.9 N Longitude: 122°43.8 W

Subject(s) and Details

Name	Type	Status	Role
[redacted]	Person	Not at Risk	Subject of Investigation

03Jun2013 23:05:00 EDT to 03Jun2013 23:05:03 EDT (Estimated): Vessel grounded outside of the channel.

Timeline Type: Event
Timeline Subtype: Grounding
Location: Known

Primary Location: Yes
Description: PUGET SOUND Admiralty Inlet

Latitude: 48°08.9 N Longitude: 122°43.8 W

Subject(s) and Details

Name	Type	Status	Role

NEAHKAHNIE	Vessel	Undamaged	Involved in a Marine Casualty

Type Of Grounding: Hard

Type Of Bottom: Gravel

Charted Depth Of Water (feet): 24

Actual Depth Of Water (feet): 10

Recorded Depth Of Water (feet): 0

Part Of Vessel Aground: Centerline Stern

Additional Information:

03Jun2013 23:05:00 EDT to 03Jun2013 23:05:03 EDT (Estimated): The Vessel was on course of 145 T at a speed of N/A Knots.

Timeline Type: Condition
Timeline Subtype: Vessel - Material/Equipment Condition
Location: Known

Primary Location: Yes
Description: PUGET SOUND Admiralty Inlet

Latitude: 48°08.9 N   Longitude: 122°43.8 W

Subject(s) and Details

Name	Type	Status	Role
NEAHKAHNIE	Vessel	Undamaged	Involved in a Marine Casualty

System: Operations/Management

Subsystem: Vessel Activity

Component: Underway

Cite:

Involves CG Approved Equipment: No

Security Violation: No

Deficiency: No

04Jun2013 20:00:00 EDT to 04Jun2013 20:00:01 EDT (Estimated): Post casualty drug test

Timeline Type: Action
Timeline Subtype: Drug/Alcohol Testing - DOT Drug Testing
Location: Known

Primary Location: No
Description: Associated Behavioral Health - collection site

Latitude: 10°00.0 N   Longitude: 100°00.0 W

Subject(s) and Details

Name	Type	Status	Role
[redacted]	Person	Not at Risk	Other

Reason Directed To Provide Sample(s): Post-casualty

Direction To Provide Sample(s)

Date/Time Directed: 04Jun2013 20:00 EDT

Means Of Direction: Employer

Organization Directing Chemical Test Sample: Marine Employer

Description: Post Casualty

Mariner Directed To Get A DOT Drug Test: No

Chemical Test Sample Provided: Yes

Reason Chemical Test Sample Not Provided:

Sample

Drug Test Sample Taken Using DOT Protocols: No

Sample Type: Urine

Date/Time Sample Was Taken: 04Jun2013 20:00 EDT

Sampling Location: Associated Behavioral Health - North Seattle

Collection Agent: [redacted]

Collection Agent's Organization: Associated Behavioral Health - North Seattle

Donor Certify Sample: Yes

Irregularities Noted: No

Drug Analysis

Analyzing Laboratory: STERLING Reference Laboratories, Tacoma, WA, 98421

Specimen Analyzed Using DOT Protocols: No

Specimen Transferred And Chain Of Custody Complete: No

Primary Specimen Test Result

Result: Metabolites Present (positive)

Positive For:

Specimen Dilute: Yes

Reason(s) Rejected For Testing:

Remarks:

Review Conducted By

Medical Review Officer:

Coroner: certifying scientist - [redacted], BS cert scie

Determination/Verification:

Specimen Dilute (MRO): N/A

Split Specimen Analyzed: No

04Jun2013 20:00:00 EDT to 04Jun2013 20:00:01 EDT (Estimated): Post casulty drug test

Timeline Type:	Action
Timeline Subtype:	Drug/Alcohol Testing - DOT Drug Testing
Location:	Known

Primary Location: No
Description: Associated Behavioral Health - collection site

Latitude: 10°00.0 N   Longitude: 100°00.0 W

Subject(s) and Details

Name	Type	Status	Role
[redacted]	Person	Not at Risk	Subject of Investigation

Reason Directed To Provide Sample(s): Post-casualty

Direction To Provide Sample(s)

Date/Time Directed: 04Jun2013 20:00 EDT

Means Of Direction: Marine Employer

Organization Directing Chemical Test Sample: Marine Employer

Description: Post Casualty

Mariner Directed To Get A DOT Drug Test: No

Chemical Test Sample Provided: Yes

Reason Chemical Test Sample Not Provided:

Sample

Drug Test Sample Taken Using DOT Protocols: No

Sample Type: Urine

Date/Time Sample Was Taken: 04Jun2013 20:00 EDT

Sampling Location: Associated behavioral Health - North Seattle

Collection Agent: [redacted]

Collection Agent's Organization: Associated behavioral Health - North Seattle

Donor Certify Sample: No

Irregularities Noted: No

Drug Analysis

Analyzing Laboratory: STERLING Reference Laboratories, Tacoma, WA, 98421

Specimen Analyzed Using DOT Protocols: No

Specimen Transferred And Chain Of Custody Complete: No

Primary Specimen Test Result

Result: Metabolites Present (positive)

Positive For:

Specimen Dilute: Yes

Reason(s) Rejected For Testing:

Remarks:

Review Conducted By

Medical Review Officer:

Coroner: Certifying Scientist [redacted], BS certifying t

Determination/Verification:

Specimen Dilute (MRO): N/A

Split Specimen Analyzed: No

04Jun2013 20:00:00 EDT to 04Jun2013 20:00:01 EDT (Estimated): Post casualty drug test

Timeline Type: Action
Timeline Subtype: Drug/Alcohol Testing - Alcohol Testing
Location: Known

Primary Location: No
Description: Associated Behavioral Health - collection site

Latitude: 10°00.0 N Longitude: 100°00.0 W

Subject(s) and Details

Name	Type	Status	Role

[redacted]	Person	Not at Risk	Other

Reason Directed To Provide Sample(s): Post-casualty

Direction To Provide Sample(s)

Date/Time Directed: 04Jun2013 20:00 EDT

Means Of Direction: Employer

Organization Directing Chemical Test Sample: Marine Employer

Description: Post Casualty

Chemical Test Sample(s) Provided: Yes

Method Of Analysis:

Instrument Used For Analysis:

Date/Time Results Obtained: 01Jan0001 00:00 EST

Sample Test Results:

Blood Alcohol Content (BAC):

Laboratory/Individual Conducting Test:

Description Of Sample Analysis:

Irregularities In The Analysis Of The Sample: No

04Jun2013 20:00:00 EDT to 04Jun2013 20:00:01 EDT (Estimated): Post casulty drug test

Timeline Type: Action
Timeline Subtype: Drug/Alcohol Testing - Alcohol Testing
Location: Known

Primary Location: No
Description: Associated Behavioral Health - collection site

Latitude: 10°00.0 N Longitude: 100°00.0 W

Subject(s) and Details

Name	Type	Status	Role
[redacted]	Person	Not at Risk	Subject of Investigation

Reason Directed To Provide Sample(s): Post-casualty

Direction To Provide Sample(s)

Date/Time Directed: 04Jun2013 20:00 EDT

Means Of Direction: Marine Employer

Organization Directing Chemical Test Sample: Marine Employer

Description: Post Casualty

Chemical Test Sample(s) Provided: Yes

Method Of Analysis:

Instrument Used For Analysis:

Date/Time Results Obtained: 01Jan0001 00:00 EST

Sample Test Results:

Blood Alcohol Content (BAC):

Laboratory/Individual Conducting Test:

Description Of Sample Analysis:

Irregularities In The Analysis Of The Sample: No

05Jun2013 20:00:00 EDT to 05Jun2013 20:00:01 EDT (Estimated): Post casualty drug test

Timeline Type: Action
Timeline Subtype: Drug/Alcohol Testing - DOT Drug Testing
Location: Known

Primary Location: No
Description: Associated Behavioral Health - collection site

Latitude: 10°00.0 N Longitude: 100°00.0 W

Subject(s) and Details

Name	Type	Status	Role
[redacted]	Person	Not at Risk	Other

Reason Directed To Provide Sample(s): Post-casualty

Direction To Provide Sample(s)

Date/Time Directed: 05Jun2013 20:00 EDT

Means Of Direction: Marine Employer

Organization Directing Chemical Test Sample: Marine Employer

Description: Post Casualty

Mariner Directed To Get A DOT Drug Test: No

Chemical Test Sample Provided: Yes

Reason Chemical Test Sample Not Provided:

Sample

Drug Test Sample Taken Using DOT Protocols: No

Sample Type: Urine

Date/Time Sample Was Taken: 05Jun2013 20:00 EDT

Sampling Location: Associated Behavioral Health - North Seattle

Collection Agent: [redacted]

Collection Agent's Organization: Associated Behavioral Health - North Seattle

Donor Certify Sample: No

Irregularities Noted: Yes

Description: The sample provided was not consistent with human urine.

Drug Analysis

Analyzing Laboratory: STERLING Reference Laboratories, Tacoma, WA, 98421

Specimen Analyzed Using DOT Protocols: No

Specimen Transferred And Chain Of Custody Complete: No

Primary Specimen Test Result

Result:

Positive For:

Specimen Dilute: Yes

Reason(s) Rejected For Testing:

Remarks:

Review Conducted By

Medical Review Officer:

Coroner: [redacted] - BS Certifying Technician

Determination/Verification:

Specimen Dilute (MRO): N/A

Split Specimen Analyzed: No

05Jun2013 20:00:00 EDT to 05Jun2013 20:00:01 EDT (Estimated): Post casualty drug test

Timeline Type: Action
Timeline Subtype: Drug/Alcohol Testing - Alcohol Testing
Location: Known

Primary Location: No
Description: Associated Behavioral Health - collection site

Latitude: 10°00.0 N Longitude: 100°00.0 W

Subject(s) and Details

Name	Type	Status	Role
[redacted]	Person	Not at Risk	Other

Reason Directed To Provide Sample(s): Post-casualty

Direction To Provide Sample(s)

Date/Time Directed: 05Jun2013 20:00 EDT

Means Of Direction: Marine Employer

Organization Directing Chemical Test Sample: Marine Employer

Description: Post Casualty

Chemical Test Sample(s) Provided: Yes

Method Of Analysis:

Instrument Used For Analysis:

Date/Time Results Obtained: 01Jan0001 00:00 EST

Sample Test Results:

Blood Alcohol Content (BAC):

Laboratory/Individual Conducting Test:

Description Of Sample Analysis:

Irregularities In The Analysis Of The Sample: No

II.VII CORRESPONDENCE

IO Notes
Source: USCG
Date: 6/4/2013 1:26:00 PM
Attachments:

IO notes; Legacy - Unknown;
[redacted] 12Jun2013 20:00:00 EDT; No

[redacted] email w UA results
Source: USCG
Date: 6/13/2013 1:34:00 PM
Attachments:

[redacted] email; Legacy - Unknown;
[redacted].; 12Jun2013 20:00:00 EDT; No

D13 FV Casualty Data collection form
Source: USCG
Date: 6/13/2013 1:37:00 PM
Attachments:

D13 CFV Data Coll Form; Legacy - Unknown;
[redacted] 12Jun2013 20:00:00 EDT; No

II.VIII CONCLUSIONS – PART 1. CAUSE

Initiating Event:
Grounding (03Jun2013 23:05:00 EDT)

Defense

Inadequate - Person
helmsman was unfamiliar with his duties and associated watch equipment

Condition/Person - Person Condition (03Jun2013 23:00:00 EDT); PUGET SOUND Admiralty Inlet ; The Helmsman had minimal training and ship familiarization.; [redacted]

Production

Execution Error – Attention Failure - Bridge Operations - Visual Monitoring and Lookout
Helmsman fell asleep due to extreme fatigue

Action/Bridge Operations - Visual Monitoring and Lookout (03Jun2013 23:04:00 EDT); PUGET SOUND Admiralty Inlet ; Helmsman fell asleep.; [redacted]

Precondition

Person - Physical Condition - Person
helmsman fell asleep

Condition/Person - Person Condition (03Jun2013 23:04:00 EDT); PUGET SOUND Admiralty Inlet ; Work rest history supported theory of extreme fatigue.; [redacted]

<u>Failures of Defense Against Subsequent Events in the Incident</u>

II.IX CONCLUSIONS – PART 2. ENFORCEMENT REFERRALS

The following referrals for enforcement action have been made as a result of this investigation and represent those instances where the Coast Guard has gathered evidence that indicates one or more alleged violations or offenses may have occurred. Any determinations as to whether or not one or more actual violations or offenses have occurred are documented in the appropriate Coast Guard enforcement activities.

Referral #1:

USCG vs [redacted]

Party: [redacted]

Enforcement Type: Warning
Status: Closed - Agency Action Complete

<u>Alleged Violations</u>

Cite: 33CFR83.05

Date/Time: 03Jun2013 23:04 EDT

Event/Action/Condition: Bridge Operations - Visual Monitoring and Lookout

Location: PUGET SOUND Admiralty Inlet

Subject(s): [redacted]

<u>Evidence</u>

4619487 03 PRS; Work rest hist; 13Jun2013 10:56:00 EDT

4619487 10 PRS; VTS screen shots; 13Jun2013 09:22:00 EDT

4619487 11 PRS; VTS Comms; 13Jun2013 09:24:00 EDT

4619487 08 PRS; Ship log; 04Jun2013 09:20:00 EDT

4619487 01 PRS; 2692 FV NEAHKAHNIE; 04Jun2013 08:57:00 EDT

4619487 02 PRS; Crewman Statements; 04Jun2013 08:59:00 EDT

4619487 04 PRS; Crewman IDs; 04Jun2013 09:05:00 EDT

4619487 06 PRS; Photo log; 04Jun2013 09:18:00 EDT

4619487 07 PRS; [redacted] UA results; 04Jun2013 09:19:00 EDT

II.X SAFETY RECOMMENDATIONS

Safety Recommendation # 1 **: Training Requirements for CFV's**

On June 04, 2013 at approximately 0330PST the CFV NEAHKAHNIE ran aground outside a marked navigational channel due to the operator falling asleep.

The Investigation revealed the operator had been on board the vessel 2 days and had a very brief wheelhouse and watch familiarization prior to taking control of the vessel hours before it grounded. The operator did not have the watch alarm set nor did he have the communications radios turned up to an audible level as to hear other radio/emergency traffic. Also the operator had not taken any other precautions to stay awake as he was unfamiliar with his duties and technologies available to him on board the vessel. There was no pollution or damage to the vessel and environment stemming from this accident.

There are currently no regulations in place requiring the individual in charge of a commercial fishing vessel fishing vessel of less than 200 gross tons to hold a Coast Guard issued license or pass an approved training program and hold a valid certificate issued under that program.

Currently the requirements contained in 46 USC 4502(g) only apply to (a), fishing vessels that operate beyond 3 nautical miles from the baseline from which the territorial sea of the United States is measured or beyond 3 nautical miles from the coastline of the Great Lakes; (b), fishing vessels that operate with more than 16 individuals on board; or (c), in the case of a fish tender vessel, engage in the Aleutian trade.

Recommend the law be amended to require commercial fishing vessel operators regardless of operating area to meet the requirements of 46 USC 4502(g) requiring individuals in charge of a commercial fishing vessel to pass an approved training program and hold a valid certificate issued under that program.

The control measures articulated in the recommendation would mitigate or eliminate the latent unsafe condition and significantly reduce the risk of a future casualty of this nature.

Date Created: 26Dec2013 EST
Current Owner Unit: COMDT INV
Date Last Modified: 10Sep2015 14:44:38 EDT
Priority: Normal

Final Agency Action:
Final Agency Comment:

Safety Recommendation # 004597 **: Licensing requirements for operators of CFV's less than 200GT**

On June 04, 2013 at approximately 0330PST the CFV NEAHKAHNIE ran aground outside a marked navigational channel due to the operator falling asleep.

The Investigation revealed the operator had been on board the vessel 2 days and had a very brief wheelhouse and watch familiarization prior to taking control of the vessel hours before it grounded. The operator did not have the watch alarm set nor did he have the communications radios turned up to an audible level as to hear other radio/emergency traffic. Also the operator had not taken any other precautions to stay awake as he was unfamiliar with his duties and technologies available to him on board the vessel. There was no pollution or damage to the vessel and environment stemming from this accident.

Recommend: Commandant prescribe licensing regulations for Commercial Fishing Vessel of less than 200 GT similar to those requirements for small passenger vessels and uninspected passenger vessels under 46 USC 8902 and 46 USC 8903 respectively.

Once implemented this would ensure that fishing vessel operators will have the minimum skills and knowledge necessary to safely operate a fishing vessel.

Date Created: 13Jan2014 EST
Current Owner Unit: COMDT INV
Date Last Modified: 10Sep2015 14:44:38 EDT
Priority: Normal

Final Agency Action:
Final Agency Comment:

Safety Recommendation # 004598 **: Chemical testing program requirement regardless of tonnage and licensing requirements**

On June 04, 2013 at approximately 0330PST the CFV NEAHKAHNIE ran aground outside a marked navigational channel due to the operator falling asleep.

Post casualty testing revealed that all three members of the crew, including the operator, tested positive for drugs.

Current regulations do not require a chemical testing program for vessels not required to be operated by a licensed individual.

Recommend: Commandant amend the chemical testing regulations in 46 CFR Part 16 to include all commercial vessels regardless of tonnage and licensing requirements.

The amended regulations would require all marine employers to conduct pre-employment testing and enroll employees in a chemical testing program. This will minimize the use of intoxicants by merchant marine personnel and to promote a drug free and safe work environment.

Date Created: 13Jan2014 EST
Current Owner Unit: COMDT INV
Date Last Modified: 10Sep2015 14:44:38 EDT
Priority: Normal

Final Agency Action:
Final Agency Comment:

Safety Alerts:

United States Coast Guard

Investigation into the Circumstances Leading to the Sinking of the Fishing Vessel

NORN

approximately 40 nautical miles West of La Push, WA on December 17, 2015

U.S. Department of Homeland Security
United States Coast Guard

Commandant
United States Coast Guard

U.S. Coast Guard STOP 7501
2703 Martin Luther King Jr. Ave. SE
Washington, DC 20593-7501
Staff Symbol: CG-INV
Phone: (202) 372-1030
Email: CG-INV@uscg.mil

16732/IIA#5791470
26 May 2022

THE SINKING OF THE COMMERCIAL FISHING VESSEL NORN 40 MILES OFF THE COAST OF LA PUSH, WASHINGTON ON DECEMBER 17, 2015

ACTION BY THE COMMANDANT

The record and the report of the investigation convened for the subject casualty have been reviewed. The record and the report, including the findings of fact, analysis, and conclusions are hereby closed.

The investigation's safety recommendations will remain under review and consideration by the responsible program offices. The response to the recommendations and any resultant actions will be documented separately.

[redacted]

Commander, U.S. Coast Guard
Acting Chief, Office of Investigations & Casualty Analysis (CG-INV)

U.S. Department of Homeland Security
United States Coast Guard

Commander
United States Coast Guard
Sector Puget Sound

1519 Alaskan Way S
Seattle, WA 98134
Staff Symbol: (s)
Phone: (206) 217-6250
Fax: (206) 217-6213

16732
May 24, 2016

MEMORANDUM

[redacted]

From: [redacted] CWO3
Lead Investigating Officer [redacted] 5/24/2016

To: Commander, Sector Puget Sound

Subj: CAPSIZING AND SINKING OF FISHING VESSEL NORN

Ref: (a) Marine Safety Manual, Volume V, Investigations and Enforcement, COMDTINST M16000.10A
(b) U. S. Coast Guard Marine Investigations: Documentation and Reporting Procedures (MCI-05), Version 1.0.

Preliminary Statement:

In accordance with references (a) and (b), an informal investigation was conducted to determine the contributing factors leading to the capsizing and sinking of the Fishing Vessel NORN (Official Number 255810), which occurred approximately 40 nautical miles west of the entrance to Quillayute River, in Washington State, on December 17, 2015. No attempt to recover the sunken vessel was made, and therefore, a post casualty analysis of the capsized hull could not be completed. However, the three surviving members of the crew were able to provide ample eyewitness testimony. Ultimately, I was able to gather evidence, conduct numerous interviews, perform a thorough analysis, and draw several conclusions regarding this casualty. The MISLE Activity number is 5791470.

Executive Summary:

On December 15, 2015, the wooden hulled fishing vessel NORN departed Neah Bay, WA for the Juan de Fuca Canyon fishing grounds. The vessel was equipped with three bilge pumps – one located in the engine room and two in the fish-hold. Two of the three bilge pumps were inoperable. The remaining functional bilge-pump was located in the fish-hold. Upon departure from Neah Bay, the bilge overboard piping for the fish-hold was witnessed continually discharging water. The crew reported the NORN was listing slightly to starboard.

At approximately 7:00 p.m. the evening before the casualty, all three crewmembers went to sleep – allowing the vessel to drift 10 nautical miles west. The wind and sea conditions were moderate and gradually increased through the night and early morning. At approximately 10:00 p.m., a crewmember awakened from his bunk located in the engine room, and noticed the starboard list had increased. The crewmember attempted to counter the starboard list by placing a fish tote and trash can on the port side of the vessel and filling them with water. This effort proved unsuccessful, yet the crewmember went back to sleep.

During the early morning of December 17, a large wave struck the hull of the NORN, knocking the captain from his bed. Without evaluating the condition of the vessel, the captain climbed back into bed and went back to sleep. Thirty minutes later, the crewmember who attempted to fix the list woke and observed increased water in the engine room bilge. The overboard discharge piping for the fish-hold bilge pump was no longer pumping water. The crewmember woke the rest of the crew. After failed efforts to bail out the engine room, the crew donned immersion suits and abandoned the vessel. All three crewmembers safely entered the vessel's life raft and were later rescued by a U.S. Coast Guard small boat.

The fastenings of the vessel below the waterline were wasted and may have allowed hull planking to loosen, which provided a means for water to intrude prior to the vessel even getting underway. The initiating event of this casualty was likely a wooden plank on the hull partially detaching in the vicinity of the port or starboard fish-hold of the vessel following an impact by a large wave. Several contributing factors led to the capsize of the NORN, including: improper hull maintenance, design of vessel bilge; failure of all bilge pumps; improper repair of damage at the stem of the vessel; improper method used to adjust the list of the vessel; and not posting a live watch while underway.

Location:

The incident occurred approximately 40 nm off the coast of La Push, Washington: 48º 06.26' North Latitude, 124º 38.7' West Longitude.

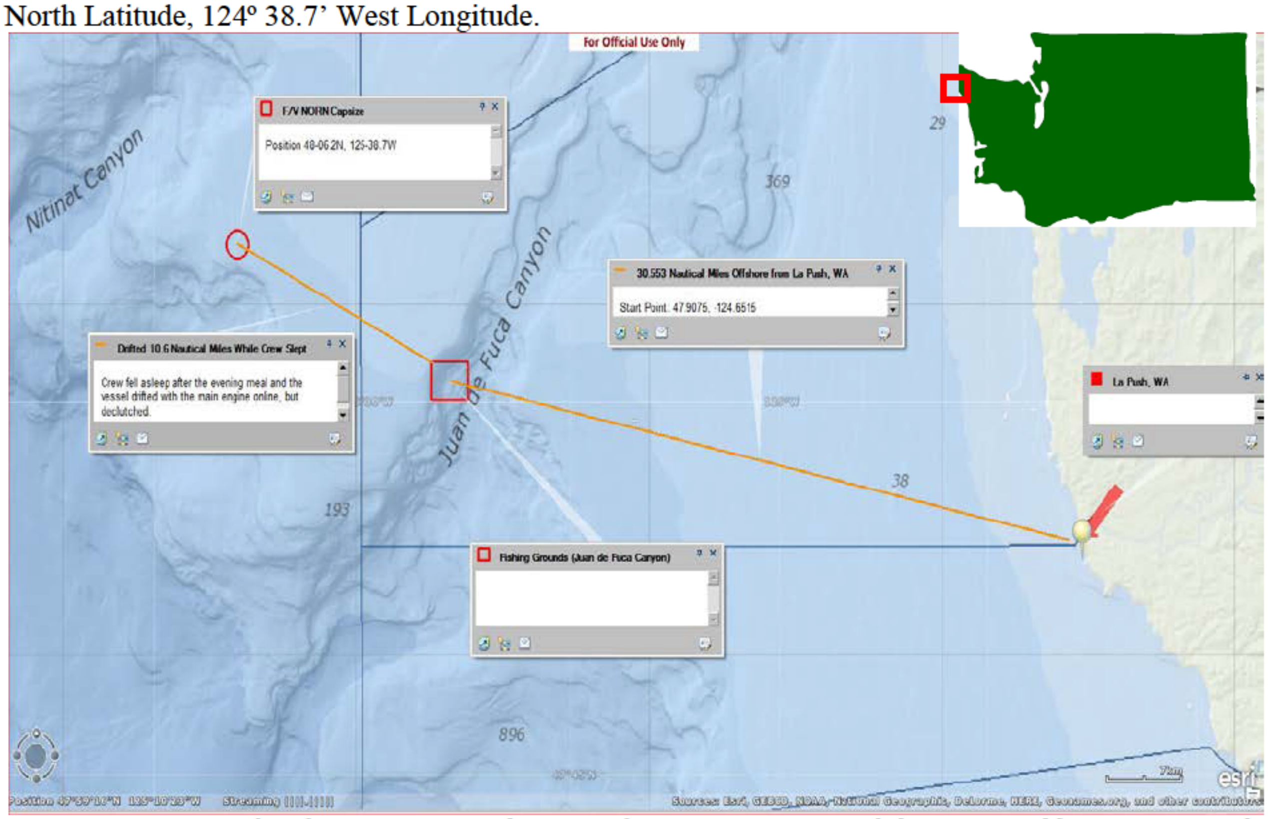


Figure 1: A graphical representation depicting the NORN's positional data received by EPIRB signal and crew statements.

Vessel Data:

F/V NORN	
Official Number:	255810
Service:	Fish Catching Vessel
Year Built	1948
Built By:	[redacted]
Gross Tons:	20
Net Tons:	16
Length:	37.8 feet
Breadth:	12 feet
Depth:	7 feet
Propulsion:	Diesel Reduction
Hull:	Wood
Horsepower:	240
Owner:	[redacted]
Operator:	[redacted]

Figure 2: Photograph of NORN in November 2006 (Credit: All Points Nor'west Marine Surveyors).

Personnel Data:

NORN Crewmembers	Position	Experience	USCG Credential[1]	Status
[redacted]	Captain	23 years	None	Uninjured
[redacted]	Deckhand	10 years	None	Injured
[redacted]	Deckhand	17 years	None	Uninjured

Environmental Data:

Air Temperature	44 degrees Fahrenheit
Water Temperature	44 degrees Fahrenheit
Winds	35 knots, from the North
Gusts	38 knots
Swells	10-15 feet

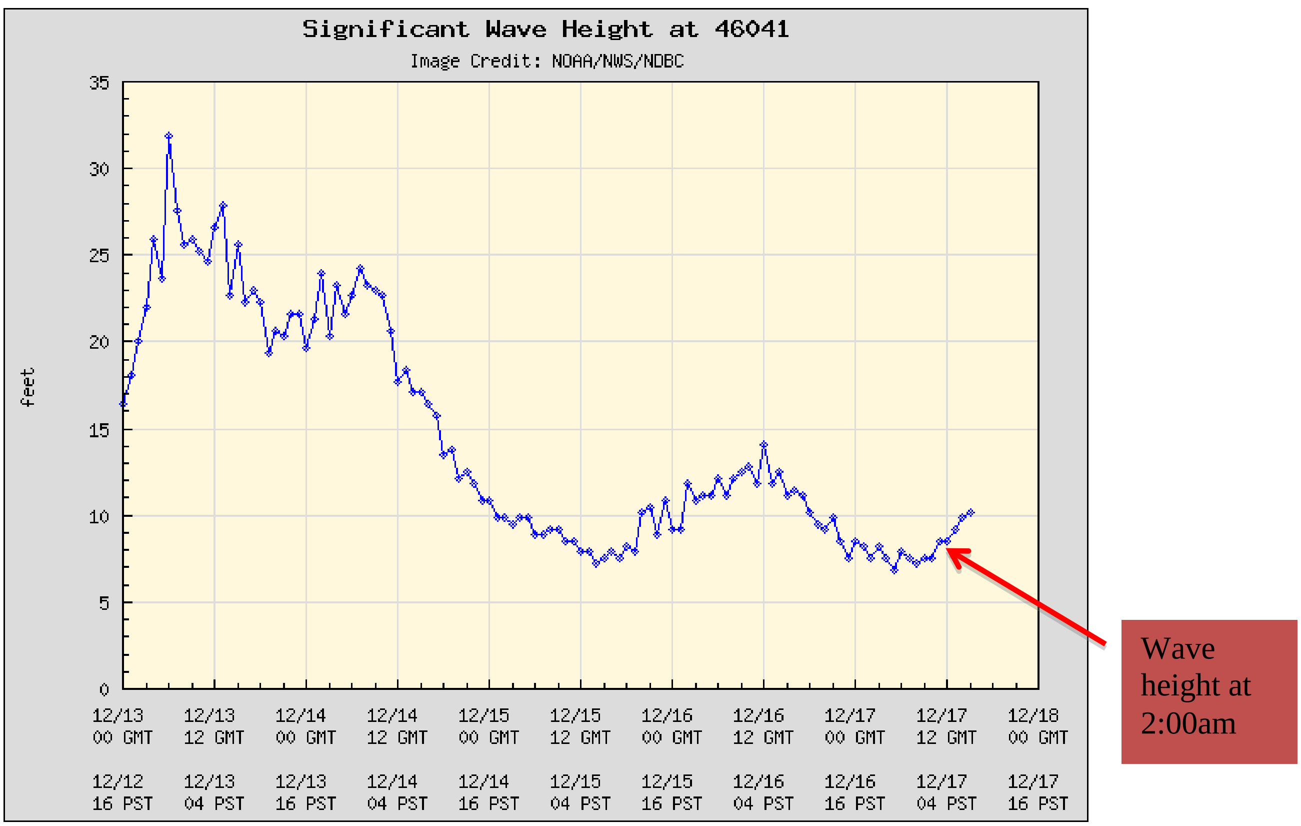


Figure 3: Swells measured at NOAA buoy 46041, approx. 20 miles offshore La Push, WA.

1 Merchant Mariner Credentials are not required for seaman operating uninspected fishing vessels less than 200 gross tons

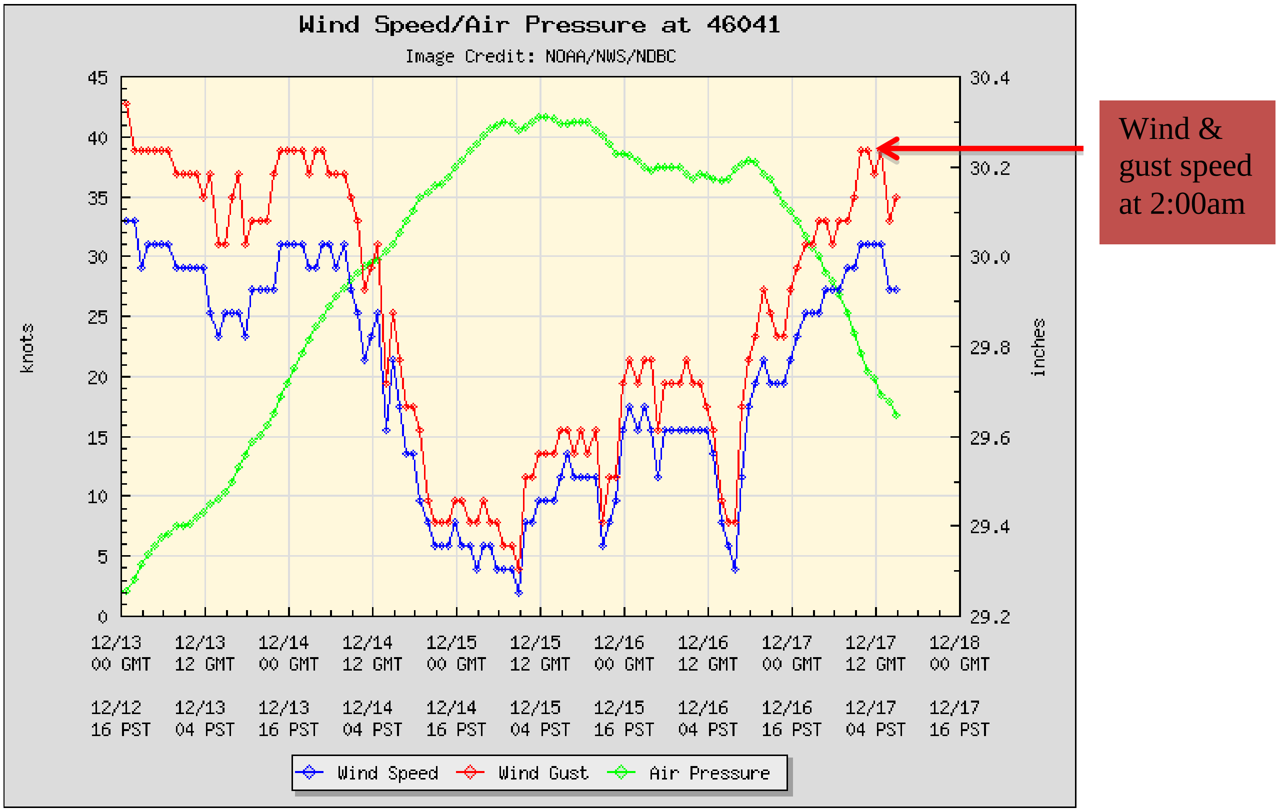


Figure 4: Winds measured at NOAA buoy 46041, approx. 20 miles offshore La Push, WA.

Finding of Facts:

❖ *NORN History & Condition:*

1. The NORN is an uninspected[2] fishing vessel documented by the U.S. Coast Guard, with a Fishery, Registry, and Coastwise Endorsement[3]. The marine casualty and safety regulations that govern NORN are found in Title 46, Code of Federal Regulations, Subchapters 4.03-1 and 28, respectively.

2. The NORN is a wooden hulled vessel built in 1948 in Poulsbo, WA. The NORN is built round bottomed with full deep keel, full ceiling, and heavy sponsons[4] of fir over bent oak. The vessel is configured for long-line reel and troll.

3. In 2006, the NORN completed an in-the-water survey by All Points Nor'west Marine Surveyors. The survey reported the vessel in good condition, but did not evaluate the bottom hull due to the vessel remaining in the water.

4. The NORN was purchased in 2012 by [redacted] and hauled out of the water in Port Townsend, WA.

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2 Uninspected fishing vessels do not require robust inspections by the U S Coast Guard as would be mandated by law for certain other commercial vessels However, all uninspected vessels must still comply with minimal federal standards for safety, navigation, and pollution prevention

3 Endorsements on a Certificate of Documentation allow a vessel to conduct commercial trade on navigable waters of the United States See 46 C F R § 67 for more info

4 Description received from 2006 and 2013 surveys

5. During a dry-dock inspection in 2012, a wooden vessel hull surveyor reported loose fasteners in the topsides and port side. The port side was re-fastened with hundreds of galvanized screws, but not the starboard. The keel fasteners were not examined. The technician recommended a complete re-fastening in the vicinity of the fish-hold area of the vessel. However, due to limited funds, no fasteners were replaced below the waterline.[5]

Figure 5: Photo of NORN at 2006 survey (Credit: All Points Nor'west Marine Surveyors)

Figure 6: Photo of NORN in 2013

5 Fasteners are used in wood boat construction to secure planks, shanks, sponsons, and other wooden structures against one another Ferrous fastenings are normally hot-dipped galvanized and consist of screws or barbed nails

6. On March 22, 2013, a survey of NORN was completed by Tom Pope Marine Surveyor. The vessel remained in the water. The survey concluded the vessel in "Good Condition." The bottom hull was excluded from the survey.

7. On March 12, 2015, the NORN completed and passed a Commercial Fishing Vessel Safety Examination by U.S. Coast Guard Station Neah Bay.[6] This examination addresses safety equipment, but does not include a hull condition examination. If obvious signs of hull deterioration are witnessed, an order may be issued revoking a vessel's ability to depart port.

8. The NORN is designed with a common bilge system, from bow to stern, via a shaft-alley. No collision bulkhead is present. The design allows bilge water to freely communicate between each compartment.

9. At an unknown time before December 15, 2015, the NORN allided[7] with a pier. The stem above the water line was damaged, allowing water to enter the vessel when waves splashed upward the stem. The Captain patched the damaged stem with a two-part epoxy, called Splash Zone.

10. Splash Zone is a compound which, when applied to a surface properly, creates a watertight seal above or below a water surface. The Splash Zone applied to the stem of the NORN, reportedly reduced water intrusion by 75%.

11. The NORN is outfitted with three, 2000 gallons per hour, 12-volt, bilge pumps. One bilge pump is located in the engine room, and two in the fish-hold. A float-switch automatically energizes the engine room pump and one of the pumps in the fish-hold. A toggle-switch in the wheelhouse manually operates the second pump in the fish-hold.

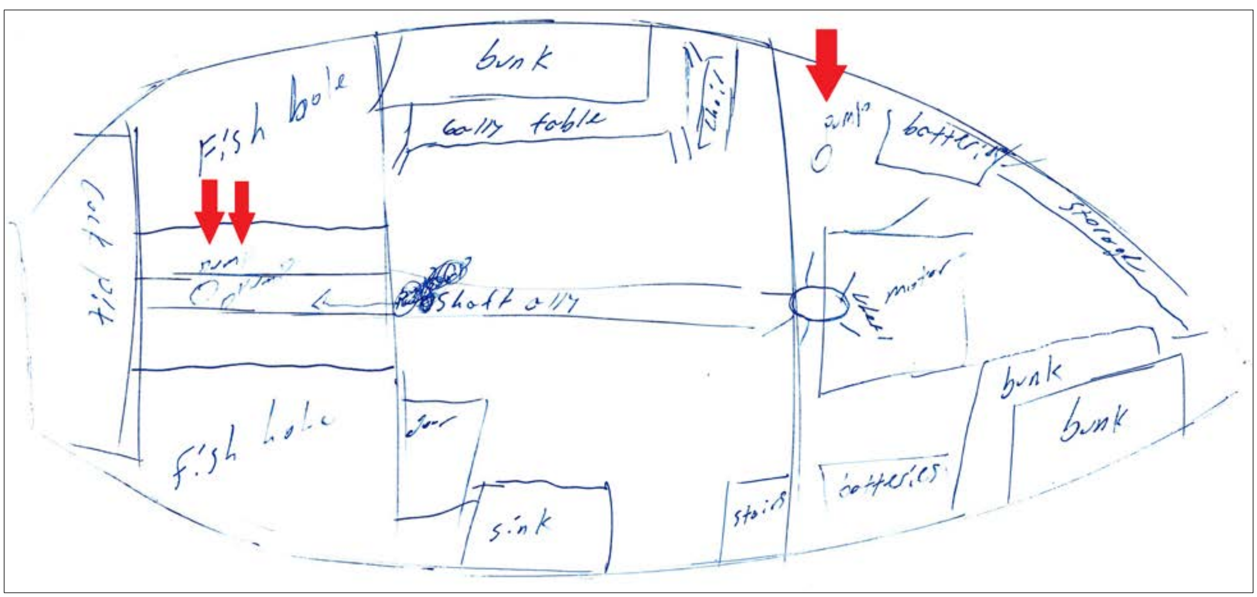

Figure 7: Sketch of NORN, completed by captain of vessel, noting bilge pump locations.

6 Commercial Fishing Vessel Safety Examinations are voluntary in nature and are designed to enhance fishing vessel safety and promote public awareness and education

7 A moving object striking a fixed object *(or allision).*

12. During the summer of 2015, the manually operated fish-hold bilge pump overheated and became inoperable. Efforts to repair the pump were not made.

13. In September of 2015, the captain of NORN unwired the engine room bilge pump because a circuit breaker continually tripped offline. A backup bilge pump was placed on board in case of an emergency. To configure the pump to operate, it was manually hard-wired directly to the battery terminals in the engine room, and submerged in the area requiring dewatering. A discharge hose was fitted to the pump and routed overboard.

❖ *The Voyage:*

1. On December 15, 2015, at approximately 10:00p.m., the NORN departed Neah Bay, Washington with three persons on board and loaded with 5,000 pounds of ice and bait.

2. Upon departure, the crew reported the vessel listing to starboard. The fish-hold bilge pump discharge hose was witnessed continually pumping water overboard, which the crew considered normal for this vessel.

3. On December 16, 2015, at approximately 6:00 a.m., the NORN began fishing for sablefish[8] in the vicinity of the Juan de Fuca Canyon[9].

4. Between 8:00 a.m. and 11:59 p.m., the weather deteriorated. Winds increased from less than 10 knots to more than 30 knots in the evening, with gusts near 40 knots. Wave height peaked at approximately 11 feet.

5. The crew hauled in approximately 10 sablefish, and stored them in an ice chest on the fish deck.

6. At approximately 7:00 p.m., after the evening meal, all three crewmembers fell asleep. The main engine remained online with the clutch disengaged. The NORN drifted 10 nautical miles to the west.

7. At approximately 11:00 p.m., a crewmember awoke and noticed the NORN listing heavily to starboard. The NORN was listing in excess of 20 degrees, which allowed water to freely enter the fish-deck freeing ports. The crewmember attempted to fix the list by moving a fish tote and a trash can to the port side fish-deck of the NORN, and then filling both with water. The crewmember noted the fish-hold bilge pump discharge hose was still continually pumping water overboard. The attempt did not result in any appreciable difference in list.

8. Approximately 45 minutes after attempting to fix the starboard list, the crewmember returned to his bed, located in the engine room. Before falling asleep, he noticed water “slushing around under the engine,” but considered it a minor effect of the sea conditions.

8 Called also *black cod*

9 Located 20 nautical miles offshore, the Juan de Fuca Canyon offers nutrient rich waters which promote an abundance of salmon, shellfish, and other ground fish, including sable fish

9. On December 17th, 2015, at approximately 1:45 a.m., a large wave impacted the NORN on the port side. The impact of the wave knocked the captain from his bed and onto the deck. The captain visually witnessed the fish-hold bilge pump light illuminated, indicating high water level. The captain returned to his bed and fell back to sleep, without checking for damage to the vessel.

10. The large wave also woke the crewmember who had attempted to fix the list. The crewmembers berth was located in the engine room., After looking at the engine room bilge and not seeing anything unusual, he went back to sleep.

11. Approximately 15 minutes following the large wave impact, the crewmember woke again and noticed his boots floating in the engine room. He woke the captain and informed him of the water in the engine room.

12. As the captain began responding, he noticed that the fish-hold bilge pump discharge piping was not pumping water. The captain noted the water level had partially submerged the main engine.

13. The captain and crew started bailing out the engine room with buckets. The weather was causing the NORN to rock and pitch heavily, which caused one of the crewmembers to slip and fall, injuring his back. The captain reported the water level falling.

14. After the crewmember's injury, the captain departed the engine room and clutched in the main engine from the wheelhouse, in an attempt to reduce the vessel movement in the seas. When the captain returned to the engine room, he witnessed an extreme increase of water in the engine room that was freely communicating from other spaces and realized the crew may have to abandon the NORN.

15. The captain ordered the crew to don immersion suits and prepare to abandon the NORN.

16. The captain rigged the spare bilge pump to reduce the water level in the engine room. The power cables for the pump were too short, which caused the pump to disconnect when lowered into the water. The discharge piping was also found not long enough to exit the vessel. The water level was knee-deep, forcing the captain to leave the engine room.

17. Between 3:10 a.m. and 3:17 a.m., the captain transmitted several MAYDAY calls, which were received by U.S. Coast Guard Sector Puget Sound.

18. At 3:18 a.m., U.S. Coast Guard helicopter CG 6501 was launched from Air Station Port Angeles.

19. At approximately 3:30 a.m., a crewmember grabbed the Emergency Position Indicating Response Beacon (EPIRB) and manually switched it to transmit the NORN's position. Shortly thereafter, while the vessel was capsizing, the EPIRB slipped from the crewmembers hand and fell overboard. U.S. Coast Guard helicopters later located the EPIRB, but did not retrieve it.

20. At approximately 3:30 a.m., the captain donned his immersion suit and then removed the life raft from its cradle to cast it overboard. The life raft painter remained attached to the NORN as the life raft was thrown overboard. As the vessel began to capsize, the captain jumped from the stern of the vessel. The other two crewmembers climbed up the port side as the vessel rolled to starboard and then jumped overboard while the NORN sank by the stern.

21. The captain ordered the crewmembers to let the life raft deploy automatically when the vessel sank. The captain claimed that he had been taught this method of inflation was best. All three crewmembers remained with the capsized vessel, and waited for it to sink so the life raft would automatically deploy.

22. As the vessel sank beneath the ocean surface, the life raft painter line pulled taut and inflated the life raft. While the life raft inflated, it became tangled in the NORN's mast rigging. The captain and crew climbed aboard the life raft, but could not close the zippered flap due to a large tear in the fabric.

Figure 8: Photo of tear in life raft canopy entrance flap.

23. At 3:40 a.m., Station Quillayute River launched rescue boat CG 47288.

24. At 4:08 a.m., Sector Puget Sound received the EPIRB positional data from NORN and relayed the information to U.S. Coast Guard Station Quillayute River, in La Push, WA.

25. At 4:50 a.m., CG 6501 arrived in the vicinity of the EPIRB transmission and reported poor visibility due to rain.

26. At 5:13 a.m., CG 6501 located the NORN's life raft and witnessed two red flares.

Figure 9: Photo of NORN's life raft. Arrow points to location of flap tear on opposite side.

27. At 5:53 a.m., CG 47288 arrived on-scene and embarked all three crewmembers from the capsized NORN.

28. At 10:19 a.m., CG 47288 returned to port in La Push, WA.

<u>Post Casualty Drug and Alcohol Testing:</u>

1. Following a serious marine incident, the marine employer is required to determine whether an intoxicating substance affected individuals directly involved in a casualty. Station Quillayute River law enforcement personnel tested the NORN crew for the presence of alcohol. [redacted]. The captain and owner were both advised of the requirement for drug testing, however, no drug testing was completed.

<u>Analysis:</u>

1. *Lack of Maintenance*: The pictures and dry-dock survey suggest maintenance was not being adequately performed. The photos also suggest that the fasteners in the NORN's hull were at some stage of decay. The dry-dock survey recommended a "complete refasten and reframe" in the vicinity of the fish-hold area. The pictures taken two years after dry-dock show rust running down from the heads of the individual fastener holes. *Figure 5* depicts a photograph of NORN's starboard bow, which is also the side re-fastened in 2011. This indicates even the most recent fasteners were suffering wastage. The U.S. Coast Guard's Navigation and Vessel Inspection Circular (NVIC) 7-95 is used in the wooden vessel industry as a guide in maintaining and repairing wooden built vessels. NVIC 7-95 addresses running rust from fasteners and recommends the removal of fastenings should occur when bleeding from fastening holes are noted.

   Causes of fastener wastage can be attributed to several influences. NVIC 7-95 instructs that wooden vessels are most susceptible to two types of fastener corrosion: simple electrochemical and galvanic corrosion. Electrochemical corrosion occurs naturally when metals are immersed in an electrolyte, such as salt water. Typically, the heads of fasteners tend to support oxygen consuming cathode reactions and thus are protected from wastage[10]. Deeper-buried parts of a fastener are inherently more vulnerable and act as an anode[11]. For this reason, it is important to occasionally remove fasteners to determine wastage of the deeper-buried shanks.

The NORN's fasteners consisted in majority of galvanized dipped steel screws. Screw type fasteners are loaded using withdrawal tensile rather than shear (i.e. bolt fasteners) and rely on threads or friction for holding power. When only a fraction of the original diameter of the screw is lost to galvanic corrosion, the holding power effectiveness has ended. Since this holding power is critical in keeping hull planking attached to a wooden vessel, fastener corrosion should be tracked using established maintenance procedures.

2. *Improper Repair*: An improper repair was made to the stem of the vessel to slow water intrusion. Splash zone is an effective temporary repairing compound that is capable of withstanding water intrusion, but does not offer significant structural strength. The captain reported a 75% reduction of water intrusion once the repair was made. The amount of water intrusion as described by the crew is not considered a significant contributing factor in this casualty.

3. *Insufficient De-Watering Capability*: Only one of the original three installed bilge pumps remained operational prior to getting underway. This reduced the overall dewatering capacity by two thirds. Dewatering via buckets appeared to reduce the water level in the engine room, however, after the captain clutched in the main engine to help reduce vessel movement, water in other compartments communicated through bulkheads and into the engine room, significantly increasing the water level.

4. *Active Flooding*: One bilge pump was continually pumping water from the fish-hold from the time the vessel departed port. Though rated at 2,000 gallons an hour with zero head pressure, bilge pumps are generally designed to occasionally remove water that has accumulated within a compartment.

5. *Inadequate Manning*: The captain claimed that he did not have enough crew on board in order to keep a live watch. No lookout was posted and no rounds of engineering spaces were made while the crew slept.

6. *Improper Stability Management*: The crewmember's decision to fill containers on deck with water raised the vessel's center of gravity and caused the vessel to submerge lower in the water. This increase in weight on the main deck caused an overall decrease in stability. Additionally, with an increase in the vessel's displacement, the vessel would sink lower, causing greater water ingress due to higher head pressure. The increase in the height of the center of gravity added to the existing starboard list, which decreased the vessel's righting moment.

10 Immersed in an electrolyte, ferrous materials release and/or absorb electrons depending on the nobility of the material For example, an underwater steel fastener would be nobler than a zinc anode The steel fastener will remove electrons from the zinc The least noble material has no ability to regain lost electrons, therefore wastage occurs

11 Saturated wood acts as the electrolyte for the deeper-buried fastener The ferrous materials located within the fishing vessel become part of a separate electro-chemical process The fasteners become the least noble metal due to nobler piping materials within the vessel Electrons are given up from the fastener and given to the more noble material (i e aluminum, brass, copper, copper-nickel, etc), while no lesser material replenishes the fasteners' lost material The end result is wastage of the deep-buried fastener

7. *Misinterpreting an Emergent Situation*: The first instance of a potential problem was the constant discharge of water from the fish-hold along with the vessel at a constant starboard list. These facts combined should have provided insight to a developing situation. While the crew was asleep, the fish-hold bilge pump ceased pumping. After the large wave impacted the vessel, the captain noticed the high water alarm illuminated for the fish-hold, yet continued back to bed.

Figure 10: NORN's port bow. Picture taken March 2013. Bleeding fasteners are easily visible.

Conclusions:

1. The vessel was not seaworthy prior to departing port. Hull maintenance was not fully completed during NORN's 2011 drydock, which fostered excessive plank fastener corrosion. The owner of the NORN was informed that the vessel required full re-fastening, at the time of drydock, and still continued operating.

2. The vessel owner did not track the rate of corrosion of the hull fasteners. The fasteners in the wooden planks of NORN's hull lost holding strength due to excessive wastage. The most likely cause of water intrusion was a sprung plank below the waterline in the vicinity of the fish-hold. However, other water intrusion points or cannot be ruled out, including additional hull fasteners, seams, or packing failures.

3. The initiating event is likely the impact of the large wave which partially detached an underwater hull plank. This was exacerbated by the downward pressure originally provided by the physical loading of 5,000 pounds of ice into the fish-hold. This force against the hull may have partially loosened a hull plank with wasted fasteners.

4. The fish-hold bilge-dewatering pump controlled the flooding until the pump failed.

5. The weather was determined a contributing factor in the capsizing of NORN. The high winds and swells encountered by the vessel heeled the vessel further to starboard, decreasing vessel stability as water flowed onto the deck via the freeing ports.

6. The crew's decision to go to sleep without posting a look-out contributed to the flooding getting to a point beyond control.

7. The crewmember filled water containers on the port side of the fish deck, contributed to the vessel becoming unstable. The center of gravity shifted and consequently deteriorated the vessel's seaworthiness.

8. The common bilge design in NORN caused progressive flooding throughout every compartment below the water line. When the captain clutched in the main engine, flood water from the forward compartments flowed aft, raising the water level in the engine room.

9. The vessel rigging likely caused the tear in the life raft as the life raft was inflating. A likely contributing factor was the decision to allow the vessel's submersion to act as the catalyst for life raft inflation.

Safety Recommendations:

1. Recommend Commandant, U.S. Coast Guard establish regulations within 46 CFR Subchapter C that adequately ensure vessel owners, operators, agent, captains, and person's in-charge, develop and follow crew endurance management policies and practices.

2. Recommend Coast Guard Sector Puget Sound Commercial Fishing Vessel Examiners educate fishermen during dockside safety exams concerning the requirement of 33 USC 1602 (RULE 5) to maintain a look-out and the dangers associated with leaving the vessel drifting unattended while the entire crew sleeps.

3. Recommend Sector Puget Sound Fishing Vessel Examiners issue Captain of the Port Orders preventing fishing vessels from proceeding underway from the dock when obvious signs of hull deterioration are present and getting underway would pose a threat to the Captain of the Port Zone.

Enforcement Recommendations:

1. Recommend Coast Guard Sector Puget Sound, District 13 and PACAREA conduct focused offshore boardings of small commercial fishing vessels to ensure and compel adherence to maintaining a lookout while underway.

2. Recommend that enforcement action be initiated against the owner of the NORN for failing to comply with drug testing requirements following a serious marine incident.

3. No enforcement action is recommended on the RULE 5 violation.

Administrative Recommendations:

1. Recommend Officer in Charge, Marine Inspection provide a copy of NVIC 7-95 to the owner of the vessel, and the two organizations that conducted in-water surveys.

2. Recommend Officer in Charge, Marine Inspection, conduct additional training to U.S. Coast Guard qualified fishing vessel examiners leading to proficiency in the identification of visual cues of wooden hull vessel fastener deterioration.

3. Recommend this casualty investigation be closed.

United States Coast Guard

Investigation into the Circumstances Surrounding the Loss of Life on board the Involving

F/V OUTNUMBERED

In Hurricane Sound near Vinalhaven, Maine on August 13, 2014

MISLE Activity Number: 4954644

U.S. Department of Homeland Security
United States Coast Guard

Commandant
United States Coast Guard

U.S. Coast Guard STOP 7501
2703 Martin Luther King Jr. Ave. SE
Washington, DC 20593-7501
Staff Symbol: CG-INV
Phone: (202) 372-1030
Email: CG-INV@uscg.mil

16732/IIA#4954644
24 May 2022

THE LOSS OF LIFE ON THE COMMERCIAL FISHING VESSEL OUTNUMBERED NEAR HURRICANE SOUND, ME ON AUGUST 12, 2014

ACTION BY THE COMMANDANT

The record and the report of the investigation convened for the subject casualty have been reviewed. The record and the report, including the findings of fact, analysis, and conclusions are hereby closed.

The investigation's safety recommendation will remain under review and consideration by the responsible program office(s). The response to the recommendations and any resultant actions will be documented separately.

[redacted]

R. S. WADDINGTON
Commander, U.S. Coast Guard
Acting Chief, Office of Investigations & Casualty Analysis (CG-INV)

U.S. Department of Homeland Security
United States Coast Guard

Commander
United States Coast Guard
Sector Northern New England

259 High Street
Portland, ME
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Phone: (207) 347-5020
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16732

MEMORANDUM

12 AUG 2015

[redacted]

From: M. A. Baroody, CAPT
CG SECTOR Northern New England

Reply to Attn of: [redacted]

To: CGD ONE (dp)

Subj: LOSS OF LIFE ON BOARD COMMERICAL FISHING VESSEL OUTNUMBERED (O. N. 635384) IN HURRICANE SOUND NEAR VINALHAVEN, MAINE ON AUGUST 13, 2014

Ref:
(a) Title 46 United States Code, Chapter 63
(b) Title 46 Code of Federal Regulations, Part 4
(c) Coast Guard Marine Safety Manual, Volume V, Investigations and Enforcement, COMDTINST M16000.10A
(d) COMDT (CG-545) Policy Letter 1-11, Marine Casualty Report of Investigation

1. In accordance with the above references, Lieutenant [redacted] was designated to conduct an informal investigation into the loss of life aboard a U.S. flagged commercial fishing vessel. The Report of Investigation (ROI) is attached.

2. I have reviewed and concur with the ROI's findings of fact, conclusions, and recommendations. I recommend you favorably endorse the enclosed ROI and forward it to COMDT (CG-INV) for approval.

#

Enclosure: Report of Investigation

U.S. Department of Homeland Security

United States Coast Guard

Supervisor
United States Coast Guard
Marine Safety Detachment Belfast

2 Franklin Street
Belfast, Maine 04915
Phone: (207) 338-8395
Fax: (207) 338-8906

16732
12 AUG 2015

MEMORANDUM

[redacted]

From: [redacted] LT
Investigating Officer

To: CG SECTOR Northern New England (s) [redacted] 12 AUG 2015
Thru: CG SECTOR Northern New England (sp) 8/10/15

Subj: LOSS OF LIFE ON BOARD COMMERICAL FISHING VESSEL OUTNUMBERED (O. N. 635384) IN HURRICANE SOUND NEAR VINALHAVEN, MAINE ON AUGUST 13, 2014

Ref: (a) Marine Safety Manual. Volume V, COMDTINST M16000.10A
(b) Marine Casualty Report of Investigation (ROI) Policy, CG-545 Policy Letter 1-11

Preliminary Statement:
Good Samaritans recovered Mr. Jeremy Philbrook's body in Hurricane Sound, ME on August 13, 2014, and he was subsequently declared deceased due to drowning. Mr. Philbrook was the owner and operator of the commercial fishing vessel OUTNUMBERED. He was fishing alone and no one witnessed him fall overboard. The vessel's track line data was retrieved from the chart plotter by Coast Guard Investigative Service Agents at the First Coast Guard District. This data, information on OUTNUMBERED's typical speed, and the amount of time it usually took Mr. Philbrook to haul and set traps was used to estimate the timeline. All times listed in the findings of fact reflect local time. Marine Safety Detachment (MSD) Belfast personnel conducted a marine investigation in accordance with reference (a) with LT [redacted] as lead investigator. The MISLE activity for this incident is 4954644.

Executive Summary:
On August 13, 2014, at approximately 1330, the commercial fishing vessel OUTNUMBERED was located by the commercial fishing vessel PAMELA JEAN approximately two-tenths of a nautical mile southwest of Buoy 15 (LLNR 3805) in Hurricane Sound, ME with the engine running, in gear, and with no one onboard. The operator of PAMELA JEAN noticed a lobster pot buoy trapped underneath the OUTNUMBERED's transom. Attached to the lobster pot buoy was OUTNUMBERED's operator, who had been hauling and setting lobster traps alone earlier that day. With the help of another commercial fishing vessel nearby, GLOUCESTER GIRL, crewmembers from both vessels were able to pull OUTNUMBERED's unresponsive operator out of the water. Officers from Maine Marine Patrol attempted to resuscitate OUTNUMBERED's operator but were unsuccessful. OUTNUMBERED's operator was pronounced deceased at 1419. A full autopsy and toxicology was conducted on OUTNUMBERED's operator; the femoral blood tested [redacted]

Location(s):

1. Mr. Philbrook fell overboard in Hurricane Sound one-half nautical mile northwest of Hurricane Island, ME in position 44 02'49.66" N 68 54'03.46" W (black arrow in Figure 1). The Army Corps of Engineer's Code for Hurricane Sound is 1093.

2. Mr. Philbrook was found in Hurricane Sound four-tenths of a nautical mile southwest of the location where he fell overboard in position 44 02' 23.88 N 68 54'15.77 W (red arrow in Figure 1).

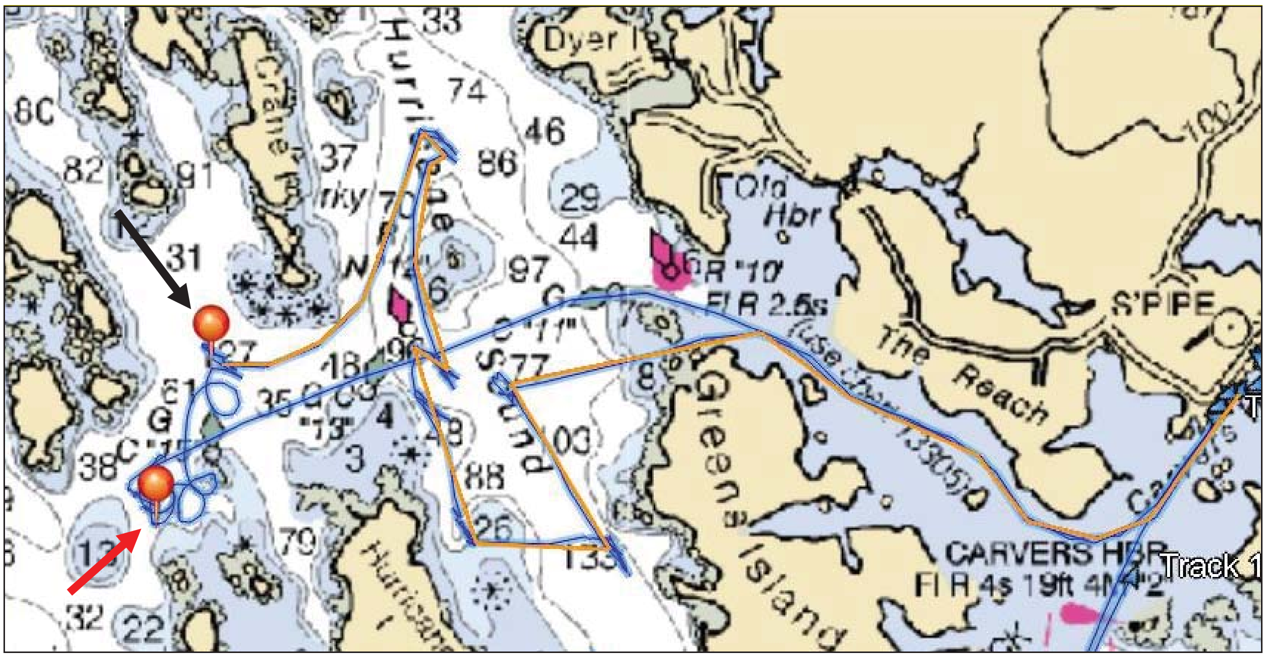

Figure 1- OUTNUMBERED's track line, August 13, 2014. The orange line overlaying the blue line denotes track line of when Mr. Philbrook was still on board the OUTNUMBERED.

Vessel Data:

OUTNUMBERED	
Name:	OUTNUMBERED
U. S. Documentation:	635384
Service:	Commercial Fishing (Lobster)
Date Built:	1981
Boat Builder:	Young Brothers Boats
Gross Tons:	9
Net Tons:	9
Length:	29.1 ft
Breadth:	10.9 ft
Propulsion:	Diesel Inboard
Horsepower:	N/A
Max Speed:	14 knots
Managing Owner/Operator:	Jeremy Philbrook
Owner:	Jeremy Philbrook

Operator:	Jeremy Philbrook
Total Persons Onboard August 13, 2014:	1

Figure 2- OUTNUMBERED moored, August 13, 2014, after the casualty occurred. Picture taken by STA Rockland

Personnel Data:

The following subject of this investigation was identified as being involved in the incident:

Name	Position/Role	Age	Status
Jeremy Philbrook	Operator of OUTNUMBERED	36	Deceased

1. Mr. Philbrook was the owner/operator of OUTNUMBERED on the day of the incident.

2. Mr. Philbrook had operated OUTNUMBERED since 2013; he had twenty years of commercial fishing experience.

3. Mr. Philbrook was not a holder of a Merchant Mariner Credential.

Findings of Fact

1. OUTNUMBERED is an uninspected commercial fishing vessel subject to the requirements in 46 Code of Federal Regulations (CFR) Part 28. OUTNUMBERED did not hold a Coast Guard Commercial Fishing Vessel Safety Decal and was last boarded by the Coast Guard on February 22, 2010. The operator was cited for expired flares and unserviceable life ring.

2. On August 13, 2014 at 0637, OUTNUMBERED departed the Vinalhaven Fisherman's Co-op in Vinalhaven, ME to fish for lobster in and around Hurricane Sound. Mr. Philbrook usually fished alone and was the sole person on board the vessel that trip. His estimated average speed during the transit was five knots.

Figure 3- OUTNUMBERED departing Vinalhaven Fishermen's Co-op.

3. Between approximately 0700 and the time of the casualty, Mr. Philbrook hauled and set approximately seven strings of lobster pots around Hurricane Sound; each string had ten pot buoys, and each pot buoy was attached to two lobster traps. He fished in Maine Department of Marine Resources Zone C inshore, less than three miles from shore. The average time it took for him to haul and set a string was approximately twenty minutes.

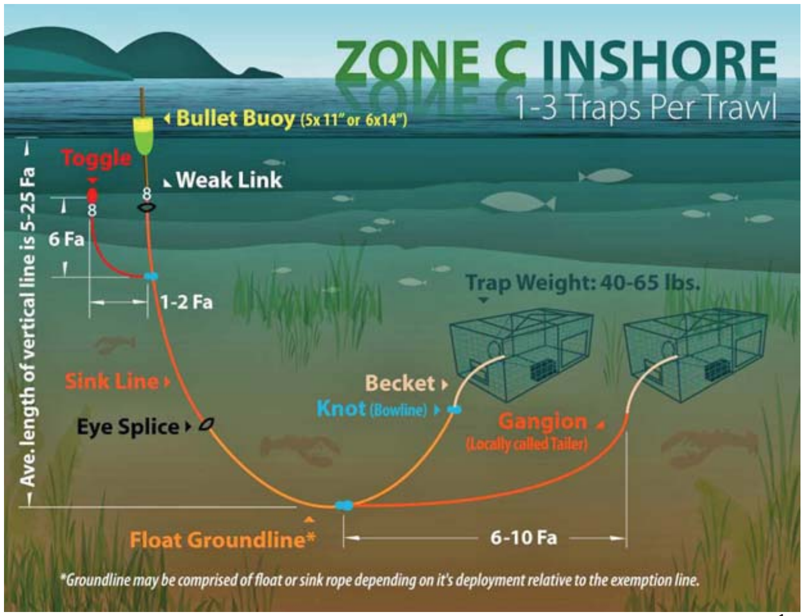

Figure 4- Typical configuration of Zone C INSHORE lobster gear.[1]

4. At approximately 0845, Mr. [redacted] operator of the fishing vessel CHEYENNE PAIGE, was hauling his own lobster traps and sighted Mr. Philbrook on board OUTNUMBERED just east of Buoy 13 (LLNR 3810) in Hurricane Sound.

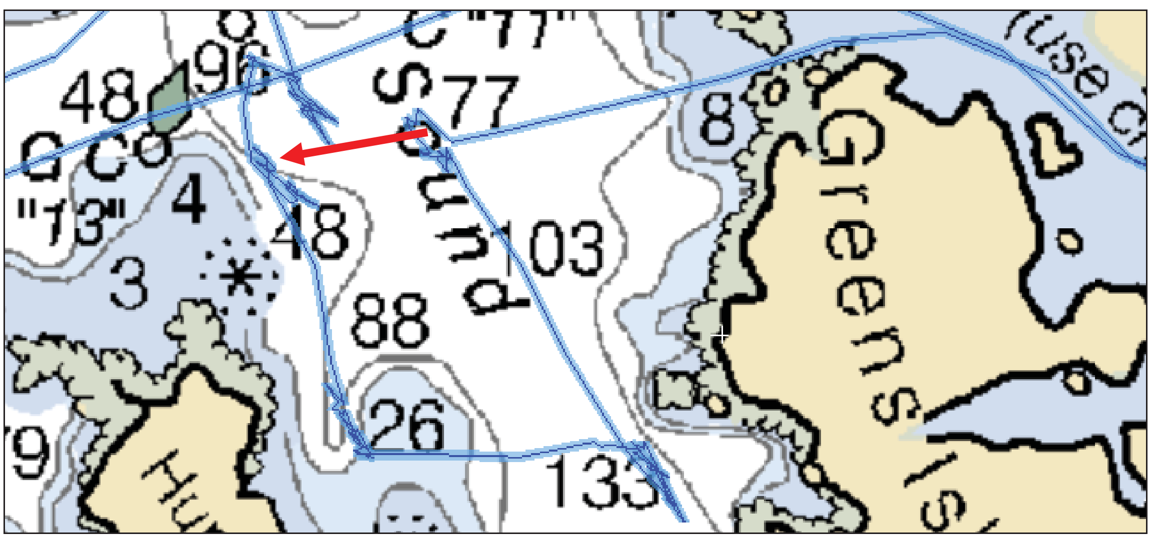

Figure 5 - Approximate location where Mr. Philbrook was last seen on board OUTNUMBERED Hurricane Sound (red arrow)

5. At approximately 1030, Mr. Philbrook was setting lobster traps and fell overboard in Hurricane Sound one-quarter nautical mile north of Buoy 15 (LLNR 3805). OUTNUMBERED was in gear at the time.

[1] http://www.bycatch.org/sites/default/files/Lobster_Gear_Report_0.pdf

6. OUTNUMBERED became fouled in twenty to thirty lobster pot buoys and eventually came to rest two-tenths of a nautical mile southwest of Buoy 15 (LLNR 3805).

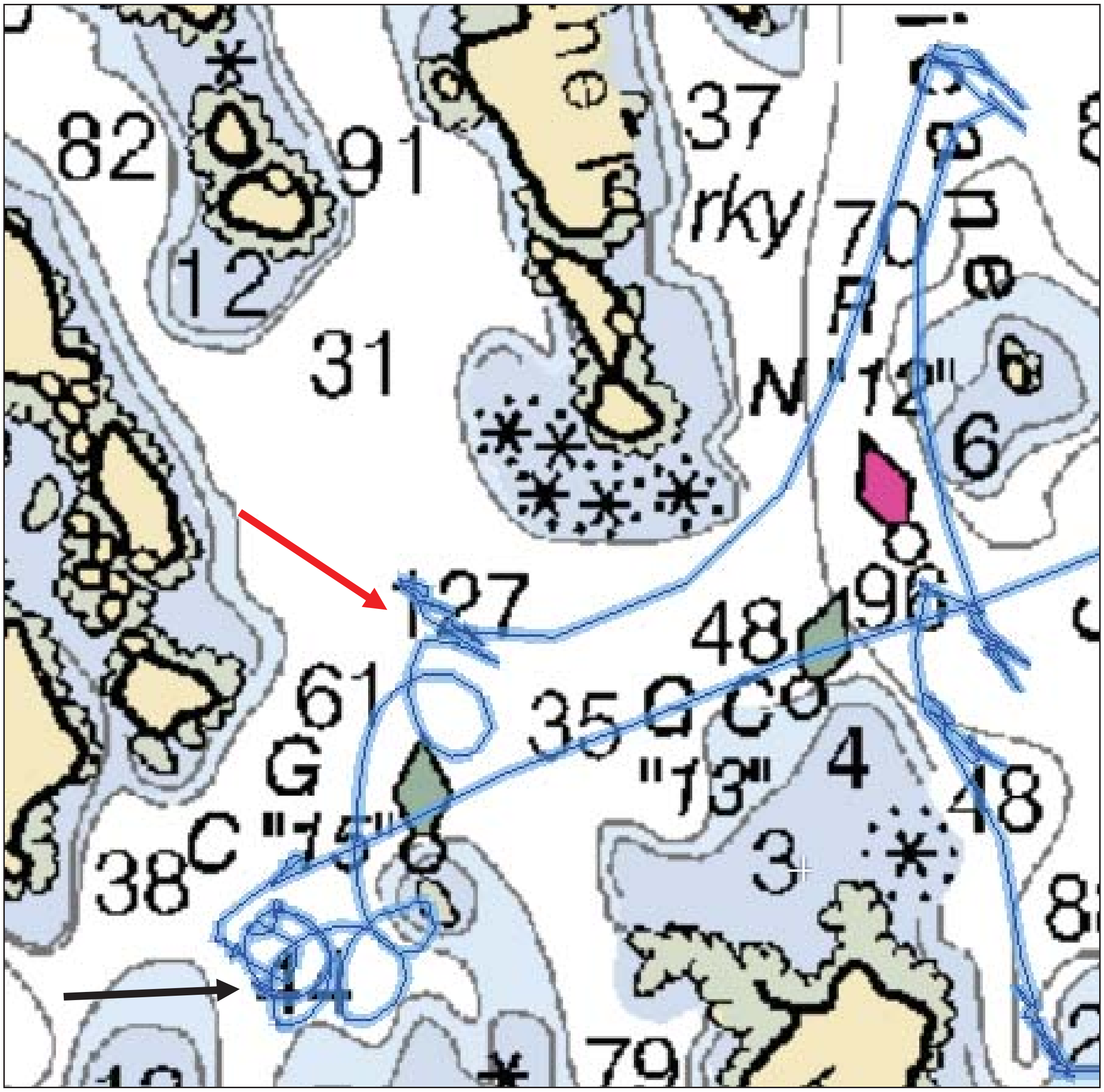

Figure 6 - Approximate location where Mr. Philbrook fell overboard (red arrow) and where OUTNUMBERED was found fouled in lobster pot buoys (black arrow), Hurricane Sound.

7. At approximately 1330, Mr. [redacted], operator of the fishing vessel PAMELA JEAN, observed OUTNUMBERED with no one on board. Mr. [redacted] had been hauling lobster traps with his crewmember, [redacted]. Mr. [redacted] proceeded to OUTNUMBERED's location and saw the vessel was fouled in lobster pot buoys and was still in gear with the engine running. He also noticed a pot buoy caught underneath OUTNUMBERED's transom with what looked to be something attached to it and in the water. Knowing the fishing vessel GLOUCESTER GIRL was in his vicinity, Mr. [redacted] hailed them on VHF radio to assist. Mr. [redacted] also contacted Coast Guard Station Rockland requesting assistance via VHF radio channel 16.

Figure 7- Aft deck gunwale of the OUTNUMBERED showing where Mr. Philbrook's pot buoy was trapped (red arrow), picture taken by [redacted].

8. At approximately 1345, GLOUCESTER GIRL arrived on scene with PAMELA JEAN and OUTNUMBERED. Mr. [redacted], crewmember on GLOUCESTER GIRL, jumped on board OUTNUMBERED, took the boat out of gear and freed the lobster pot buoy trapped underneath the transom. He handed the lobster pot buoy to Mr. [redacted], operator of GLOUCESTER GIRL. Mr. [redacted] and his second crewmember, Ms. [redacted], began to haul the trap connected to the pot buoy. Ms. [redacted] remembered hauling approximately ten fathoms (sixty feet) of line, when she saw a body with line wrapped around the leg at the surface of the water. Mr. [redacted] and Ms. [redacted] were unable to haul the body on board so Mr. [redacted] jumped on board GLOUCESTER GIRL to assist.

9. At approximately 1400, the three of them pulled the body on board GLOUCESTER GIRL. Ms. [redacted] immediately recognized the body as Mr. Philbrook. Mr. Philbrook was not wearing any personal flotation device when he was removed from the water, nor was there a knife on his person.

10. At approximately 1405, three Maine Marine Patrol vessels; GUARDIAN III, and two PROTECTOR class vessels, arrived on scene with the GLOUCESTER GIRL, PAMELA JEAN, and OUTNUMBERED. They had been conducting an exercise in Rockland Harbor when they overheard PAMELA JEAN's radio traffic requesting assistance from the Coast Guard. Two Maine Marine Patrol Officers boarded GLOUCESTER GIRL and checked Mr. Philbrook's pulse. After no pulse was found they deployed their AED and attempted to

resuscitate Mr. Philbrook. The AED advised no shock and the two officers initiated CPR which resulted in a substantial amount of water coming out of Mr. Philbrook's nose and mouth. GLOUCESTER GIRL made way towards Carver's Harbor in Vinalhaven, ME where they would be met by local Emergency Medical Services (EMS). The two Maine Marine Patrol Officers continued CPR during the entire transit.

11. Prior to entering Carver's Harbor, GLOUCESTER GIRL was met by another unknown vessel with EMS personnel onboard along with a local physician. At approximately 1419, the local physician declared Mr. Philbrook deceased.

12. Mr. Philbrook's body was transferred to Island Medical Center in Vinalhaven, ME and subsequently to the State Medical Examiners Officer in Augusta, ME for an autopsy. Ligature marks were found around both of his lower extremities, consistent with what is seen in a person with line wrapped tightly around their legs. The cause of death was determined to be drowning.

13. A toxicology test was completed for Mr. Philbrook by NMS Labs. His femoral blood tested [redacted]

Analysis:

1. *Decision to fish alone*: Mr. Philbrook got underway on OUTNUBMERED alone. He was known to fish by himself and did not employ additional crew. There are no state or federal regulations in place that require vessels fishing for lobster to have an additional crewmember on board. If Mr. Philbrook had an additional crewmember on board when he fell overboard, that crewmember could have taken OUTNUMBERED out of gear, pulled Mr. Philbrook from the water, and possibly saved his life.

2. *Presumptive use of* [redacted] *while fishing and operating a vessel:* Mr. Philbrook's [redacted] According to Mr. Philbrook's spouse, Mr. Philbrook was a daily user of [redacted], and up until recently held a medical [redacted] card for treatment of Carpal Tunnel Syndrome. Mr. Philbrook's judgment, motor coordination, and reaction time may have been impaired while he was fishing and operating OUTNUMBERED.[2]

3. *Entanglement in the line on deck and pot buoy trapped under the transom*: More than likely, Mr. Philbrook became entangled in lobster pot line lying on the deck while he was setting traps. There was no bin on deck to store the lobster pot line. The force of the boat being

[2] National Institute on Drug Abuse. (2014, December). *Does marijuana use affect driving?* Retrieved March 2015, from The Science of Drug Abuse & Addiction: http://www.drugabuse.gov/publications/research-reports/marijuana/does-marijuana-use-affect-driving

underway likely sent him overboard and into the water. The pot buoy Mr. Philbrook was attached to caught underneath the vessel's aft deck gunwale, so Mr. Philbrook was essentially dragged underwater by the OUTNUMBERED. When Mr. Philbrook was recovered, his legs were wrapped in his own lobster pot line, as well as lobster pot line from other traps in OUTNUMBERED's vicinity. There are no state or federal regulations in place that limit the amount of lobster pot line on the deck of commercial fishing vessels.

4. *Not having a knife tethered to the body:* When Mr. Philbrook was pulled from the water there was no knife found on his person. There was a sheath for a knife fastened to the outside of the pilothouse bulkhead. No knife was found in the sheath after the casualty. It is unknown whether or not Mr. Philbrook had a knife on him when he fell into the water or if he attempted to free himself from the lines caught around his leg when he was in the water. There is no state or federal regulations in place that require personnel on vessel's fishing for lobster to have a knife on their person or tethered to their body. If Mr. Philbrook had a knife tethered to his body when he fell into the water, he may have been able to use it to cut the lines wrapped around his legs and subsequently free himself.

Figure 8- Back of OUTNUMBERED's pilot house, where Mr. Philbrook kept a knife (red arrow), picture taken by LT [redacted].

5. *Not having a main engine "kill switch" installed*: OUTNUMBERED did not have a main engine "kill switch" installed. Though not seen very often, some commercial fishing vessels have such a device installed under the gunwales and around the entire perimeter of the vessel. The "kill switch" allows a crewmember to shut down the engine should they become entangled in line on deck. There is no state or federal regulations in place requiring commercial fishing vessels to have a "kill switch" or any other method of shutting down the main engine outside of the operating station. Had Mr. Philbrook had such a device installed, he could have shut down the engine when he became entangled in the line, which could have prevented him from being pulled overboard.

6. *Not wearing a personal flotation device*: When Mr. Philbrook was pulled from the water, he was not wearing a personal flotation device. Additionally, he was never seen wearing a personal flotation device. Therefore, it can be inferred Mr. Philbrook was not wearing a personal flotation device when the incident occurred. There is no state or federal regulations in place that require

personnel on vessel's fishing for lobster to wear a personal flotation device. Had Mr. Philbrook been wearing a personal flotation device it could have aided in holding his body above the surface of the water.

Conclusions:

The Initiating Event (or first unwanted outcome) for this casualty was when Mr. Philbrook fell overboard from the OUTNUMBERED in Hurricane Sound. The causal factors that led to this casualty are:

1. Rules and Regulations: There was one error related to rules and regulations identified as a causal factor:

    a. Neither the Coast Guard nor the State of Maine have effective regulations in place that protect commercial fisherman from the dangers of fishing alone.

2. Equipment: There were two equipment errors identified as causal factors:

    a. The OUTNUMBERED was not equipped with a bin locker or line locker (or 'rope locker' as industry refers to it) that could store lobster pot line and reduce the amount of lobster pot line on deck. Having less line on deck mitigates the risk of getting caught in the line.

    b. The OUTNUMBERED was not equipped with a main engine "kill switch" or other similar device that would shut off the engine in the event of an emergency.

3. Personnel: There were four personnel causal factors identified:

    a. Mr. Philbrook made the decision to fish alone; leaving him responsible for both the operation of OUTNUMBERED and the setting/hauling of lobster traps.

    b. Mr. Philbrook smoked [redacted] the day of the incident. The significance of the drug's side effects at the time of the incident is unknown, but cannot be ruled out as a factor in the incident occurring.

    c. Mr. Philbrook did not have a knife tethered to his body that could be used to cut away lobster pot line in the event of entanglement.

    d. Mr. Philbrook was not wearing a PFD at the time that he fell overboard.

Recommendations:

Safety:

1. Commandant should develop a regulation that requires operators of commercial fishing vessels working alone to provide a means to manually shutdown the main engine away from the operating station, or install a device that would automatically shut down a main engine should the operator fall overboard. A similar recommendation was made by the National Institute for Occupational Safety and Health in 2005 for lobstermen to adapt as a safe work practice[3].

2. Commandant should revise 46 CFR 28.110 to require operators of commercial fishing vessels to wear any Coast Guard approved personal flotation device when working alone. A similar recommendation was made by the National Institute for Occupational Safety and Health in 2005 for lobstermen to adapt as a safe work practice [3].

3. Commandant should develop a regulation that requires personnel working fishing gear on a commercial fishing vessel to have a knife capable of cutting through line tethered to their body at all times. A similar recommendation has been previously made by the National Institute for Occupational Safety and Health in 2005 for lobstermen to adapt as a safe work practice [3].

4. In 2011, Commandant concurred with Safety Recommendation 7612, stating sufficient evidence existed to justify consideration of a requirement that certain crew members on commercial fishing industry vessels be subject to a chemical testing program such as that prescribed by 46 CFR Part 16. This investigation shows the requirement is still necessary, and Commandant should move forward with that action.

Other:

1. It is recommended that a copy of this Report of Investigation be provided to Maine Department of Marine Resources, Maine Lobstermen's Association, and Coast Guard Station Rockland.

2. It is recommended that this marine casualty investigation be closed.

#

[3] National Institute for Occupational Safety and Health (2005). *Dangers of Entanglement during Lobstering.* http://www.cdc.gov/niosh/docs/wp-solutions/2005-137/pdfs/2005-137.pdf

United States Coast Guard

Report of the Marine Board of Investigation into the Commercial Fishing Vessel SCANDIES ROSE (O.N. 602351)

Sinking and Loss of the Vessel with Five Crewmembers Missing and Presumed Deceased South of Sutwik Island, Alaska on December 31, 2019

MISLE Activity Number: 6881487

U.S. Department of Homeland Security
United States Coast Guard

Commandant
United States Coast Guard

US Coast Guard Stop 7501
2703 Martin Luther King Jr. Ave. SE
Washington, DC 20593-7501
Staff Symbol: CG-DCO
Phone: (202) 372-2000
Email: USCGDCO@uscg.mil

16732/IIA #6881487
01 November 2023

THE SINKING AND LOSS OF THE COMMERCIAL FISHING VESSEL SCANDIES ROSE (O.N. 602351) SOUTH OF SUTWIK ISLAND, ALASKA RESULTING IN THE LOSS OF FIVE LIVES ON DECEMBER 31, 2019

ACTION BY THE COMMANDANT

The record and the report of the investigation convened for the subject casualty have been reviewed. The record and the report, including the findings of fact, analysis, conclusions, and recommendations are approved subject to the following comments. This marine casualty investigation is closed.

COMMENTS ON THE REPORT

1. The loss of the commercial fishing vessel SCANDIES ROSE and five crewmembers onboard was a tragic and preventable accident. The families of the crewmembers who lost their lives have my deepest condolences. The Coast Guard will take appropriate action on all that we have learned from this thorough investigation.

2. I want to thank members of the Marine Board of Investigation (MBI) for their hard work and dedication during this investigation. Through the public hearing and their efforts, the MBI was able to raise awareness on the hazards associated with operating in Alaskan waters in winter conditions and develop appropriate recommendations to help prevent similar occurrences.

3. The MBI found a major factor in this incident was the captain's judgment. Specifically, the captain departed on the accident voyage and later failed to seek shelter along his planned route despite a heavy weather forecast, vessel icing, and reports from other fishing vessel captains who sought shelter from the weather.

4. Another factor in this casualty was the weather conditions. The Coast Guard MBI determined that the initiating event for this incident occurred around 11:30 a.m. on December 31, 2019, when the SCANDIES ROSE maintained course and speed on its planned voyage track with weather forecasted to continue to deteriorate with heavy freezing spray and gale-force storm warnings. In conversation with the captain of the fishing vessel AMATULI, the captain of the SCANDIES ROSE reported the formation of ice on his vessel the morning of the accident but did not take actions to reduce icing formation or take early and timely

advantage of available safe and protected anchorages along his intended voyage track. Subsequent events include the vessel's reduction in and eventual loss of stability. This loss of stability was exacerbated as the vessel developed a dangerous list to starboard after making a 50-degree turn to starboard towards Sutwik Island. Subsequent events then included a loss of maneuverability, capsizing, flooding, and the vessel's sinking. Additional subsequent events included the loss of five of the vessel's crew and two surviving crewmembers entering the water, before making it to a life raft with eventual rescue.

5. The primary causal factors that directly contributed to the casualty include: 1) failure to take timely action to prevent excessive ice accumulation despite forecasted and anticipated heavy freezing spray conditions, 2) the vessel's unsafe stability conditions due to the inaccurate stability instructions provided by the naval architect who performed the last stability assessment and created the vessel's stability instructions in 2019, 3) carrying nearly the maximum number of crab pots permitted in the 2019 stability instructions despite commencing a voyage where gale force weather and heavy freezing spray were forecasted, 4) excessive ice weight accumulations from freezing spray, and 5) lack of effective federal stability regulations that do not realistically account for the dangerous effects of icing and the asymmetrical nature of icing that can endanger commercial fishing vessels operating in regions similar to this accident environment.

6. Other causal factors include the captain's decisions to: 1) not take timely action to prevent or mitigate excessive ice accumulations from the forecasted and anticipated heavy freezing spray conditions, 2) not create a means for the crew to safely move forward to observe and clear the accumulation of ice on the vessel, and 3) not attend stability training classes that were available. Also contributing to the casualty was the owner's selection of the "qualified individual" who failed to: 1) accurately examine the vessel, 2) perform stability tests and the calculations necessary to properly document the stability condition for the SCANDIES ROSE and 3) create detailed and accurate stability instructions for the captain. As a result, the owner failed to provide the captain of the SCANDIES ROSE with accurate and detailed information to maintain the vessel in a satisfactory stability condition.

7. The MBI identified the need for a detailed follow-up icing study in order to better understand the stability impacts on fishing vessels laden with oversized fishing equipment on their weather decks.

8. The Coast Guard has already taken several actions since the investigation to improve the safety of Commercial Fishing Vessels and those efforts will continue. The commercial fishing vessel industry should also take appropriate actions to prevent similar tragedies from occurring in the future.

ACTION ON RECOMMENDATIONS

Recommendation 1: Recommend that the Commandant of the Coast Guard partner with the National Commercial Fishing Safety Advisory Committee (NCFSAC) to establish a working group to draft and accept a Task Statement addressing safety of Commercial Fishing Vessels of less than 200 GTs. The Task Statement should specifically address the issues raised by this marine casualty, the total loss with fatalities of the SCANDIES ROSE, as well as the similar losses of the DESTINATION and LADY OF GRACE, caused by vessel icing leading to a loss of stability. The Task Statement should address the following items:

1. In conducting the tasking, review the multi-year statistics (provided by the Coast Guard) regarding commercial fishing vessels of less than 200 GT accidents or losses that resulted in fatalities, injuries, or property damage. Major marine casualties in addition to this one, such as the loss of the DESTINATION, NO LIMITS, and other fishing vessels with multiple fatalities and vessel losses should be reviewed to provide the background information necessary to conduct the tasking and then make informed recommendations to the Coast Guard.

2. Examine and make recommendations to the Coast Guard on best practices to reduce and mitigate the negative consequences caused by the misalignment of state and Federal regulations regarding drug laws legalizing the recreational or medical uses for drugs also classed as dangerous drugs by federal law and applicable transportation related statutes. This is critical for the safety of operations and creating an environment for vessel personnel to work in a drug-free workplace, with special emphasis on critical safety sensitive jobs such as navigation and engineering duties to bring fishing vessels into alignment with other commercial vessels. Develop recommendations that include testing for pre-employment, routine, and reasonable cause.

3. Examine and effectively disseminate recommendations for best practices to ensure full crew access to all parts of a vessel to allow for safe vessel operation. This task should address and examine things like a means to access all areas of the vessel and allow the crew to safely move fore and aft to remove ice, inspect the vessel, and operate critical equipment like the vessel's anchors and similar gear that does not require the crew to climb over the pot stack (for example, in the case of a vessel carrying pots, nets or similar devices to create pathways for access).

4. Examine and make recommendations to the Coast Guard on a way to widely distribute personal locator beacons (PLBs) at minimal expense. Ensure availability and access for crewmembers of these critical lifesaving devices which could be acquired by consortiums, associations, or other organizations for distribution to vessel crews through federally funded grant programs or other programs.

5. Establish best practices for standard procedures and guidance for crew standing navigation watches. This should include a detailed crew orientation for each unique vessel, including the operation of critical equipment and establish clear and easily understood watchstanding orders to protect the safety of the vessel for its applicable operations. This could be accomplished as a standardized form or checklist.

6. Evaluate and provide a comprehensive list of recommendations to the Coast Guard, in the form of best practices (NVICs, policies, training), or amended or new regulations, regarding stability considerations which may pose severe risk to the safety of a fishing vessel such as icing, loading, the need for stability instructions, and vessel modifications. As part of this task, review the Coast Guard's current level of oversight, provide recommendations on its adequacy, and specify needed changes to areas of the fishing safety program that require additional attention.

7. Evaluate and provide recommendations to the Coast Guard for best practices to address the high degree of risk associated with fishing vessel operations and how the acceptance of risk is prevalent and accepted in the fishing industry. Specifically, the Marine Board recommends the committee focus on topics including icing, heavy weather avoidance in voyage planning, and formalizing the navigation watch duties via onboard familiarization and written standard orders to ensure the safety of vessel during its transit and during fishing operations.

8. Evaluate and provide recommendations to the Coast Guard to ensure the most effective means to widely disseminate critical safety information for the commercial fishing industry. This Marine Board investigation revealed that current means are not effective at making it to a large portion of the commercial fishing fleet.

> **Action:** I concur with this recommendation. The recommended task statements will be provided at a future convening of the NCFSAC for review and comment.

Recommendation 2: Recommend that the Commandant of the Coast Guard clarify the existing language in the requirements contained in 46 Code of Federal Regulations (CFR) 28.270(b)—participation in drills—regarding "donning" immersion suits. The regulatory intent was to have each member of the crew physically put on an immersion suit to satisfy the requirements of the regulation. More importantly, the intent was to get the tactile experience and increase crewmember ability to rapidly and properly don the suit in extreme conditions.

> **Action:** I do not concur with this recommendation. Title 46 CFR Part 28.270(b) specifically states, "donning immersion suits" are one of the drills all individuals onboard must participate in. Additionally, there are a significant number of Coast Guard and Alaska Marine Safety Education Association (AMSEA) documents related to drills onboard commercial fishing vessels that address this through the following:
>
> - CVC-WI-016 - Fishing Vessel Drill Conductor Program Guidelines for Training Commercial Fishermen, Administration of Onboard Drills, and Acceptance of Training Courses;
> - USCG Dockside CFV Safety Examination;
> - U.S. Coast Guard Fishing Vessel Safety, Federal Requirements for Commercial Fishing Industry Vessels;
> - U.S. Coast Guard 17th District Ready for Sea Checklist; and
> - AMSEA Commercial Fishing Vessel Emergency Instruction & Drill Manual.

Recommendation 3: As previously noted in the DESTINATION Report of Investigation (ROI), recommend that the Commandant of the Coast Guard amend 46 CFR 28.550 - Icing, to clarify that the vessel's stability instructions to the master should indicate that when freezing spray forecasts or conditions exist, the vessel may experience icing conditions that dangerously compromise the vessel's stability and that captains shall consider delaying departure from port, or if already underway, seek protected waters or take immediate action to reduce or mitigate ice accumulations.

> **Action:** I do not concur with this recommendation. As stated in 46 CFR 28.530(a), the intent of stability instructions is to provide vessel operators enough information to

maintain the stability of their vessel. They should also take into account the conditions a vessel may be reasonably expected to encounter. The existing requirements in 46 CFR 28.550 provide guidance on the calculation of stability using standardized ice parameters for typical operational locations, not recommendations on risk assessment or safe vessel operation.

Prior to and since this incident, the Coast Guard has worked to address fishing vessel stability through the publication of safety bulletins and training guidelines. While none of these resources address the recommendation to consider delaying a departure from port, they do address seeking protection and removal of ice accumulation from vessels. Marine Safety Information Bulletin (MSIB) 01-21, *Improving Fishing Vessel Stability*, does recommend using all available meteorological resources to anticipate the potential for freezing spray. The guidance also stresses prudent seamanship and that it is the vessel master's responsibility to maintain satisfactory stability at all times.

Recommendation 4: Recommend that the Commandant of the Coast Guard, specifically, the Office of Commercial Vessel Compliance (CG-CVC), collaborate with marine training institutions like the North Pacific Fishing Vessel Owners Association (NPFVOA) and AMSEA seeking to amend their curriculums as appropriate for operating areas with icing conditions. The effort should increase the focus on the dangers of icing and other potential sources for loss of stability and provide for recommended best practices to reduce icing or causes of loss of stability. This could include protective measures such as dropping gear overboard when in dangerous stability condition, not getting underway in the face of severe weather, or seeking shelter if already underway.

Action: I concur with this recommendation. In 2019, the U.S. Coast Guard partnered with the NFPVOA and the AMSEA in the program review and concurrence of their fishing vessel stability curriculum outlines. NFPVOA and AMSEA course curriculums focus on a variety of stability related content, which includes icing loads and conditions. Icing curriculum includes topics such as actions to minimize icing and icing loads, ice removal, trip planning; icing condition considerations, intact stability, and determining the vessel's center of gravity.

The Coast Guard National Maritime Center (NMC) subsequently accepted the curriculums, and the approved courses are listed on their public website at https://www.dco.uscg.mil/portals/9/NMC/pdfs/courses/courses.pdf?ve.

Recommendation 5: Recommend that the Commandant of the Coast Guard, specifically the MSC, create a mechanism to track quality related issues pertaining to stability work involving professional engineers/naval architects. Develop a formal mechanism to provide feedback to regulatory bodies overseeing naval architects and professional engineers after identifying deficiencies in the quality of work that affect vessel safety.

Action: I partially concur with this recommendation. The Coast Guard Marine Safety Center (MSC) reviews commercial vessel plans and calculations, including stability calculations. Any deficiencies identified during a review are documented, and the deficient material is returned to the submitter for revision and resubmission before approval. The MSC tracks the number of identified discrepancies found in submitted plans. Under Navigation and Vessel Inspection Circular 10-92, Change 2 (NVIC 10-92) qualifying submissions to the MSC, prepared by registered professional engineers (PEs), receive expedited review. The MSC tracks which plans and calculations are submitted under NVIC 10-92. The Coast Guard does not require a submitter to hold a PE's license to complete and submit a commercial vessel design for engineering plan review because expedited review under NVIC 10-92 is a voluntary program. PE's licensing, administration, and oversight is regulated by the state in which the license is issued.

The current expedited review process in practice identifies quality related issues and provides a mechanism to address these issues with PEs. MSC staff and their supervisors are familiar with the quality of information submitted by PEs and use this knowledge when determining the scope of review to be performed on individual submissions. The MSC informs PEs when significant or repeated errors or omissions are discovered during plan review. If further errors are detected, the MSC notifies the submitter that their NVIC 10-92 status has been revoked, and that any future submissions will be scrutinized during normal plan review. The MSC will not reinstate the NVIC 10-92 priority status until satisfied that the professional engineer has demonstrated a history of satisfactory submittals and understanding of the authorities and limitations of NVIC 10-92. Thus, the current expedited review process provides a sufficient level of quality control, oversight, and communication between MSC and PEs.

Moreover, the Coast Guard is not permitted to disclose sensitive information without proper authorization under Department of Homeland Security (DHS) policy. Currently, the Coast Guard does not have authority under statute or regulation to authorize a disclosure to an individual's state engineer licensing board. Even with authorization, the Coast Guard disagrees that reporting deficiencies made by PEs should be adopted as an agency policy. Doing so would discriminate against licensed engineers and would encourage submissions made by unlicensed engineers, which could erode trust and open communication between the MSC and PEs. Additionally, domestic and international vessel design and engineering regulations, standards, and policies are often complicated, requiring a certain level of expertise to interpret. Although mistakes occasionally occur in plan drafting, they are rectified as a normal part of the vessel design and approval process due to the open communications between the MSC and design engineers.

Recommendation 6: Recommend that the Commandant of the Coast Guard, specifically CG-5P and other applicable offices, determine the real-life icing effects on commercial fishing vessels, specifically the asymmetrical nature of accumulation on the vessel and pots, and amend 46 CFR 28.550 to improve the margin of safety for vessels operating in such harsh environments. The Coast Guard Research and Development Center (RDC) Ice Accretion on Crab Pots Rapid Evaluation & Analysis of Critical Technologies (REACT) report is a baseline study and can serve as a starting point for this effort to build more effective regulatory icing standards.

Action: I partially concur with this recommendation. The Coast Guard will analyze the results of the REACT Ice Accretion on Crab Pots report and a follow-up icing study conducted by the U.S. Coast Guard Academy in order to determine whether additional studies or revisions to regulations related to vessel icing, or any other alternative actions, are warranted.

Recommendation 7: Recommend that the Commandant of the Coast Guard develop regulations that require commercial fishing captains of documented vessels operating beyond the boundary line attend and complete an accepted stability training course. Doing this would align the regulations with the 2010 CGAA which added a subsection in 46 USC §4502 that required an individual in charge of a commercial fishing vessel that operates three nautical miles beyond the territorial sea baseline to pass a training program and hold a certificate issued under that program.

> **Action:** I concur with this recommendation. In 2016 the Coast Guard stated, in Federal Register / Vol. 81, No. 119, that training would be the subject of future regulatory action. While it has not yet moved forward with this regulatory action, course outlines were developed by the Commercial Fishing Vessel Safety Advisory Committee and Coast Guard processes were established to evaluate and approve courses to meet the added requirements in Title 46 United States Code (USC) §4502. Specifically, 46 USC 4502(g)(2) mandates that an individual in charge of a commercial fishing vessel who operates three nautical miles beyond the territorial sea baseline pass a training program and hold a certificate issued under that program.
>
> Although the regulatory project remains a pending Coast Guard priority, development of the courses to fulfill the eventually training requirements have been developed and are currently available on a voluntary basis. In 2019, the U.S. Coast Guard Office of Commercial Vessel Compliance – Fishing Vessel Safety Division (CG-CVC-3) partnered with the NFPVOA and the AMSEA in the Program review and concurrence of their fishing vessel stability, firefighting, and damage control curriculum outlines. The Coast Guard NMC subsequently accepted the curriculums, and the approved courses are listed on their public website at: https://www.dco.uscg.mil/portals/9/NMC/pdfs/courses/courses.pdf?ve.

Recommendation 8: Similar to the recommendation made in the DESTINATION ROI, recommend that the Commandant of the Coast Guard amend 46 CFR Part 28 to require CFV owners and captains implement vessel policies to address crew rest, work hours and fatigue. Implementing regulations to require fishing vessels to implement vessel policies reflecting the basic principles of the Coast Guard's Crew Endurance Management System (CEMS) or similar practices that can be used to identify and control crew fatigue risk factors.

> **Action:** I partially concur with this recommendation. CEMS or similar practices are highly encouraged, although adoption of these concepts is optional. CG-CVC's Voluntary Safety Initiatives and Good Marine Practices for Commercial Fishing Industry Vessels includes recommendations on combatting fatigue. The Coast Guard will promote adoption of CEMS or similar practices by CFV owner and operators through Coast Guard District outreach initiatives. CEMS has been embraced and is successfully used on a voluntary basis within the towing industry. If adopted as intended, CEMS or similar practices could enhance the safety of the fishing industry.

Recommendation 9: Recommend that the Commandant of the Coast Guard, specifically, CG-CVC and CG-ENG, promptly produce and disseminate a Marine Safety Information Bulletin or Safety Alert discussing a best marine practice to ensure a means of access to all parts of a fishing vessel, such as an alleyway through the pot stack or along one side of the stack, while the vessel is underway/operational in inclement conditions. In doing so, fishermen will have a safer way to maintain a clearer picture of the materiel and stability condition of their vessel in icing conditions and can take steps to mitigate negative forces before the loss of stability becomes catastrophic. The Coast Guard should collaborate with marine training institutions like the NPFVOA and AMSEA in ensuring widest distribution of this message to the commercial fishing industry.

Action: I concur with the intent of this recommendation. Marine Safety Information Bulletin (MSIB) 01-21 and Marine Safety Alert (MSA) 11-17 have been published to encourage best marine practices and situational awareness to fishing vessel operators and crews, in regard to safe loading conditions to include deck gear placement and load concerns, stability instructions familiarity, addressing icing conditions and mitigation measures, being aware of assumptions and conditions, being cognizant of vessel capabilities, and setting operational expectations to ensure crews incorporate safety procedures.

As discussed in the response to Recommendation 4, the Coast Guard has partnered with NFPVOA and AMSEA to develop voluntary course curriculums that address the best practice of ensuring all parts of the fishing vessel are readily accessible to the crew, especially when anticipating or encountering inclement weather.

A brochure summarizing key MBI findings and lessons learned will be distributed by the Coast Guard following the public release of the ROI and this Final Action Memorandum. The brochure will cover operational safety information for commercial crabbing vessels including the importance of maintaining an access alley within the stacked crab pots on deck. Once finalized, it will be publicly available on the Coast Guard's Marine Casualty website: https://www.dco.uscg.mil/Our-Organization/Assistant-Commandant-for-Prevention-Policy-CG-5P/Inspections-Compliance-CG-5PC-/Office-of-Investigations-Casualty-Analysis/Marine-Casualty-Reports/ and also provided to NFPVOA and AMSEA for potential incorporation into voluntary course curriculums.

Recommendation 10: Recommend that the Commandant of the Coast Guard promote the use of a properly installed and configured Digital Selective Calling feature on marine VHF radios throughout the maritime regions of the U.S. aboard all vessels, as this will enhance the saving of life and property and the potential timeliness of rescue in marine emergencies. This safety initiative to promote the widespread use of VHF marine radios DSC features should be added to the scope of duties, checklists, and job aids used by Coast Guard personnel and Coast Guard Auxiliarists conducting marine safety related outreach to the marine community, including the recreational boating community.

Action: I concur with this recommendation. The Coast Guard agrees that there is value in promoting the use of a properly installed and configured Digital Selective Calling feature on marine VHF radios throughout the maritime regions of the U.S. aboard all vessels. The Coast Guard will further evaluate this safety recommendation and coordinate a viable course of action with appropriate resources.

Recommendation 11: Recommend that the Commandant of the Coast Guard, specifically CG-CVC in partnership with NCFSAC (National-Commercial Fishing Safety Advisory Committee), promote and encourage CFV owners and captains to attend training classes in safety and navigation related subjects such as those offered by various training institutions such as the NPFVOA and AMSEA.

Action: I concur with this recommendation. The Coast Guard remains committed to continuing the partnership with NCFSAC in order to promote and encourage Commercial Fishing Vessel crews to attend safety training classes.

The NCFSAC supported the training task-recommendation that shaped the content of the AMSEA and the NPFVOA commercial fishing vessel courses. In 2019, CG-CVC-3 partnered with the NFPVOA and AMSEA to complete the review and gain concurrence of their fishing vessel stability curriculum outlines. Course curriculum subjects include safety training on the following topics: navigation, drills, firefighting, lifesaving, crewmember survivability, damage control, and crew response/decision making.

The Coast Guard NMC subsequently accepted the curriculums, and the approved courses are listed on their public website at the following website: https://www.dco.uscg.mil/portals/9/NMC/pdfs/courses/courses.pdf?ve.

Recommendation 12: Recommend that the Commandant of the Coast Guard, specifically CG-761, examine and close the automatic identification system (AIS) and Rescue 21 (R21) coverage gaps that exist in Alaska to ensure the effectiveness of Coast Guard operations as well as meet national security requirements. As efforts to reduce coverage gaps in D17 partially rely on the work of industry partners, it is strongly recommended that Coast Guard initiatives include collaboration with existing industry partners and utilization of already available communications technology, such as the AIS/DSC capabilities of the Marine Exchange of Alaska.

Action: I concur with this recommendation. The Coast Guard is developing new operational requirements through the DHS Joint Requirements Integration and Management System (JRIMS) process for both follow-on R21 and AIS marine communications systems. These efforts will include an analysis of coverage gaps for both marine VHF (R21) and AIS capabilities in the Alaskan region. Additionally, the Coast Guard is sponsoring a distress alerting gap analysis with the DHS Science &Technology (S&T) Directorate, which will demonstrate and recommend viable approaches to use commercially available space-based solutions to augment the R21 system. The Coast Guard will continue to collaborate with the Marine Exchange of Alaska and other industry partners to utilize existing and planned marine VHF and AIS solutions to close the coverage gaps throughout the Alaskan region.

Recommendation 13: Recommend that the Commandant of the Coast Guard, specifically the Coast Guard Office of Search and Rescue (CG-SAR) and Pacific Area (PACAREA) reexamine SAR readiness and mission response standards to improve chances of recovery. While an abbreviated SAR case study has been conducted by the Coast Guard for this accident, the unique demands and challenges posed by this accident and similar accidents in remote Alaskan waters require that a full scope SAR case study with recommendations for improving Coast Guard rescue operations.

Action: I concur with the intent of this recommendation. The Seventeenth Coast Guard District conducted an exhaustive SAR Case Review of the Coast Guard's response to the sinking of the SCANDIES ROSE, which was reviewed and endorsed by PACAREA. Although named a Case Review, versus a Case Study, it was conducted in the format and with the thoroughness commensurate with a full scope Case Study. This Case Review identified resource gaps that would provide an improved level of readiness and response for SAR operations in Alaska. Furthermore, the ongoing Vice Commandant-directed SAR System Evaluation and Future Coastal/Shore Risk Assessment and Asset Laydown study is currently examining SAR readiness and mission response. An outcome of this study will be a proposed evaluation and reporting framework to assess the Coast Guard SAR System, which will inform potential adjustments to enterprise response standards. Finally, there have been several other studies to examine resource gaps and SAR responses. Two such examples of these studies include the Search and Rescue Summer Study Final Report dated December 5, 2019, and the Arctic Search and Rescue, Report to Congress of March 13, 2017. These studies, various other studies, and investigations have provided actionable recommendations that may improve SAR mission effectiveness.

Recommendation 14: Recommend that the Commandant of the Coast Guard continue outreach efforts to improve dissemination of the message to the maritime community to address the misalignment between state and federal drug laws. It is critical to reinforce the message that the use of dangerous drugs, positive drug tests, or actual impairment may lead to enforcement actions at the state or federal level up to including criminal prosecution.

Action: I concur with the intent of this recommendation. While the MBI noted in the ROI their concerns of the use of dangerous drugs as a "Finding of Concern", it will be more appropriate to publish as a Marine Safety Information Bulletin (MSIB). In 2014, Marine Safety Information Bulletin 02-14 was published to address recreational and medicinal marijuana use policies for Maritime Transportation Workers. Another MSIB will be published to highlight the additional concerns as identified by the MBI specific to the Commercial Fishing Vessel industry and published to the following website: https://www.dco.uscg.mil/Featured-Content/Mariners/Marine-Safety-Information-Bulletins-MSIB/.

Recommendation 15: Recommend that the Commandant of the Coast Guard, specifically the Assistant Commandant for Prevention Policy (CG-5P) elicit expertise from marketing and advertising professionals to better disseminate important safety information, such as "A Best Practice Guide to Vessel Stability, Second Edition" which is available on the CG-CVC-3 website. In addition, this knowledge should be implemented to other aspects of the CFVS Program to meet mandates of the Commercial Fishing Vessel Safety National Communications Plan.

Action: I concur with this recommendation. CG-5P and CG-CVC-3 will work with the Coast Guard Office of Governmental & Public Affairs (CG-0922) to explore additional outreach measures to expand the Coast Guard's communications and dissemination of existing safety information with the commercial fishing vessel industry. CG-0922 will post the SCANDIES ROSE investigation on the Coast Guard Maritime Commons website along with links to important CFV safety information.

Recommendation 16: Recommend that the Commandant of the Coast Guard, including but not limited to CG-5P and CG-SAR, partner with marine industry to promote the wearing and use of PLBs. Conduct education and outreach to promote availability and benefits that increase chances of survival and rescue. Such outreach efforts can include developing safety alerts, establishing Coast Guard presence at Maritime Expos or events that draw the maritime community, attending industry workshops, or hosting local industry days with CFV owners, operators, and crew.

Action: I concur with this recommendation. The Coast Guard plans to publish an Advanced Notice of Proposed Rule Making (ANPRM) in order to obtain input from a broad and diverse group of mariners, equipment manufacturers, and vessel operators due to the wide range of commercial vessels in different services and on varied routes that could be impacted by a PLB requirement. The Coast Guard is also aware that emerging technologies now offer multiple distress alerting options for individuals. In the interim, the Coast Guard will continue to encourage voluntary carriage of PLBs or similar locating devices during industry engagements and outreach events with recreational boaters.

Recommendation 17: Recommend that the Commandant of the Coast Guard, specifically CG-CVC, conduct effective and widespread outreach to educate mariners on abandon ship procedures to ensure proper deployment and device activation of the EPIRB allowing it to transmit the distress alert signal which would result in the receipt of the distress signal by rescue forces.

Action: I concur with this recommendation. The Coast Guard agrees that outreach to educate mariners on proper deployment and device activation of the EPIRB in emergency situations will have value to the maritime industry. CG-CVC-3 will evaluate and pursue appropriate outreach measures.

Recommendation 18: Recommend that the Commandant of the Coast Guard direct Coast Guard investment in modernizing the VHF land-based assets in D17 to meet Sea Area A1 requirements with special attention to design parameters enabling that communications equipment to handle the extremes of the Alaskan environment. Additionally, the Coast Guard must ensure that the HF radio program remains in place and operational in the D17 AOR to support an effective SAR program.

Action: I concur with this recommendation. The Coast Guard prioritized available funding and resources to support R21 modernization efforts in Alaska to meet Sea Area A1 requirements[1] where coverage exists. These efforts include the recapitalization of

[1] The Coast Guard defines Sea Area A1 as those areas where more than ninety percent of the area within 20 nautical miles seaward of the territorial baseline along the East, West and Gulf Coasts of the United States, excluding Alaska, and including Hawaii, Puerto Rico, Guam, the Virgin Islands of the United States and the Northern Mariana Islands of Saipan, Tinian and Rota, is within coverage of Coast Guard very high frequency, or VHF Coast Stations that provide both a continuous watch for Digital Selective Calling, or DSC, distress alerts on Channel 70 and a capability to respond to distress alerts.

power generators, microwave data links, radios, and network infrastructure. Due to the challenges created by the vast area and unique terrain characteristics of Alaska, the Coast Guard has not declared Sea Area A1 in Alaska. The Coast Guard is developing new operational requirements for the follow on R21 system, which will consider an expansion of R21 coverage in Alaska. Additionally, the Coast Guard is investing in modernizing HF communications equipment as the Coast Guard intends to retain HF distress monitoring services in Alaska.

Recommendation 19: Recommend that the Commandant of the Coast Guard work with IMO and the life raft manufacturing industry to examine and consider the improvement of lighting on life rafts and other survival equipment. This would include the use of the newest available lighting technology (i.e., LED lighting, laser flares, and beacons) to increase the range of detection, illumination, reliability of lamps leading to an increased amount of interior/exterior lighting and increasing the probability of survivability and rescue.

Action: I concur with this recommendation. The Coast Guard is committed to providing boaters and mariners the best available technology to alert others to a distress condition, and to indicate both broad and precise locations to rescuers. The Coast Guard has chartered the Distress Signals Policy Council (DiSPoCo) to ensure that the requirements for approval and carriage of such items are aligned with the current SAR capabilities. The Coast Guard has added this recommendation as a priority initiative for the DiSPoCo to address.

Recommendation 20: Recommend that the Commandant of the Coast Guard accept and implement the recommendations contained in the SCANDIES ROSE SAR Case Review.

Action: I partially concur with this recommendation. CG-SAR evaluated the SCANDIES ROSE Case Review and promulgated a FAM. There were two recommendations which were forwarded to the Office of Aviation Forces (CG-711) that recommended increasing MH-60s and staffing at Air Station Kodiak.

I concur with the recommendation to provide additional MH-60s to Air Station Kodiak. As a result, the Air Station Kodiak MH-65 helicopter frames are scheduled to be replaced in 2025 with the MH-60T helicopter frame.

I do not concur with the recommendation for increasing the staffing levels at Air Station Kodiak. Although adding personnel to Kodiak's Personnel Allowance List may appear to increase the Bravo 0 posture of the unit, readiness posture is predicated on the number of aircraft assigned, not the number of personnel. Allocating additional MH-60Ts to Air Station Kodiak will enable the operational commander greater flexibility to meet readiness throughout the unit's area of responsibility.

Recommendation 21: Recommend that the Commandant of the Coast Guard, specifically CG-5PC, release a Safety Alert regarding the value gained in properly configuring a marine VHF radio to enable the use of a DSC alert and provide users with the necessary steps configure the DSC function.

Action: I concur with this recommendation. On March 2, 2023, Marine Safety Alert 03-23: ENSURING PROPER CONFIGURATION OF DIGITAL SELECTIVE CALLING (DSC)-EQUIPPED RADIOS was published and it is available at the following website: https://www.dco.uscg.mil/Our-Organization/Assistant-Commandant-for-Prevention-Policy-CG-5P/Inspections-Compliance-CG-5PC-/Office-of-Investigations-Casualty-Analysis/Safety-Alerts/.

Recommendation 22: Recommend that the Commandant of the Coast Guard direct the appropriate Headquarters office(s) to implement the provisions of the 2010 CGAA and 2012 CGMTA relating to commercial fishing vessels.

Action: I concur with this recommendation. The rulemaking project to implement select mandatory provisions of the 2010 – 2012 legislation is active. USCG-2012-0025 RIN 1625-AB85 (2016) "Commercial Fishing Vessels - implementation of 2010 and 2012 Legislation" is included on the Coast Guard's Unified Agenda, which lists the current and projected Coast Guard rulemakings. The background and current status of USCG-2012-0025 RIN 1625-AB85 can be found at the following site: https://www.reginfo.gov/public/do/eAgendaViewRule?pubId=201810&RIN=1625-AB85.

Recommendation 23: It is recommended that the Commandant of the Coast Guard, specifically CG-CVC working with the SCANDIES ROSE Marine Board, develop a user-friendly abbreviated version of this report containing key findings of this report and containing relevant information from the DESTINATION ROI and the RDC's Ice Accretion on Crab Pot Report in text and image form content, where appropriate. This printed and digital guide would be developed for the purpose of widespread distribution to the appropriate segment of the commercial fishing industry (cold water operating environments).

Action: I concur with this recommendation. CG-CVC and CG-INV will work collaboratively to develop the recommended printed and digital guide. Once finalized, the guide will be distributed to the commercial fishing industry and incorporated into fishing vessel exams in cold water operating environments.

Administrative Recommendation 1: In absence of applicable regulations, recommend that the commercial fishing industry voluntarily adopt requirements outlined in 46 CFR Part 57 for the use of certified marine welders when conducting work on steel hull commercial fishing vessels. Use of procedures outlined in the Coast Guard's NVIC 7-68 (Guidelines for steel vessel hull repair) and American Welding Society (AWS) Standards for Welders are accepted best practices to determine that quality repairs have been completed.

Action: I concur with the intent of this recommendation. The Coast Guard will provide this recommendation and the ROI to NCFSAC for their consideration and potential engagement with the commercial fishing vessel industry.

Administrative Recommendation 2: Recommend the National Weather Service make forecasting as well as existing models on freezing spray and icing more operationally available and easily accessible to the maritime community. It is critical that the NWS enhance their weather products to incorporate applications such as the experimental freezing spray forecast and create easily accessible, user-friendly interfaces to improve vessel safety.

> **Action:** I concur with the intent of this recommendation. The Coast Guard will provide this recommendation and the ROI to the National Weather Service for their consideration and potential action.

Administrative Recommendation 3: Recommend the National Weather Service incorporate the data provided by the AIS based weather sensors, maintained by Marine Exchange of Alaska, into the forecasting models for the Alaska region.

> **Action:** I concur with the intent of this recommendation. The Coast Guard will provide this recommendation and the ROI to the National Weather Service for their consideration and potential action.

Administrative Recommendation 4: Recommend the National Weather Service explore and investigate a means to update the weather message content in all appropriate National Weather Service products to provide an explanation of statements such as "Freezing Spray" and "Heavy Freezing Spray" conditions, providing information that is found in the National Weather Service Glossary, on the potential rate of ice accumulation from freezing spray in inches per hour for each classification of freezing spray. Providing this information facilitates mariners' ability to appropriately manage the risk from freezing spray along their intended route.

> **Action:** I concur with the intent of this recommendation. The Coast Guard will provide this recommendation and the ROI to the National Weather Service for their consideration and potential action.

Administrative Recommendation 5: Recommend that the National Oceanic and Atmospheric Administration (NOAA) and the Marine Exchange of Alaska, in conjunction with any other applicable governmental or non-governmental organizations/stakeholders, enhance partnerships to establish a more extensive network of reliable weather stations in coastal regions to gather more accurate weather information for the transportation industry in the remote regions of Alaska.

> **Action:** I concur with the intent of this recommendation. The Coast Guard will provide this recommendation and the ROI to NOAA and the Marine Exchange of Alaska for their consideration and potential action.

Administrative Recommendation 6: Recommend the Federal Communications Commission (FCC) examine and amend existing regulations where required and revise FCC Public Notice DA 16-63. This change should require any commercial vessel be equipped with a VHF marine radio that has a properly configured DSC feature with an interconnected GPS, MMSI programmed, and ready for immediate use including within the State of Alaska (which is presently excluded) and adjacent waters. The Marine Exchange of Alaska has installed DSC receivers on its AIS towers since the accident and is continuing to expand that network. These additional DSC receivers would enable receipt of DSC distress alerts and potentially facilitate a reduction in the time it takes for Coast Guard and other rescue forces to reach vessels distress.

Action: I concur with the intent of this recommendation. The Coast Guard will provide this recommendation and the ROI to the FCC for their consideration and potential action.

Administrative Recommendation 7: Recommend that the State of Alaska implement a new measure in the Alaska Administrative Code, where appropriate, to close the safety gap where crabbers participating in the Bering Sea/Aleutian Islands Individual Fishing Quota (IFQ) Crab Fisheries Management Plan are required to report to the Coast Guard prior to departing port and vessels with similar gear are not required to report. In Section 5 AAC 39.670 - (7) an operator of a vessel participating in an IFQ, Community Development Quota (CDQ), or Adak community allocation crab fishery in the Bering Sea/Aleutian Islands area must notify the United States Coast Guard at least 24 hours before departing port when carrying crab pot gear; whereas the same vessel when fishing with modified crab pots of the same size for groundfish and, facing the same vessel stability risks, are not required to make these safety related reports prior to departure.

Action: I concur with the intent of this recommendation. The Coast Guard will provide this recommendation and ROI to the Alaska Department of Fish and Game for their consideration and potential action.

Administrative Recommendation 8: Recommend that the Washington State Board of Registration for Professional Engineers and Land Surveyors be provided with a copy of this ROI and examine it for information relating to the quality and accuracy of the stability work performed by the P.E./Naval Architect who conducted the stability testing and provided the stability instructions for the SCANDIES ROSE in 1988 and 2019 and continues to conduct stability work on vessels throughout the West Coast.

Action: I concur with the intent of this recommendation. The Coast Guard will share this investigation report with the Washington State Board of Registration for Professional Engineers and Land Surveyors for their consideration and potential action.

Administrative Recommendation 9: Recommend that the Commandant of the Coast Guard provide widest dissemination of this report throughout the CFV industry to include:

- Coast Guard District Fishing Vessel Coordinators
- To training institutions (AMSEA, NPFVOA, and others) for use as a case study. The purpose is to reach the intended audience of commercial fishing vessel crews, owners, and operators of and communicate the importance of taking timely and effective action at the first sign of emergency, to take action and maximize the chances of survivability for vessel and crew.
- Major fishing vessel associations in the Pacific Northwest and Alaska.
- In this case, it is critical that Commandant reach out to the WA State regulating body for naval architects and Professional Engineers.

Action: I concur with this recommendation. In addition to the distributions listed in the recommendation, the Coast Guard will publish this ROI and FAM for the public on the following website: https://www.dco.uscg.mil/Our-Organization/ /Assistant-Commandant-for-Prevention-Policy-CG-5P/Inspections-Compliance-CG-5PC-/ Office-of-

Investigations-Casualty-Analysis/Marine-Casualty-Reports/. The results of the investigation and the ROI will also be announced and made available in a blogpost on the Coast Guard's Maritime Commons website: https://www.news.uscg.mil/maritime-commons/.

Administrative Recommendation 10: It is recommended that the participating crews of Air Station Kodiak and the Coast Guard Cutter MELLON be commended for their search and rescue efforts after the loss of the SCANDIES ROSE.

Action: I concur with this recommendation. This recommendation and the ROI will be provided to Coast Guard Pacific Area for their consideration and potential action.

[redacted]

P. W. GAUTIER
Vice Admiral, U.S. Coast Guard
Deputy Commandant for Operations

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MEMORANDUM

[redacted]

From: D. B. Abel, VADM
CG-DCO

To: G. A. Callaghan, CDR

Subj: MARINE BOARD OF INVESTIGATION CONCERNING THE SINKING OF THE COMMERICAL FISHING VESSEL (CFV) SCANDIES ROSE (O.N. 602351) APPROXIMATELY 170-NM SOUTHWEST OF KODIAK, ALASKA, WITH MULTIPLE LOSS OF LIFE

1. Pursuant to the authority contained in Title 46, United States Code (U.S.C.), Section 6301 and the regulations promulgated thereunder, you are to convene a Formal Marine Board of Investigation consisting of the following membership. The Board will convene as soon as practicable to inquire into all aspects of the subject casualty at such times and places as directed by you.

- CDR Gregory Callaghan, USCG, Chairman
- LT [redacted] USCG, Legal Counsel
- Mr. [redacted] USCG, Member
- LT [redacted] USCG, Recorder

2. The Board will thoroughly investigate the sinking and loss of life of the CFV SCANDIES ROSE (O.N. 602351) in accordance with all applicable statutory and regulatory mandates. Upon completion of the investigation, the Board will issue a report to the Commandant with the evidence collected, the facts established, and its conclusions and recommendations. Conclusions or recommendations concerning commendatory actions or misconduct which would warrant further inquiry shall be referred by separate correspondence to the cognizant District Commander for consideration and action as appropriate. A daily summary of significant events shall be transmitted to Commandant (CG-INV) while the Board is in formal session.

3. Complete and submit your investigative report to Commandant (CG-INV) within 12 months of the convening date. If this deadline cannot be met, a written explanation for the delay and the expected completion date shall be submitted. You are highly encouraged to submit any interim recommendations intended to prevent similar casualties, if appropriate, at any point during your investigation.

4. The National Transportation Safety Board (NTSB) is also charged with the responsibility of determining the cause or probable cause of this casualty by the Independent Safety Board Act of 1974 (49 U.S.C. 1901, et. seq.) and it may designate a representative to participate in any formal

MBI sessions. The NTSB representative may make recommendations regarding the scope of the inquiry, may identify and examine witnesses, and/or submit or request additional evidence.

5. The Commandant (CG-INV) will furnish such funding, technical experts and/or technical assistance as may be required by the Board when deemed appropriate and within the requirements for the scope of this investigation. Commander, Seventeenth Coast Guard District and Commander, Thirteenth Coast Guard District will also provide such administrative, logistical, and/or legal support as may be required.

#

Copy: CG- LMI
PACAREA(5)
CCGD17(dp)
CCGD13(dp)
Sector Anchorage

U.S. Department of
Homeland Security

United States
Coast Guard

Commander
United States Coast Guard
Eleventh District

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16372
24 July 2020

MEMORANDUM

[redacted]

From: G. A. Callaghan, CDR

To: CG-DCO
Thru: CG-INV

Subj: MARINE BOARD OF INVESTIGATION CONCERNING THE SINKING OF THE COMMERCIAL FISHING VESSEL (CFV) SCANDIES ROSE (O.N. 602351) APPROXIMATELY 170-NM SOUTHWEST OF KODIAK, ALASKA, WITH MULTIPLE LOSS OF LIFE

Ref: (a) SCANDIES ROSE MBI Convening Order Memo signed by DCO on 16 Jan 2020

1. In accordance with reference (a), this is formal notification that the scheduled public hearing for the SCANDIES ROSE Marine Board of Investigation (MBI) and other investigative proceeding relative to the case have been delayed. The hearing was originally scheduled to take place from 08-18 September 2020 in Seattle, WA. With the current Federal and State restrictions that have been put in place to help prevent the spread of COVID-19 and to preserve the safety and health of the MBI team and the public, I made the decision to postpone the hearing. The gathering restrictions imposed by federal agencies and States have significantly complicated coordination of a public hearing, inhibited the execution of a hearing truly open to the public, and disallowed Next of Kin to be present. Furthermore, National Transportation Safety Board (NTSB) representatives indicated that they would not be able to physically attend a public hearing should it take place in September 2020. The Next of Kin, Parties in Interest representatives, and NTSB representatives have been notified of my decision.

2. I have directed my team to develop and present alternative plans to carry out a hearing that may include virtual only, a hybrid of virtual and in-person, and an in-person hearing. Taking into account the fishing seasons, to maximize witness availability, and the necessary logistics to plan and coordinate for an in-person hearing, the earliest opportunity will be late February into march of 2021.

3. As a result of the shifts in the timeline to conduct a public hearing, I request the Report of Investigation (ROI) submission deadline be extended to 1 October 2021.

4. In addition, an original member of the investigation team named in reference (a) recently stepped down for reasons unrelated to this investigation. Thus, the SCANDIES ROSE MBI team composition has been modified. The team is now comprised of the following members in the following roles:

- CDR Gregory Callaghan, USCG, Chairman
- CDR Karen Denny, USCG, Member
- LCDR [redacted] USCG, Member
- LT [redacted] USCG, Legal Counsel
- LT [redacted] USCG, Recorder

5. My team will continue to work with Commandant (CG-INV) on funding and/or technical assistance as may be required in coordinating a February 2021 public hearing.

#

Copy: CG-LMI
PACAREA(5)
CCGD17 (dp)
CCGD13 (dp)
CGD ELEVEN (d)
Sector Anchorage

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United States Coast Guard

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16372
27 Dec 2021

MEMORANDUM

From: Gregory A. Callaghan, CAPT

To: CG-DCO

Subj: EXTENSION OF FINAL SUBMISSION DATE OF REPORT OF INVESTIGATION CONCERNING THE SINKING OF THE COMMERCIAL FISHING VESSEL (CFV) SCANDIES ROSE (O.N. 602351)

Ref: (a) SCANDIES ROSE MBI Convening Order Memo signed by DCO on 16 Jan 2020
(b) SCANDIES ROSE Delay Memo to DCO dtd 24 July 2021
(c) CG-545 Policy Letter 5-10

1. The SCANDIES ROSE Marine Board of Investigation (MBI) was officially assigned through reference (a) and the Marine Board's composition was amended in reference (b). When CG-INV positively endorsed reference (b), the deadline for the Report of Investigation (ROI) submission was amended to October 1, 2021.

2. Section 5 of reference (c) states that certain marine casualty investigations with complex elements may have valid reasons for exceeding the time requirements. Valid reasons for exceeding the limitations of the time table include waiting on a test or report from an entity external to the investigating unit. In this case, the Marine Board engaged the Coast Guard Research and Development Center (RDC) to conduct a formal ice accretion study. This study, consisting of a series of controlled experiments, was executed over the course of several months in the summer of 2021. However, unforeseen and unpreventable delays at the research facility resulted in a delay in the final delivery of the RDC's Ice Accretion on Crab Pot REACT report.

3. In anticipation of this delay, the Marine Board sought and was granted an extension to the October 1, 2021 deadline to submit the SCANDIES ROSE ROI. The amended final submission date of ROI is December 31, 2021.

#

Copy: CG-5P
CG-INV
CG-LMI
PACAREA(5)
CGD SEVENTEEN (dp)
CGD THIRTEEN (dp)

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Hyperlinks

Throughout this report there will be various references to supporting documents or material related to this investigation in the form of hyperlinks. The hyperlinks are included in Enclosure (2).

The investigation transcripts are also available by using the hyperlinks listed in the Enclosure.

List of Acronyms

ABS	American Bureau of Shipping
ACL	Annual Catch Limit
ACSA	Alternate Compliance Safety Agreement
ADF&G	Alaska Department of Fish and Game
AGL	Above Ground Level
AIS	Automatic Identification System
AK	Alaska
AKST	Alaska Standard Time
ALCP	Alternate Loadline Compliance Program
ALPAT	Alaska Patrol
AMSEA	Alaska Marine Safety Education Association
AOR	Area of Responsibility
ASCP	Alternate Safety Compliance Program
ASTM	American Society for Testing and Material
AWS	American Welding Society
BSAI	Bering Sea/Aleutian Island
CDO	Command Duty Officer
CEMS	Crew Endurance Management System
CFR	Code of Federal Regulations
CFSAC	Commercial Fishing Safety Advisory Committee
CFV	Commercial Fishing Vessel
CG	Coast Guard
CG-60##	CG rotary wing aircraft, with an aircraft identification number used as a call sign
CGAA	Coast Guard Authorization Act
CGC/USCGC	Coast Guard Cutter
CG-CVC	Coast Guard Office of Commercial Vessel Compliance
CG-ENG	Coast Guard Office of Design and Engineering Standards
CG-INV	Coast Guard Office of Investigations and Casualty Analysis
CGMTA	Coast Guard Marine Transportation Act (of 2012)
CG-SAR	Coast Guard Office of Search and Rescue
CO	Commanding Officer
COD	Certificate of Documentation

Coast Guard	Unites States Coast Guard
COG	Course Over Ground
COMDT	Commandant / The office of the Commandant of the Coast Guard
COMDTINST	Commandant Instruction
COMMDET	Communication Detachment
COTP	Captain of the Port
CRREL	Cold Regions Research and Engineering Laboratory
D17	Coast Guard Seventeenth District
DOT	Department of Transportation
DSC	Digital Selective Calling
EPIRB	Emergency Position Indicating Radio Beacon
EO/IR	Electro-optical/Infrared
EOP	Enhanced Oversight Program
F/V	Fishing Vessel
FAST	Fatigue Avoidance Scheduling Tool
FCC	Federal Communications Commission
FOL	Forward Operating Location
FTE	Full Time Equivalent
GMT	Greenwich Mean Time, also called UTC
GPS	Global Positioning System
GT	Gross Tons (Gross Registered Tons)
HC-130	CG fixed wing aircraft
HF	High Frequency
HP	Horsepower
IFQ	Individual Fishing Quota
IMO	International Maritime Organization
ISO	International Organization for Standardization
JBER	Joint Base Elmendorf/Richardson
JRCC	Joint-Rescue Coordination Center
kt(s)	Knot(s)
LKP	Last Known Position
MBI	Marine Board of Investigation
MD	Medical Doctor
MH-##	Coast Guard Helicopter (60 or 65)
MF	Medium Frequency

MHz	Megahertz
MISLE	Marine Information for Safety and Law Enforcement
MMC	Merchant Mariner Credential
MMSI	Maritime Mobile Service Identity
MSC	Coast Guard Marine Safety Center
MSIB	Marine Safety Information Bulletin
NIOSH	National Institute for Occupational Safety & Health
NDT	Non-Destructive Testing
NM	Nautical Mile
NMC	National Maritime Center
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPRM	Notice of Proposed Rulemaking
NPFVOA	North Pacific Fishing Vessel Owners' Association
NH	New Hampshire
NT	Net Tons
NTSB	National Transportation Safety Board
NWS	National Weather Service
O.N.	Official Number
OCMI	Officer in Charge, Marine Inspection
ODO	Operations Duty Officer
OPC	Ocean Prediction Center
OPS	Operations Officer
OU	Operations Unit
PII	Party-in-Interest
PLB	Personal Locator Beacon
PSDA	Probability of Survival Decision Aid
R21 AK	Rescue 21 Alaska
RDC	Research and Development Center
ROI	Report of Investigation
ROV	Remotely Operated Vehicle
SAR	Search and Rescue
SAROPS	Search and Rescue Optimal Planning System
SARSAT	Search and Rescue Satellite-Aided Tracking
SMC	Search and Rescue Mission Coordinator

SMI	Serious Marine Incident
SOG	Speed Over Ground
SOLAS	Safety of Life at Sea
SRR	Search and Rescue Region
SRU	Search and Rescue Unit
STCW	Standards of Training, Certification and Watchkeeping for Seafarers
THC	Tetrahydrocannabinol, Marijuana
UMIB	Urgent Marine Information Broadcast
U.S.	United States
USC	United States Code
USCG or CG	United States Coast Guard
UTC	Coordinated Universal Time
VHF	Very High Frequency
VoIP	Voice over Internet Protocol
WA	Washington

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16732
December 30, 2021

COMMERCIAL FISHING VESSING SCANDIES ROSE (O.N. 602351)
SINKING AND LOSS OF THE VESSEL
WITH FIVE CREWMEMBERS MISSING AND PRESUMED DECEASED
SOUTH OF SUTWIK ISLAND, ALASKA
ON DECEMBER 31, 2019

EXECUTIVE SUMMARY

The loss of the commercial fishing vessel SCANDIES ROSE, along with five crewmembers, follows the sinking and loss of the commercial fishing vessels LADY OF GRACE and her crew in Nantucket Sound, Atlantic Ocean in 2007 and the DESTINATION with all of its crew, which occurred in February 2017, in Alaskan waters. These vessels suffered catastrophic capsizing due to compromise of the vessel's positive stability characteristics after encountering known and dangerous heavy freezing spray leading to an accumulation of ice high on the vessel.

On December 30, 2019, at approximately 8:35 p.m. (AKST), the fishing vessel SCANDIES ROSE and its seven-person crew departed from Kodiak, Alaska, headed to the Bering Sea to engage in commercial fishing operations in the cod and opilio crab fisheries. The vessel was loaded with fuel, approximately 195 combination cod/crab pots, and 15,000 pounds of bait stowed forward. The planned voyage track took the SCANDIES ROSE and her crew along the south side of the Alaska Peninsula, an area known for fierce and intensely frigid winds blowing out of the numerous inlets and coves to the north of the vessel's course line as it transited from the Shelikof Strait toward False Pass and into the Bering Sea. The Captain and crew were aware of weather forecasts from the National Weather Service along their transit, including warnings of heavy freezing spray and gale force winds. The Captain departed on the accident voyage and later failed to seek shelter along the route despite the weather forecast, vessel icing, and reports from other fishing vessel captains who took shelter from the weather.

Between 6 a.m. and 8 a.m. on December 31, 2019, the watch reported the beginning signs of ice accumulation on the interior webbing of the crab pots and on the exterior forward parts of the vessel. The vessel maintained course and an average speed of 6.5 kts in gradually worsening weather along the planned voyage track, with no indications of any attempt to reduce the accumulation of ice by changing course and speed or by manual ice removal. At approximately 7:15 p.m. on December 31, the deckhand, a survivor, woke up the Captain for the Captain's six-hour watch. At the time, the two discussed the worsening weather, the ice accumulation on the vessel and gear, and the reported starboard list of the vessel. The SCANDIES ROSE Captain made a series of cell phone calls to people and vessels and his tone of voice on the cell phone calls gradually began to reflect the worsening situation onboard the SCANDIES ROSE. In one of the final calls to the fishing vessel PACIFIC SOUNDER, the Captain indicated that he was experiencing a 20-degree list to starboard, winds of 60-70 kts from the west, wind temperature of 12° Fahrenheit and communicated that it was too dangerous to send the crew out to break off the accumulated ice. The Captain had decided to head for the protected lee of Sutwik Island located approximately 2.5 nautical miles (NM) to the north of his position.

At 9:45 p.m., the Automatic Identification System (AIS) signal of the SCANDIES ROSE indicated that the vessel had turned approximately 50 degrees to starboard, to a northwesterly heading to head to the shelter of Sutwik Island. In a final conversation with the Captain of the PACIFIC SOUNDER, the Captain indicated that the "list had gotten a lot worse" and the stress in the Captain's voice was evident to the listener. At approximately 9:50 p.m., the Captain of the SCANDIES ROSE called the U.S. Coast Guard via marine radio with a "Mayday" message and stated "we are rolling over." The Captain was able to accurately read out the vessel's geographic position before communication was lost.

Two of the seven-person crew managed to don survival suits, abandon the capsizing vessel, and swim to one of two eight-person liferafts which had deployed automatically. The two survivors were rescued approximately four hours later by a Coast Guard helicopter and suffered mild hypothermia. Coast Guard search activities included multiple MH-60 helicopters, two HC-130 fixed wing aircraft, and a large Coast Guard Cutter. The Coast Guard suspended search operations at 6:08 p.m. on January 1, 2020. The other five crew are missing and presumed deceased.

The Coast Guard MBI determined that the initiating event occurred at 11:30 a.m. on December 31, 2019, when the SCANDIES ROSE maintained course and speed on the voyage track with weather forecasted to continue to deteriorate with heavy freezing spray and gale-force storm warnings. In conversation with the captain of the fishing vessel AMATULI, Captain [redacted] reported the formation of ice on the vessel the morning of the accident day, but did not take actions to reduce icing formation or take early and timely advantage of available safe and protected anchorages along the intended voyage track.

Subsequent events include the vessel's reduction in and eventual loss of stability. This loss of stability was exacerbated as the vessel developed a dangerous list to starboard after the 50-degree turn to starboard towards Sutwik Island. Subsequent events then included a loss of maneuverability, capsizing, flooding, and the vessel's sinking. Additional subsequent events included the loss of five of the vessel's crew and two surviving crewmembers entering the water, before making it to a liferaft with eventual rescue.

The primary causal factors that directly contributed to the casualty include: 1) failure to take timely action to prevent excessive ice accumulation despite forecasted and anticipated heavy freezing spray conditions, 2) the vessel's unsafe stability conditions due to the inaccurate stability instructions provided by the Naval Architect who performed the stability assessment and created the stability instructions in 2019, 3) carrying nearly the maximum number of crab pots permitted in the 2019 stability instructions despite commencing a voyage where gale force weather and heavy freezing spray were forecasted, 4) excessive ice weight accumulations from freezing spray, and 5) lack of effective stability regulations that do not realistically account for the dangerous effects of icing and the asymmetrical nature of icing that endanger commercial fishing vessels operating in regions similar to this accident environment.

Other causal factors include the Captain's decisions to: 1) not take timely action to prevent or mitigate excessive ice accumulations from the forecasted and anticipated heavy freezing spray conditions, 2) not create a means for the crew to safely move forward to observe and clear the accumulation of ice on the vessel, and 3) not attend stability training classes that were available. Also contributing to the casualty was the owner's selection of the "qualified individual" who failed to accurately examine the vessel, perform stability tests and the calculations necessary to properly document the stability condition for the SCANDIES ROSE and then create detailed and accurate stability instructions for the Captain. Accordingly, the owners failed to provide captains for the SCANDIES ROSE with accurate and detailed information to maintain the vessel in a satisfactory stability condition.

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16732
December 30, 2021

COMMERCIAL FISHING VESSEL SCANDIES ROSE (O.N. 602351)
SINKING AND LOSS OF THE VESSEL
WITH FIVE CREWMEMBERS MISSING AND PRESUMED DECEASED
SOUTH OF SUTWIK ISLAND, ALASKA
ON DECEMBER 31, 2019

MARINE BOARD'S REPORT

1. Preliminary Statement

1.1. This marine casualty investigation was conducted and this report was submitted in accordance with Title 46, Code of Federal Regulations (CFR), Subpart 4.09, and under the authority of Title 46, United States Code (USC), Chapter 63. Under Title 46 USC §6308, no part of a report of a marine casualty investigation, including findings of fact, opinions, recommendations, deliberations, or conclusions, shall be admissible as evidence or subject to discovery in any civil or administrative proceedings, other than an administrative proceeding initiated by the United States.

1.2. On January 16, 2020, the Deputy Commandant for Operations (DCO) issued the enclosed convening order directing a Marine Board of Investigation (MBI) to thoroughly investigate the December 31, 2019 sinking of the Commercial Fishing Vessel (CFV) or F/V SCANDIES ROSE in which two crewmembers survived and the remaining five crewmembers remain missing and are presumed deceased.

1.3. The following personnel participated in the Marine Board of Investigation: Chairman – CAPT Gregory A. Callaghan, District 11 (D11) Chief, Prevention Division; Member – CDR Karen Denny, D11 Chief, Inspections and Investigations Branch; Member – LCDR [redacted], Chief, Inspections Division, Sector Maryland/National Capitol Region; Recorder – LCDR [redacted], Director of Intelligence Support, Maritime Intelligence Fusion Center Pacific; Legal Advisor – LCDR [redacted], Coast Guard Investigations National Center of Expertise; Technical Advisor – Mr. [redacted], Search and Rescue Program Manager, District 13 (D13) Response; and Technical Advisor – Mr. [redacted], Coast Guard Investigations National Center of Expertise.

1.4. On January 8, 2020, the Chairman designated the vessel's owner, Scandies Rose Fishing Company LLC, and managing owner, Captain [redacted] as a Party-In-Interest (PII) represented by the law office of Holmes, Weddle & [redacted]

1.5. On July 1, 2020, the Chairman designated Mr. [redacted] and Mr. [redacted] the two surviving crewmembers of the SCANDIES ROSE, as PIIs represented by the law office of Stacey & Jacobsen, PLLC.

1.6. On February 24, 2021, the Chairman designated Mr. [redacted] P.E., the Naval Architect who produced the SCANDIES ROSE's 2019 stability instructions, as a PII.

1.7. The Marine Board conducted a formal, recorded interview session on September 23, 2020, to hear testimony from one witness. The Marine Board held a public hearing session at the Edmonds Center for the Arts in Edmonds, Washington (WA) from February 22 through March 5, 2021. A total of 43 witnesses testified in the hearing over a period of 10 days. Due to the COVID-19 pandemic and associated state and federal gathering restrictions, witnesses appeared in person, through virtual testimony using Zoom, or telephonically, as requested, and PII representatives participated throughout the hearing. Witnesses and PIIs cooperated with all investigation requests.

1.8. The Coast Guard was the lead federal agency for initial evidence collection activities and led all efforts to recover additional evidence. The National Transportation Safety Board (NTSB) participated in the fact-finding portion of this investigation.

1.9. References to time in this report are listed as 12-hour and with an a.m. or p.m. to denote morning or afternoon times. All times reflect Alaska Standard Time (AKST), which is Coordinated Universal Time (UTC)/Greenwich Mean Time (GMT), offset of minus 9 hours.

1.10. Throughout the investigation, the Marine Board obtained helpful information from the public using the email addresses: uscg.scandiesrosembi@gmail.com and scandiesrosembi@uscg.mil.

2. Vessel Involved in the Incident

Figure 1 – Photograph of the F/V SCANDIES ROSE in Kodiak, AK, prior to the accident. Unknown date. (Source [redacted]

Official Name:	SCANDIES ROSE
Identification Number/ Official Number (O.N.):	602351
Flag:	United States (U.S.)
Vessel Class/Type/Sub-Type	Fishing Vessel/General Fishery, Coastwise
Build Year:	1978
Gross Tonnage:	195 GT
Length:	116.6 ft
Beam/Width:	34.0 ft [Certificate of Documentation]
Draft/Depth:	11.3 ft
Hull Construction:	Steel
Main/Primary Propulsion: (Configuration/System Type, Ahead Horsepower (HP))	Diesel Reduction, 2 Detroit Diesel 12V2000-R1227K22, 805 HP (600 kW)/1800 RPM
Owner/Managing Owner:	Scandies Rose Fishing Company LLC
Operator:	[redacted]

3. Deceased and/or Missing Persons

Name (First, MI, Last)	Sex	Relationship to Vessel	Age[1]	Status
[redacted]	Male	Captain	[redacted]	Deceased
[redacted]	Male	Engineer/ Deckhand	[redacted]	Deceased
[redacted]	Male	Deckhand	[redacted]	Deceased
[redacted]	Male	Deck Boss	[redacted]	Deceased
[redacted]	Male	Deckhand/ Cook	[redacted]	Deceased

4. Findings of Fact

4.1. The Accident Voyage

4.1.1. On or about December 27, 2019, five members of the crew arrived in Kodiak, AK by plane and boarded the SCANDIES ROSE. Those crewmembers were Mr. [redacted] Mr. [redacted] Mr. [redacted] Mr. [redacted] and Mr. [redacted] Mr. [redacted] who was already on the island, picked them up at the airport and took them to the vessel. While the crew was waiting for the Captain's arrival, they did general clean-up of the vessel.

4.1.1.1. Part of the clean-up process included consolidating and stacking some steel plate that was scattered on deck.

[1] At time of accident.

4.1.1.2. It is believed that the scrap steel stacked by the crew was the metal which had been cut out as a result of a recent repair made to the SCANDIES ROSE's starboard forward waste chute by Highmark Marine. This wasted steel was dumped overboard by the vessel's crew.

4.1.2. Later that same day, Captain [redacted] landed in Kodiak, AK and then boarded the SCANDIES ROSE. Captain [redacted] and Captain [redacted] part owner of Scandies Rose Fishing Company LLC and captain of the fishing vessel (F/V) AMATULI, were on the same flight into Kodiak, AK. Upon arrival, they went their separate ways to prepare their respective vessels for departure.

4.1.3. On December 27, 2019, the SCANDIES ROSE was moved to the Trident Dock to load gear and rig pots. Before the vessel could shift locations, the crew worked three to four hours to free mooring lines that froze on the mooring devices on the vessel during the time the SCANDIES ROSE was laid up between fishing seasons. A deckhand, Mr [redacted] described this evolution and that it took some time "...putting water on the lines, beating it with...ice hammers trying to get the, the boat cut loose. So that was quite an extensive task."[2]

4.1.4. The vessel docked at a Trident Seafoods dock at approximately 1:48 p.m. on December 27, 2019, and stayed in this location until December 30, 2019.

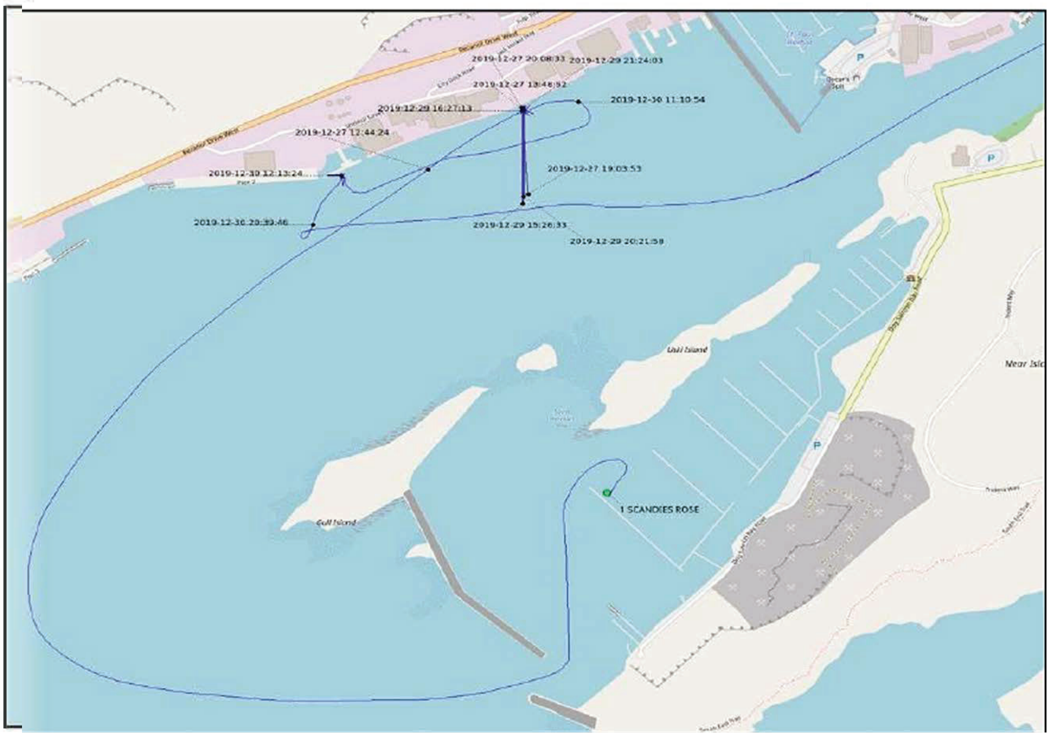

Figure 2 – Composite of vessel movements of the SCANDIES ROSE from December 27-30, 2019, based on Automatic Identification System (AIS) transmissions to land based AIS base station antennas. The solid line is the track of the SCANDIES ROSE and includes a composite of the vessel's movements in Kodiak Harbor from the time it docks at the dock in the vicinity of Ocean Beauty Seafood to when it shifted to the North Pacific Fuel dock and then to its departure of the harbor. Times are in AK Standard Time. (Source Marine Exchange of Alaska)

[2] Mr. [redacted] MBI Hearing testimony, Pg. 535

4.1.5. During the time the vessel was readying for departure, Mr. [redacted] determined that he did not want to sail on the SCANDIES ROSE for the scheduled trip due to his lack of cold weather fishing experience and tendered his resignation to the Captain.

4.1.5.1. Mr. [redacted] had previously sailed as a deckhand/bait man on the SCANDIES ROSE for one season starting on the vessel on September 10, 2019, but had not fished pot cod and king crab before.[3]

4.1.5.2. Mr. [redacted] resigned on December 27, 2019, and had his gear off the vessel that same day.

4.1.6. The Captain needed a replacement for the Mr. [redacted] and Mr. [redacted] suggested a friend, Mr. [redacted] an experienced fisherman. Mr. [redacted] was contacted on December 28, 2019, by Mr. [redacted] who stated that the SCANDIES ROSE needed an experienced deckhand. Initially, the Captain wanted the newly hired deckhand to fly to Kodiak the same day, but Mr. [redacted] needed time to get his affairs in order. In the early afternoon on December 29, 2019, Mr. [redacted] arrived in Kodiak and then reported to the vessel.

4.1.7. The SCANDIES ROSE crew complement now included two new crewmembers, Mr. [redacted] and Mr. [redacted] who had no previous experience sailing on the SCANDIES ROSE. They did, however, have prior experience on commercial fishing vessels operating in Alaskan waters and the Bering Sea.

4.1.8. The crew configured, loaded, and secured between 192 and 198[4] crab pots, sized 7 ft x 8 ft x 34 in, onto the vessel's deck. The pot configuration was secured on deck in a manner that did not provide an alleyway along the sides or down the middle of the deck for the crew to get from the house forward to the bow. The pot configuration onboard the SCANDIES ROSE required the crew to climb over the top of the pots to get anywhere forward of the super structure including the forward deck area. Additionally, the crew loaded bait required for pot cod fishing in the freezers located forward on the vessel.

4.1.9. On December 30, 2019, the crew continued preparing the vessel for sea by chaining down the pot stacks, dogging hatches, and testing bilge alarms.[5] The SCANDIES ROSE got underway and shifted to a fuel dock where the vessel took on diesel fuel for the main engines and generators, as well as potable water.

4.1.10. In compliance with the company practices at the beginning of each season, the crew filled out contracts, medical questionnaires, and other company related documents. These documents were sent electronically ashore to the vessel manager after the vessel sailed.

4.1.11. Captain [redacted] who was the vessel's certified drill instructor, conducted the required training and drills with the crew. The drills included discussions about the engine room fire suppression system, locations of liferafts onboard, and the vessel's Emergency

[3] Mr. [redacted] MBI Hearing testimony, Pg. 711
[4] The number of crab pots varied based on witness testimony between 192 and 198. One witness, Captain [redacted] who spoke to the Captain right before the accident stating that the Captain said he had 195 pots aboard.
[5] Mr. [redacted] CG Exhibit 132, Pre-Hearing Transcript, Pg. 145

Position Indicating Radio Beacon (EPIRB). The vessel's crew was instructed on how to make a "mayday" call using the vessel's radios. The newest crewmember, Mr. [redacted] was directed to don an immersion suit while other crewmembers observed him putting the suit on. The rest of the crew did not don immersion suits during this drill.

4.1.12. The EPIRB was taken into the wheelhouse as part of the training. The crew talked about the use of the EPIRB, but Mr. [redacted] stated that the operation of the beacon was not demonstrated because the Captain feared possibly sending a false alert signal.

> *...we did bring the EPIRB into the wheelhouse, and this is a thing I do remember which is* [redacted] *hit the button on it, and he -- I remember, he's like, whoops, I shouldn't have done that, because I'll call you guys* [the Coast Guard] *on accident. But I never saw the lights flash on when it happened. We were in a dark wheelhouse.*[6]

4.1.13. The SCANDIES ROSE's departure on December 30, 2019, was delayed by approximately six hours to wait on a favorable tide so the vessel could transit through Whale Pass for the early part of the voyage. Transiting through Whale Pass would provide the vessel shelter from the weather for the first part of the voyage.[7]

4.1.14. In addition to conducting the required safety drills, Captain [redacted] and the crew discussed the forecasted weather for their proposed route to the fishing grounds. In testimony, Mr. [redacted] spoke about the forecast:

> *Q. ... so you referenced the forecast you heard on the radio. And, and what kind of forecast were you hearing at that time?*
> *A. I, I couldn't quote it verbatim, but it was enough of a shitty forecast to -- I didn't think we were going to leave that night.*[8]

4.1.15. The following figures show the National Weather Service (NWS) weather forecast zones for the Shelikof Strait and the area south of the Alaska Peninsula, Sitkinak, to Castle Cape.

[6] Mr. [redacted] MBI Hearing Transcript, Pg. 553
[7] Mr. [redacted] MBI Hearing transcript, Pg. 549
[8] Mr. [redacted] MBI Hearing transcript, Pg. 160

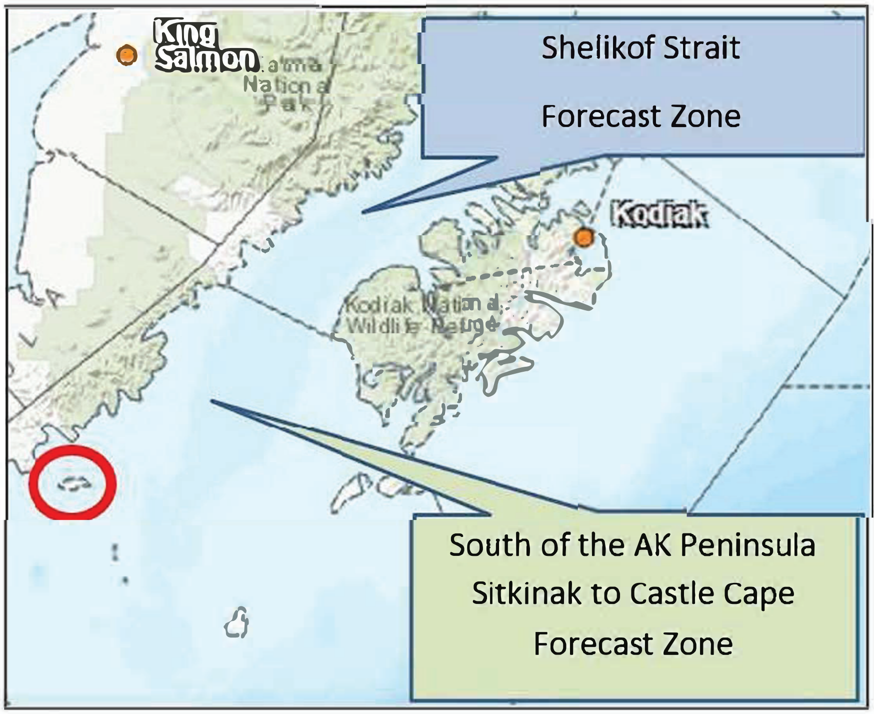

Figure 3 – Areas that the SCANDIES ROSE traveled in the Shelikof Strait and later in the area south of the Alaska Peninsula where the National Weather Service provides weather forecasts to mariners. SCANDIES ROSE accident site circled in red. (Source Coast Guard)

PKZ138-311345-

Shelikof Strait –

329 PM AKST Mon Dec 30 2019

...GALE WARNING TUESDAY NIGHT...

.TONIGHT...S wind 25 kt. Seas 5 ft. Rain.
.TUE...S wind 15 kt becoming SW 25 kt in the afternoon. Seas 3 ft building to 6 ft in the afternoon.
.TUE NIGHT...W wind 35 kt. Seas 9 ft. Freezing spray.
.WED... W wind 30 kt. Seas 8 ft.
.WED NIGHT...W wind 25 kt. Seas 4 ft.
.THU...NW wind 20 kt. Seas 5 ft.
.FRI THROUGH SAT...NW wind 25 kt. Seas 6 ft.

Figure 4 – Weather forecast issued at 3 29 p.m. on December 30, 2019 for the area in the vicinity of Shelikof Strait. (Source NWS)

4.1.16. On Monday, December 30, 2019, between 8:35 p.m. and 8:41 p.m., the SCANDIES ROSE departed the North Pacific Fuel dock, Kodiak, AK. Captain [redacted] was at the helm as the vessel headed to sea on a route that would ultimately take the vessel up into and then through the Shelikof Strait and then generally to the west/southwest down the south side of the Alaska Peninsula.

HYPERLINK: Enclosure (2) contains hyperlink (1) which is a video based voyage animation for the SCANDIES ROSE voyage based on its AIS data with certain significant points of the voyage highlighted.

4.1.17. The vessel sailed northeast out the harbor channel, under the Near Island Bridge, and turned to the northwest about an hour later, navigating through Narrow Strait. The vessel continued in a westerly direction through Whale Pass averaging 9-10 knots (kts) speed over ground (SOG).

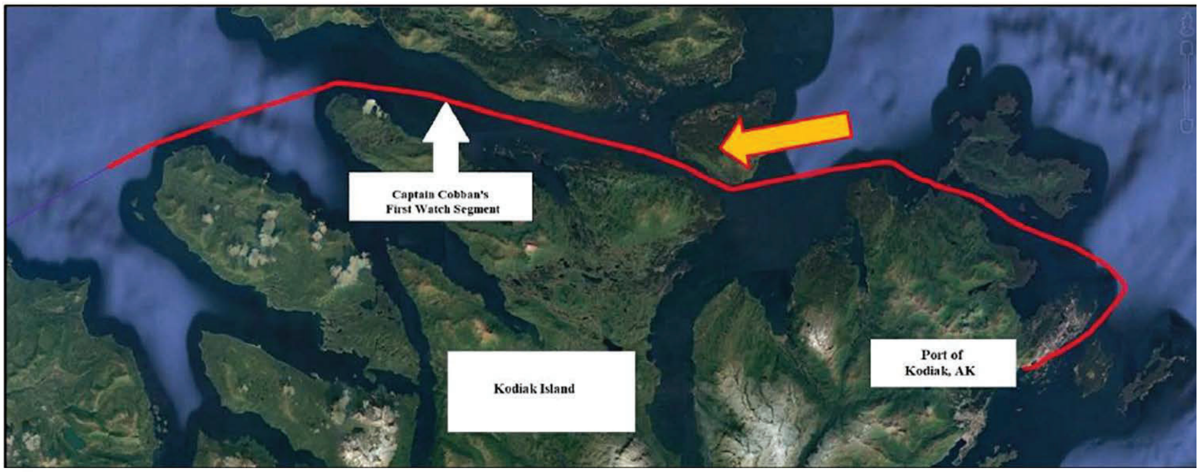

Figure 5 – Image showing the track, indicated in red, of the SCANDIES ROSE after the vessel departed Kodiak at approximately 8 35 p.m. on December 30, 2019. During this part of the transit, the Captain was reportedly on the navigation watch. (Source Coast Guard)

4.1.18. While underway during the transit to the fishing grounds, Captain [redacted] and the six crewmembers stood a navigation watch. On the accident voyage, the Captain created a watch rotation that had him operating the vessel for a period of six hours and then each of the other six crewmembers standing a 1-hour navigation watch. After 12 hours, the rotation would repeat. The figure below illustrates the approximate times that the crew stood watch throughout the accident voyage.

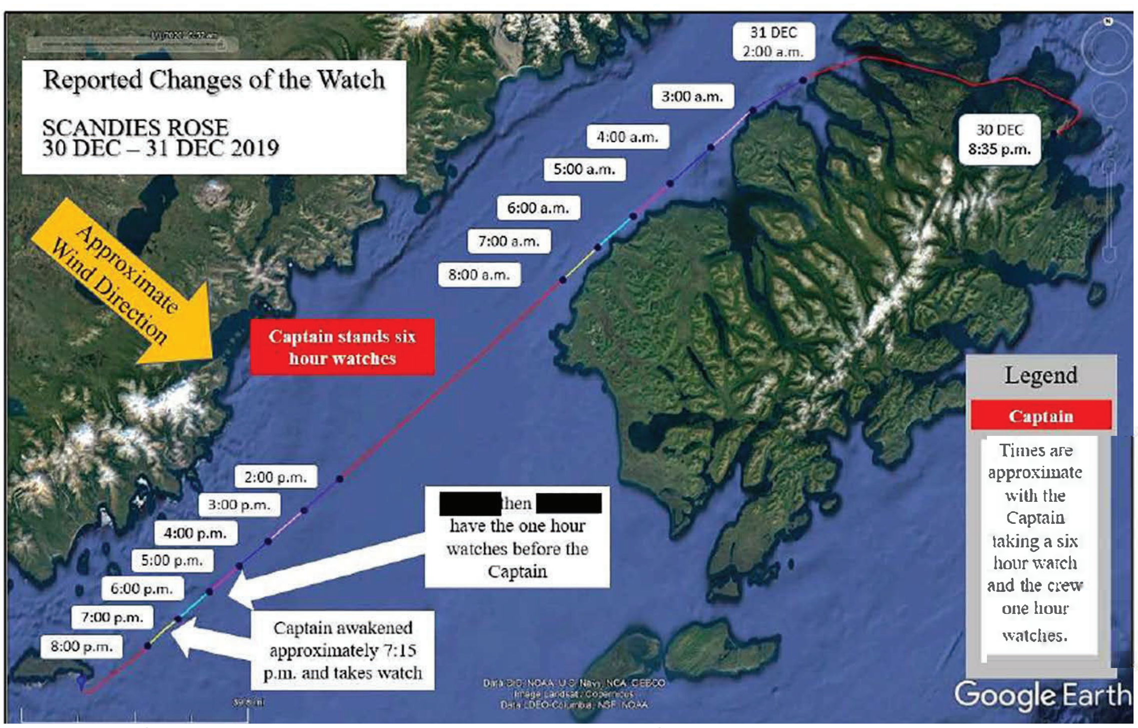

Figure 6 – Track line of the SCANDIES ROSE with segments of the course colored to indicate the navigational watch schedule as described in witness testimony. The yellow arrow shows the approximate wind direction. (Source Coast Guard)

4.1.19. At approximately 2:00 a.m. on December 31, 2019, the SCANDIES ROSE exited the Kupreanof Strait and entered the Shelikof Strait, between the south side of the Alaska Peninsula and the west coast of Kodiak Island. The vessel turned to port and steadied on a southwesterly course that followed the Kodiak Island coastline.[9]

PKZ150-010045-
South of the AK Peninsula Sitkinak to Castle Cape-
313 AM AKST Tue Dec 31 2019

...GALE WARNING THROUGH WEDNESDAY...
...HEAVY FREEZING SPRAY WARNING TONIGHT AND WEDNESDAY...

.TODAY...W wind 30 kt becoming NW 40 kt in the afternoon. Seas 17 ft. Freezing spray.
.TONIGHT...NW wind 45 kt. Seas 21 ft. Heavy freezing spray. Snow showers.
.WED...W wind 45 kt. Seas 21 ft. Heavy freezing spray. Snow showers.
.WED NIGHT...W wind 40 kt. Seas 16 ft.
.THU...NW wind 30 kt. Seas 12 ft.
.FRI THROUGH SAT...NW wind 30 kt. Seas 8 ft.

Figure 7 – NWS forecast for the period issued at 3 13 a.m. on December 31, 2019, including the vicinity of Sutwik Island. (Source NWS)

4.1.20. On December 31, 2019, between 2:00 a.m. and 8:00 a.m., the crew of the SCANDIES ROSE rotated through their hourly bridge watches. As part of the vessel routine, at the end of each watch, the off-going crewmember was to complete a round of the engine room to ensure the vessel's engines and auxiliary equipment were in good working order. A surviving crewmember stated the vessel had little ice buildup during his watch periods, and the amount of observed accumulated ice on the vessel was not enough to be a concern.[10]

4.1.21. Captain [redacted] assumed the watch from Mr. [redacted] the morning of December 31, 2019. The vessel continued on a course of approximately 240 degrees at a steady speed of 8 kts.[11]

4.1.22. Cell phone records indicate that at 11:18 a.m., the Captain called the AMATULI using the satellite phone onboard the SCANDIES ROSE. The Captain of the AMATULI, Captain [redacted] was the majority owner of the SCANDIES ROSE. Captain [redacted] spoke to Captain [redacted] for approximately 12 minutes.

4.1.22.1. The AMATULI departed Kodiak on December 28, 2019. This was done so the vessel could be in Dutch Harbor, AK by January 1, 2020, which was a stipulation in the AMATULI's contract for cod tendering operations.

[9] The proposed voyage plan would have had the SCANDIES ROSE sailing southwest along the Alaska Peninsula, then navigating through False Pass in order to enter the Bering Sea.
[10] Mr. [redacted] MBI Hearing Transcript, Pg. 558
[11] CG Exhibit 020, the survivors' work/rest history forms slightly contradict testimony as to times of watch rotation.

4.1.22.2. During this conversation, Captain [redacted] told Captain [redacted] that he (and the AMATULI) had to pull into Unimak Bight that night to get out of the weather. He testified:

> *I asked him how it was going. And he said it was a shitty ride, which was a shitty ride for me, 150 miles farther down the pike. So, I didn't doubt that. He said it was very cold and he was making light icing at that time. And I said, well, I had to pull into Unimak Bight* [sic][12] *to just rest the crew because I wasn't going to go through Unimak Pass when I was tired and the weather was so foul. And I said, you know, just you go ahead and do that if you need to. It's not -- there's no hurry here. Just get, be safe.*[13]

4.1.23. At approximately 2:00 p.m., Captain [redacted] was relieved of the navigation watch. The SCANDIES ROSE was maintaining a southwesterly course and a SOG of 9-10 kts.

4.1.24. Between 2:00 p.m. and 8:00 p.m., the vessel's heading remained steady on a southwesterly course and the average speed decreased to 6.5 kts. Based on Automatic Identification System (AIS)[14] data, from 6:20 p.m. and until 7:20 p.m., the course track which had previously been relatively steady, began to yaw to the right or left in a manner which had not been observed earlier or later during the transit. During this time, the weather conditions deteriorated with increased wind and growing seas.

PKZ150-011300-
South of the AK Peninsula Sitkinak to Castle Cape-
252 PM AKST Tue Dec 31 2019

...GALE WARNING THROUGH WEDNESDAY NIGHT...
...HEAVY FREEZING SPRAY WARNING THROUGH WEDNESDAY NIGHT...

.TONIGHT...NW wind 45 kt. Seas 21 ft. Heavy freezing spray. Widespread snow showers.
.WED...NW wind 45 kt. Seas 20 ft. Heavy freezing spray. Widespread snow showers.
.WED NIGHT...W wind 40 kt diminishing to 30 kt after midnight. Seas 15 ft subsiding to 9 ft after midnight. Heavy freezing spray.
.THU...W wind 25 kt. Seas 9 ft.
.THU NIGHT...NW wind 30 kt. Seas 9 ft.
.FRI...NW wind 35 kt. Seas 8 ft.
.SAT...NW wind 30 kt. Seas 8 ft.
.SUN...N wind 25 kt. Seas 8 ft.

Figure 8 – NWS forecast for the period, issued at 2 52 p.m. on December 31, 2019 for the area in the vicinity of Sutwik Island where the SCANDIES ROSE would attempt to seek shelter. (Source NWS)

[12] Minor grammatical corrections have been made where appropriate throughout this document in the quoted text that is used from various interview transcripts.
[13] Captain [redacted] CG Exhibit 132, Pre-hearing Transcript, Pgs. 61-62
[14] AIS, a vessel tracking system to enhance the safety of navigation.

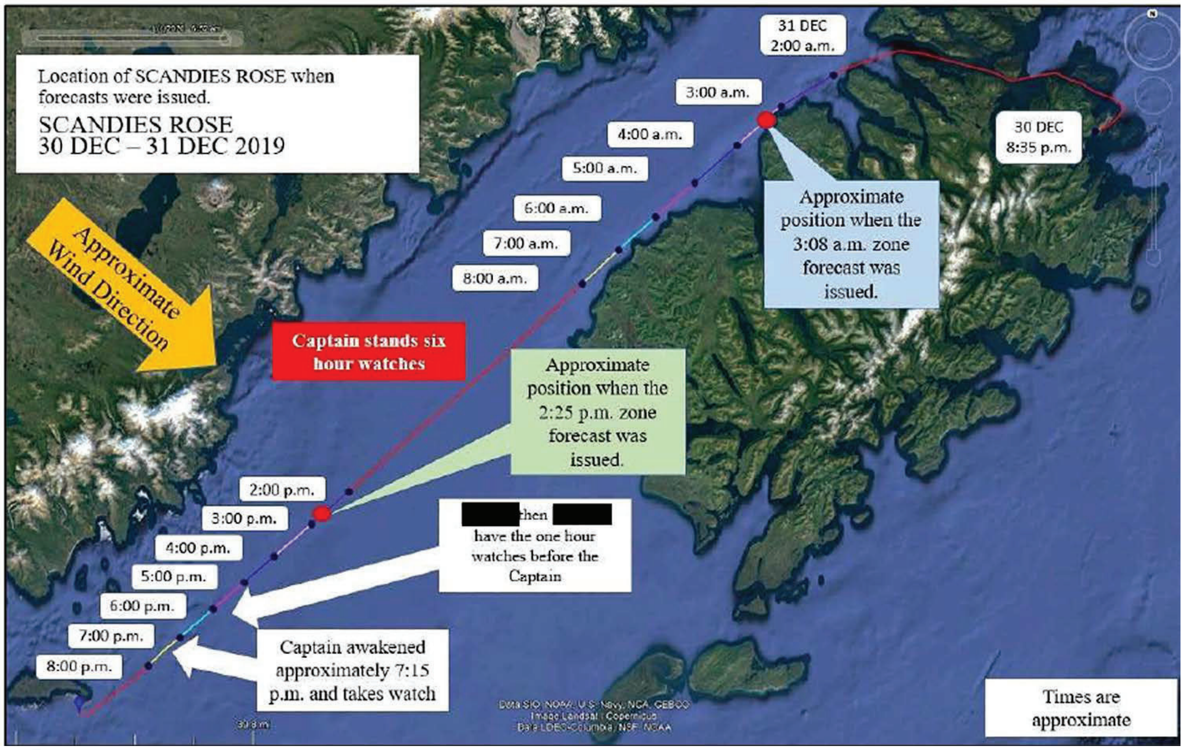

Figure 9 – Track of the SCANDIES ROSE showing the location where the weather broadcasts would have been issued for the appropriate location or zone. As noted, watch times are approximate and forecast issue times are accurate. (Source Coast Guard)

4.1.25. At approximately 5:00 p.m., Mr. [redacted] took over the navigation watch. He was relieved at approximately 6:00 p.m. by Mr. [redacted]

4.1.26. At approximately 7:15 p.m., Mr. [redacted] called Captain [redacted] to wake him up for watch. Minutes later, Captain [redacted] came up to the bridge and the two discussed the worsening weather, the ice accumulation on the pot stack and vessel's superstructure, and the development of an estimated 2-degree list to starboard. In testimony, a surviving crewmember recalled

> *Everything was fine until about -- I was on, I was on watch until about 7:15 on the 31st. 7:15, I woke up [redacted] for his watch. I was the last of our crew to take the watch, and then so I got... [redacted] came up. And I told [redacted] I go, yeah, it looks like we have a little bit of a list. But it wasn't nothing—it wasn't anything too crazy.*[15]

4.1.27. When asked to describe the list, the crewmember stated it was one to two degrees to starboard and that the SCANDIES ROSE was continuing to build ice. He continued that Captain [redacted] and he discussed de-icing the vessel.

> *We were like, okay, well, you know, we're going to have to get this off. And I go, well, do you want to go get it off now? And he goes, well, we'll just wait till we get into shelter ... and I didn't have any, I didn't have any qualms at the time of that.*[16]

[15] Mr. [redacted] CG Exhibit 132, Pre-hearing transcript, Pg. 146
[16] Mr. [redacted] CG Exhibit 132, Pre-hearing transcript, Pg. 147

4.1.28. Based on the testimony of Mr. [redacted] the SCANDIES ROSE was taking seas on the starboard bow with sea spray from the prevailing winds increasing the rate of icing.

> *Well, because the weather came up and, like I said, it was kind of hitting us -- we were bucking into it, and it was quarterly to the bow. So we were making a lot of spray, and the spray was making ice*[17]

4.1.29. During this last watch relief, when the Captain arrived in the wheelhouse, Captain [redacted] and Mr. [redacted] discussed ways to reduce the icing:

> *We're starting to list a little to the starboard side. It was kind of hard to tell if it's the waves. It was rolling around. It's kind of hard to tell. But it felt like we were a little heavier on the starboard side. So I let him know that and asked him if we wanted to slow down, because we were bumping into it, making a lot of spray, making a lot of ice, and he didn't seem concerned with that or changed course.*[18]

4.1.30. Between 7:15 p.m. and 7:30 p.m., after being relieved of the watch and before leaving the bridge, Mr. [redacted] recalled the condition of the vessel in terms of ice accumulation

> *...the windows were all iced, except for the first two that have the heat film, but everything else was iced over. The pots had a good -- I mean, it doesn't look like much, but ice is really heavy. It was probably couple inches when it started.*
> *Q. And is that --*
> *A. -- glazed -- more of them glazed probably back on the pots within the bow head. It had a good little ice build-up.*[19]

4.1.31. After relief, the Captain maintained the SCANDIES ROSE's intended course and speed. After concluding the relief with the Captain, Mr. [redacted] went below and met the vessel's engineer coming out of the engine room. Mr. [redacted] stated that he thought the engineer had been in the engine room transferring fuel to alleviate the starboard list but did not talk to the engineer to confirm.

4.1.32. Mr. [redacted] went into the stateroom he shared with Mr. [redacted] to rest.

4.1.33. After taking the watch and after 8:00 p.m., Captain [redacted] made a series of phone calls using the satellite phone.

> 4.1.33.1. One phone call was to a friend in North Carolina to wish her Happy New Year. During this phone call, Captain [redacted] told the friend that the vessel was listing, but she

[17] Mr. [redacted] MBI Hearing Transcript, Pg. 1063
[18] Mr. [redacted] MBI Hearing Transcript, Pg. 1063
[19] Mr. [redacted] MBI Hearing Transcript, Pg. 1065

said he did not sound alarmed. A newspaper quote from the friend stated that the Captain said he needed to seek shelter from the weather.[20]

4.1.33.2. At 8:12 p.m.,[21] Captain [redacted] called Captain [redacted] again on the tag phone.[22] The SCANDIES ROSE was continuing on course to the west/southwest about 8 NMs northeast of Sutwik Island. The two Captains discussed the weather conditions the SCANDIES ROSE was experiencing and the list of the vessel. During this call, the AMATULI was about to round Ulakta Head and then head into port in Dutch Harbor, AK. During testimony, Captain [redacted] recalled discussing de-icing options with Captain [redacted]

And then finally he came back to me on the, I think it was the 31st, but it was fairly early in the afternoon, or maybe later afternoon but early evening. And I asked him how it was going. And he said that it was a shitty ride, which was a shitty ride for me, 150 miles farther down the pike. So, I didn't doubt that. He said it was very cold and he was making light icing at that time.[23]

4.1.34. Sometime after 9:00 p.m.,[24] the SCANDIES ROSE was about 5.5 NM due east of Sutwik Island and holding the original course to False Pass. Captain [redacted] called the PACIFIC SOUNDER and spoke to the vessel's captain, a longtime fellow fisherman. At the time of the call, the PACIFIC SOUNDER was in the Bering Sea north of the Aleutian Chain and fishing for cod. The PACIFIC SOUNDER had just set its pots and was jogging into the weather to minimize the effects of the seas and freezing spray while the crew was breaking ice, which had accumulated on the vessel, and securing the vessel for the sea conditions they were encountering. During this conversation, the Captains discussed the following:

4.1.34.1. Captain [redacted] asked him about his knowledge and experience with good anchorage spots around Sutwik Island. Captain [redacted] stated that he wanted to get into the shelter of that land mass.

4.1.34.2. Captain [redacted] told him that the SCANDIES ROSE had accumulated quite a bit of ice and that the vessel had developed about a 20-degree starboard list. Captain [redacted] also stated that due to the weather conditions that included 60-70 kt winds, he did not believe that it was safe to send the crew on deck to break ice.

During testimony, Captain [redacted] recalled discussing de-icing options with Captain [redacted]

Yes, he did mention that he thought it wasn't safe for the crew to go out, so they are working themselves to get leeway behind the island before they break ice. And I

[20] https://www.adn.com/alaska-news/2020/01/02/crab-boat-that-sank-on-new-years-eve-leaving-5-presumed-dead-was-headed-into-area-under-gale-warning/
[21] CG Exhibit 139, SCANDIES ROSE Tag Phone Records
[22] The "tag phone" is a Mitsubishi track/tag satellite phone which was installed on the vessel.
[23] Captain [redacted] CG Exhibit 132, Pre-Hearing Transcript, Pg. 62
[24] Testimony from Captain [redacted] approximates the phone call as between 9:15 and 9:30 p m.

imagine in blowing 60, 70, down there, it would have been pretty nasty, so it probably wouldn't have been safe to bring the boys out to do that at that time.[25]

Figure 10 - SCANDIES ROSE Marine Safety Center (MSC) modeling with a 20-degree list to starboard as described in section 4.1.34.2. of the ROI. (Source Coast Guard Marine Safety Center)

4.1.34.3. Captain [redacted] told him that the SCANDIES ROSE had recently received new stability instructions and that he was carrying 195 pots onboard.

4.1.34.4. Captain [redacted] and Captain [redacted] had a casual conversation about the recent holiday season and Captain [redacted] shared that he had recently purchased more shares of the SCANDIES ROSE.

4.1.34.5. When asked about his sense of Captain [redacted] concern at the time of the call, Captain [redacted] recalled:

> *...we also talked about Christmas, and he got stuck in Sitka there over Christmas at the airport. So it was -- he was talking about other things at that point, so I didn't -- it didn't seem like it was that bad.*[26]

4.1.34.6. After approximately 10 minutes, Captain [redacted] ended the conversation, as he had to go to his vessel's engine room and switch a generator over.

4.1.35. Shortly before the SCANIDES ROSE's "mayday" call, Captain [redacted] called the SCANDIES ROSE back after completing his work in the PACIFIC SOUNDER's engine room. Captain [redacted] called the SCANDIES ROSE using his vessel's satellite phone and, in testimony, stated:

[25] Captain [redacted] MBI Hearing Transcript, Pg. 802
[26] Captain [redacted] CG Exhibit 132, Pre-hearing Transcript, Pg. 394

...I believe the time was 2158, he told me at that time the list had gotten a lot worse, and he didn't know how this was going to go. And that's when I lost communications with him at that point.
Q. And did he mention anything else ... when he mentioned that the list had gotten a lot worse, did he give you any estimation?
A. No, he didn't. He didn't from 20 degrees the first time, and there was more distress in his voice when he told me that. I mean those last few sentences there, he had some concern there. So he didn't mention how, how much worse the list had gotten, but he said the list had got worse, and he didn't know how this was going to go. And then I lost communication with him.[27]

4.1.35.1. Captain [redacted] indicated that he had known Captain [redacted] for approximately nine years and never heard that level of stress in Captain [redacted] voice before.

4.1.36. At approximately 9:45 p.m., the SCANDIES ROSE was approximately 2.5 NMs south of Sutwik Island. The vessel turned approximately 50 degrees to starboard towards the shelter of the island, the vessel's speed reduced to about 6 kts, and the vessel held a northwesterly course as indicated in figure 11, below:

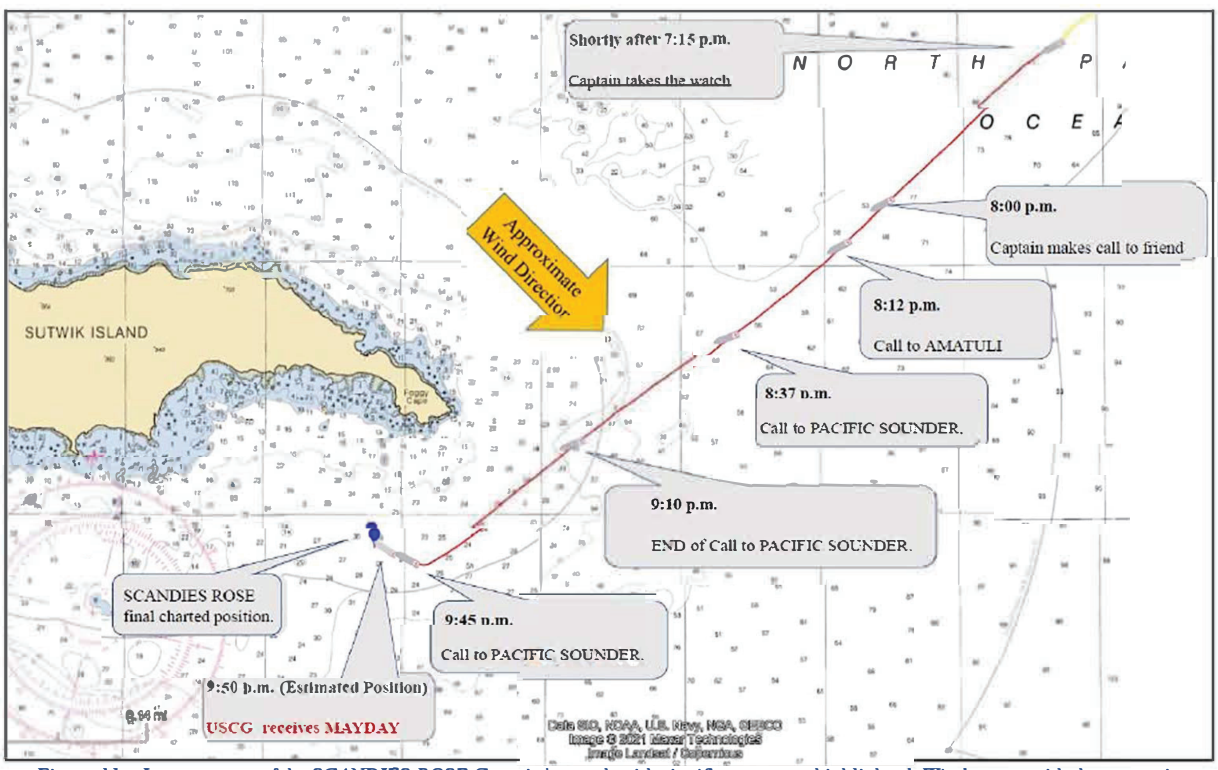

Figure 11 – Last segment of the SCANDIES ROSE Captain's watch with significant events highlighted. Wind arrow with the approximate wind direction has been added. (Source Coast Guard)

4.1.37. At the same time, the two survivors were in their shared stateroom when the vessel suddenly heeled farther to starboard and remained at that angle of list. The precise angle of

[27] Captain [redacted] MBI Hearing Transcript, Pg. 800

heel or list at that time cannot be determined. Mr. [redacted] immediately left the stateroom to head up the one flight of stairs to the wheelhouse.

4.1.38. There is no evidence that the general alarm was activated to alert the crew of any emergency.

4.1.39. There was little time between the extreme heel to starboard and loss of vessel's stability that led to the vessel's sinking. Upon, reaching the wheelhouse, Mr. [redacted] recounted

> *Oh, it was pretty much immediate. I mean, I looked at [redacted] and I -- just that, that -- I don't know how to explain it to anybody. Just that gut wrench that not -- this is not good. Like this is -- there's no coming back from this. Like we are sinking now. And I just kept yelling, just started yelling because there's no alarm going off.*[28]

4.1.40. Shortly after this, other crew made their way into the wheelhouse. Survivors recall seeing some of the other crew but could not confirm if all of the crew made it to the wheelhouse prior to the vessel sinking.

4.1.41. Captain [redacted] was in the starboard area of the wheelhouse where the main control station for the vessel was located.

4.1.42. The survival suits were in a locker in the wheelhouse which was slightly to port of the vessel centerline in the after console. The suits were passed out to the crew.

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[28] Mr. [redacted] MBI Hearing Transcript, Pg. 565

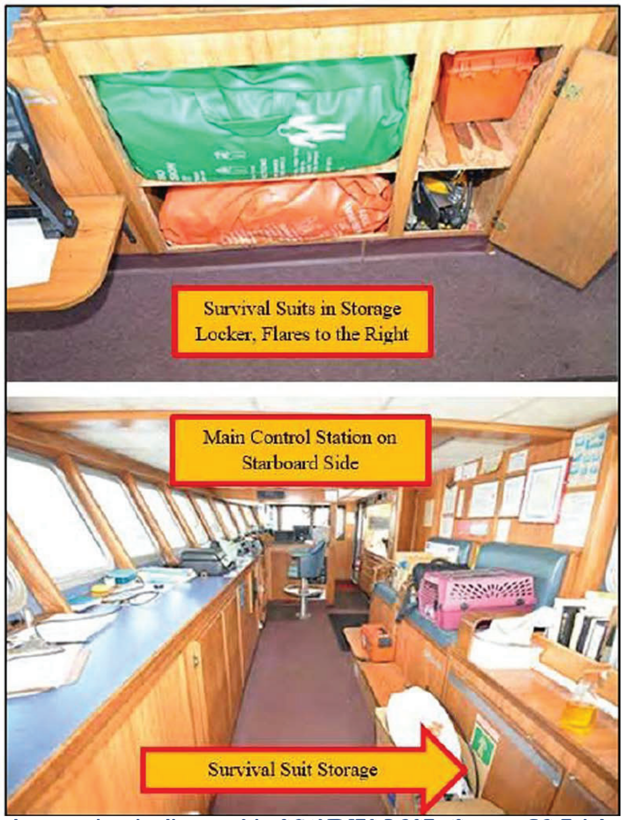

Figure 12 – Location of the survival suits in the wheelhouse of the SCANDIES ROSE. (Source CG Exhibit 004)

4.1.43. The crew began putting on their survival suits as the vessel maintained a heavy list to starboard and, at this time, there was evidence of available electrical power on the vessel.

> *And as I'm getting my suit on, there's people around me. I do remember looking up, and the throttles got pulled back on the boat, and then it just -- it was downhill from there. The boat started going fast. Like fast. After we lost the, you know, forward momentum.*[29]

4.1.44. The two survivors moved to the high side of the wheelhouse, where the port side door to the outside was located and continued putting on the survival suits.

4.1.45. In the wheelhouse, crewmembers were having great difficulty finding secure footing to put on the cumbersome survival suits due to the heeling deck creating lack of a flat space and loss of footholds. One survivor recounted:

> [redacted] *was on the port side right over there by the door, behind that chair, so that was preventing him from sliding down to the starboard side. And then after I jumped into the bench,* [redacted] *slid down to this chair. So all those guys were down by the chart table trying to get their suits on and their -- trying to -- I don't know, get to -- help* [redacted] *and see what* [redacted] *wanted them to do, and they were kind of looking to him for guidance…*[30]

[29] Mr. [redacted] MBI Hearing Transcript, Pg. 567
[30] Mr. [redacted] MBI Hearing Transcript, Pg. 1113

4.1.46. At some point immediately prior to the call to the Coast Guard on the high frequency (HF) radio, Mr. [redacted] recounted that the Captain shifted the vessel's propulsion system from ahead to the out of gear or neutral propulsion position

> *When I first went up there and was talking to [redacted] and was like, what was going on, call the Coast Guard, he was like okay, and then he took it out of gear. That's what made the boat start going more -- I think maybe the transitional force maybe. I don't know, but as soon as he took it out of gear, everything kind of sped up a little bit more.*[31]

4.1.47. At 9:50 p.m., Coast Guard Communication Detachment (COMMDET) Kodiak watchstanders received a "mayday" call on 4125 KHz from the SCANDIES ROSE – "mayday, mayday, mayday… SCANDIES ROSE, SCANDIES ROSE, SCANDIES ROSE… (Position given two times) we are rolling over."

4.1.47.1. The Captain included the SCANDIES ROSE's position during this "mayday" call, 56º-29' N, 157º-01' W. In the background, an unidentified person is heard calling out part of vessel's position.

4.1.47.2. An alarm, similar to other warning alarms heard previously, could be heard in the background to the radio transmission as well as other people's voices. It is unknown what that alarm signified.

4.1.47.3. COMMDET Kodiak received the transmission and nearly immediately called back the SCANDIES ROSE to establish communications with the vessel. COMMDET Kodiak watchstanders were unable to make contact with the SCANDIES ROSE.

HYPERLINK: Enclosure (2) contains hyperlink (2) which is an audio recording of the distress call the SCANDIES ROSE transmitted on the night of the accident and the initial Coast Guard response to the mayday transmission.

4.1.48. Mr. [redacted] assisted Mr. [redacted] in closing the long zipper to the survival suit and they exited the wheelhouse through the port side door shown in figure 13.

4.1.49. Mr. [redacted] recalled that while he and Mr. [redacted] were out of the wheelhouse and close to the door on the port side of the vessel, he recalled hearing a faint voice on the marine radio but the transmissions were broken.[32]

4.1.50. The survivors did not see the EPIRB or mention the use or deployment of the EPIRB. The EPIRB was located on that same side just aft of the wheelhouse on the same deck as the wheelhouse.

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[31] Mr. [redacted] MBI Hearing Transcript, Pg. 1072
[32] Mr. [redacted] MBI Hearing Transcript, Pg. 36

Figure 13 – Large arrow points to the port side wheelhouse door on the SCANDIES ROSE. The smaller arrow points to the location where the EPIRB was stored in the float free bracket, which is circled in red. (Source CG Exhibit 004, with markup)

4.1.51. Crewmember [redacted] [redacted] was reported to have successfully donned an immersion suit and made it to the port side door but did not join crewmembers [redacted] and [redacted] outside. Mr. [redacted] location was described as just inside the port wheelhouse door. The survivors recounted:

> *So then me and [redacted] kind of screaming at [redacted] We were just standing around right outside the port door on the right down -- down the stairs along the wall is like where they standing, and we're like, what do we do? We can't get to the … raft because it's up on the roof, and it's, you know, at a super steep angle. The EPIRB is on the other side. You can't get to that. Because I'm thinking – I'm trying to get to these things.*[33]

[33] Mr. [redacted] MBI Hearing Transcript, Pg. 1073

Figure 14 – Composite of photo montage of the SCANDIES ROSE EPIRB. Top left, EPIRB in housing on the inside of top rail aft of the wheelhouse. Top right is the location shown with the yellow arrow in reference to the position in relationship to the port wheelhouse door. Bottom left, the open EPIRB housing during inspection for 2019 Valuation and Condition Survey. Bottom right, the empty housing as seen during underwater site survey conducted by Remotely Operated Vehicle (ROV) in February 2020. (Source – [redacted] *photos for 2019 Valuation Survey and bottom right, CG Exhibit 008)*

4.1.52. Mr. [redacted] and Mr. [redacted] attempted to locate a line to assist the other crewmembers still inside the wheelhouse. These attempts were unsuccessful as the lines tied to the railings that could have been used in this attempt were "too iced up."[34] Crewmembers [redacted] and [redacted] remained on the port side exterior in the vicinity of the door yelling to the other crewmembers to exit the wheelhouse.

4.1.53. The SCANDIES ROSE continued to roll to starboard and the two crewmembers attempted to stay close to one another. Crewmembers [redacted] and [redacted] agreed that their plan was to stay on the SCANDIES ROSE as long as they could and then try to stay together if or when they had to enter the water. The lights of the SCANDIES ROSE went out.

4.1.54. The last AIS transmission from the vessel was received at 9:51:52 p.m. AKST by a satellite designed to track AIS on vessels. Without power, or having sunk, the SCANDIES ROSE AIS would no longer transmit a signal.

[34] Mr. [redacted] MBI Hearing Transcript, Pg. 1074

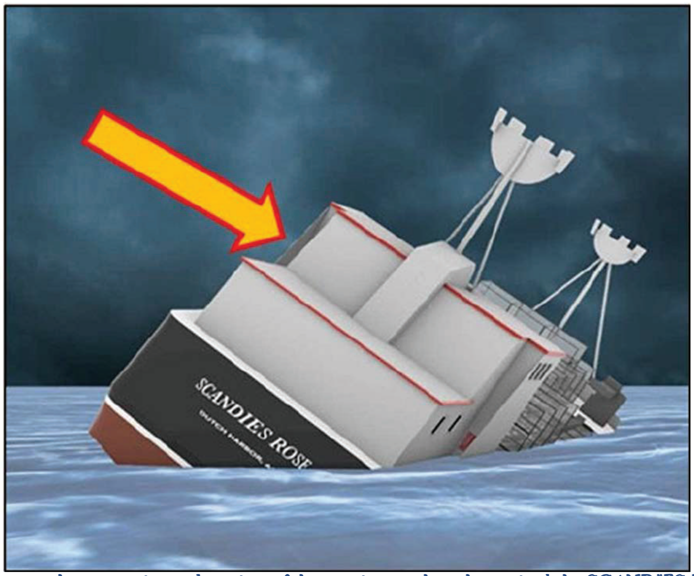

Figure 15 – Yellow arrow points to the approximate location of the survivors when they exited the SCANDIES ROSE wheelhouse port side door. They later moved forward as the vessel began to sink and a wave washed them overboard. The MSC model is displaying an approximate list to starboard of 35 degrees. (Source Coast Guard)

4.1.55. At some point, Mr. [redacted] and Mr. [redacted] entered the water after being washed off the sinking vessel by a wave. Initially, the two survivors were separated after entering the water. The observed conditions included "30-foot seas" and "icy conditions."[35]

4.1.56. After orienting themselves in the water, the survivors recounted the observed condition of the SCANDIES ROSE:

> *Yeah, finally, when I kind of got my bearings, I just remembered seeing the bow of the boat was up. And you could hear it too.*[36]

> *It went – first went -- and then it goes bow straight up in the air, and it was just like a toy in a tub, just getting like tossed around pretty good.*[37]

4.1.57. After being in the water approximately 20 minutes, Mr. [redacted] recounted that he saw the light from an inflatable liferaft that had automatically deployed off the SCANDIES ROSE. In testimony, he recounted that the current propelled the raft towards his position in the water.

> *I was very fortunate to see the glowing of the survival raft couple hundred yards off, and it kept -- I kept seeing it, and it kept going under. Waves were so big...*

> *...Luckily, I made it over to it, because the tide kind of brought it. It started to pass me, and then I kind of surfed a wave over to it. And then I was kind of tired at first when I got to it.*[38]

[35] Mr. [redacted] MBI Hearing Transcript, Pg. 1078
[36] Mr. [redacted] MBI Hearing Transcript, Pg. 571
[37] Mr. [redacted] MBI Hearing Transcript, Pg. 1077
[38] Mr. [redacted] MBI Hearing Transcript, Pg. 1078

4.1.58. Once inside the liferaft, Mr. [redacted] began calling for Mr. [redacted] After several minutes, Mr. [redacted] heard Mr. [redacted] shouts and was able to swim an unspecified distance towards the raft and was assisted aboard the liferaft by Mr. [redacted]

4.1.59. After a short time, the light inside the liferaft canopy went out. Wave action threatened to capsize the water-filled raft and the survivors were forced to move towards the lifting side to stabilize the raft.

4.1.60. One survivor recounted their efforts to locate additional surviving crewmembers

> *A lot of screaming still, like yelling out, hoping there would be someone else. There was, there was nobody else.*[39]

4.1.61. There is no evidence to suggest that any other crewmembers made it off the SCANDIES ROSE before it sank.

4.1.62. When both Mr. [redacted] and Mr. [redacted] were in the liferaft, they observed the canopy light of the SCANDIES ROSE's second raft, which had also auto deployed. They considered swimming to the other raft since the one they were in did not have interior illumination and they were initially unable to locate the raft's equipment pack.

4.1.63. At some point after they got in the raft, Mr. [redacted] and Mr. [redacted] located the liferaft's equipment pack. The crewmembers had difficulty accessing the equipment pack's contents due to lack of dexterity in the use of their hands while wearing the immersion suits, the environmental darkness, and prolonged exposure to frigid waters. They were eventually able to access the equipment contents. Mr. [redacted] testified:

> *Then we found the survival bag, which is stupid because they have it tight tied -- it's tied down super tight to the bottom. So it was completely underwater. And it's right by the door. And we're in 30-foot seas. I don't want to --anywhere near that door before I get, you know, I get bounced out of it or something.*[40]

4.1.64. Despite not seeing any rescue vessels or aircraft, the survivors fired all the aerial flares in the equipment bag. Mr. [redacted] recalled the experience in the raft:

> *I -- we, we were able to get to a bag and, and get some flares out. I thought I'd, you know, wait a little bit. The EPIRB got to kick the signal off. I don't want to start firing flares off yet. You know, we were able to fire, fire some flares off. It, it was a -- fired one off, two off, and then waited. Then three, four, and no one ever came. But the wind was so violent against that thing, I kept hearing -- I kept thinking I heard the chopper the whole time. It was just playing games with my head, the wind just beating that thing.*[41]

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[39] Mr. [redacted] MBI Hearing Transcript, Pg. 572
[40] Mr. [redacted] MBI Hearing Transcript, Pg. 1080
[41] Mr. [redacted] MBI Hearing Transcript, Pg. 572

4.1.65. The survivors still had the properly functioning flashlight that was contained in the equipment pack for signaling.

Coast Guard Actions after Receiving "Mayday" Call

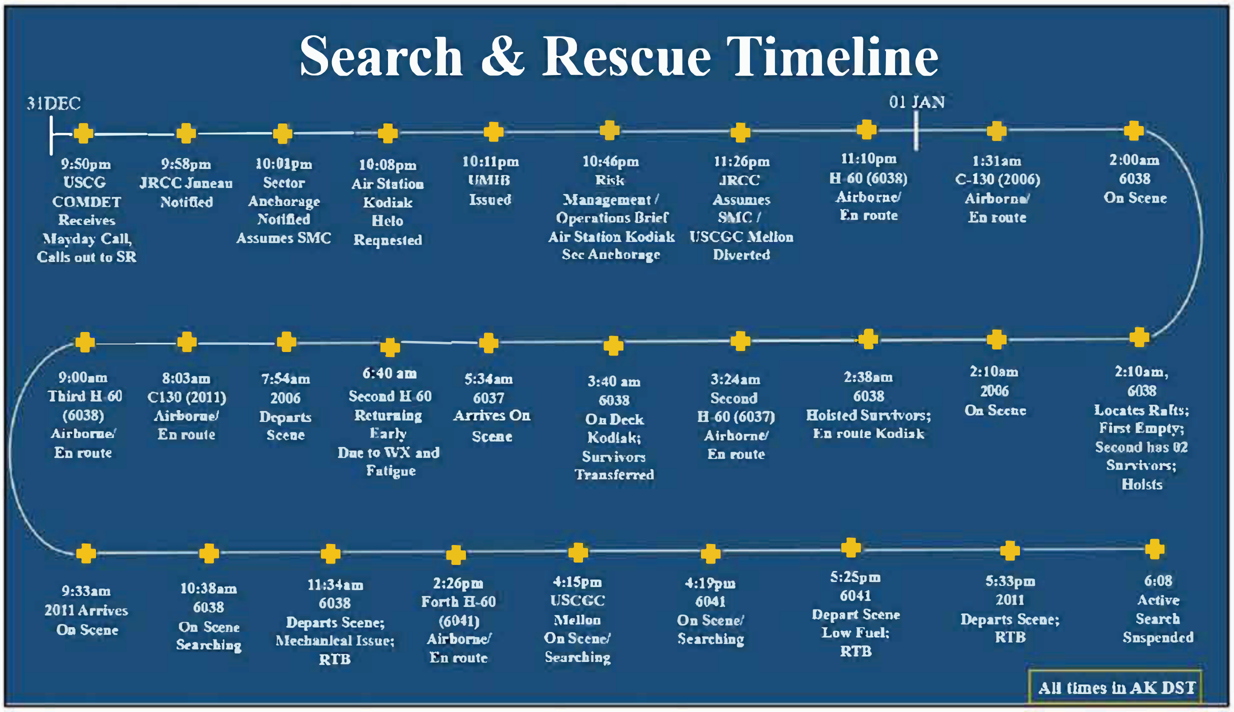

Figure 16 – Timeline of Coast Guard Search and Rescue (SAR) activities following the "mayday" call at 9 50 p.m., December 31, 3019, until the search was suspended at 6 08 p.m. on January 1, 2020. (Source CG Exhibit 076)

4.1.66. At approximately 9:58 p.m., COMMDET Kodiak reported the distress call to Joint Rescue Coordination Center (JRCC) Juneau.

4.1.67. At approximately 10:01 p.m., JRCC notified Sector Anchorage Command Center of the distress case and authorized the use of Air Station Kodiak to launch the ready helicopter. Sector Anchorage assigned a search and rescue (SAR) Mission Coordinator (SMC).[42]

4.1.68. After being briefed on the case, the JRCC SMC examined the last AIS position of the SCANDIES ROSE and the information in the "mayday" call from the SCANDIES ROSE and testified:

> *... So I went down, logged on my computer, and I saw that the vessel had gone late, meaning that the signal from the AIS transmitter was old. Typically, you get transmissions every several minutes, but this had been about 20 minutes since the last signal had been received.*[43]

[42] The SMC is the person assigned and designated to individual SAR cases, who provides incident oversight and supervision, as well as ensuring proper SAR mission execution.
[43] Captain Hollingsworth (USCG, Ret.) MBI Hearing Transcript, Pg. 1427

4.1.69. Following this last AIS broadcast and the mayday received via radio, the Coast Guard did not receive or find evidence of any further electronic signals broadcasted by the SCANDIES ROSE. This Marine Board verified that no other signals were received by AIS, Very High Frequency (VHF) radio, Digital Selective Calling (DSC)[44] alert, HF radio, satellite communications, EPIRB, or cell phone.

4.1.70. At approximately 10:08 p.m., Sector Anchorage requested Air Station Kodiak launch the rescue helicopter, a MH-60.

4.1.71. At approximately 10:11 p.m., after repeated attempts to call out and get a radio response from the SCANDIES ROSE to establish communications, Coast Guard Sector Anchorage and COMMDET Kodiak issued an Urgent Marine Information Broadcast (UMIB) on both HF and VHF radio frequencies. This UMIB requested that all vessels in the area of the SCANDIES ROSE's last known position (LKP) maintain a sharp lookout and report all sightings to the Coast Guard.

4.1.72. No vessels responded to the UMIB.

4.1.73. At approximately 10:12 p.m., JRCC reached out to Air Station Kodiak and confirmed that they had been directed to launch the ready MH-60 by Sector Anchorage.

4.1.73.1. A flight crew was on duty and ready to fly at Air Station Kodiak and the plan was for that aircrew to conduct a helicopter sortie to search for the SCANDIES ROSE and any survivors.

4.1.73.2. The flight crew and helicopter in Kodiak were in a Bravo-0 status. The requirement is to have one helicopter in this status at Air Station Kodiak.

4.1.74. The remoteness of the accident location and the severe forecasted weather conditions along the route resulted in an increased complexity for the rescue operation. This required the crew to conduct additional flight planning and they made a decision to take on additional fuel for the helicopter to extend its range and search time when it arrived at the search location.

4.1.75. Using AIS, the watchstanders identified that the nearest vessel to the SCANDIES ROSE was the RUFF & REDDY, located approximately 28 NMs from the LKP. Command Center watchstanders then looked up the RUFF & REDDY's vessel details and found a contact number for a landside dispatcher. They contacted the dispatcher, who relayed the Coast Guard's request for the vessel to contact the Command Center.

[44] Standard for transmitting pre-defined digital messages, including distress messages, via HF, MF and VHF maritime radio systems.

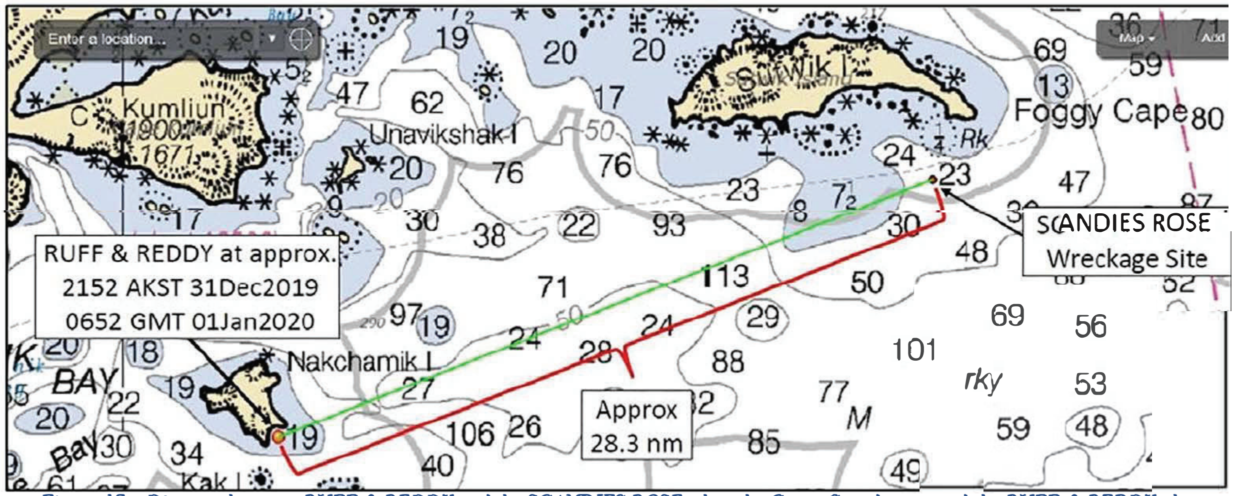

Figure 17 – Distance between RUFF & REDDY and the SCANDIES ROSE when the Coast Guard contacted the RUFF & REDDY about the possibility of assisting the SCANDIES ROSE in distress. (Source CG Exhibit 023, with markups)

4.1.76. At approximately 11:00 p.m., the RUFF & REDDY's Captain was notified by a crew person who took the call that the Coast Guard requested that he contact the Command Center. The RUFF & REDDY was anchored close to Nakchamik Island where they had been anchored since 5:00 a.m. that morning in order to shelter from the severe sea/wind conditions. Earlier in the day, between approximately 2:00 a.m. and 3:00 a.m., the Captain recalled the observed weather conditions and the resultant icing.

> *We were starting to build a little ice on the bow, northwest probably, I guess at the time, 25- to 30-knot winds. Started to accumulate ice on the bow and on the rails, and a little bit of spray on the pots there. So we decided to hold up on the lee side in Nakchamik.*[45]

4.1.77. Shortly after 11:00 p.m., the Captain of the RUFF & REDDY called the Command Center via satellite phone.

4.1.77.1. The Command Center confirmed that the SCANDIES ROSE was in distress based on the "mayday" call, and it may have sunk. Based on the information at hand, the Coast Guard asked if the RUFF & REDDY was able to assist in the distress response as the closest vessel to the LKP.

4.1.77.2. No one on the RUFF & REDDY heard the SCANDIES ROSE "mayday" call nor did they hear the UMIBs the Coast Guard was transmitting about the distress call looking for immediate assistance.

4.1.77.3. At the time of the phone call, the Captain testified about the observed weather conditions the RUFF & REDDY was experiencing

> *As we were in the lee, we weren't taking any spray. We were in the lee of the island there. Very cold, very cold, our inside was freezing up. Our windows were getting ice just from the condensation, but I didn't have an outside thermometer, so I can't say*

[45] Captain [redacted] MBI Hearing Transcript, Pg. 838

the temperatures. But obviously, they were below freezing for sure. Snow, heavy winds, heavy gusts out of the northwest, but we weren't accumulating any ice due to spray. We were in the lee of the island there, so we didn't have any.[46]

4.1.78. Coast Guard watchstanders inquired and determined that the RUFF & REDDY could not assist based on the severity of the weather. The Captain testified about his reasoning for declining the Coast Guard's request for assistance:

I declined due to weather and the conditions outside behind the lee of the island. I could not travel with a load of gear. So I declined on being able to assist.[47]

4.1.79. Between 10:46 p.m. and 11:20 p.m., Sector Anchorage Operations Unit (OU)[48] and Air Station Kodiak Operations Officer (OPS) had a conference call and discussed the need for HC-130 fixed wing aircraft support. They also discussed the anticipated need and timing of additional MH-60 helicopters and crews based on the complexity of the SAR case. Sector Anchorage OU and Air Station Kodiak OPS agreed to launch the HC-130 staged out of Joint Base Elmendorf/Richardson (JBER) located in Anchorage, AK and recommended recall of a second MH-60 crew until either the first MH-60 or HC-130 arrived on scene or located objects in the search area.

4.1.79.1. The ready HC-130 aircraft was relocated to JBER in Anchorage, AK due to weather and visibility at Air Station Kodiak. During times of inclement weather, affecting the runways in Kodiak, Air Station Kodiak relocates their ready HC-130 to JBER in Anchorage, where that aircraft assumes a Bravo-2 status. This is in accordance with the Seventeenth District (D17) SAR Plan and Air Station Kodiak Standard Operating Procedures.

4.1.79.2. The relocated HC-130 was now 417 NMs from the LKP of SCANDIES ROSE. Air Station Kodiak is located 190 NMs from the LKP of SCANDIES ROSE.

[46] Captain [redacted] MBI Hearing Transcript, Pg. 839
[47] Captain [redacted] MBI Hearing Transcript, Pg. 836
[48] The OU is a watchstanding position at a Command Center/JRCC.

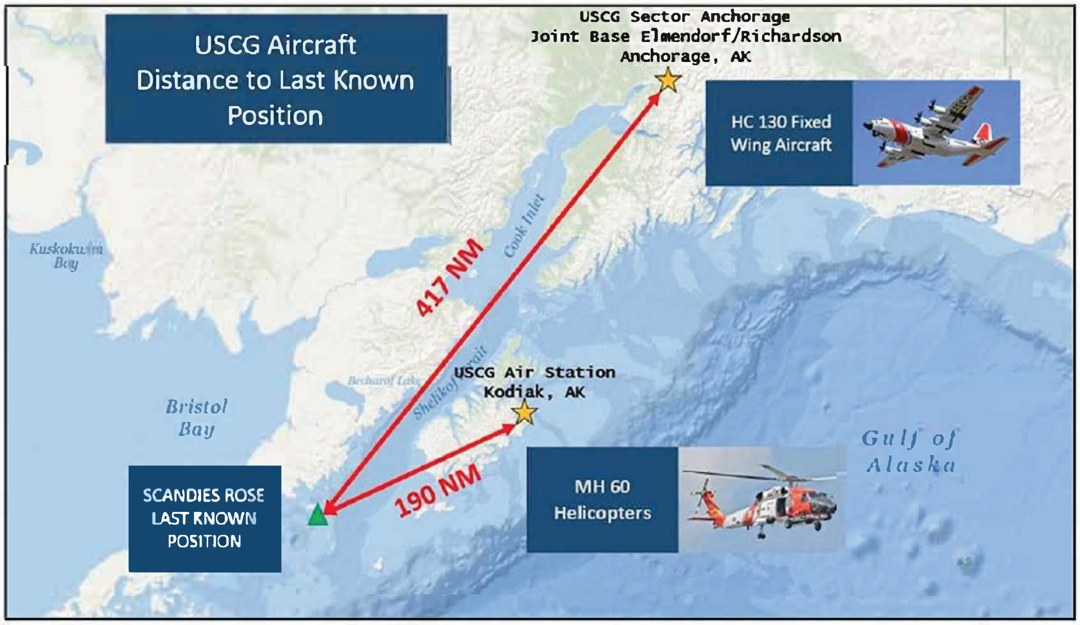

Figure 18 – Location of Coast Guard helicopters and fixed wing aircraft that responded to the SCANDIES ROSE sinking with distances to the green triangle representing the SCANDIES ROSE, last known position in nautical miles. (Source CG Exhibit 076, with markups)

4.1.79.3. The HC-130 would provide another SAR asset on scene as well as a set of eyes on the helicopter rescue operation. The HC-130 would also act as a communications relay platform due to the distance of the rescue area from communications facilities.

4.1.79.4. The holiday evening created difficulty in identifying a crew for a second MH-60 helicopter. The Air Station was not required to maintain a Bravo-2 crew and other potential crews were off duty.

4.1.80. At approximately 11:26 p.m., JRCC SMC relieved the Sector Anchorage SMC after determining that JRCC was the primary SAR AOR and the JRCC/D17 assumed tactical control of all the responding Coast Guard resources.

4.1.81. At approximately 11:44 p.m., JRCC directed the U.S. Coast Guard Cutter (CGC) MELLON, which was sheltering from the weather in Beaver Inlet near Dutch Harbor, 185 NMs from the SCANDIES ROSE's LKP, to proceed at best speed to the search area. CGC MELLON's estimated time of arrival based on weather conditions was 16.25 hours, or 4:15 p.m. January 1, 2020.

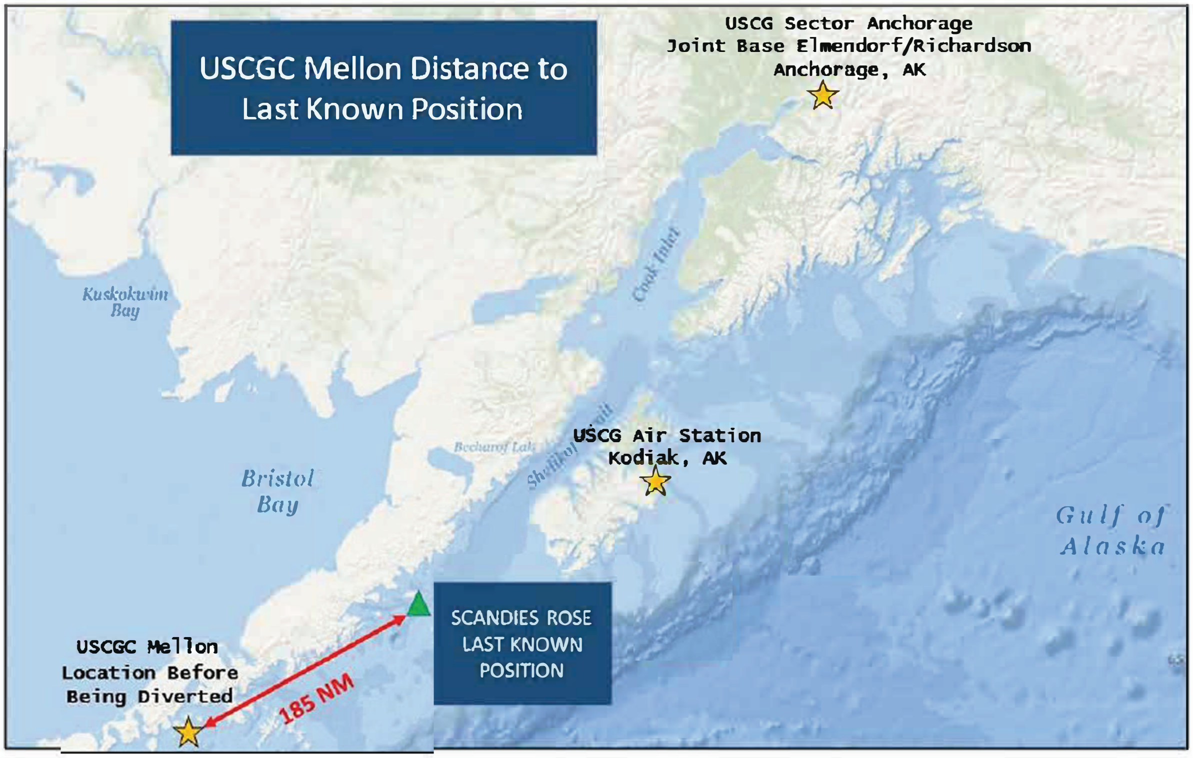

Figure 19 – Location of the CGC MELLON with distances to the green triangle representing the SCANDIES ROSE last known position in nautical miles. (Source CG Exhibit 076, with markups)

4.1.81.1. Based on the ship's logs, the CGC MELLON observed 20 kt winds from 288° True, overcast/snow, air temperature at 30° Fahrenheit, and water temperature of 36° Fahrenheit.[49]

4.1.81.2. At the time the CGC MELLON was diverted, the helicopter that was assigned to be onboard the ship for this type of deployment was not aboard. The helicopter was in Dutch Harbor, AK waiting for parts for maintenance.

4.1.82. At approximately 11:30 p.m., the CG-6038, a Coast Guard MH-60 helicopter, departed Air Station Kodiak to conduct SAR operations at the LKP of the SCANDIES ROSE.

4.1.83. At approximately 11:51 p.m., the JRCC Command Duty Officer (CDO), and Air Station Kodiak Operations Duty Officer (ODO) discussed the logistical details on refueling options and recall of crews. The ODO supported the course of action to recall a second MH-60 helicopter air crew but recommended that the second helicopter be kept on the ground at Air Station Kodiak and only be launched if the HC-130 or MH-60 crews detected survivors that required hoisting by the helicopter at the scene. JRCC CDO concurred with this recommendation.

4.1.84. On January 1, 2020, at approximately 12:55 a.m., the JRCC CDO and Air Station Kodiak ODO re-engaged on the issue of refueling locations and viable options for these

[49] CG Exhibit 133

search operations and potential survivor recovery. The intent of assessing refueling at an alternate location other than back at the Air Station was to determine if it would extend the helicopters' on scene search time and potentially improve rescue outcomes.

4.1.84.1. Although the next MH-60 helicopter crew was not yet at the Air Station, the ODO anticipated that they could have a second MH-60 helicopter airborne at 2:30 a.m. for an arrival in the search area at 4:30 a.m.

4.1.84.2. One refueling alternative was Sand Point, AK. While this was closer to the search area, the added evolution would only add 15 minutes of additional search time but would create an added risk of icing for the aircraft.

4.1.84.3. Another alternative refueling option was Sitkinak, AK, which would give the CG-6038 as much as 30 minutes of additional on scene time and would also create the same risk of icing for the aircraft.

4.1.85. The helicopter pilot described the conditions that he encountered on the flight to the last position of the SCANDIES ROSE

…We were anticipating bad weather, but I think it ended up being a lot worse than what we thought right off the bat. Once we got to the other side of the island we immediately got into about 300-foot ceilings and a half a mile to no visibility where we had to fly the aircraft between islands to get to the Shelikof Strait where -- with the headwinds and the winds that are with the terrain causes severe turbulence. So I think this was the most challenging flight of my career just getting out there.[50]

4.1.86. At approximately 1:31 a.m. January 1, 2020,[51] a HC-130 (CG-2006) took off from Joint Base Elmendorf/Richardson in Anchorage, AK to conduct joint SAR operations at the LKP of the SCANDIES ROSE. The HC-130 would act as a communications relay platform due to the distance from Kodiak.

4.1.87. At approximately 1:46 a.m., JRCC SMC and Air Station Kodiak OPS talked to each other to discuss refuel locations and availability of additional crews.

4.1.87.1. The helicopter and crew were at the Air Station and could be launched immediately.

4.1.87.2. OPS indicated a third MH-60 helicopter aircrew could be recalled and available at 8:00 a.m. that morning.

4.1.87.3. The decision was reached that Sand Point would be the primary re-fueling location for responding MH-60 helicopters.

[50] LT [redacted] MBI Hearing Transcript, Pg. 1458

[51] The date in CG Exhibit 076 says January 1, 2021, but this is a typographical error. The actual date was January 1, 2020.

4.1.87.4. At approximately 2:00 a.m., JRCC CDO directed COMMDET Kodiak to advise CG-6038 that they were to refuel in Sand Point in order to provide additional on-scene search time.

4.1.88. At approximately 2:10 a.m., the crew on board CG-6038 arrived to the vicinity of the accident site and began searching for any evidence of the SCANDIES ROSE and survivors.

4.1.89. Upon the CG-6038's arrival in the search area, observed weather conditions were seas of 20-30 ft, winds 35-50 kts, cloud ceiling varying from 200-500 ft above ground level (AGL), rain/snow, heavy at times, water temperature 38º Fahrenheit, and air temperature of 10º Fahrenheit. The pilot testified that his instruments indicated that he was making excursions vertically of up to 30 ft, confirming sea wave heights of up to 30 ft.

4.1.90. The helicopter pilot recalled how the on scene weather conditions changed as they neared the search area improving the helicopter's ability to search:

> *So once we got on scene, it was like the weather miraculously opened up to about two NMs, and we were flying towards the box, and we were under night-vision goggles the entire time, which is probably the only way we spotted the -- what looked like a flashing light at the time.*[52]

4.1.91. After several minutes, the CG-6038 crew located a SCANDIES ROSE liferaft floating on the surface of the water with the aid of the flashing exterior canopy light. The rescue swimmer was lowered via hoist down to the liferaft. No persons, survivors or otherwise, were located in the first liferaft that was examined.

4.1.92. A decision was made to keep the empty liferaft inflated in the event other, undiscovered, surviving crewmembers were able to reach it.

4.1.93. Around the same time, shortly after 2:00 a.m. (4 hours after abandoning ship), Mr. [redacted] and Mr. [redacted] saw what they believed was a vessel's mast light in the vicinity of the other liferaft.[53] With no flares left to fire, they used a flashlight from the raft's equipment pack to signal by waving the flashlight in a side-to-side motion. The rescue helicopter pilot recounted

> *And as we brought the swimmer up, the pilot in the right seat who was flying happened to see under his night-vision goggles a waving light, and it was definitely not like the normal blinking light. It was a side-to-side, so we knew it was somebody trying to signal us. So we quickly got the rescue swimmer back up into the helicopter, and we kind of like had the flight mechanic, you know, brief the swimmer on what we were doing, what we saw. And at that time, the -- even the flight mechanic was saying that he had to de-ice the rescue swimmer. It was so cold that the rescue swimmer, just from going out the door and coming back up, was covered in ice.*[54]

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[52] LT [redacted] MBI Hearing Transcript, Pg. 1460

[53] At this point, the survivors' accounts are interlaced with the precise times of the Coast Guard activities in the search and rescue operations.

[54] LT [redacted] MBI Hearing Transcript, Pg. 1461

4.1.94. At approximately 2:08 a.m., the crew of the CG-6038 commenced hoisting operations to hoist Mr. [redacted] and Mr. [redacted] out of the liferaft. The pilot testified

> *...it was probably the hardest hoisting I've ever had to do with the other pilot flying, and there was times where, I mean, a wave would hit, and all of a sudden, the raft would be out the left side of the helicopter, and we we're having to, you know, work together to kind of keep a steady hover over this raft. And somehow, we got the swimmer to the raft, and he was able to hook the survivor to himself and then bring him up.*[55]

4.1.95. At approximately 2:11 a.m., the fixed wing aircraft, CG-2006 reported arrival at the search area.

4.1.96. Shortly after that, the crew of the CG-6038 successfully recovered crewmembers [redacted] and [redacted]

4.1.97. The helicopter crew asked the survivors about the possibility that there were other survivors and began to follow protocols used to treat hypothermic survivors in the aircraft.

4.1.98. At approximately 2:26 a.m., the JRCC CDO requested Air Station ODO to direct the CG-6038 with the survivors to Sand Point, refuel the aircraft, and return to the search area to continue the search for the five remaining crew.

4.1.99. The rescue helicopter pilot talked about his decision based on the circumstances his crew was facing.

> *... we had two fuel options: it was Sand Point, which was a shorter distance, but we would've had to have fought a headwind to get there, and based on the calculations of that and then plugging in Kodiak, we determined it was the same amount of time to get back to Kodiak with the -- what we -- since we had a headwind coming out, we knew we'd have a tailwind going back. So we chose with the known fuel there that we had there and the higher level of care, we just made a quick decision to go back to Kodiak to bring the survivors back.*[56]

> 4.1.99.1. On the return trip, the Aircraft Commander made the decision to shut off the Auxiliary Power Unit (APU) which powered auxiliary equipment such as interior heaters in an effort to conserve fuel for the return trip to Kodiak.

4.1.100. At approximately 2:58 a.m., the Air Station Kodiak ODO advised the JRCC Juneau that the second MH-60, CG-6037, crew was finishing taking on additional fuel and would be airborne within 20 minutes.

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[55] LT [redacted] MBI Hearing Transcript, Pg. 1462
[56] LT [redacted] MBI Hearing Transcript, Pg. 1463

4.1.101. Using on-scene weather conditions reported back from Coast Guard aircraft, the JRCC produced different drift models for liferafts or any crewmembers who were drifting in the water.

4.1.102. Due to an error in the transposition of the coordinates into the computer modeling software Search and Rescue Optimal Planning System (SAROPS), one search model was built for an area north of Sutwik Island, which was used by the second Coast Guard helicopter, the CG-6037. The SAR Program Manager talked about that error:

> *Unfortunately, what happened was the -- in some way, it's not completely clear, but the position was passed incorrectly. And so the second set of searches were based off of that brown circle, and that's where the Coast Guard assumed the second liferaft was ...It would be, it would be very hard, based on the weather conditions that night, for a search object at this point in time to have gone around the northeast tip of Sutwik Island and end up north of Sutwik Island. I know they have these discussions on the watch floor, but from when I talked to them, they just had nothing else to base it off of, so they just went with what they had.*[57]

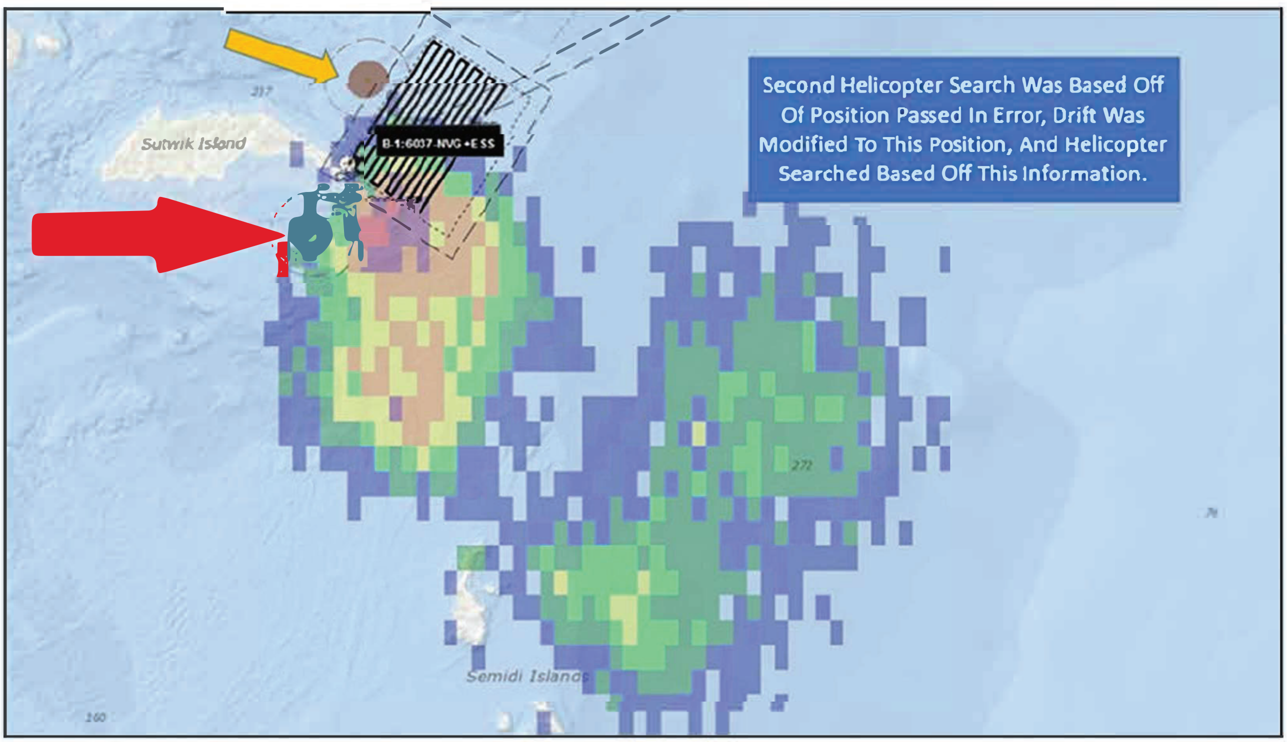

Figure 20 – Second search pattern with red arrow indicating the position of the SCANDIES ROSE from the distress radio message. Yellow arrow points to the incorrect position of the liferaft which was used as the center point of search #2. The small colored rectangles represent the computer modeling prediction of the best location for searching based on the computer drift modelling. Red and magenta colors indicate the greatest possible chance of search success based on the modeling of the weather conditions and the characteristics of the search object. (Source CG Exhibit 076, with markups)

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[57] Mr. [redacted] MBI Hearing Transcript, Pg. 1384

4.1.103. At approximately 3:38 a.m., while the CG-6038 was enroute to base with two survivors, the second helicopter, CG-6037 took off from Air Station Kodiak to continue the search for additional survivors.

4.1.104. Upon identifying the error in the liferaft assumed position during the second search, the correct coordinates were confirmed and the correct calculated positions were incorporated into the subsequent search patterns used by the search and rescue aircraft and the CGC MELLON.

4.1.105. At approximately 5:34 a.m., the second helicopter, CG-6037 arrived on scene to the search area and commenced search efforts. During the search timeframe, the aircrew experienced severe inclement weather and became mission ineffective.

4.1.106. At approximately 6:40 a.m., the helicopter with the survivors landed at Air Station Kodiak where the survivors were transferred from the helicopter to a waiting ambulance and driven to Kodiak Island Medical Center in Kodiak, AK. Both were treated for hypothermia and released later the same day, January 1, 2020.

4.1.107. At approximately 6:40 a.m., the Air Station Kodiak ODO advised the JRCC CDO that CG-6037 was returning to base due to weather and crew fatigue. The SAR Program Manager described the search conditions the second helicopter crew encountered as "pretty horrible" and continued to say that

> *Between wind and visibility, it was very hard -- and wave actions, it was very hard to see anything, and the helicopter crews went through quite a bit of fatigue on scene just to try to keep the helicopter kind of going straight line searching.*[58]

4.1.108. The JRCC CDO and SMC directed immediate recall and launch of the oncoming flight crew.

4.1.109. At approximately 7:47 a.m., Air Station Kodiak ODO advised the JRCC CDO that the first HC-130, CG-2006, had 1.5 hours remaining on scene.

4.1.110. From approximately 8:00-8:30 a.m., the third MH-60 helicopter crew reported to base and was making preparations to get airborne.

4.1.111. At approximately 8:40 a.m., the original rescue helicopter, CG-6038, was refueled and ready. It got airborne with a new flight crew and headed back to the search area to continue SAR efforts.

4.1.112. At approximately 8:54 a.m., the HC-130, CG-2006, departed the search location and began its flight back to Air Station Kodiak.

[58] Mr. [redacted] MBI Hearing Transcript, Pg. 1381

4.1.113. At approximately 9:00 a.m., a second HC-130, CG-2011, got airborne from Air Station Kodiak and headed to the search area. The CG-2011 arrived on scene at approximately 9:33 a.m.

4.1.114. From approximately 9:33 a.m. through 10:30 a.m., search units continued to search the area using the search patterns created with the search and rescue software taking into account the anticipated drift of any possible search objects such as possible survivors in the water.

4.1.115. At approximately 10:38 a.m., the CG-6038 arrived on scene and commenced search efforts in conjunction with the other search units looking for survivors. However, this helicopter was forced to end their search efforts early due to an Auxiliary Power Unit (APU) failure. At approximately 11:34 a.m., the CG-6038 left the search area and returned to Air Station Kodiak.

4.1.116. At approximately 2:26 p.m., after landing back at Air Station Kodiak and switching out rescue swimmers and aircraft, that flight crew was once again airborne in a new helicopter, the CG-6041, heading back to the search area. The CG-6041 arrived in the search area at approximately 4:19 p.m.

4.1.117. At approximately 4:15 p.m., the CGC MELLON arrived on scene in the search area to assist with search and rescue efforts and began searching using a search and rescue pattern provided by the computer software modeling based on visibility and characteristics of the search target.

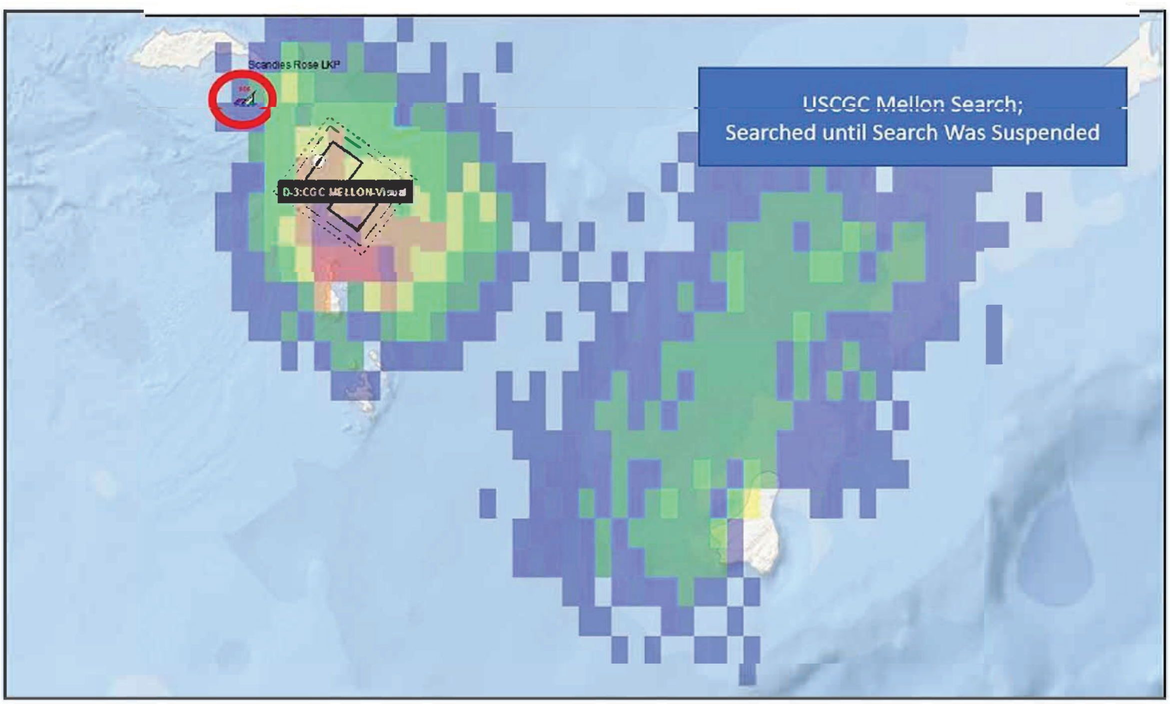

Figure 21 – Black line indicates a "creeping line" search pattern used by the CGC MELLON during the search. This visual search pattern considers the search object and visibility to provide optimum detection probability. The yellow, red and magenta colored rectangles indicate the areas with the highest probability of search target detection based on a wide array of variables. The red circle indicates the location of the SCANDIES ROSE when they called the "mayday" high frequency call to the Coast Guard. (Source CG Exhibit 076, with markups)

4.1.117.1. The CGC MELLON deployed crewmembers out onto the cutter's deck to conduct manual removal of the ice that had formed on the bow area and superstructure during its transit to the search area. The crew used tools to manually break the ice off rails, deck surfaces, and other fittings. This was done specifically during daylight hours to reduce the risk to the crew.

Figure 22 – Image of USCGC MELLON crewmembers on the bow of the vessel breaking ice shortly after arriving in the search area. The red circle shows the difference between a de-iced portion of the port side railing and the parts of the ship that had not yet been de-iced highlighting the level of ice accretion the CGC MELLON experienced as it steamed to the SCANDIES ROSE's last known position. (Source Coast Guard Exhibit 095 screen capture, with markups)

4.1.118. The CGC MELLON's logs recorded the following weather observations while on scene: 32-knot winds from 280 degrees True, 22° Fahrenheit air temperature, 36° Fahrenheit water temperature and sea and swell height of 6 ft.

4.1.119. At approximately 5:25 p.m., CG-6041, low on fuel, departed scene and returned to Air Station Kodiak.

4.1.120. At approximately 5:33 p.m., the CG-2011 departed the active search area enroute to Air Station Kodiak.

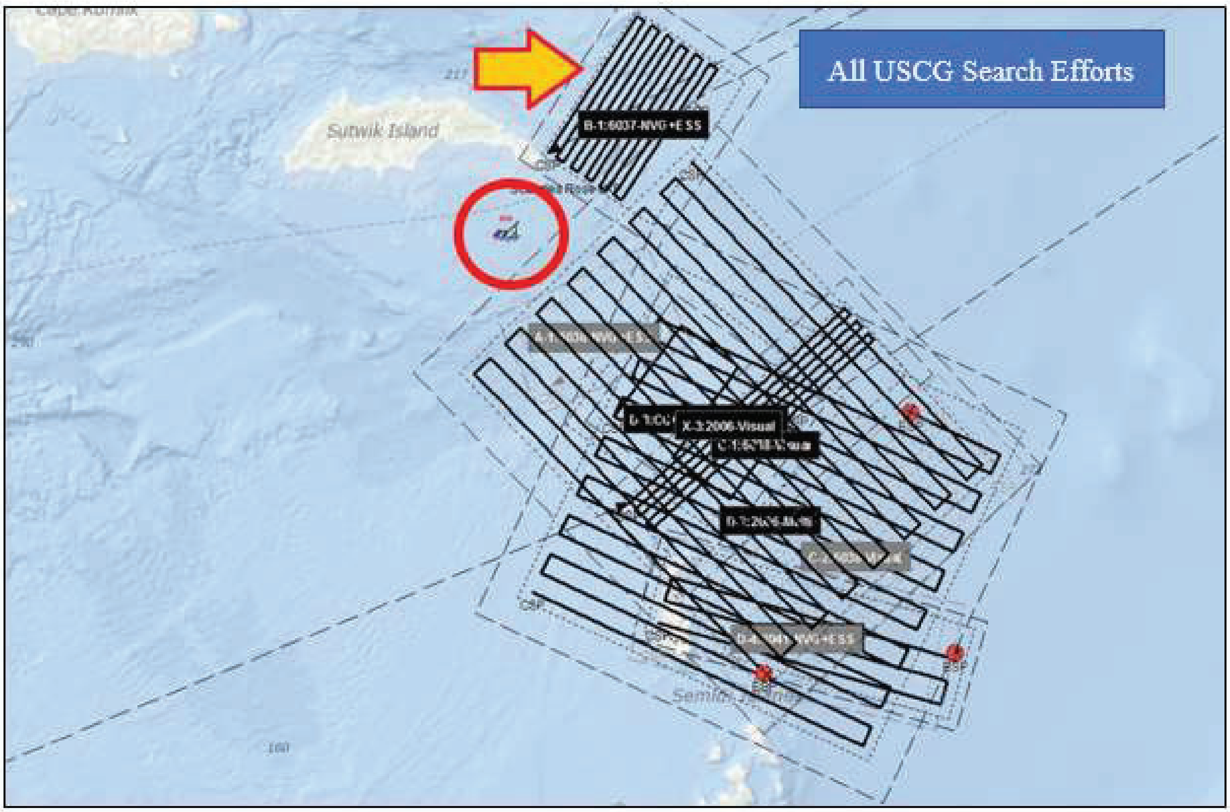

Figure 23 – Red circle indicates the position of the SCANDIES ROSE when the Captain called the Coast Guard in distress. Black lines represent the search patterns used by the aircraft and ship in the search of potential crew that were not initially rescued by the first helicopter on the scene. The yellow arrow points to the second search pattern that resulted from the error in transposing the geographic position of the liferaft that was used as a drift marker for the second search by a helicopter. (Source CG 076, with markups)

4.1.121. On January 1, 2020, at 6:08 p.m., the Coast Guard District 17 SAR Coordinator,[59] suspended the active search and rescue operations. The CGC MELLON was, subsequently, released from the search area to resume the ship's patrol operations.

4.1.122. A portion of the Coast Guard's SAR Case Review, CG Exhibit 078, summarizes the aircraft search and rescue activities:

4.1.122.1. Due to the 380-mile roundtrip transit from AIRSTA Kodiak to the search area, the on-scene endurance of responding MH-60 helicopters was expected to be approximately one hour.

4.1.122.2. AIRSTA Kodiak provided a total of four MH-60 sorties utilizing three different aircrews.

4.1.122.3. Over the 19 hour and 43 minute period from distress notification to the Active Search being Suspended (ACTSUS), there was approximately 3.5 hours of total MH-60 helicopter search effort.

[59] The SAR Coordinator is the person within the Coast Guard watchstanding organization with overall responsibility for establishing and providing SAR services and ensuring that planning for those services is properly coordinated.

4.1.122.4. A total of two HC-130 sorties were conducted, providing 15 hours of on-scene presence and communications support. HC-130s were not able to provide search coverage due to on-scene weather conditions.

4.1.122.5. There were a total of 10 searches planned with six searches completed before ACTSUS was granted.

4.1.122.6. The duration of the SAR case was 20.30 hours. In that time, a total of 781 NM^2 was searched over the course of 10.34 hours of on-scene search time.

4.2. Additional/Supporting Information:

Post-Casualty Wreckage Survey

4.2.1. Following the sinking of the SCANDIES ROSE, the owners of the vessel hired Global Diving, a marine salvor and a hydrographic survey company to oversee a project to find the vessel and document the wreck.

4.2.2. On February 9, 2020, the M/V ENDURANCE, a vessel owned and operated by Paradigm Marine, departed Kodiak harbor for the purpose of acting as an operations platform for a variety of specialized survey equipment and a Remotely Operated Vehicle (ROV). [60] The mission's objectives were to locate the SCANDIES ROSE and examine the site to determine the circumstances related to the sinking of the vessel with particular concern for the starboard side of the vessel. The person in charge of the operation in testimony stated

> *... before we left dock, I mean, it was obvious there was questions about the fabrication work that had been going on prior to the ship sailing and that that was a potential cause for her potentially to have gone down if the repair had not been done correctly or it failed. So we were -- our job was to look and see what we could see and record it as much as we possibly could, and we just couldn't get there.*[61]

4.2.3. On the morning of February 10, 2020, the ENDURANCE arrived at the SCANDIES ROSE's LKP. Using multi-beam sonar, a bathymetric survey was completed and the SCANDIES ROSE was located in about 160 feet of water at position 56º29.4682 N, 157º-2.1082 W.

[60] CG Exhibit 008

[61] Mr. [redacted] MBI Hearing Transcript, Pg. 385

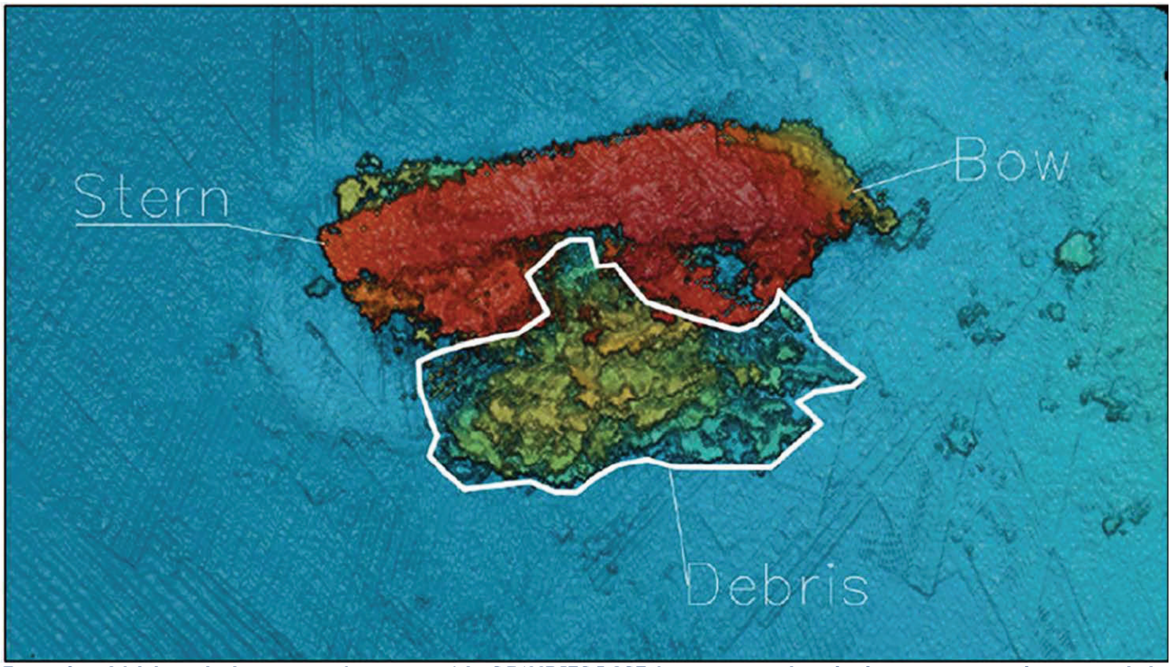

Figure 24 – Multibeam bathymetric surface image of the SCANDIES ROSE lying on its starboard side in an east-west direction with the bow pointing east. Off the deck side of the vessel is a debris field roughly 94 ft x 42 ft with height off the seafloor of approximately 20ft. (Source CG Exhibit 008, F/V SCANDIES ROSE Search and Survey Report, pg. 13)

4.2.4. The SCANDIES ROSE lies intact on her starboard side in a generally east-west direction with the bow pointing east. At the time of the ENDURANCE's arrival, a fuel oil sheen stretching 0.25 miles was observed on the water's surface. Off to the side of the vessel was a debris field roughly 92 ft x 42 ft across with a vertical height of about 20 ft off the sea floor. Buoyant fishing buoys with trailing lines still attached to the vessel extended upward to within 40 ft of the water's surface. In addition, there is a larger debris field extending to the eastern side that may contain some of the SCANDIES ROSE associated wreckage.

4.2.5. Due to winter weather and extremely strong and shifting underwater currents, a second survey by the ROV was conducted on February 13, 2020 in attempt to gain better video quality of the SCANDIES ROSE's condition and debris field. The underwater work was hampered by the collection of submerged debris including buoy lines stretching towards the surface from the vessel.

4.2.5.1. The origin of the diesel fuel sheen could not be positively identified.

4.2.5.2. A search was conducted for the EPIRB and the empty EPIRB bracket was located on the port rail aft of the wheelhouse door. The search did not locate the EPIRB.

4.2.5.3. Several of the SCANDIES ROSE's external doors were open, most notably the door leading to the accommodation spaces that was located on the after bulkhead on the starboard side and a person from the ROV team could be heard stating on the video that it appeared to have been damaged by the impact with the seafloor.

Figure 25 – After starboard side accommodation door of the SCANDIES ROSE on the after bulkhead showing damage. (CG Exhibit 008, with markup)

4.2.6. The ROV survey was unable to document the starboard side of the vessel because of the way the SCANDIES ROSE was lying on the seafloor.

4.2.7. The ROV survey indicated that there was evidence of some damage on the visible after starboard side of the vessel, including damage to the aft handrails, door, and top of the exhaust stack. The masts were missing from the vessel and located on the sea floor in proximity to the crab pots and associated gear.

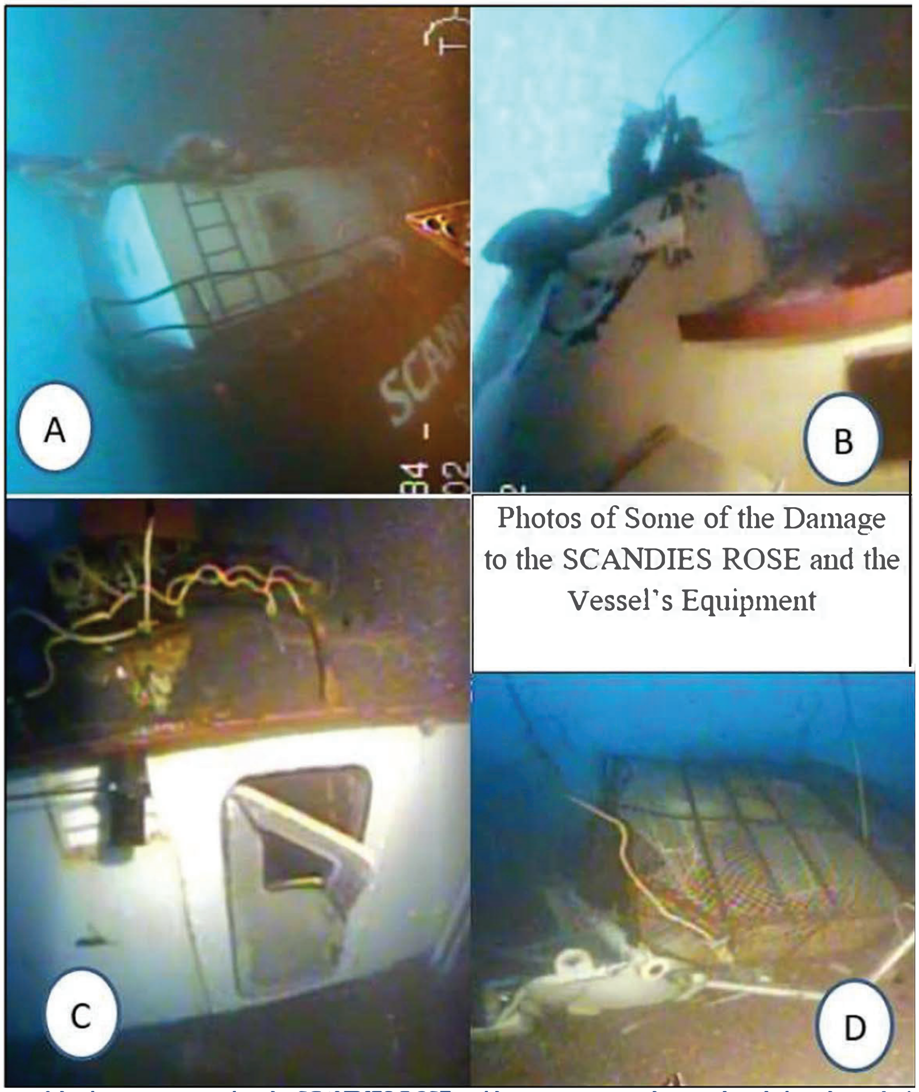

Figure 26 – Images of the damage sustained to the SCANDIES ROSE and her equipment as the vessel settled on the seabed. Image "A" shows the damage to the railings that run across the stern of the vessel. "B" indicates the damage to the top of the exhaust stack while "C" shows the damage to an external door aft from the superstructure. Finally, image" D" shows the mast and one of the large crab traps on the sea floor near the SCANDIES ROSE. (Source CG Exhibit 009 still frames, with markup)

4.2.8. The ROV footage of the SCANDIES ROSE's bottom, port side, and stern was examined to determine if there was any evidence of damage or visible defects that could have contributed to the sinking. There was no discernable evidence to support any issues in that area of examination that may have been related to the cause of the vessel sinking.

4.2.9. The ROV inspection of the wheelhouse showed what appear to be the remains of two people inside the wheelhouse. The verification and identification of the presumed deceased victims was incomplete as the ROV did not enter the wheelhouse and had limited vantage points.

4.2.10. No attempts were made to access the bridge. No other victims were located in the survey area.

4.2.11. The Coast Guard attempted to retrieve and weigh SCANDIES ROSE crab pot(s) with the assistance of another government agency. On September 23, 2020, the National Oceanic and Atmospheric Administration (NOAA) vessel OSCAR DYSON made five attempts to recover submerged pots from the SCANDIES ROSE's debris field with a grappling device. Efforts to retrieve one or more pots and gear were unsuccessful. The intention of this effort was to examine, measure and weigh an actual pot and gear from the SCANDIES ROSE.

Post-Casualty Chemical Testing

4.2.12. Per 46 CFR § 4.06-3, after any Serious Marine Incident (SMI) such as the loss of the SCANDIES ROSE, an owner is required to conduct drug and alcohol testing of all persons involved. Per regulations, a post-casualty alcohol test shall be conducted within 2 hours[62] of the casualty and a post-casualty Department of Transportation (DOT) approved drug test shall be conducted within 32 hours of the casualty.

4.2.13. Following the incident, the surviving crewmembers were not tested for alcohol because the regulatory time window for the testing had been exceeded by the time they arrived at the hospital.

4.2.14. [redacted] and [redacted] each submitted a urine sample utilizing at-home drug test kits purchased locally. The tests were brought to the hospital, but were ultimately conducted at the home of [redacted].[63] The hospital would not administer the tests as it was not in hospital protocols for this course of care. The vessel manager asked [redacted] in Kodiak to obtain test kits in an attempt to satisfy the requirements for post-casualty drug testing and she obtained two five-panel test kits. [redacted] testified about her efforts to meet the post casualty drug testing requirements

> *I did with the help of* [redacted]. *First we tried to get the hospital to do the drug testing. They wouldn't because it's not in the service of their treatment. So I asked* [redacted] *if she would go to Walmart and pick up two, you know, in-home drug screening kits and she did and to come back and ask them to take the test.*[64]

4.2.15. The test strips from each survivor's sample were observed and photographed and they were sent to the vessel manager via text message. [redacted] was negative for all tested drugs. [redacted] test indicated positive for Tetrahydrocannabinol (THC), or marijuana. However, the positive test results and the samples were not sent to an accredited lab as recommended by the manufacturer.

[62] 46 CFR 4.06-3 discusses the requirements for alcohol testing for Serious Marine Incidents (SMIs) and states that "if safety concerns directly related to the SMI prevent the alcohol testing from being conducted within two hours of the occurrence of the incident, then alcohol testing must be completed as soon as the safety concerns are addressed… alcohol testing is not required to be completed more than 8 hours after the occurrence of the SMI."
[63] [redacted], MBI Hearing Transcript, Pg. 611
[64] [redacted], MBI Hearing Transcript, Pg. 136

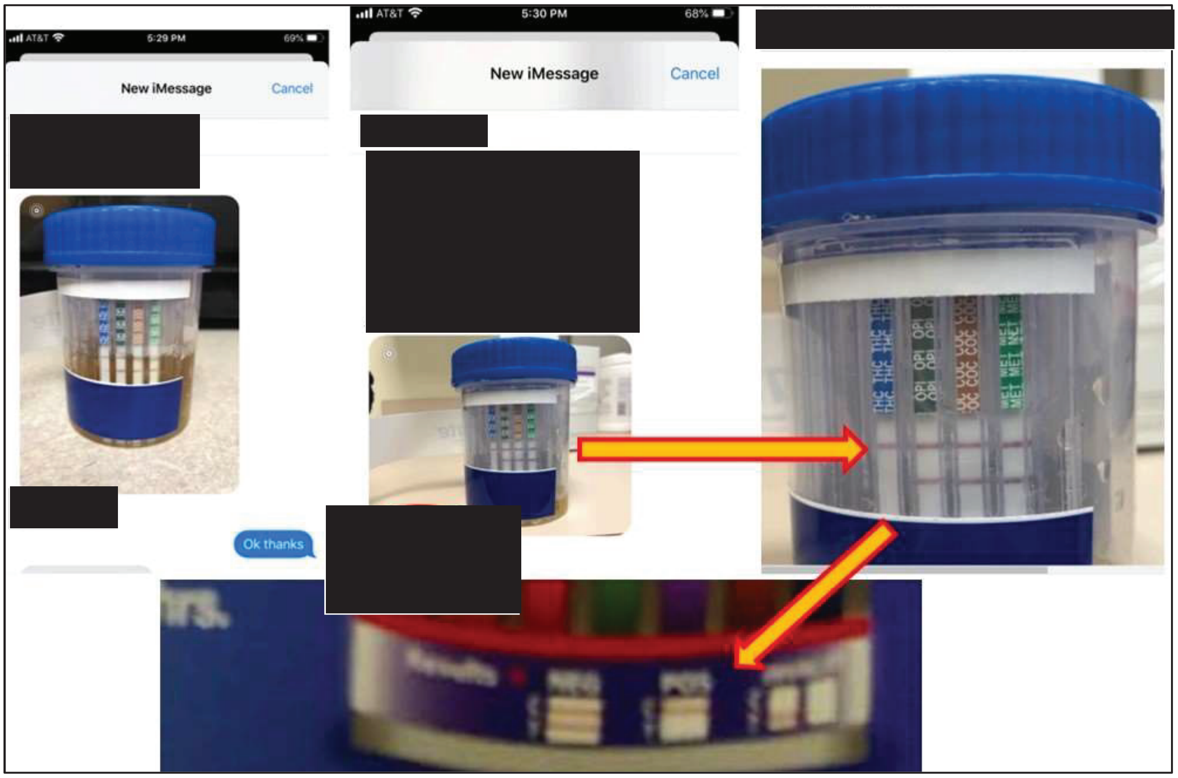

Figure 27 – Results of the post-accident drug test administered to the two survivors. The hospital staff would not drug test the survivors based on hospital protocol. As a result, [redacted] *purchased the home test kits upon request of the vessel manager and the crew submitted urine samples, the results were photographed and sent via text message to the vessel manager. The testing was not conducted by a certified lab. (Source: CG Exhibit 080, with markups)*

4.2.16. In testimony, the vessel manager talked about the results for [redacted] and the company's attempt to meet drug testing requirements after the accident.

> *Q. ...And are these the tests that were recorded to meet that post-casualty testing requirement?*
> *A. Yes.*
> *Q. Can you tell us what the results of those tests were?*
> *A.* [redacted] *was negative and* [redacted] *was positive. For THC.*
> *Q. At what point was that positive test relayed to you?*
> *A. As soon as she got them, she texted them to me.*
> *Q. And were the results ever validated by a certified lab or anything?*
> *A. No.*
> *Q. And so going back to company policy, did this test, line of testing meet company or federal requirements for post-casualty testing?*
> *A. It does not meet federal requirements, no, that's supposed to be a DOT. For us, we do whatever we can knowing that we're in an environment where our hands are a bit tied.*[65]

4.2.17. Post-accident drug testing for the survivors was not carried out under controlled conditions by a certified laboratory and a Medical Review Officer did not verify the results.

65 [redacted], MBI Hearing Transcript, Pg. 137

Drills and Crew Training Prior to Departure

4.2.18. 46 CFR 28.270—Instruction, drills, and safety orientation—are existing regulations applicable to the SCANDIES ROSE and require that "the master or individual in charge of each vessel must ensure that drills are conducted and instruction is given to each individual on board at least once each month." [redacted] had attended a drill conductor training course at Kodiak, Alaska in 2009 and was certified to perform that function.

4.2.19. Per company policy, the drill conducted on December 30, 2019 was documented on a company-approved form, signed by all crewmembers, and sent via text message to the vessel manager onshore.

4.2.20. During the investigation, both survivors misidentified the location where the EPIRB was located on the SCANDIES ROSE, stating that it was on the starboard side aft of the wheelhouse.

4.2.21. [redacted], the newest member of the crew, was the only one to physically put on the immersion suit as part of the drill and training prior to departure on December 30, 2019.[66]

Company Management

4.2.22. Scandies Rose Fishing Company LLC was the registered owner of the SCANDIES ROSE, and the management operations were based out of Bremerton, WA.

4.2.23. In 2008, the vessel was purchased from [redacted] by the current ownership. Originally, there were seven partners but shares had been bought out over the years. From 2008 to December 2019, the ownership share breakdown had been the same: Mattsen Management LLC – 50.2%, [redacted] – 30%, and [redacted] – 19.8%.

4.2.24. At the time of the accident voyage, [redacted] was in the process of buying [redacted] shares of the SCANDIES ROSE for both himself and his son, [redacted].[67]

4.2.25. [redacted] and the Captain had negotiated and agreed upon terms for the sale of 19.8% ownership held by [redacted] before the SCANDIES ROSE departed Kodiak, AK on December 30, 2019. As the SCANDIES ROSE sailed on the accident voyage, the financial transactions were beginning to take place and [redacted] had sent a down payment check to [redacted] bank. The vessel's sinking meant that the sale of the shares of the minority owner did not take place, but in testimony, [redacted] stated

> *[H]e had already made the loan arrangements with Mountain Pacific Bank. He'd send -- he'd sent the down payment down, and I'd asked him if he wanted to wait until after fishing, and he said no, he wanted to do it immediately*.[68]

[66] [redacted], MBI Hearing Transcript, Pg. 552
[67] [redacted], MBI Hearing Transcript, Pg. 165
[68] [redacted], MBI Hearing Transcript, Pg. 164

4.2.26. [redacted] spoke to both friends and family members about his plans to purchase a larger share in the SCANDIES ROSE and his desire to have more control over purchasing and decision-making.

Said he wanted complete control. He wanted to be able to make all the decisions.[69]

4.2.27. The division of roles and responsibilities for the SCANDIES ROSE was as follows:

4.2.27.1. As the majority owner, [redacted] dealt with the vessel's finances. [redacted] would also give input on fishing strategy and had the final say on major purchases and repairs authorized for the vessel. [redacted] made the final decisions on hiring and employment of vessel captains.

4.2.27.2. The minority owner was not involved in the management or operational decisions of the SCANDIES ROSE. [redacted] bought into the vessel as an investment venture and had not seen the vessel in over two years. As an insurance broker, his company had negotiated the insurance policies for the SCANDIES ROSE as well as many other fishing vessels in the industry.[70]

4.2.27.3. The captain of the vessel oversaw the operation of the vessel and made decisions while the vessel was fishing. Several captains had worked on the vessel. The captain had ultimate authority on when the SCANDIES ROSE would leave port and where the vessel would fish. The captain was in charge of the crew to maintain the vessel and effect repairs on board. The captain was also in charge of selecting and working the crew employed on board the vessel and responsible for their safety. Purchases made by the captain for the vessel were approved through the vessel manager and majority owner.

4.2.27.4. The SCANDIES ROSE's vessel manager was the company's sole shoreside full-time employee. She worked out of Bremerton, WA, and had been in this position for approximately seven years. The vessel manager was responsible for:

4.2.27.4.1. Running prospective crewmembers through the hiring process after the vessel captain had identified them. Typically, the vessel manager verified that an incoming employee's criminal background, medical screening, and drug screening met company policy.

4.2.27.4.2. The purchasing of equipment, parts, and stores for the vessel. All invoices for purchases made for the SCANDIES ROSE would go through the vessel manager.

4.2.27.4.3. Creating and maintaining a "shipyard list" that tracked repair and preventative work that needed to be completed, and parts to be ordered for the vessel's planned shipyard maintenance.

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[69] [redacted], CG Exhibit 132, Pre-Hearing Transcripts, Pg. 270
[70] [redacted], MBI Hearing Transcript, Pg. 160

4.2.27.4.4. Coordinating with third-party companies to facilitate servicing of the vessel's safety equipment and completing any paperwork associated with lifesaving equipment such as registering the EPIRB with NOAA.

4.2.28. Up until the spring of 2019, the company employed a Port Engineer. That person passed away in early 2019 and the position was vacant at the time of the accident. The duties previously held by the person in this position were parsed out amongst the vessel manager and the majority owner but the vessel manager essentially took over most of the port engineer responsibilities despite her lack of marine engineering background. In testimony, the vessel manager described the role and responsibilities

Or we have had a port engineer at times, you know… he would be the primary mechanic/engineer who was in my employ, who would guide the surveyor if there was any need to say can you look at this, you know, is there -- we think we might have an issue here.[71]

The majority owner described the Port Engineer's duties in this manner

Well, I think it was hauled out in 2018 because we had to --there was something going on with the generator or the motor and I don't remember because we had -- our port engineer … he really handled those sorts of things.[72]

4.2.29. With respect to the starboard side overboard chutes, one welding company performed work that was later redone after [redacted] complained to management about leakage into the starboard pipe alley from faulty welds. In testimony, the majority owner was asked about the supervision of that work to ensure the quality of the repairs.

Q. Is it typical for Mattsen Management or for the owners of the SCANDIES ROSE to ask for nondestructive testing or essentially for quality assurance work to be done on welding work? Do you have to ask specifically or is that --
A. We do have to ask specifically.
Q. Okay.
A. And unfortunately, and that was a detail that I didn't do.[73]

<u>Company Drug and Alcohol Policies</u>

4.2.30. The SCANDIES ROSE, as well as other vessels operating under Mattsen Management, followed a specific alcohol and drug use/abuse policy that prohibited the use of drugs or alcohol while onboard the vessel.

4.2.31. Upon securing employment with the company, each crewmember was required to sign a document acknowledging this policy and submit to a pre-employment test. This was typically completed before the crewmember boarded the vessel. [redacted] completed a

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[71] [redacted], MBI Hearing Transcript, Pg. 54
[72] [redacted], MBI Hearing Transcript, Pg. 127
[73] [redacted], MBI Hearing Transcript, Pg. 143

pre-employment drug test using a “home use” urinalysis test kit supplied by the vessel’s operator after his arrival in Kodiak.[74]

4.2.32. As part of the company policy, the vessel operator or a company representative could require an employee to submit to a random drug test at any time.

4.2.33. Upon being hired, [redacted] had to fill out employment paperwork and was directed to submit to a pre-employment drug test. The test results were certified before he came aboard.

4.2.33.1. This pre-employment drug test submitted on December 23, 2019 was negative for all drugs on the test panel.[75]

4.2.34. The last crewman to join the vessel, [redacted], submitted to a drug the test onboard with a commercially available urinalysis test kit. The Captain sent text messages and photos of the test strip on the sample container to the vessel manager.

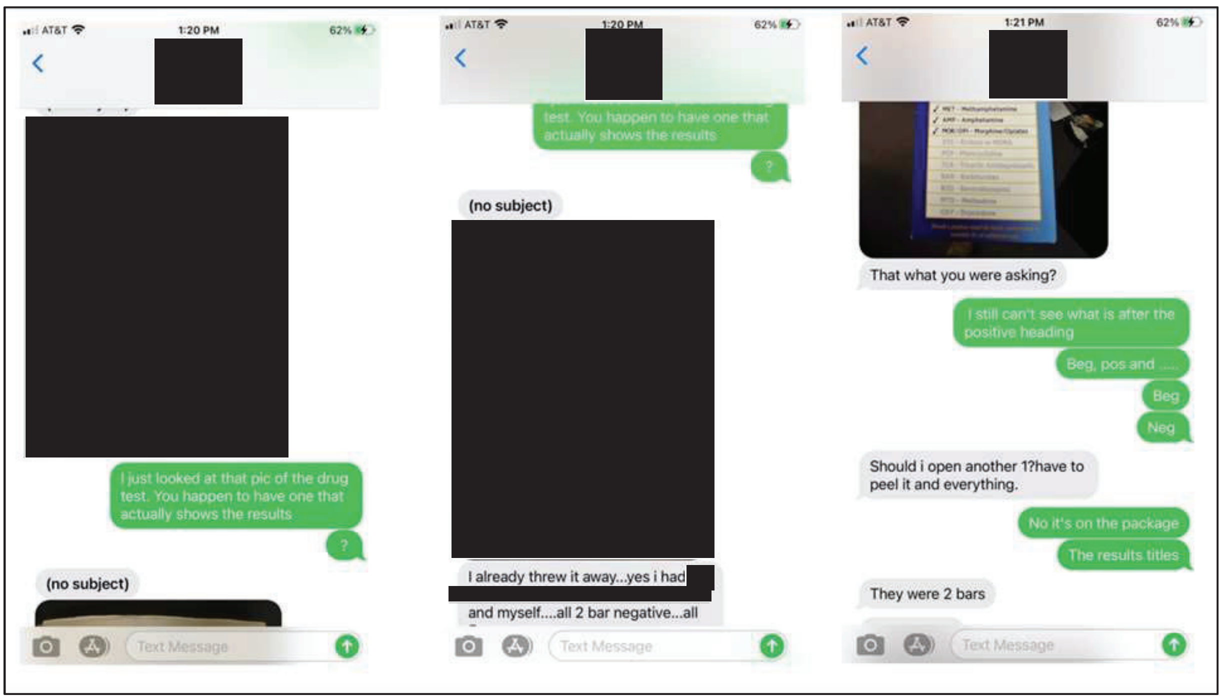

Figure 28 – Series of text messages regarding the onboard drug testing for [redacted]*. (Source: CG Exhibit 081)*

4.2.35. The Captain of the SCANDIES ROSE texted a picture of [redacted] home test kit results to the vessel manager prior to sailing. The subsequent text string showed that [redacted] was unable verify the results of the test kit and replied “I just looked at that pic of the drug test. You happen to have one that actually shows the results.” [redacted] replied “I already threw it away…yes I had [redacted] and myself…all 2 bar negative… all 5.” He further went on to say, “Ya i made sure to have witnesses.”

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[74] [redacted], MBI Hearing Transcript, Pg. 125

[75] [redacted], MBI Hearing Transcript, Pg. 532

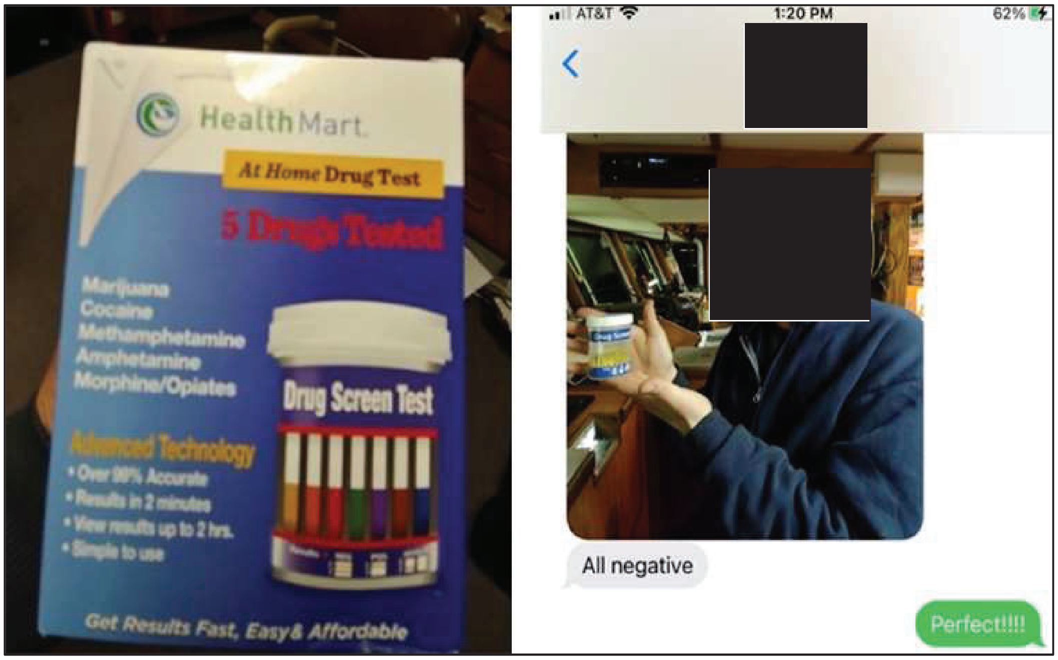

Figure 29 – On the left is the box that contained the home drug test kit used onboard the SCANDIES ROSE to test [redacted]*. On the right is a photo of* [redacted] *holding up the test sample, in this image the results of the tests are not visible. (Source: CG Exhibit 081)*

<u>SCANDIES ROSE Operational Management</u>

4.2.36. Prior to being offered employment aboard the SCANDIES ROSE, the Captain would identify prospective crew for the vessel and provide those names to the vessel manager for follow-up.

4.2.36.1. The Captain would sometimes ask other fishing vessel captains for their opinion on a particular person that was under consideration for work on the SCANDIES ROSE for a particular type of operation, such as fishing or tendering. The Captain of the vessel would then refer prospective crew to the vessel manager who would determine suitability and obtain a criminal background check, medical questionnaires, and coordinate pre-employment drug testing. Typically, this was accomplished prior to a crewmember arriving at the vessel.

4.2.36.2. Each crewmember was an independent contractor and signed a contract with Scandies Rose Fishing Company LLC. They each completed paperwork such as consent to release medical records, routing information for funds, drug and alcohol policy acknowledgment forms, sexual harassment policy, and other documents. In addition to other provisions in the employment contract, the contract stipulated the position the crew person would fill and discharge provisions listing conditions for termination. There was a clause on the use and care of the survival suit and the circumstances for drug and alcohol testing.

4.2.36.3. Each of the crew who sailed on the SCANDIES ROSE's accident voyage had a signed employment contract for the Bering Sea cod and opilio crab seasons prior to departure on December 30, 2019. Those contracts also stipulated the shares of the catch in terms of percentages that would be impacted by vessel operating expenses.

4.2.36.4. Shares for the crew translated into the payment that they would receive at the end of the season and varied by position on board. The final pay would be based on the percentage of the total fish caught, minus expenses the vessel accrued during that term or season.[76]

4.2.37. None of the crewpersons aboard the vessel during the accident voyage held or had, at any time, a Coast Guard Merchant Mariner Credential (MMC),[77] nor was such a document required by company policy, state, or federal regulations. This was due to the SCANDIES ROSE being under 200 gross tons (GT). On documented commercial fishing vessels 200 GT or greater which operate beyond the Boundary Line,[78] the master, mate, and engineers must have appropriate Coast Guard credentials for the tonnage, horsepower, etc. of the vessel on which they are serving.

4.2.38. The SCANDIES ROSE crew was composed of the Captain and six additional crew for the accident voyage.

4.2.39. The deck hands' duties onboard included preparing gear for the crabbing and cod fishing, operating equipment to deploy and retrieve crab pots and associated gear, mending and repairing pots and gear, participating in safety drills, and standing navigation watches. For the accident voyage, navigation watches were reportedly one hour shifts.

4.2.40. One crewman acted as the vessel's engineer. He was responsible for the operation and maintenance of mechanical equipment onboard the vessel. The engineer, Mr. [redacted] had worked aboard the SCANDIES ROSE since 2017.

4.2.41. Mr. [redacted] acted as a "deck boss" who, under the direction of Captain [redacted] supervised the work on deck of the vessel, made sure the fishing gear was ready for use, and mustered and supervised the crew when it was time to work on deck.

4.2.42. The SCANDIES ROSE had a permanent Captain and he was in charge on the accident voyage. Crews were assembled based on their previous work on the vessel or identified as potential crewmembers based on other fishing work and they were offered employment for the fishing season.

4.2.43. The SCANDIES ROSE departed Kodiak on the accident voyage with a "pot stack" consisting of approximately 195 combination cod/crab pots.[79] Accounts varied as to the number of pots aboard the vessel, the total number anywhere from between 192 and 198. The stability document dated 2019 indicated that the maximum load of typical 835-pound crab pots would be 208. This loading configuration took up all of the vessel's main deck space. Once loaded on the vessel, the pots were secured with chains running across the top of the

[76] CG Exhibit 017
[77] A MMC is a document issued by the Coast Guard to commercial mariners.
[78] Boundary lines are defined in 46 CFR Part 7. "Seaward" means you are beyond the boundary line and in Near Coastal waters. The "boundary line" is generally a line drawn between the most seaward points of land at the entrances to rivers, harbors, bays, etc. This line will vary by geographic location.
[79] Commonly referred to as "crab pots," combination pots can be used to harvest fish, such as cod.

stack from side to side of the vessel. Tension was applied to the chains with chain binders to secure the load.

4.2.44. The 2019 stability instruction called for 168 pots when all three fish holds were full and, in that case, the forward wing tanks were to be empty.

4.2.45. The pot stack on the SCANDIES ROSE for the accident voyage was **not** configured with alleyways fore and aft on the vessel. Alleyways through the pot stack provide access to the anchor handling equipment, observing ice accumulation forward, and removal of that ice as well as other important vessel functions. Not having these alleyways, the crew would have to go over the top of the pot stack or move forward alongside the vessel's bulwarks if they desired to access the forward part of the vessel.

4.2.46. For the accident voyage, the vessel was loaded so that the pot stack along the vessel's starboard side was one tier of pots lower than the rest of the pot stack. This allowed for a limited segment of visibility forward along the starboard side.

4.2.47. From the wheelhouse, the crew could not see the forward side of the stack of pots. They also could not see the interior of the pots up forward at a distance of approximately 60 ft from the wheelhouse.

4.2.48. Estimates of ice accumulation on the vessel and the pots were made by the crew from the inside the wheelhouse of the vessel. The only bridge windows that could be seen out of were the two directly in front of the starboard helm station which had heating elements installed. The other windows did not have heating elements and were glazed with a coating of ice making it difficult to see out of them. To accurately assess the accumulation of ice on the forward part of the vessel would require leaving the wheelhouse and going forward to accurately observe the accumulation of ice on the vessel and the pots.

Figure 30 – Arrows indicate the general route a crewmember would have to take to climb up to the top of the pot stack and then go forward to do a full assessment of the ice accumulation on the accident voyage. (Source CG Exhibit 014, with markups)

4.2.49. Mr. [redacted] provided the following information regarding his observation of the ice accumulation on the vessel:

Q. Do you know if anybody ever physically went out on the forward decks to look at the ice deck to look at the ice and how bad it was, or were all these observations made from the bridge?
A. From the bridge. Because we didn't have an alleyway or some -- you know, so you'd have to climb over the stack and go down there. And (expletive), now that I'm thinking about it, I (expletive) — I wanted to go up there, but it just was, like, real cold out there. And you know, we were taking (expletive) water over the house, so I didn't want to go out there walking on the pots and then get smacked with a wave and (expletive) be all wet. So in hindsight, I kind of maybe wish I would have.[80]

4.2.50. The SCANDIES ROSE did not place tarps over the stack of pots.

Managing Owner's Duties and Responsibilities

4.2.51. The Scandies Rose Fishing Company LLC managed the vessel and generally handled the payroll, repairs, acquisition of supplies, insurance, fuel and consumables, permitting, manning and other typical vessel management functions.

4.2.52. United States Code (USC) and federal regulations implemented in Title 46 USC §8304 and Title 46 CFR 15.1111 contain a provision which details the requirements for watch standing and balancing the operational needs of a vessel with the need to mitigate the risks associated with fatigue and rest requirements. Based on the characteristics and service of the SCANDIES ROSE, that vessel was exempt from those requirements.

(a) Except as noted in paragraphs (a)(1) and (2) of this section, the regulations in this subpart apply to seagoing vessels as defined in § 10.107 of this subchapter.
(1) The following vessels are exempt from application of the STCW[81] *Convention:*
(i) Fishing vessels as defined in 46 U.S.C. 2101(11)(a).
(ii) Fishing vessels used as fish-tender vessels as defined in 46 U.S.C. 2101(11)(c)…….)[82]

4.2.53. The company did not have any written or verbal company policies relating to work hours to reduce the considerable safety risks associated with fatigue. The managing owner left the day-to-day operations of the vessel up to the Captain of the SCANDIES ROSE. In port, prior to departure the crew worked long hours preparing the vessel for sea. This included heavy manual labor such as stacking and securing the pots onboard the vessel. Based on survivor testimony, the Captain of the vessel instituted a watch schedule for the accident voyage that had him standing 6-hour watches and the other five crew persons each standing roughly a one-hour watch and then the rotation would begin again.

[80] Mr. [redacted] CG Exhibit 132, Pre-Hearing Transcript, Pg. 163
[81] "STCW" stands for Standards of Training, Certification and Watchkeeping for Seafarers.
[82] 46 CFR § 15.1101 General

Crew Experience and Familiarity with the SCANDIES ROSE

4.2.54. Captain [redacted] had 45 years of fishing experience, with approximately 40 years of experience as an operator/captain of various fishing vessels in the Gulf of Alaska and the Bering Sea.

4.2.54.1. In 2009, Captain [redacted] assumed the role of the SCANDIES ROSE captain full time. There are instances where other captains took over the operation of the vessel, such as the transit voyage in 2019 from the Seattle area back up to Alaska after the vessel had a shipyard period. However, the majority of the time, Captain [redacted] fished the boat as Captain and was a key decision maker.

4.2.54.2. In February 2009, the Captain attended training and received certification for the Alaska Marine Safety Education Association (AMSEA) Drill Conductor course, with a total 12 hours of instruction. This certification does not expire and regulations require that one person must be onboard with that certification to conduct drills and training for the vessel. This onboard training is intended to familiarize the crew with the vessel's safety equipment and its use prior to departing for sea.

4.2.54.3. The Captain conducted the required training and drills on December 30, 2019 in the evening prior to departure and these drills were described by former crewmembers as "thorough." During the MBI hearing, the following testimony was provided by a former crewmember regarding his observations of Captain [redacted] knowledge and effort with respect to training and drills

Q. …Based on your experience fishing, with regards to drills, what's your experience on the different vessels that you've worked on in regards to drills in donning of immersion suits?
A. As far as information covered versus some of the other boats I've been on, [redacted] *was pretty thorough.*[83]

Another more recent crewmember's testimony confirmed that drills were conducted onboard the SCANDIES ROSE

A. …We did safety drills. We'd all meet in the wheelhouse and we did, you know, all -- we all tried on the life suits and we did it until we got it -- our life suits on under a minute. And then we also went over the liferaft, you know, we made sure that we checked all the liferafts. ...And then we also went on what procedures of the radio, whenever there would be an emergency, how we would call out, who would call out, and we also -- there was a -- for each job, there was a kind of a primary and a secondary person of like this person is going to be a guy who does it, but if this guy can't, this person is going to be the one that does it. And there was, for everything from the radio to if someone would go overboard, who would be the person to try to retrieve them and how that would all work.[84]

[83] Mr. [redacted] MBI Hearing Transcript, Pg. 705
[84] Mr. [redacted] MBI Hearing Transcript, Pg. 730

4.2.54.4. Captain [redacted] was described by many peers in the industry as a "very, very good fisherman." A former crew person explained

> *Well, [redacted] had been around a long time, you know, fishing his whole life… I mean, as far as breaking ice or mechanical things, he was -- [redacted] had a very good feel for that boat I always felt. He knew just how to, how to push her and, you know, when to pull back on the reins, I guess, so to speak.*[85]

4.2.55. Crewmember [redacted] started working on board the SCANDIES ROSE in 2017.

4.2.55.1. Mr. [redacted] was hired as a deckhand as well and, in addition, he was responsible to maintain the vessel's engineering equipment and machinery, transferring fuel, and maintaining the engine room and fuel logs.

4.2.55.2. A former crew person described Mr. [redacted] when testifying

> *Yeah, his experience was -- I mean, he had been fishing for nearly 30 years. [redacted] was a very, very competent deckhand and as well as an engineer…Yeah, he was a solid deckhand, very competent mechanic.*[86]

4.2.56. Crewmember [redacted] was filling the "deck boss" role on the SCANDIES ROSE. He had been commercially fishing for approximately 20 years and had been aboard the SCANDIES ROSE since 2014. As the "deck boss," he was in charge of the general work on deck working under the direct supervision of the Captain.

4.2.56.1. A former crewmember described Mr. [redacted]

> [redacted] *had been fishing a long time also, 20 years, mostly smaller boats. He had fished Dungeness crab off the coast for many years. And he had worked on the New Venture,* [redacted] *and* [redacted] *other boats, had fished cod and brown crab on the New Venture prior to coming over and fishing opilios on the SCANDIES ROSE.* [redacted] *was a solid deckhand, a little goofy, lighthearted, but now it comes from -- that fisherman -- he was a good deckhand*.[87]

4.2.57. Crewmember [redacted] had fished on the vessel for the 2019 king crab (fishery) season and on the accident voyage he was serving as cook and deckhand.

4.2.58. Crewmember [redacted] had approximately 10 years of commercial fishing experience. He had been fishing onboard the SCANDIES ROSE and other fishing vessels with close ties to the vessel for about 8 years.

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[85] Mr. [redacted] MBI Hearing Transcript, Pg. 694
[86] Mr. [redacted] MBI Hearing Transcript, Pg. 692
[87] Mr. [redacted] MBI Hearing Transcript, Pg. 692

4.2.59. Mr. [redacted] has approximately 12 years of commercial fishing experience where he had filled several positions including operating a vessel. This was his first experience working onboard the SCANDIES ROSE.

4.2.59.1. Mr. [redacted] in testimony, stated that he had taken an Able Seaman's and/or a course for a 100-ton Master's license at some point but did not complete the process to receive his Coast Guard issued credential. There is no record of a credential or license issued to Mr. [redacted] in the Coast Guard's Marine Information Safety & Law Enforcement (MISLE) database.[88]

4.2.59.2. Prior to commercial crabbing and fishing in Alaska, Mr. [redacted] was employed in the sport fishing industry on charter vessels and on commercial fishing vessels involved in the squid fishery in southern California.

4.2.59.3. Mr. [redacted] experience with fishing in Alaska included drift netting in Bristol Bay, crabbing for red crab, opilio crab, and fishing pot cod.

4.2.59.4. Mr. [redacted] stated the he had attended various types of marine training throughout his career such as advanced firefighting and CPR/first aid. He also testified that he had completed training to prepare him in getting an Able-bodied Seamen (AB) ticket or a 100-ton Master license.

4.2.59.5. Mr. [redacted] had some previous experience sailing on aft house crabbing vessels, having sailed on the F/V WIZARD for one season. He had more experience working on vessels configured with the superstructure or house up forward on the vessel.

4.2.59.6. Mr. [redacted] had previous experience working with Mr. [redacted] prior to their work on the SCANDIES ROSE. Mr. [redacted] and Mr. [redacted] previously sailed on the F/V WESTERN MARINER together.

4.2.59.7. Upon being hired, Mr. [redacted] role was designated as a deckhand. Mr. [redacted] joined the vessel on December 27, 2019, three days prior to departure.

4.2.59.8. Mr. [redacted] approached Captain [redacted] about employment onboard the SCANDIES ROSE for this season.[89] According to the vessel manager, Mr. [redacted] received a recommendation from a previous employer.[90]

4.2.60. Crewmember [redacted] has approximately 20 years of commercial fishing experience.

4.2.60.1. Mr. [redacted] started fishing from the age of 11. He began fishing for crab in 2000.

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[88] MISLE is a Coast Guard database for tracking vessel related activities for a range of operations, ranging from vessel exams to law enforcement boardings to involvement with search and rescue incidents.

[89] Mr. [redacted] MBI Hearing Transcript, Pg. 530

[90] Ms. [redacted] MBI Hearing Transcript, Pg. 146

4.2.60.2. Mr. [redacted] has previous experience with trawling, salmon fishing, and salmon tendering.

4.2.60.3. Mr. [redacted] stated that he had some experience working on the F/V PATRICIA LEE, a vessel he noted as a “sister vessel” to the SCANDIES ROSE.

4.2.60.4. Mr. [redacted] joined the vessel on December 29, 2019, the day before departure, and this was his first time working on board the SCANDIES ROSE.[91]

4.2.60.5. Mr. [redacted] indicated that he received a phone call from Mr. [redacted] and was told about the employment opportunity on the SCANDIES ROSE. Captain [redacted] had never previously worked with Mr. [redacted] but he offered him the job on the SCANDIES ROSE for the season.

Watchstanding Arrangements Onboard the SCANDIES ROSE

4.2.61. The Captain set the at-sea watch schedule. On other voyages, there were times where the watch periods for the crew were one and a half hour watches with the engineer excluded from the watch schedule. On the accident voyage, the survivors testified that all crew stood a one-hour watch with the exception of the Captain, who stood a six-hour watch turn.

4.2.61.1. The rotation of the crew was described by survivors as follows: After the Captain, Mr. [redacted] took over, followed by Mr. [redacted] Mr. [redacted] Mr. [redacted] Mr. [redacted] and then Mr. [redacted][92]

4.2.61.2. The two most recent hires, the survivors, were experienced in the operation of commercial fishing vessels from the standpoint of standing a navigational watch at sea. Mr. [redacted] a former member of the crew who left the vessel just before the departure, stated that he had been given some level of training or verbal instruction on what was expected of him while standing watch. That former crewmember stated:

> *Yes. I was briefed essentially on just the, you know, the function of each computer and the GPS and the autopilot and also the radio and the -- just there was, you know, the alarm system that was directly behind, behind you to your left, maybe five feet away, and I was instructed that, you know, if anything would happen to -- if anything would happen then right away to pull that if it was an emergency*.[93]

4.2.61.3. There is no copy of the written standing orders from the Captain for the accident voyage, however, figure 31, below, is a copy of standing orders previously used by Captain [redacted] on the vessel.

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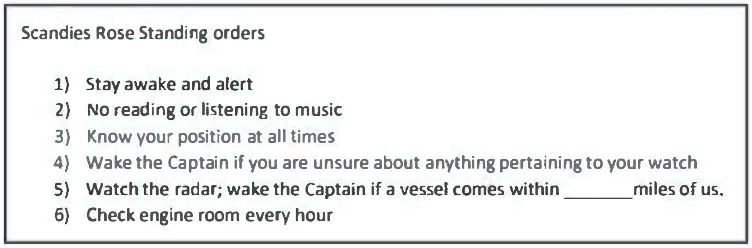
[91] Mr. [redacted] CG Exhibit 132, Pre-Hearing Transcript, Pg. 70
[92] CG Exhibit 132, Combined Pre-Hearing Transcript, Pg. 161
[93] Mr. [redacted] MBI Hearing Transcript, Pg. 713


Scandies Rose Standing orders

1) Stay awake and alert
2) No reading or listening to music
3) Know your position at all times
4) Wake the Captain if you are unsure about anything pertaining to your watch
5) Watch the radar; wake the Captain if a vessel comes within _______miles of us.
6) Check engine room every hour

Figure 31 – Image of document provided as an example of a typical set of Standing Orders for the SCANDIES ROSE. This was a version used from a previous voyage on an undetermined date. (Source CG Exhibit 019)

4.2.61.4. Typically, nearing the completion of a navigational watch, crewmembers would use the house phone to call the stateroom of the next person scheduled for watch to alert them that it was time for watch relief. Once the relief had been briefed, the off watch crew would be required to conduct a round of the engine room to make sure that there were no obvious problems such as flooding, leaking oil, or any other problems in that space. After that, the crew could occupy their time as they saw fit during the trip.

Vessel Layout

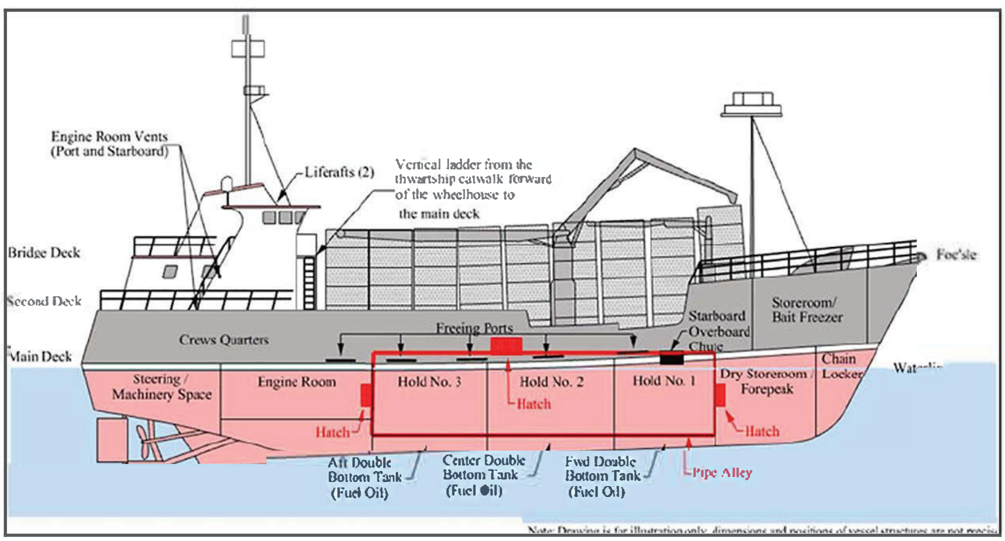


Figure 32 – This is the starboard outboard profile of the SCANDIES ROSE with key features of the vessel identified. The large pipe alley running down the starboard side and its associated components are shown in red for clarity. There is another pipe alley on the other side of the vessel. (Source Coast Guard)

Vessel History, Maintenance, & Material Condition

4.2.62. On October 13, 1978, the F/V ENTERPRISE was delivered by Bender Shipbuilding in Mobile, AL. The 116.6 foot, 195 GT vessel was constructed of 3/8-inch steel hull plate as hull number #47.

4.2.63. In the 1980s, the vessel experienced a fire. There is no documentation of this in the Coast Guard's MISLE database, but the Condition and Valuation Survey lists this event in the vessel repair or modification history section and that document reports that the vessel's superstructure was rebuilt.[94]

4.2.64. In 1988, arrangements were made for a stability assessment for the vessel and calculations were done by a Naval Architect, Professional Engineer (PE) Mr. [redacted] The Naval Architect conducted the stability assessment and the vessel was issued its first SCANDIES ROSE stability instruction. The stability instruction indicated that the inclined stability test was conducted in Seattle, WA on August 28, 1988.

4.2.65. The general description section of the 2019 Condition and Valuation Survey describes a modification that took place in 1995; however, the history section of repairs of the same report does not contain any amplifying data on that modification. There is no documentation of these modifications to the vessel in the Coast Guard's MISLE database.

4.2.66. Existing regulations did not require fishing vessels like the SCANDIES ROSE to conduct any kind of hull testing to identify hull wastage or thinning on the vessel's steel hull.

4.2.66.1. In April 2003, limited audio gauging was carried out by the same surveyor who conducted the Condition and Valuation Surveys in order to determine the hull's thickness. The audio gauging testing was done in ninety-seven places in the hull. The surveyor stated in the valuation and condition reports, that "based on the results of the gauging, the hull is in very good condition."[95]

4.2.67. In 2010, the sewage tank at the starboard stern of the vessel was replaced. The external hull plating that made up a portion of the sewage holding tank was replaced after the tank was fitted inside the hull. The sewage tank design was changed and converted to an independent internal tank that did not share any external portions of the SCANDIES ROSE's hull.

4.2.68. In 2012, audio gauging was conducted in the vessel's three double-bottom fuel tanks. Some pitting was found in the after tank and repaired by filling the pits with weld material.[96]

4.2.69. According to the Marine Surveyor who conducted a significant number of the vessel's surveys, the reason he stopped measuring the hull's thickness (audio gauging) was because he "decided he was just getting too old for this stuff" as this type of work required spending time on his back in wet conditions under the vessel in dry dock.[97]

4.2.70. Hull repairs were made to the vessel's two starboard waste chutes in mid- to late-April 2019 by Aztec Welding, which included closing off the after waste chute on the starboard side. Figure 35, below, shows communication from the Captain to the vessel manager indicating that the crew identified leakage in the void space during the previous

[94] CG Exhibit 004
[95] CG Exhibit 004, Pg. 38
[96] CG Exhibit 004, Pg. 38
[97] Captain [redacted] MBI Hearing Transcript, Pg. 305

winter (presumably during the 2018/2019 fishery). The crew mitigated this water intrusion by applying a large amount commercial underwater epoxy to the leaking welds in an attempt to stop the leaks.[98]

4.2.71. At the time of the sinking, the SCANDIES ROSE had two active waste chutes, one on the port side and one on the starboard side. The two steel chutes were used to discharge by-catch or other unwanted material brought onboard while fishing. The chutes ran from the main deck, down through the pipe alley voids on either side of the vessel and then passed thru the side of the hull, slightly above the waterline. When the vessel was underway or fishing, these chutes would be exposed to constant wave action and the corrosive effects of the salt water. During the period between April 15 and April 26, 2019, the starboard fore and aft chutes were attended to while the SCANDIES ROSE was at the dock while in the Seattle, WA area. The starboard side forward chute was repaired with "doublers"[99] and the aft chute was closed off. This work was performed by Aztec Marine LLC, a commercial welding contractor, who was hired to weld steel plate over sections of deteriorated steel that made up the chutes. The welders who performed the work were not certified marine welders.

Figure 33 - Starboard side of the SCANDIES ROSE prior to the repair of the overboard chutes, taken several years earlier. Yellow circles indicate two chutes, one forward and one aft through the side shell plating and into the starboard pipe alley. (Source Mr. [redacted] ©, with permission and with Coast Guard mark up)

Figure 34 – SCANDIES ROSE on the blocks May 2019 at Lovric's Shipyard, Anacortes, WA. "Starboard Waste Chute" highlighted, inset photo, lower right, displays the completely rebuilt starboard waste chute as repaired later in 2019 by High Mark Marine certified welders. (Source [redacted], with Coast Guard mark up)

[98] Captain [redacted] MBI Hearing Testimony, Pg. 1924

[99] Doubler plates are used as one of the solutions for plate damage from corrosion in the structures of the ships. Doubler plates are also called "doublers." This method is one method for repairing the structure of ships as it is less costly and relatively easy compared to inserting a permanent welded plate.

4.2.72. The repairs were completed as per the invoice on April 26, 2019. At some point after the repair was completed and while the vessel was engaged in fishing operations, the crew on board the SCANDIES ROSE discovered that the welds from the starboard waste chute repair had failed and an undetermined amount of seawater was leaking into the starboard pipe void. The Captain sent images and text messages of the leaking areas and his concerns to the vessel manager ashore and asked her to get arrangements made to repair this issue.

[redacted]

Figure 35 – Composite of text messages sent ashore by the Captain of the SCANDIES ROSE in mid-2019 detailing the leaks and temporary repairs with a chemical sealing compound. The crew also had to pump out seawater that had leaked through the porous welds from the pipe alley that ran the length of the tanks on the starboard side of the vessel. (Source CG Exhibit 112)

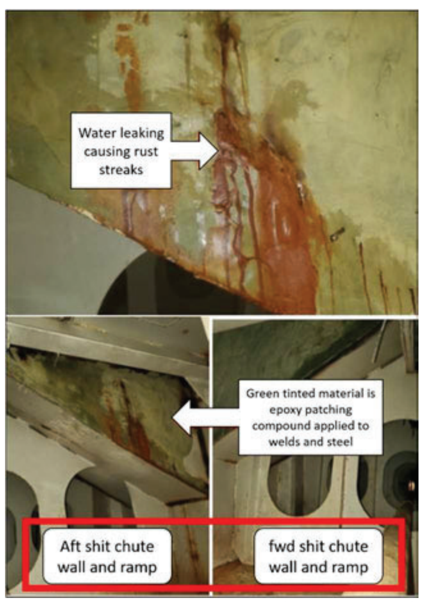


Figure 36 – Composite of the photos the SCANDIES ROSE Captain sent ashore showing the size and extent of the leakage and the areas where temporary repairs were made with a product called, "Splash Zone"®. Comments within the red box are vessel Captain's comments, boxes with arrows are Coast Guard mark ups (Source CG Exhibit 112, with mark ups)

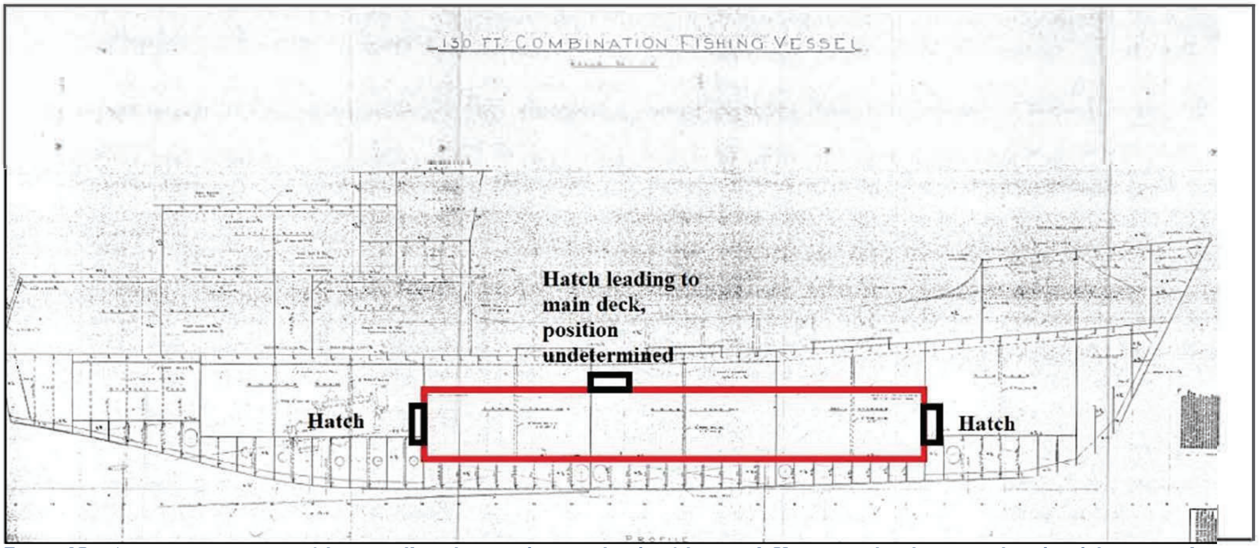


Figure 37 – Approximate position of the pipe alleys that ran down each side of the vessel. There were hatches on each end and there was also one hatch in the top of the pipe alley that was able to vertically access the main deck. Position of that hatch is not precise. (Source CG Exhibit 005, with markups)

4.2.73. Between April 27 and June 6, 2019, Captain [redacted] a Marine Surveyor from Fishermen's Maritime Services, Inc., conducted a Survey on SCANDIES ROSE, and found the vessel to be in apparent good order, in sound condition and suitable for the intended service as a fishing vessel. This survey was carried out over the course of five visits while the SCANDIES ROSE was dockside and hauled out of the water. The items listed below in italics are directly quoted from the 2019 Condition and Valuation Survey.

4.2.73.1. *The vessel was licensed to fish in the Bering Sea for king crab, opilio crab, and Pacific cod using regular rectangular shaped, rigid-steel mesh cages, known as pots. In the summer months, the vessel would act as a tendering vessel for the salmon fishery in the Gulf of Alaska.*[100]

4.2.73.2. *The vessel was fitted with 10 integral fuel tanks that had a total fuel carrying capacity of 60,832 gallons. Additionally, the vessel had an integral tank for hydraulic oil with a capacity of 720 gallons and an integral tank to carry 1,200 gallons of lubricating oil.*

4.2.73.3. *The SCANDIES ROSE had two 12-cylinder Detroit Diesel 805-hp prime movers. The turbocharged engines were coupled to reduction gears and 6-inch stainless steel shafts. The shafts ran out through the stern tubes and were connected to two 4-bladed, fixed pitch propellers. Steering of the vessel was accomplished by twin rudders, powered by hydraulic rams.*

4.2.73.4. *The vessel had two Detroit Diesel electric generator packages supplied the vessel with alternating current power. The diesel engine prime movers were also coupled*

[100] A fish tendering vessel moves commercial supplies, stores, refrigerates, or transports fish to or from a fishing, fish processing, or fish tender vessel or a fish processing facility.

to hydraulic pumps, which supplied the vessel's hydraulic consumers. The two deck cranes had self-contained hydraulic power packs.

4.2.73.5. *The SCANDIES ROSE was constructed of a steel hull with a steel house. Both the hull and deck plating was comprised of 3/8-inch mild steel. The bow plating to the hull was 5/8-inch and 1/2-inch mild steel plate. The hull bottom was nearly flat, with a dead rise of two feet and vertical sides. The bow was raked and there was a transom stern, a single hard chine and a single centerline skeg.*[101]

4.2.73.6. *The vessel's fully enclosed forepeak housed the bait freezer on the port side and a workshop on the starboard side. Aft was the fishing deck, which had an elevated hardwood wear deck. Further aft was the deckhouse that had fishing machinery, equipment, and a deck crane on the port and starboard sides.*

4.2.73.7. *The main deck level was full width and housed a galley, electrical equipment room, and accommodations for the crew. The second deck, above the main deck, was a partial-width deckhouse with accommodations and utility spaces.*

4.2.73.8. *Weather galleries were aft, with access ladderways port and starboard leading up. Underneath these ladders were engine room vents. The third deck was also partial width and housed the navigational bridge forward and an open weather deck aft. The bridge had three maneuvering stations (port, starboard and center), with the main station positioned all the way starboard.*

4.2.73.9. *The starboard operating station was forward facing and the surrounding windows were equipped with heaters to melt away accumulated ice. The operating station was equipped with radars, navigation and positioning equipment, maneuvering controls, communication equipment, weather monitoring equipment, and machinery monitoring gauges and alarm panels. The alarms panels on the bridge would alert the operator of abnormal operation of the vessel's equipment. A general alarm bell and actuation lever were also located near the starboard-side control station. Atop the navigation bridge, deck lights, radars, and communication equipment antennas were mounted.*

4.2.74. Upon returning to the dock after the king crab season, the owner had agreed with the repairs to the waste chute and another welding contractor, Highmark Marine, was hired to assess the issue of the leaking starboard waste chute and make repairs.

4.2.75. The repair work was undertaken and completed in late November 2019, with an invoice date of November 22, 2019.[102] The new welding contractor cut out the existing starboard waste chute and rebuilt it using 3/8" steel plate. The ABS-certified welder who conducted the welding work used a dye penetrant to inspect his welds after completion.

[101] A chine is the seam in a boat's hull where the bottom and side pieces of sheet material meet. A skeg is a keel projection designed to protect the propeller and support the rudder.
[102] CG Exhibit 007

Using a dye penetrant is one form of non-destructive testing. All welds passed inspection, and the work was completed before the SCANDIES ROSE departed.

4.2.76. The engine room and forepeak were equipped with float-type bilge alarms that would alarm locally and on the bridge when activated by the rising of water in the vessel's bilge.

4.2.77. The fish holds were not equipped with "slack" tank alarms that would sound on the bridge if the tanks were not full or empty. The majority owner told investigators that it is common industry practice to continually take a suction on the tank if trying to keep a crab tank empty.

4.2.78. In the 2019 SCANDIES ROSE Condition and Valuation Survey, the Surveyor, Captain [redacted] commented that the vessel was "well-kept and maintained" and that the construction of the SCANDIES ROSE was "extraordinary" for a vessel of her era. The survey included a list of maintenance completed during annual and bi-annual dry-docking periods, for a period of over 20 years. Items such as main engine overhauls, communication equipment renewal, refrigeration equipment maintenance, and other vessel systems were documented in the history.

4.2.79. A SCANDIES ROSE former crewmember spoke of the vessel's seaworthiness

> *It appears to me that in that summary you told the Coast Guard that the SCANDIES ROSE was like a battleship, and you loved that boat, and you described it as a Cadillac. Is that still how you feel about the SCANDIES ROSE?*
> *A. Yes, sir. That was incredible platform.* [103]

Another former crewmember stated

> *It's a nice big boat. You kind of don't think of a big boat going down. You kind of get the idea that they're, you know, indestructible when you look at these little guys and you're like, you know, I'm glad I'm on this big guy. So yeah, I kind of -- I felt safe on that boat most definitely.*[104]

4.2.80. The hull below the water line was divided transversely into six watertight compartments. A ballast tank is at the stem, going aft is a chain locker and then further aft is the dry stores. Next aft are three flooded raw water tanks arranged along the centerline. Pipe alleys port and starboard were fitted with ventilation fans and accessible through hatches in the engine room and through the forepeak. The fuel tanks were outboard along the sides of the hull. The vessel had double bottom fuel tanks. The machinery space included main and auxiliary engines, systems machinery spaces, and steering equipment in the aft part of the vessel.

[103] Mr. [redacted] MBI Hearing Transcript, Pg. 702
[104] Mr. [redacted] MBI Hearing Transcript, Pg. 734

4.2.81. The hatches at the end of the pipe alley or voids were bolt-on types, not designed to be easily opened, and required a wrench to loosen the bolts to remove the hatch from the studs to gain access to the void.

4.2.82. Existing regulations did not require the SCANDIES ROSE to adhere to a dry-docking inspection schedule, but the vessel owners set their own schedule and would haul the SCANDIES ROSE out of the water roughly every two years. In testimony, the managing owner was asked about the vessel's maintenance and dry dock schedule

> *Q. …So then in the last 18 months, to the best of your recollection, how many -- how many dry-dock or dockside periods did the SCANDIES ROSE have?*
> *A. I think just one, I think just the one that -- we usually haul out -- we usually haul out every 2 years and -- but bring the boat south every year, so the boat always comes down for a maintenance period, but I think we only haul out every 2 years.*[105]

During this biennial event, the vessel's sacrificial zincs would be replaced, and the hull would be stripped, visually inspected, and repainted.[106]

4.2.83. In 2019, the SCANDIES ROSE underwent a dry dock period at. Lovric's Sea Craft Inc., in Anacortes, WA. The vessel was hauled out on May 9 through May 26, 2019 and the invoice for the work was dated May 28, 2019.[107]

> 4.2.83.1. During this dry dock period, Captain [redacted] the vessel's primary captain, was not present at the shipyard. During Captain [redacted] absence, Captain [redacted] the majority owner, oversaw completion of the established worklist.

4.2.84. After the shipyard period was complete, the SCANDIES ROSE departed the Seattle area and returned to Alaska. It then participated in the king crab fishery in the Bering Sea, which had opened October 15, 2019. The crew of the SCANDIES ROSE completed crabbing operations and then returned to Kodiak, AK on November 2, 2019 where the vessel stayed at the dock for the remainder of the year.

4.2.85. A decision was made to bring the vessel and a full load of pots to Kodiak, AK instead of Dutch Harbor, AK. This was done as the Captain wanted to make repairs on some of the crab pots while in port and because of continued logistical difficulties in getting crew on and off at Dutch Harbor due to an issue with the airport runway and the frequent inclement weather at that end of the Aleutian Island chain.

<u>Vessel Communication Capabilities</u>

4.2.86. The SCANDIES ROSE was outfitted with the communications capabilities listed in the figure below. There were a number of ways that the crew could have utilized this

[105] Captain [redacted] MBI Hearing Transcript, Pg. 47
[106] A sacrificial zinc is a type of galvanic anode designed to be attached to the submerged surface of the vessel's hull and to corrode instead of the steel hull of the vessel corroding.
[107] CG Exhibit 111

equipment to receive weather information or contact other vessels or the Coast Guard in the event of an emergency.

SCANDIES ROSE Communications Equipment	
Type	**Investigator Comments**
SSB High Freq. Radio: Skanti 8000	Potentially the radio used in broadcasting the HF 4125 kHz mayday call
SSB High Freq. Radio: SEA 222	Potentially the radio used in broadcasting the HF 4125 kHz mayday call
VHF Radio: Icom, model IC-M504	This model is capable of Digital Select Calling which can send position data to nearby vessels or stations when the distress button is pressed when properly configured
VHF Radio: Standard, model HX 250 portable VHF FM transceiver	
Simrad Model RS 35 VHF receiver with a remote communicator for use in the tendering booth.	This enables greater range of vessel-to-vessel communication than a handheld VHF from the tendering booth. (Note contained in CG Exhibit 004))
2-meter Radio: Yaesu, model FT 2600	
Saturn M Satellite communications system with distress signal sender	Typical installation includes distress signal sending Indications are that this system, though installed was no longer supported.
Sailor, Iridium Satellite Communications System	
Mitsubishi Trac/Tag Phone	
Satellite Communications Unit: SeaSat 3 C 6003 standard C with Hitachi laptop computer	
KVH, Mini-VSAT Satellite Communications system	
CLS "Thorium" VMS Transmitter with broadband email service	
Satellite TAG Phone in the Captain's stateroom for emergency calls	
Inno Media Modem with D-Link DES 1008pA switch	
Two (2) V-Tech Telephones	
One (1) Dial Pad "Plus" Telephone dialer	

Figure 38 – Table showing the communications equipment onboard the SCANDIES ROSE at the time of the accident, compiled from the 2019 Condition and Valuation Survey. (Source Coast Guard)

4.2.87. At least one of the SCANDIES ROSE wheelhouse VHF marine radios had the capability of having the Digital Selective Calling (DSC) feature available.

Weather Equipment Aboard the Vessel

4.2.88. The vessel was equipped with the typical kind and types of weather equipment for a commercial fishing vessel operating in Alaskan waters. The internet was accessible for weather information and detailed weather forecasts when at the pier and within limited distances from shore. In addition, the crew relied on weather applications on wireless devices like cell phones. One such supplication that was used was the "Windy® App." In testimony, a deckhand described how the use of this weather application was widely used in the fishing community and how knowledge gathered using this application impacted decisions on the vessel

And then just kind of making everything tight because we knew the weather was going to be bad. I mean, we -- everybody has a Windy app. We knew it was going to [be] like purple, so yeah, we knew it was going to be shitty. So we just made sure everything was tight.[108]

4.2.89. The table below lists the weather equipment aboard the SCANDIES ROSE.

SCANDIES ROSE Weather Equipment	
Type	Significant Details
Furuno, DFAX model Fax-207 weather fax receiver	
Barometer: Seth Thomas	
Tide Finder tide calculation computer	
Telcor, series 520D anemometer	Measured wind speed in knots, does not measure wind direction
Cell Phone Application "Windy.Com"	Wireless device-based application with user friendly images of wind direction and intensity, sea heights and other information. Carried on vessel's crew phones or available from the internet.
SCANDIES ROSE VHF Radios to monitor marine weather broadcasts made by the National Weather Service	

Figure 39 – Table with a listing of the equipment that was aboard the SCANDIES ROSE that would have been available for weather monitoring. Based on the equipment listed in the 2019 Condition and Valuation Survey. (Source Coast Guard)

Figure 40 – Wind speed indicator with controller mounted on the upper part of the after-wheelhouse bulkhead of the SCANDIES ROSE that indicate apparent wind speed in knots. The device does not measure wind direction. Also shown in the bottom right of the right picture is the weatherfax, another means to receive weather information. (Source Captain [redacted] Survey Photos)

4.2.90. Mr. [redacted] a survivor, recounted that he listened to the NWS weather forecasts on the marine VHF radio on his respective watches and prior to leaving port. While waiting for the tide for Whale Pass, Mr. [redacted] stated

Then it was taking my watch, listening to the radio, channel 16 for you folks and put the weather channel once in a while.[109]

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[108] Mr. [redacted] MBI Hearing Transcript, Pg. 1051
[109] Mr. [redacted] MBI Hearing Transcript, Pg. 558

Lifesaving Equipment

4.2.91. At the time of the last Safety Compliance Check conducted in October 2019, the SCANDIES ROSE complied with the lifesaving equipment requirements contained in 46 CFR 28.105 – Lifesaving equipment, general requirements.

4.2.92. The SCANDIES ROSE was outfitted with the lifesaving equipment listed in the figure below.

SCANDIES ROSE Lifesaving Equipment		
Type	Amount	Details
Personal Floatation Devices (Life Jackets)	Unknown	Not listed in Condition and Valuation Report (CG Exhibit 004) or in CG Safety Compliance Checks (CG Exhibit 034)
Liferings	6	Placed around vessel
Immersion or Survival Suits	10	4 Adult Universal, 3 Jumbo, 1 Intermediate (Wheelhouse) and 2 Adult Universal in Captain's cabin
Flares	12	Various Types
Inflatable Liferaft	2 (8 Person)	Located on top of the wheelhouse on either side of vessel
Gear pack for Liferafts	-	SOLAS A
Liferaft Hydrostatic Release Expiration Dates	-	June and October 2020
Liferaft, Inspection Dates	-	17 April 2019 – 28 Nov 2019
EPIRB	1	ACR "Global Fix" Model V4 406
EPIRB Bracket Hydrostatic Device Expiration	1	November 2021
EPIRB Battery Expiration Date	-	Nov 2027
EPIRB Registered with NOAA	-	Yes
EPIRB ID	-	2DCD8760D0FFBFF

Figure 41 – Significant lifesaving equipment carried onboard the SCANDIES ROSE at the time of her accident voyage. (Source Coast Guard)

Immersion Suits

4.2.93. Immersion suits, also called exposure or survival suits, are buoyant waterproof thermal suits designed to protect the wearer from hypothermia after abandoning a vessel, especially in colder waters. The immersion suits on the SCANDIES ROSE were equipped with a whistle, strobe light, reflective material, and a high rider ring to provide increased buoyancy for the wearer's upper body. The suits were stored in a cabinet in the wheelhouse and there were two located in the Captain's cabin as stated in the Condition and Valuation Survey dated 2019.[110] In discussing the pre-departure training and drills, the witnesses testified that there were no issues relating to the location, composition, or storage of the suits.

4.2.94. The company that owned the SCANDIES ROSE provided the immersion suits for the crew and the crew person signed a contract which contained the following provisions:

[110] CG Exhibit 004

Survival Suit/Safety Equipment. Owner will provide a survival suit to Crew Member for use during this agreement. Crew Member shall maintain the survival suit in good condition and advise Owner or Skipper immediately regarding any problems with the condition of the survival suit or its fit. Crew Member shall participate in all meetings and drills concerning use and location of the survival suit and the safety equipment aboard the Vessel. The Skipper may require Crew Member to wear certain safety gear during fishing operations, including flotation devices and safety headgear. Crew Member shall wear the required safety gear.[111]

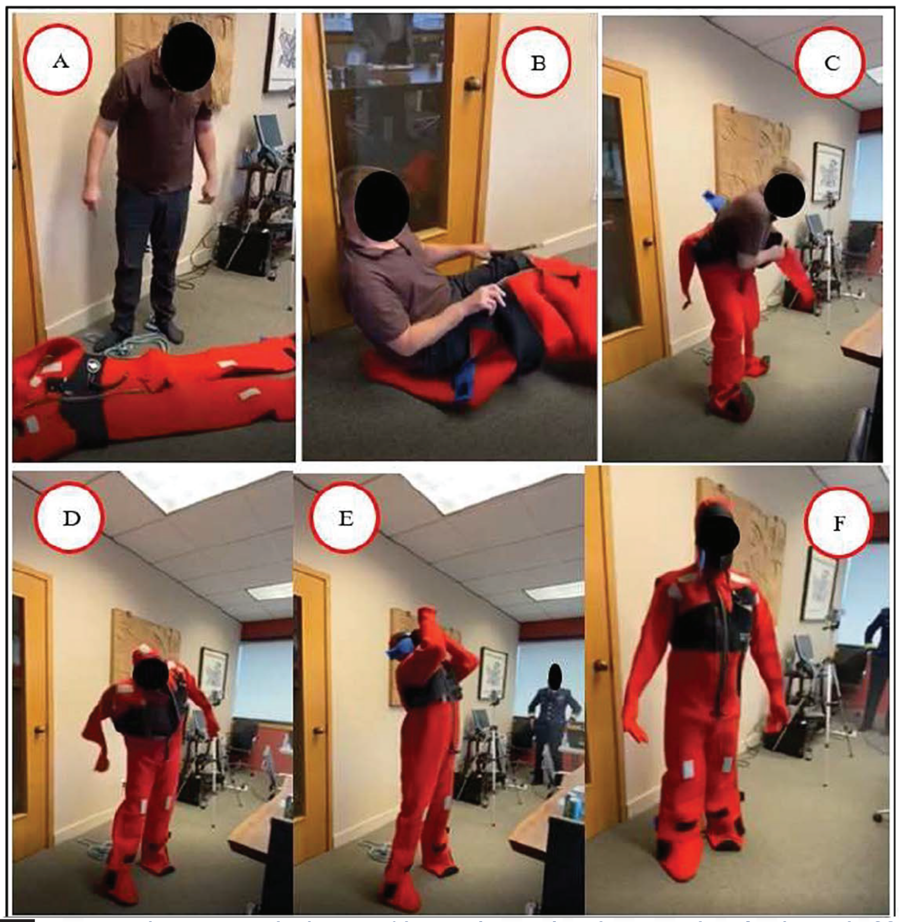

Figure 42 – Mr. [redacted] a survivor, demonstrating the donning of the actual survival suit he put on when abandoning the SCANDIES ROSE. Sequence starts at A and end at F with the suit properly worn but without the inflatable bladder inflated. The inflated bladder puts the wearer in a more upright position in the water. (Source CG Exhibit 102, still images from the video)

<u>Emergency Position Indicating Radio Beacon (EPIRB)</u>

4.2.95. The SCANDIES ROSE was equipped with a “Type I” ACR “Global Fix” model V4 406 EPIRB. The EPIRB onboard the SCANDIES ROSE was properly registered and the registration data was stored in the NOAA database. This data included shore side contacts and other critical information about the SCANDIES ROSE to assist rescue forces.

[111] CG Exhibit 017

4.2.95.1. On or about October 2017, the company purchased and then registered a new EPIRB for the SCANDIES ROSE.

4.2.95.2. NOAA's EPIRB registration site indicates that on August 17, 2019, the vessel's beacon registration was updated. The internal EPIRB battery was listed as valid until 2027.[112]

4.2.95.3. An EPIRB is a float-free, automatically activated device detectable by satellite anywhere in the world. The device emits a 406-Megahertz (MHz) distress signal containing a unique identification code that can be used to reference information about the carrying vessel, including its name, type of survival gear, and emergency points of contact ashore. Encoded in that signal is geographic positional information from an internal global positioning system (GPS) navigation device where the distress position is sent to rescue forces. The device is also equipped with a homing signal, 121.5 Hz to allow rescue forces to home in on the position of the EPIRB during the search.

Figure 43 – To the right is an EPIRB of the type and manufacture that was carried on the SCANDIES ROSE. The EPIRB on the SCANDIES ROSE did not transmit a signal received by rescue forces and the storage bracket was empty when the ROV inspected the wreckage. On the left is one type of personal locator beacon for size comparison. (Source Coast Guard Auxiliary Photo)

4.2.96. Mounted on the inward side of a handrail aft of the wheelhouse on the port side, the SCANDIES ROSE's EPIRB was mounted clear of obstructions and it was designed to float free and activate automatically if the vessel sank. The EPIRB could also be manually activated in an emergency by removing it from the bracket and sliding the clear cover from left to right to break the witness seal and pressing the red activation button for one second. It was housed inside a special bracket and protected from the elements. The bracket was equipped with a hydrostatic release mechanism similar to what was used on the vessel's liferafts. Between approximately 5 and 13 feet underwater, the release mechanism would activate, allowing the bracket's cover to open and the EPIRB to float free. Water activation sensors on the front of the EPIRB would automatically activate the device when wet with water.

[112] CG Exhibit 034

Figure 44 – Composite of photomontage of the SCANDIES ROSE EPIRB. Top left, EPIRB in housing on the inside of top rail aft of the wheelhouse. Top, right is the location shown with the yellow arrow in reference to the position in relationship to the port wheelhouse door. Bottom left, the open EPIRB housing during inspection for 2019 Valuation and Condition Survey. Bottom right, the empty housing as seen during underwater ROV site survey February 2020. (Source – [redacted] photos for 2019 Valuation Survey and bottom right, CG Exhibit 008)

4.2.97. The hydrostatic release was required to be renewed every two years.

4.2.98. During the October 11, 2019 Safety Compliance Check exam conducted by the Coast Guard, it was noted by the Coast Guard that the EPIRB hydrostatic releasing mechanism was due to expire that same month.[113] An invoice shows a new hydrostatic device was purchased in Dutch Harbor, AK on or about October 16, 2019.[114]

4.2.99. The expiration date for the EPIRB's hydrostatic release mechanism listed on the "Monthly Emergency Test and Check Log For: F/V Scandies Rose," which was completed

[113] CG Exhibit 034
[114] CG Exhibit 010, Pg. 24

prior to departure, was October 2022. The Marine Board was unable to determine why this entry differed from the information in figure 41 which listed all the lifesaving equipment.

4.2.100. Regulations under 46 CFR 25.26-50(b) require that the EPIRB be tested once a month but do not require this test to be logged. There is no company record of EPIRB tests being conducted.

4.2.101. In the vessel's June 2019 Condition and Valuation Survey, the EPIRB is pictured on the port side, mounted on handrails aft of the portside wheelhouse door on the wheelhouse deck. In recounting testimony about the EPIRB and their familiarization with that device, both survivors incorrectly stated that it was mounted on the stern on the starboard side of the vessel

Yeah, it was, it was on the stern on the, the handrail there behind the starboard side, I believe.
Q. Okay. So --
A. Down, down the stairs I believe it was. I'm trying to remember right, and so -- I only saw it that one quick moment, but I'm -- if my memory serves me correctly, it was, yeah, just, just behind the, the starboard side.[115]

And

Q. Okay. And then you mentioned the EPIRB was on the other side. Can you tell us to port or starboard where they – where your recollection of the EPIRB being located?
A. It's on the starboard side right outside the wheelhouse door, right on the -- there's like a -- bars and stuff there just had it up on the -- so right on the -- right as you walk out the door on the service side, the captain's door.[116]

4.2.102. Neither of the surviving crew saw the EPIRB while abandoning the vessel.

4.2.103. ACR Electronics, the manufacturer of the EPIRB, indicated that the fresh battery will transmit for 48 hours at -4º Fahrenheit and that the unit can be submerged in water up to 5 minutes and depths of 33 feet although the unit is designed to float free and operate on the sea's surface with the antenna pointed up. This provides a clear transmission path to satellites and the homing signal. At night, the EPIRB also has a 4-LED strobe light array to assist in location of the persons awaiting rescue assistance.

Visual Signaling Devices Aboard the Vessel

4.2.104. The Condition and Valuation Survey report completed in 2019 indicated that the SCANDIES ROSE had a box of distress flares located in a cabinet in the wheelhouse. The flares were within their expiration date and were serviceable. That flare kit located in an orange waterproof box in the wheelhouse contained:

Six (6) Pains-Wessex red hand held flares

[115] Mr. [redacted] MBI Hearing Transcript, Pg. 553
[116] Mr. [redacted] MBI Hearing Transcript, Pg.1074

Three (3) Pains-Wessex red parachute flares
Three (3) Pains-Wessex orange smoke canisters
One (1) red flag

<u>Liferaft Stowage, Usage, and Visual Signaling Devices</u>

4.2.105. The SCANDIES ROSE was equipped with two, eight person, liferafts that were mounted on the top of the vessel's wheelhouse. By regulation, the SCANDIES ROSE was only required to have one, eight person, liferaft onboard.

4.2.106. The liferafts were equipped with a hydrostatic release device which would activate and release the raft if the vessel sank to a certain water depth.

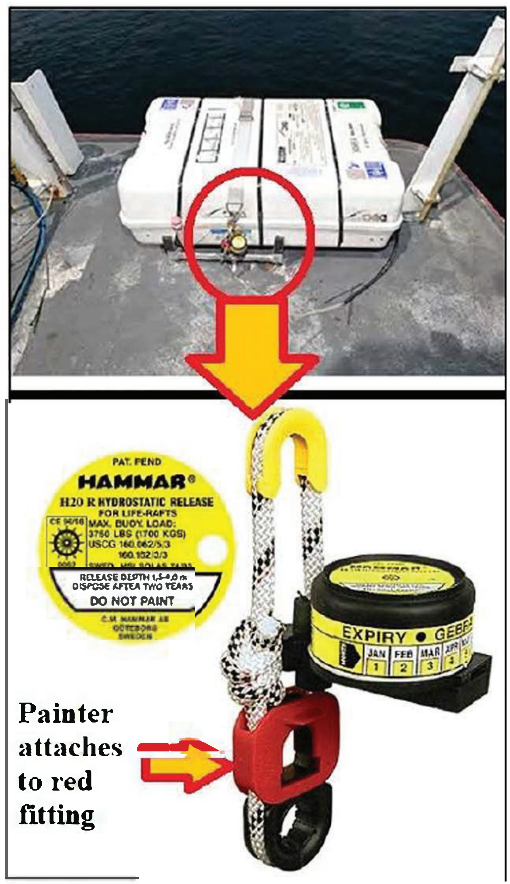

Figure 45 – One of two liferafts on the SCANDIES ROSE. Circled in red is the hydrostatic release device which allows the liferaft to inflate and float free of the vessel as it sank. The close-up of the hydrostatic release device shows the point where the liferaft painter attaches, once the device activates, the raft floats free, inflates and then the painter is released from the device allowing the raft to stay on the surface. (Source CG Exhibit 004 and close-up from the CG D17 Commercial Fishing Vessel Safety Reference Guide http //www.fishsafewest.info/PDFs/D17CFVSE_JobAid.pdf)

4.2.107. The rafts were equipped with a survival equipment bag as well as an exterior and interior canopy light, boarding ladder, sea anchor and other equipment. The raft and its equipment were classed as a Safety of Life at Sea (SOLAS) A[117] standard. This equipment is generally carried on vessels on longer international voyages. On the exterior of the raft, there were areas covered with retroreflective tape to enhance the ability of rescue forces to locate the raft at night. The canopy was a high visibility orange color.

4.2.108. Both rafts had been serviced and inspected at a certified liferaft servicing facility April 17, 2019 and November 20, 2019.

4.2.109. The rafts are required to contain various visual signaling devices inside the survival equipment bag.

- 6 Handheld flares
- 4 Parachute Flares
- 2 Smoke Flares
- 1 Signaling Mirror (Day Use)
- 1 Radar reflector
- 1 Flashlight[118]

4.2.110. The survivors recounted that when they entered the liferaft and got under the canopy, the raft was partially filled with seawater. The raft was equipped with a boarding platform with grab straps, grab ropes around the hull of the raft, as well as water filled stabilization bags that were beneath the bottom of the raft. This stabilization system was designed to assist in stabilizing the raft in a rough sea. In the case of the SCANDIES ROSE, sea and wind action threatened to capsize the raft and the survivors would move to the side of the raft that was trying to rise up and use their weight to prevent capsizing.

4.2.111. Initially, the interior light in the raft canopy was working and providing interior illumination, but after an undetermined time it was extinguished. The interior light is designed to provide illumination for twelve hours, be operated manually after it automatically illuminates after inflation, and provide enough light to allow the survivors to read the instructions on various equipment in the raft.

4.2.112. The survivors recounted that they had difficulty locating and retrieving survival equipment from the dark interior of the water filled raft. They also talked about the difficulty of using the survival equipment when wearing the survival suit with the attached three finger hand mitt.

<u>Regulatory Framework & Agency Partnerships</u>

4.2.113. The Coast Guard issued the regulations for U.S. documented or state numbered uninspected fishing, fish processing, and fish tender vessels to implement provisions of the

[117] "SOLAS" refers to the International Convention for the Safety of Life at Sea which is an international maritime treaty which sets minimum safety standards in the construction, equipment and operation of merchant ships. The convention requires signatory flag states to ensure that ships flagged by them comply with at least these standards. The current version of SOLAS is the 1974 version, known as SOLAS 1974, which came into force on May 25, 1980. (Wikipedia)
[118] 46 CFR 199.175

Commercial Fishing Industry Vessel Safety Act of 1988, codified in 46 USC 4501-4508.[119] The intent of these regulations is to improve the overall safety of commercial fishing industry vessels, and to reduce CFV fatalities and losses. These regulations provide requirements for the equipment, design, and operations of vessels, and include provisions for lifesaving, firefighting, navigation, communication, emergency instructions, and stability which includes righting energy criteria and freeing port clearing area.

4.2.114. COMDTINST 16711.13B – Implementation of the CFV Regulations (August 1995), establishes the Coast Guard's CFV Safety Program.

4.2.115. When additional or clarifying information is necessary, the Coast Guard provides industry guidance in various forms to help assist and inform CFV operators and examiners. Guidance includes Coast Guard Navigation and Vessel Inspection Circulars (NVICs), Policy Letters, Voluntary Safety Initiative and Good Marine Practices, Safety Flyers, Safety Alerts and Regulatory Reference Guides.

4.2.116. Coast Guard guidance covers a broad range of topics, including rules of the road, safety equipment, and stability. The Coast Guard posts these documents on various Coast Guard web pages, including www.dco.uscg.mil and www.fishsafewest.info.

4.2.117. As part of their duties, Coast Guard Commercial Fishing program managers and CFV examiners distribute Coast Guard guidance information while attending industry association meetings, outreach events, and during dockside safety exams.

4.2.118. The Fishing Vessel Safety Program Manager of the Fishing Vessel Division within the Coast Guard Office of Commercial Vessel Compliance (CG-CVC-3) at Coast Guard Headquarters manages the Coast Guard's Fishing Vessel Safety Program. CG-CVC-3 provides program oversight and guidance, interacting with all Coast Guard District Fishing Vessel Safety Coordinators and, on occasion, with the field examiners including Auxiliary personnel who are qualified to conduct dockside safety exams.

4.2.119. COMDTINST 16711.13B directs Coast Guard Districts to conduct annual audits and oversight of their respective CFV Safety Program. After conducting a review of data within the Coast Guard's MISLE database, this oversight process measures the effectiveness of the program and allows managers to identify program strengths and weaknesses to inform program improvement.

4.2.120. The mission and goal of the D17 Fishing Vessel Safety Program is to enhance safety within the commercial fishing fleet and reduce accidents associated with that industry.

4.2.120.1. The program develops or initiates regulations to implement laws, as well as drafting and issuing guidance regarding current compliance standards for both Coast Guard and industry personnel. The program also promotes awareness and training for safety initiatives, including working with the CFV Federal Advisory Committee and other industry partners at conferences and industry association meetings.

[119] Title 46 CFR 28 final rule became effective on September 15, 1991

4.2.120.2. The program works with NOAA and National Marine Fisheries Service (NMFS) regarding fisheries permitting and National Institute for Occupational Safety and Health (NIOSH) to share and analyze casualty data and implement safety initiatives or recommendations.

4.2.121. COMDTINST 16711.14 – Commercial Fishing Industry Vessel Safety Training and Qualification (March 1993), establishes the training and qualification process for Coast Guard personnel performing dockside examinations. The intent of the training is to provide the examiner with additional technical skills and specific knowledge of current regulations and policies.

4.2.122. CFV examiners are tasked with executing the Commercial Fishing Vessel safety program including conducting CFV exams and issuing safety decals when vessels meet the applicable regulatory standards.

4.2.123. The Coast Guard Authorization Act (CGAA) of 2010 and the Coast Guard and Maritime Transportation Act (CGMTA) of 2012 both amended 46 USC Chapter 45 – Uninspected Commercial Fishing Industry Vessels. In particular, it amended 46 USC 4502(f) to direct both State-registered and federally-documented vessels that operate beyond three NMs from shore to complete a Coast Guard dockside safety examination no later than October 15, 2015. CFVs that met these criteria, including the SCANDIES ROSE, had to complete this safety examination at least once every five years thereafter.

4.2.124. There are five full time civilian CFV examiners for the D17's Area of Responsibility (AOR). The CFV Program has incorporated the use of qualified Coast Guard Auxiliary personnel to augment the CFV work force to facilitate responsiveness to the approximately 8,500 fishing vessel fleet that operates in the District 17 AOR. The Coast Guard also utilizes active duty military officers, warrant officers, and enlisted personnel CG-wide to conduct CFV examinations.

4.2.125. Upon successful completion of a dockside exam, the examiner issues an examination decal, valid for two years. In D17, CFV Safety examinations are documented using a district-produced examination booklet. This booklet lists items from the standard CFVS Exam Booklet CG-5587 (Rev 06-08), but tailors it to district-specific items and data gathering requirements.

Figure 46 – A sample of a Commercial Fishing Vessel Safety Decal which would be issued to a vessel after it has been inspected by qualified Coast Guard Fishing Vessel Examiners and found to be in compliance with the requirements of Title 46 CFR 28. (Source Coast Guard)

4.2.126. The scope of the CFV exam is limited primarily to the safety equipment on the vessel as opposed to the design or material condition of the vessel. In addition, the scope of the exam precludes a CFV examiner from assessing an operator's technical knowledge.

4.2.126.1. COMDTINST 16711.13B directs dockside safety examiners to use the CFV Safety Examination Booklet, CG-5587. This booklet assists examiners by providing a comprehensive listing of regulations in a checklist format. The instruction indicates the booklet is self-explanatory and lets the examiner and fishing vessel operator know exactly which regulations are applicable, complied with, and whether there are any deficiencies uncovered in the exam.

4.2.126.2. The CFV Safety Examination Booklet, CG-5587, under certain checklist items, references and directs CFV examiners to utilize the supplement, CG-5587B. The supplement provides additional checklist items, including requirements based on tonnage, operating area, alteration or conversion date, and pollution prevention requirements.

4.2.126.3. When the examiner notes deficiencies during the exam, they advise the operator of the deficiency, document it in writing using the examination form, and encourage the operator to correct all deficiencies as soon as possible. Coast Guard examiners document the results of the dockside safety exam into the Coast Guard MISLE database under a fishing vessel examination activity.

4.2.127. Coast Guard regulations contained within 46 CFR 28.73 and 28.76 and policies detailed in Coast Guard work instruction CVC-WI-019(1) establish the Third Party Examiner Program. Under the program, designated third party examiners such as a third party surveyor are authorized to conduct periodic dockside safety examinations upon the request of the vessel owners. Accepted organizations or similarly qualified organizations request designation from Coast Guard Commandant to carry out dockside safety examinations.

4.2.127.1. The SCANDIES ROSE did not receive Third Party examination. Coast Guard CFV examiners conducted all commercial fishing exams for the SCANDIES ROSE prior to the accident voyage.

4.2.128. On or about October 13, 2018, the SCANDIES ROSE participated in a dockside safety examination in Dutch Harbor, AK.

4.2.128.1. This exam was conducted by Coast Guard safety examiners and the evolution was documented in the Coast Guard's MISLE database under activity # 6596171.

4.2.128.2. No deficiencies were noted and safety decal # 257066 was issued to the SCANDIES ROSE.

4.2.129. Developed in 1999, the Coast Guard initiated dockside Safety Compliance Checks to assist in reducing fatalities and vessel loss within the Bering Sea/Aleutian Island (BSAI) crab fleet. The goal of Safety Compliance Checks was to deter vessels from overloading with crab pots. Coast Guard D13 and D17 collaborated with the Alaska Crab Coalition, NIOSH, Alaska Department of Fish and Game (ADF&G), and the North Pacific Fishing Vessel Owners' Association (NPFVOA) to develop the Safety Compliance Check.

4.2.130. On or about October 11, 2019, the SCANDIES ROSE participated in a Safety Compliance Check in Dutch Harbor, AK, prior to participating in the king crab season. At the time of the Safety Compliance Check, the vessel was loaded with 185 pots. The three crab pots sampled all measured 7 ft x 8 ft x 2.8 ft and weighed 863, 799, and 800 pounds, respectively.

U.S. COAST GUARD – SAFETY COMPLIANCE CHECK

Vessel Name: SCANDIES ROSE | I.D. Number: 602351
LOA: 116.6 | Gross Tonnage: 195 | Location: DUTCH HARBOR
POB: 7 | # of Suits: 12 | # of Pots Allowed: 208 | # Loaded: 185 | Pot Weight: 863 799 800
Stability Book Onboard? (Y) N | Date: APRIL 2019 | Preparer [redacted]
Current CFVS Decal? (Y) N | Decal #: 2570606 | Expiration Mo / Yr: OCTOBER 2020

EPIRB (46 CFR 28.150, 46 CFR 25.26)
2DCC8 7606D0 FFBFF
POTS: 7x8x34 ALL SAME
FUEL: CONDITION 4. BAIT: 7,000 lbs
(Y) N WAS EPIRB ONBOARD?
Y N SATISFACTORY SELF TEST?
Y (N) BATTERY EXPIRD? BATT EXP DATE: 2027
Y (N) HRU EXPIRED? OCT 2019 HRU EXP DATE: OCT 2019
Y (N) NOAA REGISTRATION EXPIRED? REG EXP DATE: AUG 2020

LIFERAFT (46 CFR 28.120)
(Y) N WAS SURVIVAL CRAFT ONBOARD? 02
Y (N) SERVICING EXPIRED? SVC EXP DATE: OCT 2019
(Y) N ADEQUATE CAPACITY?
Y (N) HRU EXPIRED? HRU EXP DATE: OCT 2020
(Y) N CORRECT INSTALLATION CORRECTED: N/A

SURVIVAL SUITS (46 CFR 28.110, 46 CFR 25.25)
(Y) N SERVICABLE?
(Y) N CORRECT AMOUNT?
(Y) N PML? BATT EXP DATE: 2021 LITHIUM
(Y) N READILY ACCESSIBLE?
(Y) N MARKED CORRECTLY?

Owner/Operator Name: [redacted]
Address: [redacted]
[redacted]
COAST GUARD OFFICIAL SIGNATURE [redacted] ATURE

COTP Action if necessary – Document below and brief Sector Anchorage for approval 46 CFR 28.65

Inadequate or unserviceable immersion suits		Inadequate survival craft capacity	
Inoperable EPIRB/Battery		Watertight Integrity	
Instability - Overloaded/Lack of Freeboard		Improper Pot Loading	
Inoperable Bilge system			

Date/Time: 11OCT19 | Activity #: [illegible] | Team [redacted]

U.S. Coast Guard Sector Anchorage
Safety Compliance Checklist (08/13)

Office Copy

Figure 47 – Copy of SCANDIES ROSE Safety Compliance Check Form conducted on October 11, 2019 (Source CG Exhibit 034)

4.2.131. When compared to other occupations in the U.S., commercial fishing is historically a dangerous job. Data for 2019, gathered by the U.S. Bureau of Labor Statistics and published in late 2020, indicated that "Fishing and hunting workers had a fatal injury rate of

145 fatal work injuries per 100,000 full time equivalents (FTEs) in 2019, which was ranked the highest in all other groups.[120]

4.2.132. NIOSH is the government agency responsible for conducting research and making recommendations for the prevention of work-related injury and illness. In 2016, NIOSH published a report titled "Assessment of Safety in the Bering Sea/Aleutian Islands Crab Fleet" and provided "a detailed analysis of work-related injuries and vessels safety issues within the BSAI crab fleet" for the purpose of identifying both hazards and opportunities for safety improvements within that fleet. The report focused on data from the 2005-06 through 2012-13 fishing seasons but also used data from previous studies for comparison and analysis. During the 1990s, the BSAI crab fleet was the most dangerous commercial fishery in the U.S., claiming 73 lives. However, between 1999 and 2013, the fishery fatality rate dropped to less than one death per year. The report predated the DESTINATION and SCANDIES ROSE accidents. As such, it did not include the seven lives lost aboard the DESTINATION in 2017, when the vessel sank while participating in the Bering Sea opilio crab fishery. The five lives lost aboard the SCANDIES ROSE were also not included.

4.2.133. NIOSH is able to collect and analyze data on fatalities due to a longstanding partnership between NIOSH and the Coast Guard that emphasizes data sharing between the two agencies.[121]

4.2.133.1. In 2017, NIOSH published a Commercial Fishing Fatality Summary for the Alaska Region. The document examined commercial fishing fatalities between the years of 2000-2014. One of the leading causes of fatalities came from vessel disasters, including sinking, capsizing, fire, grounding, or other events in which crew are forced to abandon ship. The report listed several recommendations, some of which are included here, directed at minimizing the risk of vessel disasters.

4.2.133.2. The first recommendation was that fishermen take a marine safety class at least every five years, and stated that "safety training is available, affordable and saves lives."

4.2.133.3. Another recommendation was that fishing vessels should adhere to their vessel's stability instructions and vessels should always be loaded in compliance with these instructions.

4.2.133.4. A third recommendation was that a naval architect should be consulted periodically to review safe loading limits of the vessel.

4.2.134. From 1990 to 2000, there was an average of 8 deaths per year associated with the BSAI crab fishery. In the five-year period between 2000 and 2005, the average fatalities per year was reduced to 1.3 annually. NIOSH credited this reduction in deaths to several factors:

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[120] News Release Bureau of Labor Statistics, National Census of Fatal Occupational Injuries in 2019. https://www.bls.gov/news.release/pdf/cfoi.pdf
[121] CG Exhibit 130, Pg.5

4.2.134.1. The Coast Guard's implementation of the Safety Stability Checks program which put Coast Guard personnel on commercial fishing vessels prior to the fishing season to weigh pots, complete a basic safety gear inspection, and consult with the vessel's captain regarding the vessel's stability instructions.

4.2.134.2. NIOSH also attributed the reduction in fatalities to shifting from "derby style" to rationalization of the fishery which extended the fishing season, allowing more experienced and less fatigued crew to operate vessels with potentially smaller pot loads.

4.2.134.3. A final factor NIOSH noted was the reduction in the number of vessels participating in the fishery, which was also a result of rationalization.

4.2.134.4. Prior to rationalization, an average of 243 vessels participated in the BSAI crab fishery. Post-rationalization, that average number decreased to 78 vessels as of 2010. The number of vessels participating has further decreased in recent years, as only 59 vessels participated in the 2019-2020 opilio season.

4.2.135. As a fishing vessel of less than 200 GT, the SCANDIES ROSE was not subject to Coast Guard inspection and certification or manning and licensing requirements. However, because the SCANDIES ROSE harvested crab, fished for cod, and operated part-time in the summer months as a fish tender, it was subject to the regulations set forth in 46 CFR Subchapter C – Uninspected Vessels, Part 28 – Requirements for Commercial Fishing Industry Vessels, which includes equipment, stability, and other safety requirements.

4.2.136. Based on the class and type of vessel under the existing regulations, the crew operating the SCANDIES ROSE were not required to have any certification of competency for the duties they performed on the vessel. The Captain and the crew member serving as the engineer had not been holders of a Coast Guard issued MMC.

4.2.137. 46 CFR Subchapter C has specific training requirements. At least one member of the crew must be first aid and CPR certified. In addition, the person who leads the monthly drills must have been trained in the proper emergency procedures. Regulations required these certifications to be obtained through a Coast Guard-approved third party. That requirement was satisfied by way of the Captain's certification as a Drill Conductor.

4.2.138. Monthly drills and instruction were required of the crew while aboard the vessel. At a minimum, the monthly drills and instruction had to cover abandon ship, firefighting, flooding, man overboard, donning an immersion suit, launching a survival craft, making a voice radio distress call, use of visual distress signals, and activation of the general alarm. That requirement was satisfied in the SCANDIES ROSE pre-departure drills and training carried out on December 30, 2019.

4.2.139. The SCANDIES ROSE had a valid Certificate of Documentation (COD) as required for vessels of five Net Tons (NT) or more used in fishing activities on navigable waters of the United States.

4.2.140. The SCANDIES ROSE was also required to participate in the Coast Guard's commercial fishing vessel dockside safety examination program, which primarily focuses on lifesaving equipment and those related practices on board the vessel. This program, as applied to the SCANDIES ROSE, does not include the examination of the design and construction, or sufficiency of the fishing vessel's hull and machinery condition as required for Coast Guard-inspected vessels.

4.2.140.1. The SCANDIES ROSE underwent the required safety examination and was issued a safety decal.[122] No deficiencies were noted and the vessel was issued a decal with an expiration date of October 31, 2020.

4.2.141. ADF&G regulations require BSAI vessels participating in the crab fishery to contact the Coast Guard 24 hours prior to departing port with pots loaded onboard.[123]

4.2.141.1. The regulation does not require any specific action on the part of the Coast Guard, and the Coast Guard does not have regulations or policies that address the ADF&G regulation.

4.2.141.2. When contacted by vessel operators 24 hours prior to departure, Coast Guard will typically ask the operator what size and how many pots the vessel is carrying and encourage the operator to consult their stability instructions.

4.2.141.3. In addition, the Coast Guard will ask the operator if they would like to voluntarily participate and receive a Safety Compliance Check.

4.2.142. The SCANDIES ROSE did not contact the Coast Guard 24 hours prior to departing Kodiak on December 30, 2019. Although the vessel was loaded with pots, the vessel was departing to initially participate in the cod fishery and not the crab fishery, so the ADF&G regulation did not apply in this particular case.

4.2.143. Stability regulations that applied to the SCANDIES ROSE were included in 46 CFR C, Part 28, Subpart E. The regulations state that it is the responsibility of the vessel owner to select a "qualified individual" to perform a stability test and calculations. In the case of the SCANDIES ROSE, that person was a naval architect and that same person conducted stability testing for the vessel in 1988 and in 2019.

4.2.144. The regulations define a qualified individual as "an individual or an organization with formal training in and experience in matters dealing with naval architecture calculations."[124] It is further stated that the intent of the stability instructions are to ensure the masters and individuals in charge of vessels are provided with enough stability information to allow them to maintain their vessel in a satisfactory stability condition.

4.2.145. The regulations note that, because few operating personnel in the commercial fishing industry have had specialized training in vessel stability, stability instructions should

[122] CG Exhibit 034, 13 October 2018 USCG Commercial Fishing Vessel Dockside Examination Form
[123] § 5 AAC 39.670. Bering Sea/Aleutian Islands Individual Fishing Quota (IFQ) Crab Fisheries Management Plan
[124] 46 CFR 28.510

take into account the conditions a vessel may reasonably be expected to encounter and provide simple guidance. The instructions must be developed based on each vessel's individual characteristics and must be in a format that is easily understood by the individual in charge of the vessel.

4.2.146. For vessels which operate in areas where icing conditions are present, like the SCANDIES ROSE, the regulations require stability instructions to factor in the added weight of ice accumulation on the vessel.

4.2.147. The text of the regulation mirrors guidance from the International Maritime Organization (IMO). It requires 1.3-inch thick ice to be applied to continuous horizontal surfaces and 0.65-inch thick ice to be applied to vertical surfaces and assumes that ice accumulation around a stack of crab pots is distributed evenly. However, the regulation does not provide guidance for the manner in which crab pots should be treated for icing and does not refer to a formal study or test when giving guidance on how to calculate ice accumulation on crab pots webbing, framework, or the gear stored inside the pots themselves. A panel of naval architects was called as witnesses for the MBI Hearing and counsel for the vessel owners asked them about the term "shoebox" as it applies to how the regulations take icing into account. The regulation does not provide clarification how the icing conditions are to be applied to the sides of the vessel and in the case of the SCANDIES ROSE, the crab pot stack.

> *MR.* [redacted] *And you've talked about a shoebox, and the concept of a shoebox has been used, but again, I want to make sure this is really understandable. If you put a giant shoebox over the stack of crab pots and accumulated ice on that shoebox, six-tenths of an inch on the vertical surfaces and 1.3 inches or so on the horizontal surfaces, is that what the regulations tell you to do in calculating icing?*
> *MR.* [redacted] *That's the guidance it provides, yes.*
> *MR.* [redacted] *Okay. And does -- do the regulations also assume that that ice will accumulate uniformly over those surfaces?*
> *MR.* [redacted] *It does.*[125]

4.2.148. During the MBI Hearing, BSAI crab fishermen and industry naval architects said that, in reality, ice accumulates asymmetrically on pot stacks—the side of the stack that is exposed to the wind and freezing spray accumulates the majority of the ice, while the opposite side could accumulate very little. The formation of ice at sea on a vessel encountering asymmetrical icing can cause the vessel to list or heel to one side or the other and it may affect the fore and aft trim of the fishing vessel. They further stated that ice also accumulates on the interior webbing of the pots, something that is not accounted for in the regulations.

4.2.149. The regulations for commercial fishing vessels like the SCANDIES ROSE do not specify the length of time stability instructions and stability books are valid. In fact, stability instructions produced by a qualified individual for vessels such as the SCANDIES ROSE are

[125] Naval Architect Hearing Panel, MBI Hearing Transcript, Pg. 451

valid for the life of the vessel as long as no major alterations or modifications have been made.

Stability

Stability Analysis by Marine Safety Center

4.2.150. The Marine Board formally requested that the Coast Guard's Marine Safety Center (MSC) conduct an analysis on the design and construction of the SCANDIES ROSE as it related to the stability of the vessel during the accident voyage. The MSC's Naval Architect completed that tasking and prepared a report and analysis which was introduced as CG Exhibit 059, the Technical Report, SCANDIES ROSE Stability Analysis, February 8, 2021.

4.2.151. There were two stability instructions prepared for the SCANDIES ROSE, one in 1988 and one in 2019. Both stability assessments and their stability instructions were completed by the same Naval Architect.

4.2.152. The majority owner was asked about his decision to select the same naval architect that had done the previous stability assessment work in 1988:

> *I used [redacted] just because he had done the previous one, that was the -- that was the impetus, that was the sole impetus.*[126]

4.2.153. The owner was asked why he had a stability analysis done and an instruction prepared in 2019 and he testified:

> *Q. …Sir, have you ever examined either the Coast Guard or National Transportation Safety Board's Report of Investigation for the Destination, for the sinking of the Destination?*
> *A. No, did not read the report, but that's the reason why I did a new stability report for the SCANDIES ROSE. We just thought -- figured that everybody's using heavier pots than stability reports were written for and a lot of these vessels have had alterations, whether minor or major, and I just thought it was prudent to do a new incline test.*[127]

4.2.154. The incline test, which is the foundation for a stability instruction, was performed in the Seattle area in mid-April 2019. Once the physical tests dockside were complete on the actual vessel, the Naval Architect completed the calculations that resulted in the stability instructions being prepared for the client.

4.2.155. Due to a previous fire onboard resulting in design modifications, the SCANDIES ROSE, in 2019, differed from the 1977 plans of the vessel in several areas.

[126] Captain [redacted] MBI Hearing Transcript, Pg. 97
[127] Captain [redacted] MBI Hearing Transcript, Pg. 59

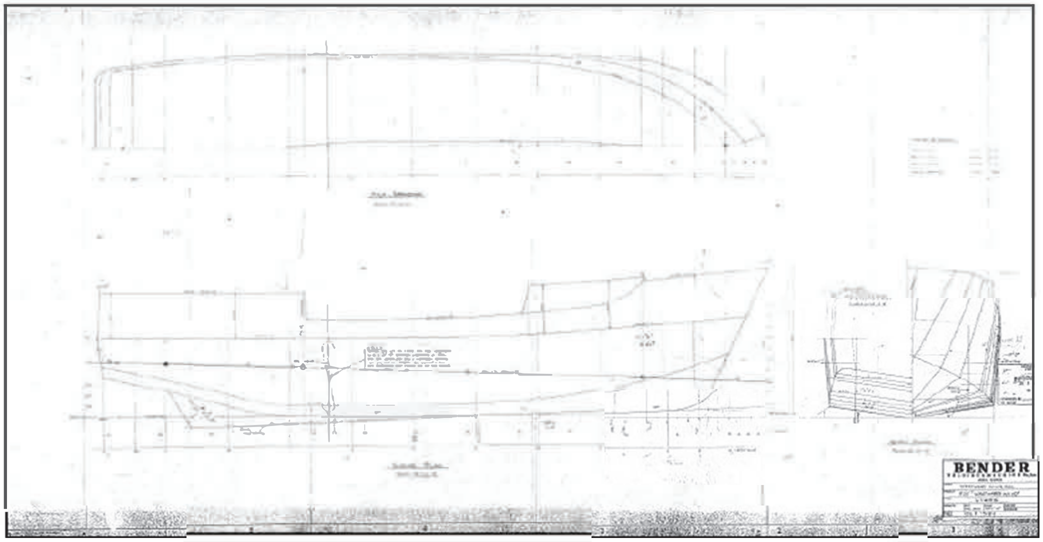

Figure 48 – SCANDIES ROSE Lines Plans, dated May 1977. (Source Coast Guard MSC Report, CG Exhibit 059)

Figure 49 – SCANDIES ROSE around the time of delivery in 1978. Formerly called the ENTERPRISE. (Source Coast Guard MSC Report)

4.2.156. The MSC took recent photos of the SCANDIES ROSE and overlaid them on the original plans to determine if there were any differences in the modern configuration of the vessel in comparison to the original vessel as noted in the figure above. There were differences noted as shown in figures 50 and 51, below. The MSC then used computerized hydrostatic modeling to determine the stability characteristics for the SCANDIES ROSE based on the available drawings, photographs, naval architect's notations, documentary evidence, and other available information.

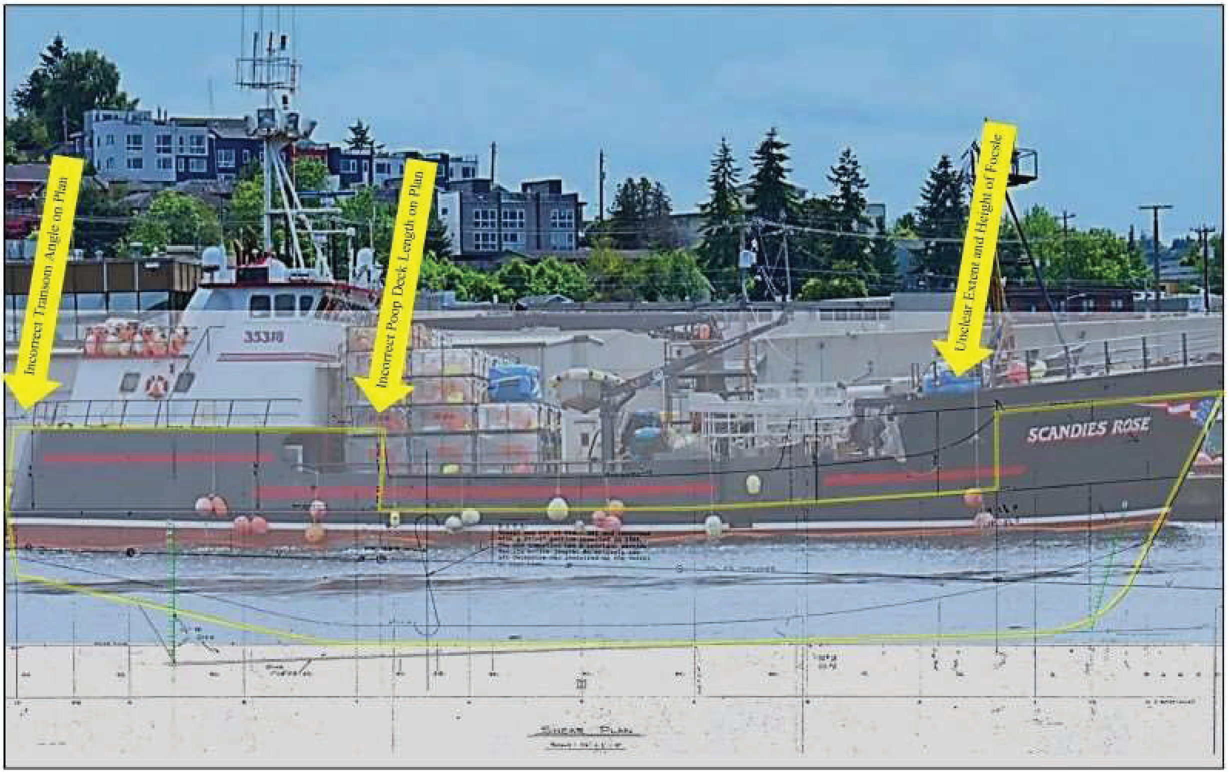

Figure 50 - Profile photograph of SCANDIES ROSE with Line Plans overlaid with watertight envelope highlighted in yellow and large profile differences in poop and forecastle called out. (Source; Coast Guard MSC Report, CG Exhibit 059)

Figure 51 - Profile photograph of the SCANDIES ROSE with Scantling Plan and Profile overlaid. Note that the plan matches the vessel's transom but indicates additional buoyant volume at the forward end of the poop. (White highlighted area) (Source USCG MSC Report, CG Exhibit 059)

Downflooding Points into the Interior of the Vessel

4.2.157. The Naval Architect who created the 1988 and 2019 stability documents wrote the following note in his work documents related to the downflooding considerations posed by the engine room air intakes located on each side of the vessel.

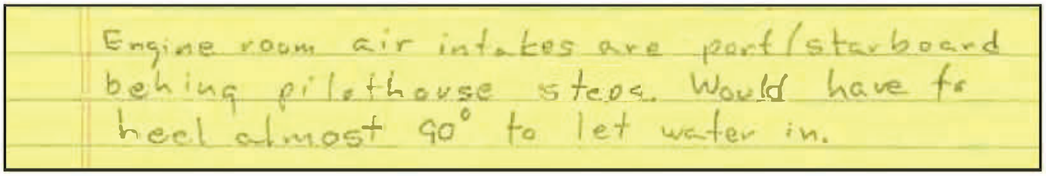
Engine room air intakes are port/starboard behind pilothouse steps. Would have to heel almost 90° to let water in.

Figure 52 – SCANDIES ROSE Naval Architect's working notation on the location of the air intakes for the engine room and their potential for downflooding into the interior of the vessel. (Source CG Exhibit 039)

4.2.158. In testimony, the location and routing of possible flooding were discussed with the Naval Architect who authored the 2019 stability instruction:

Q. Ok[redacted]y. And then, do you remember how you calculated the angle of downflooding in 2019?
A. I asked the owner about the air intake for the engine room. That's normally where the downflooding point would be. He told me that it was up high, right behind the steps from the pilot house. I think it's in the side of the stack. It's real high, and maybe 2 or 3 feet off the fender line, so I didn't feel like it would be a factor and I didn't put it into the computer model.
Q. Ok[redacted]y. Did -- when you were out there, did you verify where those downflooding points were?
A. No, I didn't go up there. Since then, I went and -- because there was an issue about it, I went and visited the other sister ship, the Westwood[128] [sic] *Wind, and went up on it. And the opening was where I thought it would be. It's possible that there's some other kind of opening. I don't think they could have had the engine room intake down any lower.*
Q. So, and you said about 2 feet off the centerline. Are you aware that the engine room air intake ventilation's underneath the ladder wells that go up to the bridge, so that essentially more outboard and towards the side of each, on both the port and starboard side?
A. I didn't go up and look at where they actually are. I think where they would go down into the trunk would be almost right on the centerline.[129]

4.2.159. The MSC calculated that the lowest downflooding points are the engine room vents, which are noted to be behind the stairs to the pilothouse on the poop deck. The location of these vents is indicated on the "Poop and Focsle Deck" which shows them as 4 feet long, on the poop deck between frames 45 and 47, and 12 feet 10 inches off centerline on both the port and starboard sides.[130] These vents lead directly down into the engine room from their location on each side of the vessel. The MSC calculated that the resulting downflooding angle from these vents would be only 35 degrees at typical loaded draft condition of the

[128] Spelling error in the transcript; should be "westward"
[129] Mr. [redacted] MBI Hearing Transcript, Pg. 1861
[130] CG Exhibit 059, Reference (f) Bender Welding & Machine Co., Inc., "Poop and Focsle Deck," 132B-108-1, Rev. 1, Dated Sept-1977

vessel, which was significantly less than the downflooding angle which Mr. [redacted] testified to.

Figure 53– Engine room air intakes under and behind the stairs leading up to the SCANDIES ROSE wheelhouse highlighted by red box and yellow arrow. The air intakes are near the outboard side of the vessel and lead directly down into the vessel's engine room. (Source CG Exhibit 004, with markup)

4.2.160. The capacity and volume of the contents of the cargo, fuel, and water tanks of the SCANDIES ROSE was captured in a tank plan created in 2007.

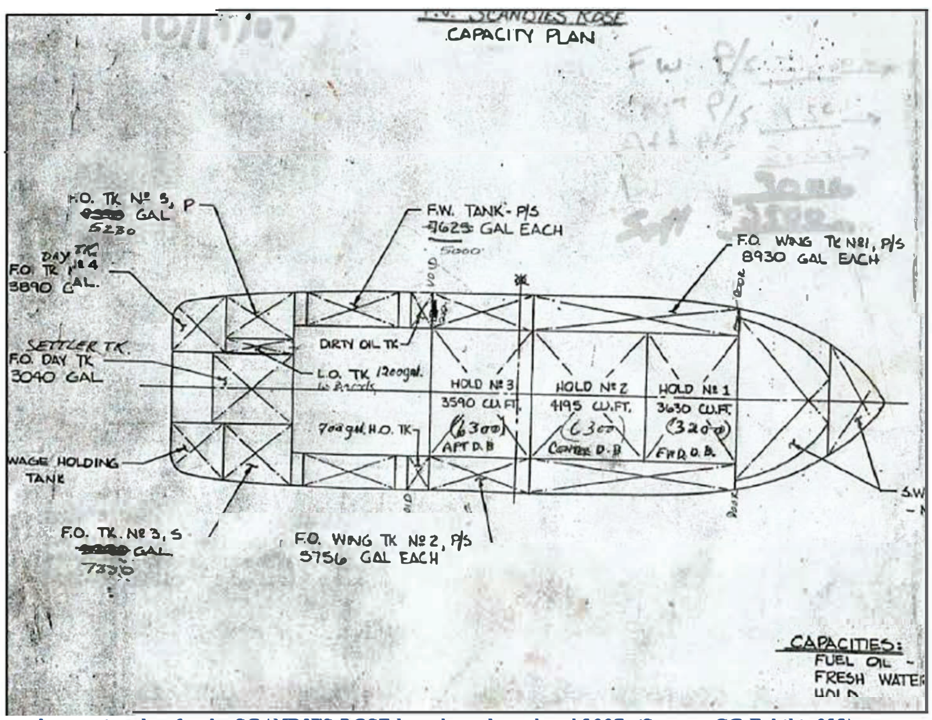

Figure 54 – The tank capacity plan for the SCANDIES ROSE based on plans dated 2007. (Source CG Exhibit 059)

4.2.161. During the course of modeling the vessel, MSC calculated the volumes of many of the tanks to differ from those reported by the Naval Architect. Developing stability instructions with inaccurate tank quantities can affect the stability limitations imposed on the vessel by a naval architect. The differences between the MSC model and the Naval Architect's model indicate that deviations in tank load weights were less than 1% of the total displacement of the vessel as shown in the figure below which focuses on the 11 loading conditions captured in the 2019 stability instructions.

Loading Condition	Hydro-Statics Model	Tank fwdwing (s) Weight Diff. (LT)	Tank fwdwing (p) Weight Diff. (LT)	Tank midwing (s) Weight Diff. (LT)	Tank midwing (p) Weight Diff. (LT)	Tank aftwing (s) Weight Diff. (LT)	Tank aftwing (p) Weight Diff. (LT)	Tank water (s) Weight Diff. (LT)	Tank water (p) Weight Diff. (LT)	Tank aftfuel (s) Weight Diff. (LT)	Tank aftfuel (p) Weight Diff. (LT)	Tank Lubeoil (p) Weight Diff. (LT)	Tank daytank (p) Weight Diff. (LT)	Tank sewage (s) Weight Diff. (LT)	Tank dblbtmc Weight Diff. (LT)	Total Difference (LT)	% Difference (of Displacement, LT)
2019 Stability Book Condition 1: Max Consumables, 208 Pots, Holds 2 and 3 full	MSC	0.0	0.0	-0.3	-0.3	-2.1	-2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**4.8**	0.45%
2019 Stability Book Condition 2: 75% Consumables, 208 Pots, Holds 2 and 3 Full	MSC	0.0	0.0	0.0	0.0	-2.1	-2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**4.2**	0.41%
2019 Stability Book Condition 3: 50% Consumables, 208 Pots, Holds 2 and 3 Full	MSC	0.0	0.0	0.0	0.0	-2.1	-2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**4.2**	0.41%
2019 Stability Book Condition 4: 25% Consumables, 208 Pots, Holds 2 and 3 Full	MSC	0.0	0.0	0.0	0.0	-2.1	-2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**4.2**	0.43%
2019 Stability Book Condition 5: 10% Consumables, 208 Pots, Holds 2 and 3 Full	MSC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**	0.00%
2019 Stability Book Condition 6: Max Consumables, Tendering, All Holds Full	MSC	0.0	0.0	-0.3	-0.3	-2.1	-2.1	0.0	0.0	-0.3	-1.6	0.0	0.0	0.0	0.0	**6.7**	0.58%
2019 Stability Book Condition 7: 75% Consumables, Tendering, All Holds Full	MSC	0.0	0.0	0.0	0.0	-2.1	-2.1	0.0	0.0	-0.3	-1.6	0.0	0.0	0.0	0.0	**6.1**	0.55%
2019 Stability Book Condition 8: 50% Consumables, Tendering, All Holds Full	MSC	0.0	0.0	0.0	0.0	-2.1	-2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**4.2**	0.40%
2019 Stability Book Condition 9: 25% Consumables, Tendering, All Holds Full	MSC	0.0	0.0	0.0	0.0	-2.1	-2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**4.2**	0.41%
2019 Stability Book Condition 10: 10% Consumables, Tendering, All Holds Full	MSC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**	0.00%
2019 Stability Book Condition 11: Crabbing, 3 Holds Full, 168 Pots	MSC	0.0	0.0	-0.3	-0.3	-2.1	-2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**4.8**	0.41%

Figure 55 – This table is an excerpt from Table 27 in the MSC Final Technical Report. The table shows the differences in tank loads between the MSC model and the load conditions specified in the calculation prepared by the Naval Architect to produce the 2019 stability instructions. (Source CG Exhibit 059, Pg. 66)

<u>Stability Instructions to the Master of the SCANDIES ROSE</u>

4.2.162. 46 CFR 28.530 provides regulatory information for the stability instructions for the operation of a commercial fishing vessel:

> *Each vessel must be provided with stability instructions which provide the master or individual in charge of the vessel with loading constraints and operating restrictions which maintain the vessel in a condition which meets the applicable stability requirements of this subpart*
>
> > (*c) Stability instructions must be developed by a qualified individual.*

(d) Stability instructions must be in a format easily understood by the master or individual in charge of the vessel. Units of measure, language, and rigor of calculations in the stability instructions must be consistent with the ability of the master or the individual in charge of the vessel. The format of the stability instructions may include, at the owner's discretion, any of the following:
(1) Simple loading instructions;
(2) A simple loading diagram with instructions;
(3) A stability booklet with sample calculations; or
(4) Any other appropriate format for providing stability instructions.

4.2.163. During the course of this investigation, several stability instructions were collected as evidence and formally documented as exhibits for this investigation[131] which were referred to or titled as stability booklets or stability books. These widely accepted industry terms are considered synonymous with referring to the stability instructions. For the purpose of the investigation, the regulatory term stability instruction will be used to refer to as the cumulative document that is provided to the master or individual in charge of the vessel to inform them of important stability information such as loading constraints and operating restrictions which maintain the vessel in a condition that meets the stability requirements as outlined in Title 46 CFR, Part 28. If a figure or witness quote addresses a stability book or stability booklet, it should be accepted as meaning the stability instructions.

4.2.164. The Naval Architect developed the 2019 stability instructions and included this note into the bound copy of the documents

[redacted] NAVAL ARCHITECT
[redacted]

TELEPHONE [redacted]
Email [redacted]

May 17, 2019

[redacted]

Enclosed are two copies of the stability book for the Scandies Rose. It can carry pots up to the pilothouse windows as discussed without much difficulty. The light ship weight was a bit heavier than I expected – there may have been something in the holds that we missed, or it may have gained some weight over the years. The tankage is a little different between this boat and the Patricia Lee, and some things may be done differently than when I first did this. If you see anything that should be changed let me know and I'll revise it at no charge.

Sincerely,
[redacted]

Figure 56 – Letter to owner that was bound into and included with the 2019 stability instructions. (Source CG Exhibit 036)

[131] CG Exhibits 035, 036, and 134.

4.2.165. The 2019 stability instructions that were provided to the owner contained these instructions to the Captain of the SCANDIES ROSE.

INSTRUCTIONS TO MASTER

F/V SCANDIES ROSE

1. Stability characteristics of this vessel are evaluated for compliance with 46CFR Subchapter C, paragraph 28

2. A total of (208) 835 pound crab pots can be carried on deck. The first tier on edge and the rest flat, Do not obscure vision from the pilothouse. This applies in icing or non-icing conditions. If all three Holds are flooded (168) pots can be carried, and forward wing tanks are to be empty.

3. Flooded holds must be filled or emptied. In a sheltered location or in port. Do not operate with a slack . Do not operate with a slack (partially filled) hold.

4. Freeboard is not to be less than six inches at any point.

5. Always determine the cause of any list before taking corrective action.

6. All gear carried on deck or in a hold must be firmly secured against shifting.

7. All doors, hatches, manholes, scuttles, etc., must be kept securely closed while at sea except when Actually in use.

8 Bilges must be kept pumped to minimum content at all times subject to pollution regulations.

9. Freeing ports must be kept clear and operable at all times.

10. Avoid accumulation of unnecessary weights such as spare parts, tools, gear and stores.

11. No modifications to the vessel, such as adding or removing ballast or other weights is to be performed without first determining their effect on stability.

12. The master of the vessel is responsible for maintaining watertight integrity at all times and to exercise prudent seamanship, giving consideration to the season of the year, weather, sea and ice conditions.

May 28, 2019

Figure 57 - Instructions to Captain of the SCANDIES ROSE that were contained in the stability document dated May 28, 2019. (Source CG Exhibit 036)

Regulatory Standards for Icing

4.2.166. The regulations regarding the ice accumulation on commercial fishing vessels operating in Alaska or in the waters of the northeastern U.S. require consideration for ice buildup on the vessel when creating the stability instructions.

4.2.167. The regulatory icing standards account for a uniform or symmetrical loading of ice.

4.2.168. 46 CFR 28.550 reads in part and with the applicable portion highlighted, as the SCANDIES ROSE was operating at or near latitude 56° 29', North.

> *28.550 Icing.*
> *(a) Applicability. Each vessel that operates north of 42° North latitude between November 15 and April 15 or south of 42° South latitude between April 15 and November 15 must meet the requirements of this section.*

(b) Except as provided in paragraph (d) of this section, the weight of assumed ice on each surface above the waterline of a vessel which operates north of 66°30' North latitude or south of 66° South latitude must be assumed to be at least:

(1) 6.14 pounds per square foot (30 Kilograms per square meter) of horizontal projected area which corresponds to a thickness of 1.3 inches (33 millimeters); and

(2) 3.07 pounds per square foot (15 Kilograms per square meter) of vertical projected area which corresponds to a thickness of 0.65 inches (16.5 millimeters).

(c) Except as provided in paragraph (d) of this section, the weight of assumed ice on a vessel that operates north of 42° North but south of 66°30' North latitude or south of 42° South but north of 66° South latitude must be assumed to be at least one-half of the values required by paragraphs (b)(1) and (b)(2) of this section.

4.2.169. When testifying, the MSC naval architect was asked about the implications for this icing criteria being applied to a fishing vessel, like the SCANDIES ROSE

Q. …The regulatory basis for the icing conditions in a stability study appears to me, and tell me if I've got this, to have two serious flaws. The first is the regulation assumes an even coat of ice 0.6 inches approximately on vertical surfaces and 1.3 inches on horizontal surfaces, and that is spread evenly in the shape of a shoebox over the top of the crab stack; is that correct?
A. That's correct. It's supposed to be applied to surfaces. So if the crab pots are assumed to be surfaces, then that would be how you would apply it.[132]

4.2.170. In 2005, the Coast Guard published *A Best Practices Guide to Vessel Stability* for commercial fishermen. The guide provides a general overview of fishing vessel stability and addresses icing caused by winds and waves. It states that:

Stability is the ability of a fishing vessel to return to its upright position after being heeled over by any combination of wind, waves, or forces from fishing operations…A fishing vessel's stability is constantly changing during its voyage. An originally stable fishing vessel may become unstable from changes in the weather, the vessel's loading or fishing operations…The key to having a stable vessel is making sure there is always be sufficient stability to counter the capsizing moments from the current weather, waves, and fishing conditions during the entire voyage.

4.2.171. In January 2017, the Coast Guard published *Voluntary Safety Initiatives and Good Marine Practices for Commercial Fishing Industry Vessels.* The target audience for the document was operators of vessels greater than 50 feet in length, operating beyond three NMs from shore, and more than 25 years old. The initiatives and good marine practices contained in the document were reviewed, validated, and recommended by the Commercial Fishing Safety Advisory Committee (CFSAC), which represented the industry.

[132] Mr. [redacted] MBI Hearing Transcript, Pg. 671

4.2.171.1. One section was devoted to Stability Standards, in which the Coast Guard recommended that a vessel's stability instructions "should be" updated by a qualified individual every five years, or after a modification or alteration occurs to the vessel. In addition, they stated that the operator of the vessel should be provided training on vessel stability and on specific loading conditions of their vessel. The guidance also included information to better help vessel owners beware of weight creep and other changes a vessel can experience over time. Weight creep is the weight added to a vessel over time from modifications, alterations, or the addition of fishing gear and spare parts. The added weight can significantly change a fishing vessel's overall stability. Regulations do not reflect this guidance.

Stability and the Accident Voyage

4.2.172. The SCANDIES ROSE departed Kodiak on the accident voyage with a "pot stack" consisting of between 192 and 198 combination crab pots, under the 208-pot limit stated on the vessel's stability instructions.[133] The Captain reported to Captain [redacted] in one of the last phone calls before sinking that he had 195 pots aboard.

4.2.173. The pots were not weighed prior to departure as they had been before king crab season, but the majority owner indicated that they were the same pots that were used during the king crab season but with new webbing installed.

4.2.174. The majority of pots were stacked five high, with the exception of those in front of the starboard wheelhouse operating station where the pots were only stacked four high so that the crew could have less obstructed line of sight while navigating the vessel. The lower first tier of pots were positioned on their sides.

4.2.174.1. The pots were secured to the vessel with chains running across the SCANDIES ROSE from side to side, across the vessel. Those chains were tightened with chain binders to get all the slack out of the chain and secure the load.

4.2.174.2. A small amount of gear was put onto the top of the stack, which included the sorting table.

4.2.174.3. The majority owner and surviving crew were not certain about the status of the three crab tanks during the voyage but agreed that the number 1 tank was most likely empty, while the number 2 and 3 tanks were most likely full.[134]

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[133] Captain [redacted] CG Exhibit 132, Pre-hearing Transcript, Pg. 393
[134] Captain [redacted] CG Exhibit 132, Pre-hearing Transcript, Pg. 107, 109

Figure 58 – SCANDIES ROSE at the dock just prior to departure with chain binders, chains and height of the pot stack at its highest point shown. (Source Mr. [redacted] and Mr. [redacted]

4.2.175. On or about September 2019, after the summer tendering season, the SCANDIES ROSE was topped off with fuel.

4.2.176. The majority owner estimated that, while operating, the vessel would consume approximately 1,000 gallons of fuel per day.

4.2.177. The vessel operated about 15 days during the 2019 king crab season before returning to port in Kodiak, Alaska.

4.2.178. On or about December 30, 2019, the SCANDIES ROSE loaded 2,100 gallons of fuel. Taking into account the amount of fuel that was consumed while operating and while tied to the dock in between fishing seasons, the majority owner believed that the fuel taken prior to departure was to top off the number 2 port and starboard wing tanks, and that the number 1 port and starboard wing tanks were empty.[135]

4.2.179. The vessel loaded 14,928 pounds of bait into the freezers forward and topped off the potable water tanks prior to departure.[136]

[135] CG Exhibit 012, Pg. 8
[136] CG Exhibit 013

Commercial Pressure and SCANDIES ROSE Operations

4.2.180. The SCANDIES ROSE was planning to participate in the BSAI Pacific cod fishery right after the season start on January 1, 2020. The plan was for the vessel to finish fishing for cod and shift to the BSAI opilio crab fishery. After departing Kodiak, the plan was to fish for Pacific cod with the modified crab traps that were the same crab pots that would later be used for opilio crab.

4.2.181. Prior to departure, the pots, fitted with new webbing, had to be rigged and triggers for cod had to be installed on each pot. Later, the crab pots would have to be reconfigured slightly for crab fishing operations by removing the cod triggers upon completion of cod fishing.

4.2.182. In testimony, the vessel manager laid out the details of the fishing plan

> *You know, are we going to fish codfish before opilio, which is the only real question mark because king crab opens, you're going to fish king crab. There's not a question of oh, well, we're going to skip king crab this year, you wouldn't, you wouldn't do that. But January 1st -- actually not even January 1st, but around December 27th, 28th, the SCANDIES ROSE always got ready to go to depart and would either go fish codfish or go fish opilio right after that. And we primarily erred -- not erred, but we primarily focused on opilio, we'd like to get a quick start on opilio and neglected cod for several years.*[137]

4.2.183. ADF&G set the quotas for the BSAI opilio crab fishery and determine the annual catch limit (ACL). The crab fisheries in the Bering Sea and Gulf of Alaska are co-managed by the State of Alaska and NMFS, under the provisions of the Federal Fisheries Management Plan. The NMFS website contains the following information on Pacific cod fishing

> *Managed under the Bering Sea/Aleutian Islands Groundfish Fishery Management Plan:*
>
> *10.7 percent of the allowable catch is allocated to the community development quota program, which benefits fishery-dependent communities in western Alaska. The rest is allocated among the various fishing sectors based on gear type, vessel size, and ability to process their catch.*
>
> *In the Gulf of Alaska, Being Sea, and Aleutian Islands:*
>
> *Fishermen must have a permit to participate in these fisheries, and the number of available permits is limited to control the amount of fishing.*

[137] Ms. [redacted] MBI Hearing Transcript, Pg. 29

Managers determine how much Pacific cod can be caught and then allocate this catch quota among groups of fishermen. Catch is monitored through record keeping, reporting requirements, and observer monitoring.

Fishermen must retain all of their Pacific cod catch.[138]

4.2.184. The opilio crab season opened on October 15 each year and did not close until the end of May the following year.

4.2.185. The Pacific cod season for 2020 started January 1, 2020 and ended on January 15, 2020. In testimony, when asked about the closure date and the length of the fishery season, the representative for NOAA's National Marine Fisheries Service commented that the 15-day length was the same as it had been in 2019 and is "the shortest season that we've seen for the fishery."[139]

And when a former crewman and experienced fisherman was asked about the rationale for going cod fishing before fishing crab, he replied to a question

Q: Do you have an understanding why a vessel like the SCANDIES ROSE might want to fish when it could in the cod season and then shift over to opilios?
A. Yes. It's a pretty common practice. They do it so that the boat has a catching streak. This is in anticipation of the cod fishery eventually going rationalized with the quota system like crab is as opposed to being a (indiscernible) fishery.[140]

4.2.186. The SCANDIES ROSE had obtained the appropriate permits for Pacific cod and crab.[141]

Coast Guard Response Resources

4.2.187. Coast Guard SAR readiness and mission response standards are published in COMDTINST M16130.2F and provide resource planning guidance to Coast Guard District and Sector Commanders, who are responsible for the basing or staging of SAR units and assets. In making their resource deployment decisions, they must take into account resource constraints, environmental considerations and other factors.

4.2.187.1. Bravo-0 means an aircraft will launch within 30 minutes of notification of distress with an on-scene time within 90 minutes after launch.

4.2.187.2. Other statuses like Bravo-2 mean an aircraft will launch within two hours of first notification of distress. Bravo-2 readiness does not include a requirement for the aircraft to arrive on-scene within a certain timeframe.

[138] Website link: https://www.fisheries.noaa.gov/species/pacific-cod
[139] Ms. [redacted] MBI Hearing Transcript, Pg. 975
[140] Mr. [redacted] MBI Hearing Transcript, Pg. 704
[141] https://www fisheries noaa.gov/sites/default/files/akro/1920cratfcvp.csv

4.2.187.3. Per the D17 SAR Plan,[142] Air Station Kodiak was required to maintain, to the maximum extent possible, at least one Bravo-0 MH-60 helicopter and at least one Bravo-0 HC-130.

4.2.187.4. During times of inclement weather affecting the runways in Kodiak, Air Station Kodiak has a standard operating policy to relocate their HC-130 to JBER in Anchorage, AK, where they assume a Bravo-2 status. Once alerted to launch, these aircraft provide long-range communications relay capabilities for other Search and Rescue Units (SRUs) on scene. This is what happened in preparation of the predicted winter storm front during the time of this accident. The aircraft were relocated to JBER on December 31, 2019 where they assumed Bravo-2 status.

4.2.188. The HC-130 is a fixed wing aircraft and serves as the Coast Guard's long-range patrol and search and rescue asset. The HC-130 as an on-scene command-and-control platform with extended loitering capabilities as well as performing various missions, including maritime patrol, law enforcement, search and rescue, disaster response, and cargo and personnel transport. The HC-130 is fitted with a powerful multimode surface-search radar and a nose-mounted electro-optical/infrared (EO/IR) device combined with an Airborne Tactical Workstation and military satellite communications.

Figure 59 – Image of a Coast Guard HC-130 which is similar to the aircraft used in the search operations. (Source Coast Guard)

4.2.189. The HC-130's operating capabilities are shown in the figure below.

[142] D17 SAR Plan, CGD17INST 16104.1(series)

One HC-130J HERCULES (Aircraft #2006)		
Engines	**4**	**4,910-hp Allison T56-A15 turboprop engines**
Operating Environment	**All weather, day/night**	
Maximum Speed	**362**	**Knots**
Cruise Speed	**280**	**Knots**
Service **Altitude**	**39,000**	**Feet**
Range	**5,200**	**Nautical Miles**
Crew Size	**6**	**Persons**
Operating Restrictions and Notes		
Aircraft was operating within operating limits the night of the accident. Due to weather conditions, the HC-130 aircraft number 2006 launched from Joint Base Elmendorf-Richardson, Anchorage, AK.		

Figure 60 – Capabilities of a fixed wing aircraft that was used in the Coast Guard's search and rescue operation after the sinking of the SCANDIES ROSE. (Source Coast Guard)

4.2.190. The MH-60, also known as a Jayhawk, is the Coast Guard's longer range rotary wing aircraft. The MH-60 employs full night-vision-device capability. Primary navigation is accomplished through blended GPS and inertial navigation system receivers. In addition to a rescue hoist – rated for 600 pounds – the Jayhawk is equipped with a heavy-lift external sling with a capacity of 6,000 pounds. The MH-60 carries sensors and equipment for SAR missions, law enforcement, and homeland security missions. Its primary mission in this case was to search for and recover survivors. The forecasted weather and the distance to the LKP of the SCANDIES ROSE would require additional flight planning which included taking on additional fuel for the search mission to a position south of Sutwik Island. The night flight with blowing snow and low ceiling hampered the pilot and co-pilot's night vision equipment and adverse weather conditions, at times, requiring both pilots to control the aircraft in order to maintain the safety of the aircraft and manage the risk to the crew and mission.

Figure 60 – Image of a Coast Guard MH-60, similar to the types used in the search operations. (Source Coast Guard)

The MH-60 operating capabilities are shown in the figure below.

Two MH-60 Jayhawk Helicopters (Aircraft #'s 6038, 6037)		
Engines	**2**	**1,560-shp General Electric T700-GE-401C turboshaft engines**
Operating Environment	**All weather, day/night**	
Maximum Speed	**180**	**Knots**
Cruise Speed	**120**	**Knots**
Maximum Altitude	**13,000**	**Feet**
Range	**700**	**Nautical Miles**
Crew Size	**4**	**Persons**
Hoist Capable	**Yes**	
Rescue Swimmer in Crew	**Yes**	
Operating Restrictions and Notes		
Operating within operating limits on the accident night. MH 60T aircraft number 6038 rescued the survivors and returned to Air Station Kodiak, AK with the Auxiliary power Unit switched off to conserve fuel.		

Figure 61 – Capabilities of the helicopters used in the Coast Guard's search and rescue operation after the sinking of the SCANDIES ROSE. (Source Coast Guard)

4.2.191. Air Station Kodiak is assigned four MH-65 aircraft. Short range recovery aircraft satisfy the International Civil Aviation Organization/IMO SAR equipment definition of Helicopter-Light. In optimal conditions, these aircraft have a 100 NM action radius and a capacity for evacuating one to five persons. The Coast Guard MH-65 helicopter can land on any cutter with a flight deck and can perform helicopter inflight refueling from those ships to extend range. With the limited range, this aircraft was not a viable option for this SAR response because of the transit distance to the search area.

Figure 62 – Image of a Coast Guard MH-65. (Source Coast Guard)

One MH-65D (Aircraft # 6590)		
Engines	2	Two 835-shp turboshaft engines
Operating Environment	All weather, day/night	
Maximum Speed	175	Knots
Cruise Speed	120	Knots
Maximum Altitude	10,000	Feet
Range	375	Nautical Miles
Crew Size	4	Persons
Hoist Capable	Yes	
Rescue Swimmer in Crew	Yes	
Operating Restrictions and Notes		
The MH65 deployed to the USCGC MELLON. It was not mission capable due to a maintenance issue, and was on deck at the Dutch Harbor Airport (PADU). Due to this, it was unable to embark to the MELLON.		

Figure 63 – Capabilities of one of the aircraft that was attached to the CGC MELLON but unavailable for the Coast Guard's search and rescue operation after the sinking of the SCANDIES ROSE. (Source Coast Guard)

4.2.192. The CGC MELLON is a high endurance vessel that is 378 ft in length. The Secretary-class cutter is ideally suited for long-range, high-endurance missions, and for fulfilling the maritime security role, which includes drug interdiction, illegal immigrant interception, and fisheries patrol.

Figure 64 – USCG Cutter MELLON (WHEC-717) in an undated photo. (Source Coast Guard)

4.2.193. The CGC MELLON's operating capabilities are listed in the figure below.

USCGC MELLON WHEC 717		
Engines	**2**	**Diesel engines 3,500 bhp each / Two gas turbine engines**
Shafts	**2**	**36,000 Shaft Horsepower**
Length Over All	**378 Feet**	
Displacement	**3400 Tons**	
Operating Environment	**All weather, day/night**	**Sea State: N/A**
Range and Speeds: 2,400 nautical miles at 29 knots or 9,600 miles at 19 knots (on gas turbines); 12,000 nautical miles at 14 knots (on diesels)		
Crew Size:	**167**	
Length Over All	**378 Feet**	
Operating Restrictions and Notes		
Vessel was operating within operating limits on the accident night. The USCGC MELLON transited to search area running at times on one of two gas turbine engines due to weather conditions. During search operations had to stop active search operations to break ice that had accumulated on the forward part of the ship.		

Figure 65 – Capabilities of the CGC MELLON used in the Coast Guard's search and rescue operation after the sinking of the SCANDIES ROSE. (Source Coast Guard)

Radio Communication Gaps

4.2.194. The Coast Guard VHF radio system in Alaska, or R21 AK,[143] was funded through a Coast Guard Authorization Bill to upgrade the VHF-F communications system the Coast Guard uses in the Alaska region. The system was upgraded in the early 2010s with a newer radio and electronics package to include DSC and three additional remote fixed facilities were added to the system to increase the coverage area. However, 20 remote fixed facilities, network and backbone upgrades, microwave consolidation, power generation including generators and solar panels, and shelter/hut upgrades that were originally in the bill were removed and not included in the upgrades that were authorized. This left a significant shortfall in the capabilities and sustainment of the system. As a result, the R21 AK system still depends on obsolete equipment that includes 1980s era network technology such as microwaves that are past their end of service life and generators lacking supervisory control and data acquisition, all of which are unsupported by the current Coast Guard system. Mountain top huts containing critical equipment like generators, electronics, and other critical Information Technology equipment are in disrepair with long-standing upgrade and repair requests. Propane and other fuel systems that power these systems are left empty due to the logistics of refueling at high altitudes, in remote mountain-top regions, leaving the equipment inoperative. The SCANDIES ROSE accident location was not within a current R21 AK coverage area.

[143] Rescue 21 Alaska (R21 AK) is the VHF radio communication system the Coast Guard utilizes in Alaska.

Survivability Factors

4.2.195. Command Center watchstanders used the Probability of Survival Decision Aid (PSDA) software within the SAROPS program to calculate predicted survival times from the effects of hypothermia during cold-water immersion. Coast Guard rescue forces calculated that the water temperature was 38º Fahrenheit and air temperature 10º Fahrenheit.[144]

4.2.196. Using the latest version of the PSDA, the survival times were calculated for an individual with and without a survival suit on. With a survival suit on, the functional time was 3.84 hours and predicted cold survival time was 8.15 hours, assuming crewmembers were wearing a clothing ensemble of shirt, sweater, and plastic polyvinyl chloride (PVC) rain suit. Without a survival suit on, the functional time was 1.73 hours and predicted cold survival time was 6.23 hours, assuming crewmembers were wearing a clothing ensemble of shirt, sweater, and PVC rain suit. However, the effects of sudden cold-water immersion below 68º Fahrenheit can result in a respiratory reflex resulting in a rapid loss of life. The survival times in the PSDA are based on entering the water slowly in a non-catastrophic marine accident such as a planned event like abandoning ship in a case where a procedure is carried out calmly and methodically.

4.2.197. Functional Time (core temperature above 34° Celsius or 93.2° Fahrenheit) is the length of time (hours) during which an individual may participate in self-rescue or take actions that will enhance survival/protection from exposure. Cold Survival Time (hours) is the time it takes for the core temperature to drop to 28° Celsius or 82.4° Fahrenheit. Below that threshold, the probability of death due to hypothermia significantly increases. Proper wearing of a properly sized immersion suit helps to protect the wearer from sudden immersion shock, can reduce the effects of hypothermia, and increase chances of survival.

5. Analysis and Opinions

5.1. Voyage Planning

5.1.1. Weather

5.1.1.1. Pre-departure Weather Assessment and Strategy to Reduce Risks

The Captain and the crew were fully aware of the weather forecasted along the route on the accident voyage and they discussed the weather prior to departure. The forecasts called for gradually worsening weather along the intended route with a gale warning for Shelikof Strait. That gale warning indicated winds of 35 kts, 9 ft seas, and presence of freezing spray in the forecast area. This forecast was available at 3:39 p.m. on Monday, December 30, 2019, the day of departure. There were also forecasts available for further along the route, including the area in the vicinity of Sutwik Island that forecasted the same sustained high winds and seas as well as freezing spray warnings. One of the most important aspects to incorporate in voyage planning was the Captain's considerable experience in the dangerous Alaskan weather. That experience would serve as input into the planning and decision making for the voyage. Some examples would be how ice

[144] CG Exhibit 008

might form on the vessel, the weather's effects on list, fuel consumption, and how the plan would manage wind and sea conditions to minimize risk to personnel, including seasickness and fatigue. That extensive seagoing experience could have been a critical element in assessing and reducing all of the risks to the vessel and crew.

The voyage would take the SCANDIES ROSE out of Kodiak, then north up Whale Pass and then into the Shelikof Strait where the SCANDIES ROSE would settle on a generally southwesterly course. The survivors indicated that the predicted hazardous weather was discussed informally amongst the crew and Captain prior to departure on multiple occasions. However, there is no evidence that subsequent discussions took place between the Captain and the crew reassessing the weather in the early stages of the voyage or at any regular interval during the voyage. In addition, there is no evidence that any discussion took place between the Captain and the crew about seeking shelter or conducting weather avoidance maneuvering should ice begin to form as was predicted in the heavy freezing spray weather warnings which were included in the later forecasts. In deep sea shipping, this team planning is called Bridge Resource Management (BRM) and it is specifically used so that all of the persons responsible for operating the vessel as the navigation watch are aware of the plans for a voyage and get the opportunity to give input and voice their concerns for the safety of the voyage. There is no evidence that this was done onboard the SCANDIES ROSE on the accident voyage.[145]

5.1.1.2. Weather Forecasts and Weather Information to Plan the Voyage

The NWS issues freezing spray warnings and forecasts several days in advance of predicted conditions, understanding that mariners use this information to make pre-planning voyage decisions. A wide variety of weather forecasts, actual observations, and related weather information were available to Captain [redacted] as a voyage planning tool prior to departure. He also decided to wait six hours for the tide before departure which gave him more time to assess the upcoming weather and make safety based decisions for the voyage.

The figure below is an example of one of the forecasts available. Reports from weather stations and weather buoys were also available.

[145] Bridge Resource Management is the effective management and utilization of all available resources, both human and electronic, by the navigation watch team to ensure the safe navigation of the vessel. The essence of BRM is a safety culture and management approach that facilitates communication, cooperation, and coordination among the individuals involved in a ship's navigation. BRM is required by the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers. (Coast Guard Safety Alert 09-13, 9/30/2013)

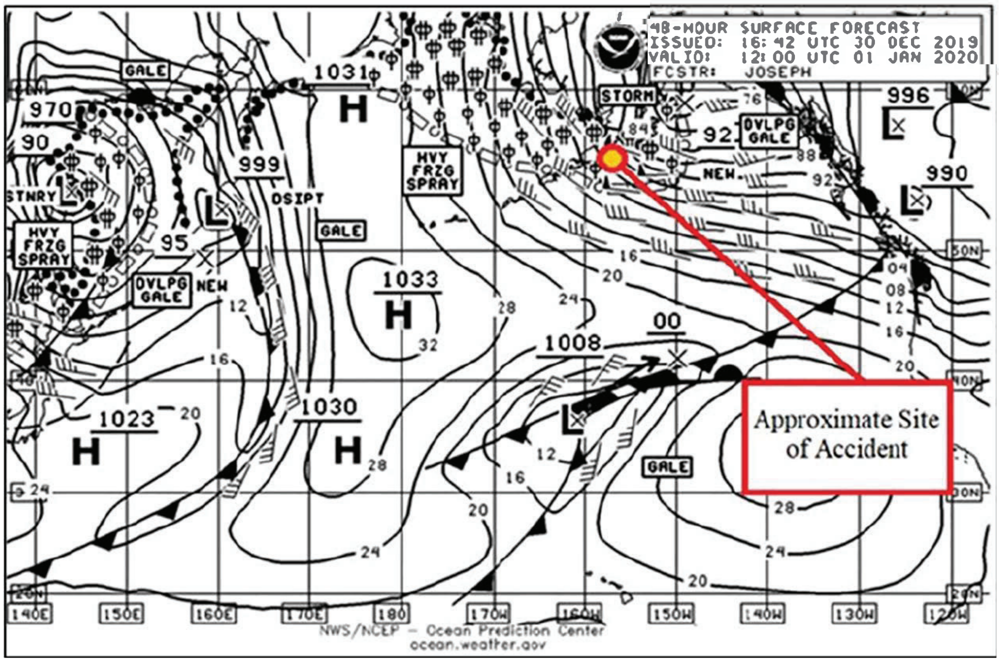

Figure 66 – NWS Ocean Prediction Center High Seas 48-Hour Surface Forecast for 07 42 a.m. AKST, December 30, 2019, thru 3 00 a.m. AKST, January 1, 2020. The storm is located in an area where the isobars are located fairly close to one another and relatively close to the word "storm." (Source CG Exhibit 028)

Figure 66 was developed by NOAA's Ocean Prediction Center (OPC) as a tool for mariners. This type of weather map is specifically designed to rapidly allow mariners to understand the weather in the area displayed. It uses standard symbols and format so a mariner can quickly identify dangers. Weather graphic products such as this one would have been available to the Captain of the SCANDIES ROSE via the internet onboard the vessel. In figure 67, below, which is a one of the weather charts that would have been available to the SCANDIES ROSE, the labels for heavy freezing spray (HVY FRZG SPRAY) are prominent and the symbols for the heavy freezing spray on the chart in the vicinity of the accident site along the SCANDIES ROSE voyage track. The actual weather chart does not explain what the freezing spray symbols are and there is no explanation of the amounts of freezing spray that those symbols represent. The NOAA website, which contains a glossary, provides an explanation of the symbols as well as the amounts of anticipated icing per hour for moderate and heavy freezing spray. The information from the glossary page of the NOAA website can be seen at the top of figure 67, below.

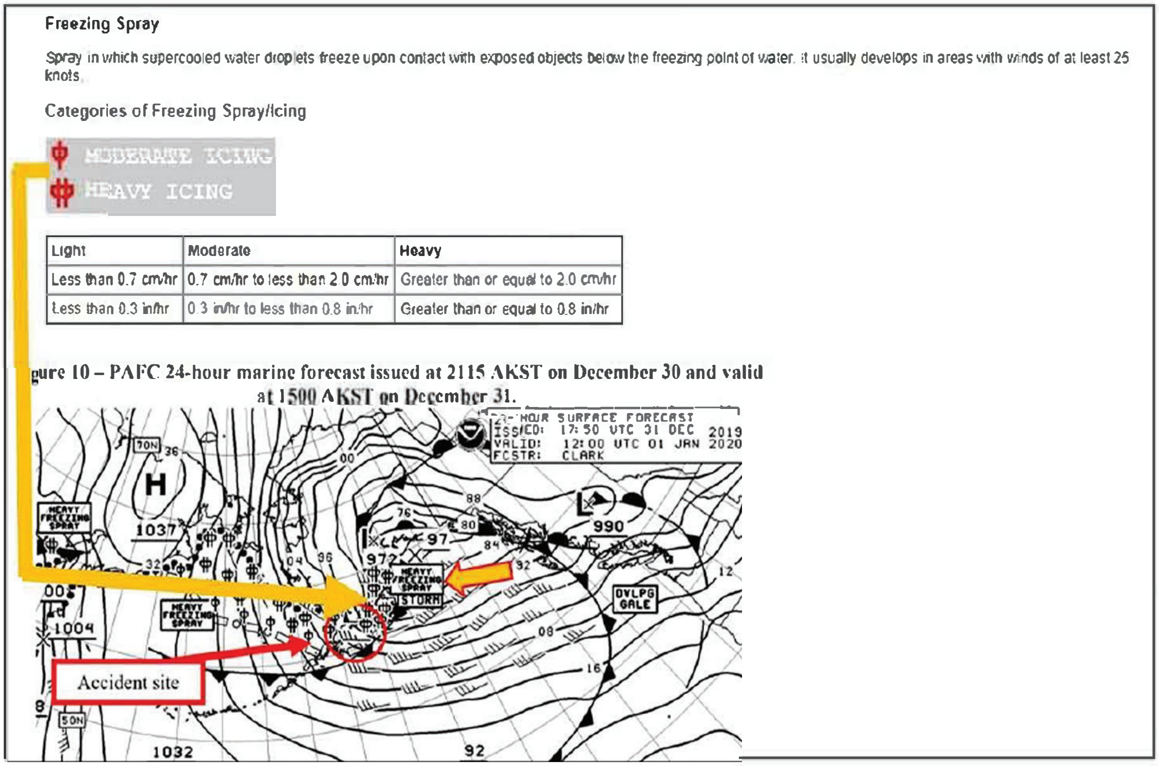

Figure 67 – The top section of this figure is an explanation of the terms and symbols used by the OPC for freezing spray which is contained in the information on its website. One the bottom of the figure is the 48 hour marine forecast issues at 9 15 p.m. on December 30, 2019 and valid at 3 00 p.m. AKST on December 31, 2019. The yellow arrow on the left shows the symbols for moderate and heavy freezing spray and the arrow on the right shows the label for heavy freezing spray, (HVY FRZG SPRAY). (Source OPC, with markups)

In text-based weather forecasts, the NWS uses "Headlines" in all capital letter type under the forecast time and date to highlight urgent information. This is intended to alert the mariner who is looking at the text-based product to the specific hazard, be it heavy freezing spray or other dangerous weather. Once the forecast is produced, it can be distributed to the mariner as a text based product available on the internet or it can be broadcast over the radio. Forecasts delivered by voice radio broadcasts, unfortunately, do not have a means to emphasize the urgent weather "headline." An example of the text forecast with headline is provided in figure 68, below.

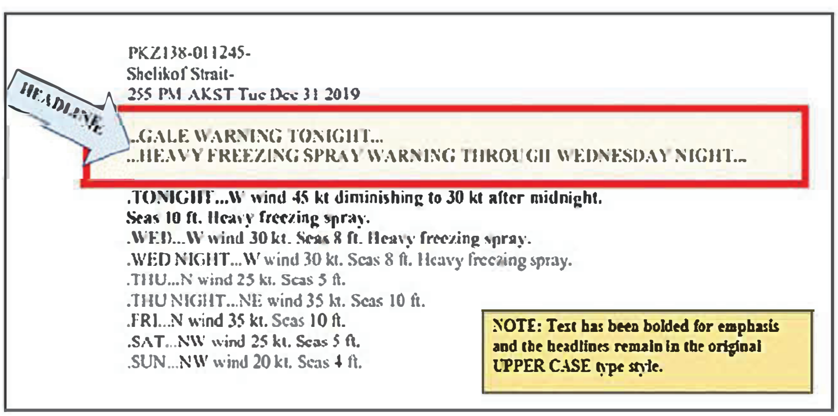

Figure 68 – All capital letter text in the graphical forecast, the "headline" for the urgent information is in the red highlighted box. NWS forecast for the period 2 55 p.m. on December 31, 2019 for the area in the western end of the Shelikof Strait where the SCANDIES ROSE could attempt to seek shelter. (Source NWS, with markup)

In looking at the NWS forecasts, there is no evidence that the crew, or fishing vessel crews in general, knew the difference between a freezing spray forecast and a heavy freezing spray forecast and the greater danger of the heavy freezing spray for rapid and substantial accumulation of ice on the vessel and on the crab pot stack.[146]

5.1.1.3. Weather Instruments

The SCANDIES ROSE Captain reported wind speeds of 60-70 kts during last hours of the voyage when he spoke to other fishing vessel captains on the tag phone. The 2019 Condition and Valuation Survey lists an anemometer as part of the vessel's equipment inventory. The wind speed indicator was mounted on the after bulkhead of the SCANDIES ROSE wheelhouse. There is no evidence that the vessel was equipped with a device that accurately measures wind direction. Since the SCANDIES ROSE was proceeding at speeds of approximately 6 kts and the winds were in excess of 45 kts, the anemometers relative wind speed would still have provided a valuable data to inform the captain and crew driving the vessel of the potential impacts of the wind.

The SCANDIES ROSE was also equipped with a barometer and a tide calculation computer. The barometer would have been available to give the crew information as to changes in atmospheric pressure which would signal the presence of changes in weather such as nearing a low pressure system and the more forceful winds that might be encountered in that kind of weather system.

During the accident voyage, all available data regarding the sea heights, and speed and direction of winds were estimates based on the experience of the crew on board the vessel. In the case of the final report of 60-70 kt winds, that report was made during darkness with fleeting illumination by the small amount of moonlight and is believed to be an estimate of the wind speed. It could have been an observation if the Captain consulted the wind speed indicator. Sea height at the rescue time, approximately four hours after the sinking, was determined to be approximately 30 ft with the helicopter's up and down motion observed on the radar altimeter trying to hold the aircraft steady during the survivor rescue. The Coast Guard's factual portion of the D17 SAR Case Review Extract indicates that the weather at the rescue scene was

> *Weather on scene was seas 20-30 feet, winds 35-50 knots, cloud ceiling varying from 200-500 feet above ground level (AGL), rain/ snow, heavy at times, water temp 38°F, and air temp 10°F.*[147]

If the wind indicator, barometer, and thermometer were functioning correctly they should have given a continual readout of those values to a person standing the navigation watch enabling them to make data driven decisions. There was no testimony from either of the two survivors that Captain [redacted] instructed them to monitor the weather broadcasts, weather information available on the internet, wind speed, barometer, or temperature

[146] https://ocean.weather.gov/product_description/keyterm.php
[147] CG Exhibit 078, CG SAR Review

instruments and notify him of specific changes which is critical to the safe operation of any vessel.

5.1.1.4. Weather Applications

Commercial fishermen on vessels of the size and tonnage of the SCANDIES ROSE are not required to take any weather training courses. A mariner sailing on an oceans route and who holds a CG issued deck officer credential will normally have received some form of weather training in their career. Commercial fishermen have to rely on the same weather products that credentialed mariners would, such as receiving textual and graphical reports via radio or internet messages or “Navtex” messages. Testimony from several witnesses shared insight on how fishermen have used readily available third party tools in order to supplement, or in many cases, replace the typical marine weather reports. One third-party tool that was discussed in testimony and used on the accident voyage was an application, Windy®.

The Windy® application is reliant on internet, cellular or Wi-Fi connectivity to be updated. If a fisherman departs port with one report on their software application, that information will not be updated unless the vessel has satellite internet capability or the vessel gets connectivity for wireless devices. Based on interviews and photographic evidence, there is reason to believe that the SCANDIES ROSE had internet but not with the bandwidth that land based internet users enjoy. The two survivors both testified that they did not know how to access this internet onboard the SCANDIES ROSE, so they were unlikely to be able to access more updated Windy® information during their navigation watches.

Other witnesses, who work as fishermen, referenced the weather application Windy® as their primary source for weather, stating that it is simply more user friendly than the National Weather Service products. This application simply takes data provided from the NWS weather model and plots it in the application. The software designers for this weather application do not forecast the weather. Windy® and similar weather applications, do not compare models (unless one pays for the premium version, and even then, it looks like the user still has to interpret what all of that information means). The free version only graphs the output from the most recent run from one weather model. Just from that screen image, a user gets less information than what is contained in a typical NWS forecast. If an individual user is savvy in navigating through these applications, he or she might flip through the four models it offers and see if the models differ from one another but most people do not know that feature exists.

Weather applications such as these are taking raw data out of one model and plotting it. The fancy graphical output may lead a user to believe that the forecast may be of better quality and more accurate than a NWS or OPC forecast, but that is not the case because the resolution is set by the model. The application can be deceptive and if the next model run is substantially different, Windy® just plots the output. No consideration is given for outliers or bad data that could be contained in the data used to create the image that the mariner sees. This weather application also defaults to the European weather model, which may not be the optimal choice for many locations like Alaskan waters. The

European model is significantly different from the U.S. based models.

The surviving crew and the personnel working on commercial fishing vessels interviewed by the Marine Board revealed the prevalent usage of the cell phone application, Windy® to ascertain the current and forecasted weather along the intended routes to fishing grounds. A person looking at this application or similar applications on a handheld wireless device such as a cell phone connected to the world wide web would see user friendly graphic, chart based images depicting the weather in colored layering over a sublayer containing a chart or map. Figure 69, below, shows an example of the type of information that is available when the application is accessed.

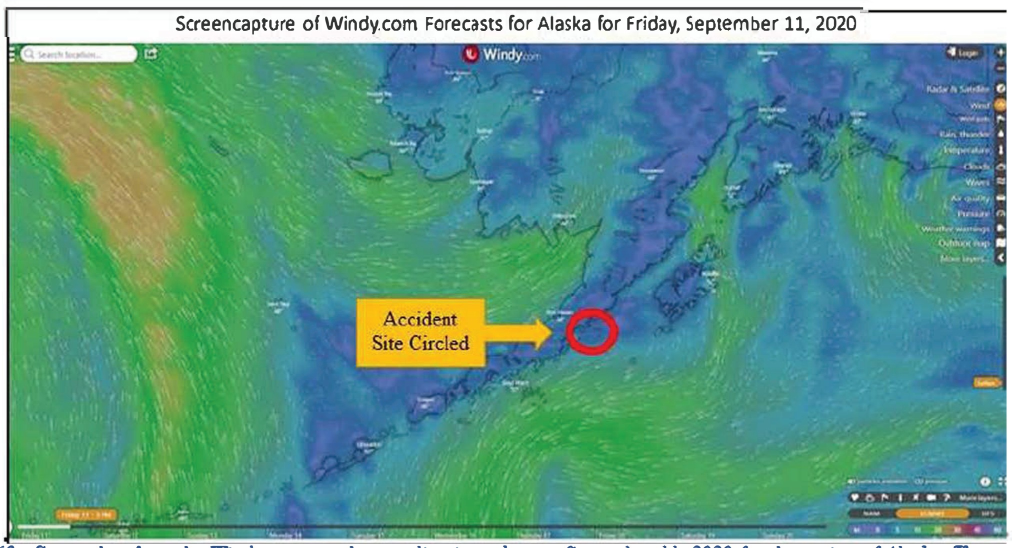

Figure 69 - Screenshot from the Windy.com weather application taken on September 11, 2020 for the region of Alaska. The accident site is circled in red. The colors deepening from yellow to magenta indicate the highest wind speeds and a scale is provided in the application in the lower right corner of the screenshot. (Source CG Exhibit 026, with markup)

The application display will show winds as moving arrows showing directional wind flow. The Windy® application has multiple layers that could prove beneficial to a mariner and the user can look ahead to times in the future to see what the weather will be doing. The user can select a time in the future and see the forecasted conditions. However, there was no layer or feature for a mariner to examine text-based forecasts that were identical to the products produced by the NWS which would include freezing or heavy freezing spray forecasts along with other urgent weather information.

The NWS forecasts delivered via internet and over radio and available to all mariners for the time leading up to and during the accident voyage indicated a progressive increase in the danger of freezing spray leading to heavy freezing spray and a gale warning. At the time of the accident, the crew of the SCANDIES ROSE would not have known that the Windy® application would not warn them of the heavy freezing spray and the associated text based "Headline" indicating urgent information. If Captain [redacted] relied heavily on the information provided by the Windy® application and not the NWS forecasts, he may have missed critically important details in the weather forecast information that the SCANDIES ROSE would be sailing through the heavy freezing spray zones.

Throughout the course of this investigation, the survivors and numerous other commercial fisherman spoke about the user-friendly interface of Windy® being the predominant reason it was utilized over information directly from the NWS. The use of a convenient application that supplies easily understood, applicable weather information in a graphical form with updated weather and warnings of urgent weather information is beneficial to mariners.

5.1.1.5. The Overland Method Model and/or NOAA OPC's Freezing Spray Website

During the Coast Guard's MBI Hearing, a number of fishing vessel captains were asked if they were aware of the experimental freezing spray website created by the NOAA OPC which provides vessel icing information based on the Overland Method Model. All of the witnesses that were asked were unaware of the website and information on vessel icing that site provided. Given their testimony, there is no evidence that, at the time of the accident, the SCANDIES ROSE or other fishing vessel operators in Alaska interviewed used the NOAA experimental freezing spray website.

The Overland Model is a mathematical algorithm that is used to predict icing based on a number of environmental factors. Wave-ship-interaction generates sea spray, for example, when a vessel hits the sea waves and swell provides larger spray amounts than the finer sea spray blown off the white caps of the waves. The Overland Model identifies this as the most important source of water which would contribute to ice freezing on vessels and then accumulating ice in dangerous icing events. Most models estimate the amount of ice accumulation by taking into account how much spray would be produced by the seas slapping the hull of the vessel and a shower of sea spray is generated, coating the surfaces of the vessel, coupled with the relative rate at which that water would freeze on a solid surface.[148] If the NOAA OPC experimental freezing spray website became fully operational and easily available, then access to that information would be beneficial to mariners operating in areas subject to freezing spray.

5.1.1.6. Accident Voyage Trackline Deviation

Once the SCANDIES ROSE settled onto the generally southwest course down the Shelikof Strait, the vessel's speed fluctuated from between 7-8 kts with some speeds approaching 9 kts. As the voyage continued, the vessel speed dropped to between 6 and 7 kts. Until the final course change to starboard at approximately 9:45 p.m. on the night of the accident, the vessel held a steady course with no significant changes of course or speed to suggest the crew attempting to reduce the risk of ice accumulation on the vessel. The dangers posed to the vessel and crew were the gale force winds, heavy seas, and, more importantly, the heavy freezing spray that the vessel began to encounter. Vessel icing was observed sometime between 2:00 a.m. to 6:00 a.m. on the morning of December 31, 2021 and still course and speed were maintained despite the risk. In

[148] Samuelsen, E. M. (2018). Ship-icing prediction methods applied in operational weather forecasting. *Quarterly Journal of the Royal Meteorological Society*, *144*(710), 13–33. https://rmets.onlinelibrary.wiley.com/doi/10.1002/qj.3174

examining the vessel's AIS data, there is a time from 6:20 p.m. until 7:20 p.m. on the accident day when the vessel yawed on its base course for unexplained reasons. During the course of this investigation, there was no evidence or testimony as to the exact purpose for these very slight heading changes. For that reason, it is unknown if these heading changes were intentional to counteract on-scene conditions or if they were due to natural forces encountered by the vessel without manual adjustments to counter them. In this case, it could indicate worsening weather or icing conditions. Figure 70, below, shows that segment of the AIS track of the SCANDIES ROSE.

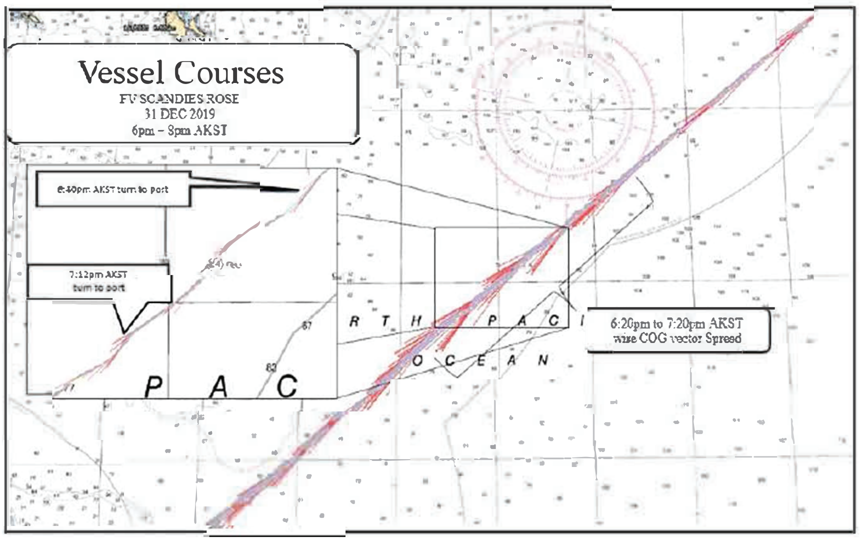

Figure 70 – Segment of the SCANDIES ROSE trackline with a focus on the 6 20 p.m. to 7 20 p.m. portion of that trackline showing a pronounced yawing which is a greater deviation from the base track than on any earlier portion of the voyage. Course Over Ground (COG). (Source Coast Guard)

Published guidance on reducing the accumulation of ice on a vessel include reducing the freezing spray by reducing speed, changing course, seeking shelter, or running on an opposite course to reduce the relative wind and the accompanying freezing spray. The more obvious strategy, in this case, would have been to seek shelter from the dangerous conditions earlier during the voyage.

5.1.2. Route Taken by the SCANDIES ROSE

5.1.2.1. SCANDIES ROSE's Route Down the South Side of the Alaska Peninsula and the Local Weather Conditions

The track of the SCANDIES ROSE would take the vessel down the south side of the Alaska Peninsula towards Sutwik Island as illustrated in the figure below. The Shelikof Strait is a commonly used route for vessels transiting this area. As it travelled along the track, the vessel began to get closer to the Alaska Peninsula landmass off the starboard side and, with it, the general winds blowing towards the vessel from across that landmass. The shoreline to the north is indented with numerous bays and inlets bordered by high mountains which can funnel and intensify the wind into a local condition called a "Williwaw," a sudden violent squall blowing offshore from the mountainous coast.

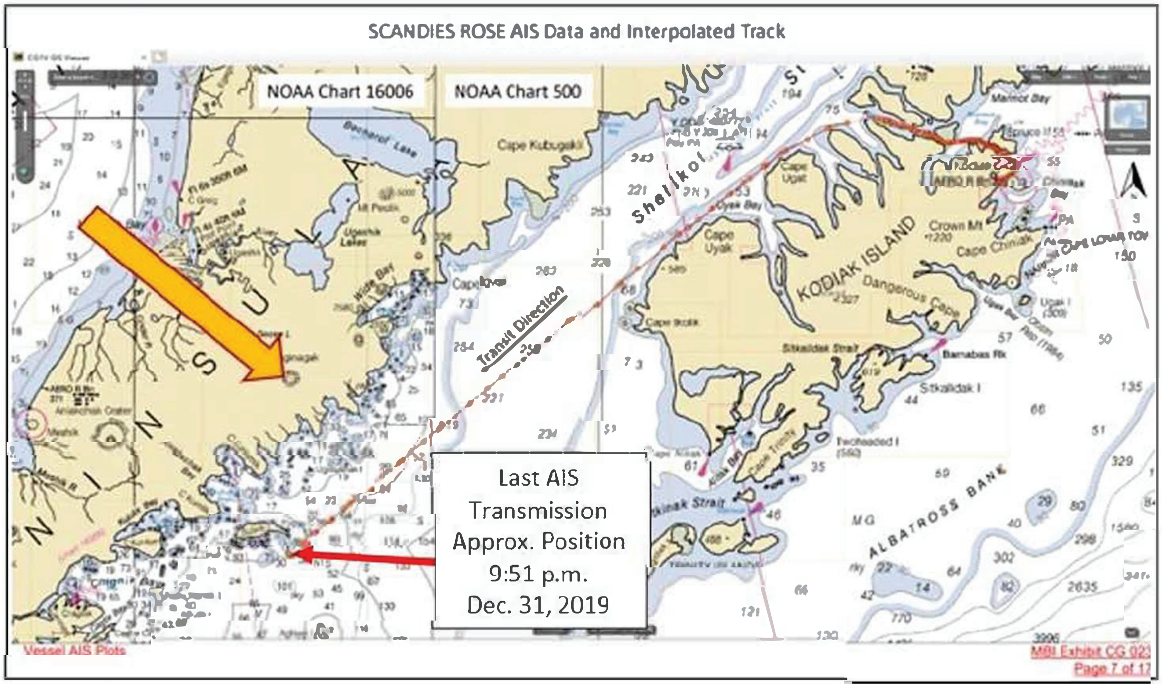

Figure 71 – Track of the SCANDIES ROSE on the accident voyage showing the vessel's proximity to land with the yellow arrow indicating the general direction of the wind. (Source CG Exhibit 023, with arrow as markup)

The captain of the PACIFIC SOUNDER testified about travelling along that coastline in the hearing

> *There is no area worse than where they were at for icing. It's -- I've called it the freezer hold of hell, because the problem is, if you get a westerly or a northwest coming through the mountains of Chignik, there's glaciers all over that. And you get -- a 30- to 40-knot wind comes across that mountain and it picks up all this fresh water, and this cold, cold water, and it turns into ice crystals. Then, when it comes down, it hits the hot water, and the ice -- I've never iced up so bad in my life as I've iced up in that area, within 50 miles of where that boat went down.*

5.1.2.2. Refuge From Heavy Weather Along the Route

Travelling along the vessel's planned course, there were many opportunities for the Captain of the SCANDIES ROSE to make a decision for the vessel to duck into a place of refuge to clear ice safely or to stop and prevent the further accumulation of ice as well as to rest the crew. Incorporating these places of refuge in voyage planning would have included established waypoints to allow for timely decision making. Without having done this, he could not respond fast enough to the rapidly worsening conditions and safely reach shelter. Other fishing vessel captains had taken that opportunity to ensure the safety of the crew and the vessel. The majority owner of the SCANDIES ROSE and an experienced captain who was running the AMUTULI ahead of the SCANDIES ROSE talked about the availability of seeking shelter in his interview

> *There are literally hundreds of places from Kodiak to, in a northwest wind, you're going down the, you're running southwest down the Alaska Peninsula. You've got*

bays every, you know, couple miles. You know, there's a bay or an indent or a bight [sic] *where you could drop the pick. It's, and since he went out Shelikof and went down the left side of the island, you know, he would have had to cross over to the mainland. And then he would have had any number of places to hide.*[149]

Other captains who testified at the hearing were later queried about the availability of anchorage locations based on the prevailing winds on the route that the SCANDIES ROSE transited. Based on the information they provided, the figure below identifies several of the potential places of refuge along the route.[150] There were a number of potential safe and protected anchorages along the route that Captain [redacted] did not take advantage of for the safety of the vessel and crew.

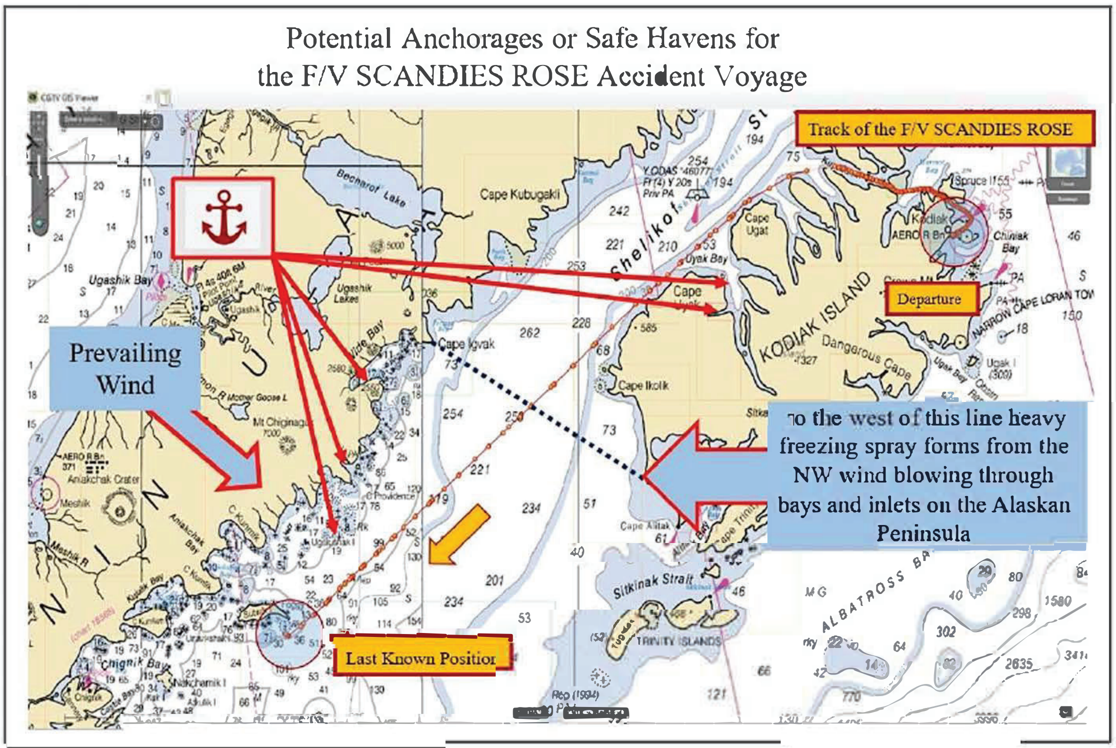

Figure 72 – Nautical chart showing the route of the SCANDIES ROSE on the accident voyage. Positions are marked representing reportedly good anchorages in northwest winds similar to the weather the SCANDIES ROSE was experiencing on the accident voyage. Other bays or inlets along the track were reported to offer poor anchor holding ground in the NW winds the SCANDIES ROSE encountered. To the southwest of the blue dotted line mariners would be expected to experience heavy freezing spray accumulation depending on the weather conditions. The numerous inlets on the south side of the Alaska Peninsula funnel the wind, increase its velocity and can rapidly increase the icing effects on a vessel. (Source Coast Guard)

5.1.2.3. Comparison To Other Fishing Vessels Heading West From Kodiak

To determine what the impact of the weather would be on other vessels, the investigation examined evidence in the form of testimony and AIS tracking of vessels in the area starting on December 29, 2019. In testimony, a number of vessel captains discussed leaving earlier based on their individual plans and fishing schedules.

[149] Captain [redacted] CG Exhibit 132, Pre-Hearing Transcript, Pg. 102
[150] CG Exhibit 137, Shelter and Anchorage Correspondence Post-SCANDIES ROSE Hearing

The majority owner of the SCANDIES ROSE, operating the AMATULI, experienced a rough ride and anchored to rest his crew well to the west of the accident site as he was considerably ahead of the SCANDIES ROSE's departure from Kodiak. When the vessel departed Kodiak the captain elected to run down the south side of Kodiak Island to take advantage of the protection of the island as he headed in a generally westerly direction. In another case, the fishing vessel RUFF & REDDY was also running ahead of the SCANDIES ROSE, having departed Kodiak earlier on December 29, 2019. Based on worsening weather conditions the RUFF & REDDY was experiencing, the captain of the vessel anchored in the shelter of Nakchamik Island in a position which was approximately 28 NMs to the west of the position where the SCANDIES ROSE sank. The RUFF & REDDY anchored there at approximately 6:00 a.m. on the accident day. In testimony, Captain [redacted] talked about the crew awakening him due to the weather

> *I would say we were probably 10 miles from Nakchamik Island when I was awoken and told that we were -- I believe it was my -- I'm sorry, I'm not great on the memory there, but I believe I was woken up, had time to get up there around, I guess it was probably 2:00 to 3:00 in the morning on the 31st. We were starting to build a little ice on the bow, northwest probably, I guess at the time, 25- to 30-knot winds. Started to accumulate ice on the bow and on the rails, and a little bit of spray on the pots there. So we decided to hold up on the lee side in Nakchamik. I knew the weather was coming. We were hoping to make it past Chignik Bay beforehand, but we knew that we had either Sutwik or Nakchamik to take cover in if we didn't make it that far. So we decided to anchor up, with ice beginning to accumulate on the boat.*[151]

5.1.3. Loading

5.1.3.1. Loading for the Accident Voyage

While the Captain of the SCANDIES ROSE was not on board for all pre-departure activities, he oversaw pre-departure loading operations and assigned crewmembers who were both experienced fishermen and were extremely familiar with the vessel having sailed her for multiple years and different fisheries. The crewmembers who directed the majority of the pre-departure operations loaded the pots on the vessel and took on fuel and water in preparation for a voyage. The crew loaded the sorting table on the top of the pot stack and took on approximately 15,000 pounds of bait in the forward bait freezers. They also took on stores and provisions for the crew as part of the loading operation. As the master of the vessel, Captain [redacted] was responsible for the entirety of the operation and verified the apparent sufficiency of the loading configuration based on his experience, and the tools he had available to him, including the 2019 stability instructions.

The Captain loaded the approximately 195 pots so that the vessel could maximize profit on the intended voyage. The reduction of the number of pots from the 208-maximum allowed to the final total of approximately 195 pots was most likely a decision to provide visibility while navigating. This reduction in pots from the maximum could have also

[151] Captain [redacted] MBI Hearing Transcript, Pg. 838

been the Captain's safety margin for the anticipated weather. The instructions to the master from the 2019 stability instructions contained this language: "Do not obscure vision from the pilothouse. This applies in icing or non-icing conditions."[152] That very statement is ambiguous and confusing, as lacks the clarity of detail as to whether the icing applies to visibility or the actual pot load. The stability instructions do not account for the size of the pots used during calculations and the Marine Board believes that the SCANDIES ROSE could not have safely carried 208 of the large pots used on this voyage.

Based on survivor testimony, tarping of the pot stack was discussed but the decision was made to not tarp the pot stack.

Figure 73, below, is a copy of the 2019 instructions to the master document that the Captain would have considered when directing his crew in loading fuel, water, provisions, and pots on deck.

INSTRUCTIONS TO MASTER

F/V SCANDIES ROSE

1. Stability characteristics of this vessel are evaluated for compliance with 46CFR Subchapter C, paragraph 28
2. A total of (208) 835 pound crab pots can be carried on deck. The first tier on edge and the rest flat. Do not obscure vision from the pilothouse. This applies in icing or non-icing conditions. If all three Holds are flooded (168) pots can be carried, and forward wing tanks are to be empty.
3. Flooded holds must be filled or emptied. In a sheltered location or in port. Do not operate with a slack Do not operate with a slack (partially filled) hold.
4. Freeboard is not to be less than six inches at any point.
5. Always determine the cause of any list before taking corrective action.
6. All gear carried on deck or in a hold must be firmly secured against shifting.
7. All doors, hatches, manholes, scuttles, etc., must be kept securely closed while at sea except when Actually in use.
8 Bilges must be kept pumped to minimum content at all times subject to pollution regulations.
9. Freeing ports must be kept clear and operable at all times.
10. Avoid accumulation of unnecessary weights such as spare parts, tools, gear and stores.
11. No modifications to the vessel, such as adding or removing ballast or other weights is to be performed without first determining their effect on stability.
12. The master of the vessel is responsible for maintaining watertight integrity at all times and to exercise prudent seamanship, giving consideration to the season of the year, weather, sea and ice conditions.

May 28, 2019

Figure 73 – SCANDIES ROSE's 2019 stability Instructions to the Master provided by the Naval Architect. (Source CG Exhibit 036, with Coast Guard mark ups)

5.1.3.2. Reliance on Stability Information

Captains typically rely heavily on stability instructions created for the master of a vessel, not the complicated tables and calculations contained in the bulk of a stability instruction booklet which can be many pages. The intent of a stability "Instructions to the Master" is to clearly articulate the most important safeguards for a vessel in terms of maintaining

[152] CG Exhibit 036

positive stability. In the case of the 2019 instructions, these were vague and lacking detail. Critically speaking, they relied on a flawed stability assessment of the SCANDIES ROSE.

The Captain was provided with the 2019 stability information which included "Instructions to the Master." These instructions were specifically designed to give the operator of the SCANDIES ROSE the stability information to ensure the safety and stability of the vessel. The specifics of those instructions and the contents of the 2019 stability information are examined and analyzed in other sections of this report.

Captain [redacted] was not a naval architect, nor had he attended any form of stability training course available to formally instruct him in the many facets of stability such as center of gravity, righting arm, wind heel, icing, severe wind/roll, freeing ports, and other critical elements to ensure the safety of a vessel such as the SCANDIES ROSE. Thus, the "instructions" were even more important to the critical decisions affecting the safe loading and operation of the vessel.

Post casualty, the stability instructions were examined by the Coast Guard's MSC. The investigation determined that as he loaded and prepared for the voyage, the Captain relied on this stability analysis and the documents that he had received that were prepared by the Naval Architect, a "Qualified Individual." Making the critical decision to proceed on the voyage after departing the dock with a gale warning and with a forecast going from freezing spray to heavy freezing spray, the Captain would not have been aware of some of the critical flaws in the 2019 stability analysis and documentation provided to the owner. Captain [redacted] was not present at the 2019 stability assessment to provide his experienced input, specific to the SCANDIES ROSE, to the attending Naval Architect developing the calculations and the guidance in the stability instructions.

Based on the "Instructions to Master" contents in the stability instructions, dated May 28, 2019, the downflooding point was never specifically addressed. As a result, it is unclear if the Captain knew what the critical downflooding points were. This is considered critical as it provides a clear point in which the heel of the boat would compromise the watertight integrity of the vessel and would initiate free communication with the sea, even if the vessel was fully intact.

The Naval Architect who created the report failed to identify those downflooding points[153] which impacted the stability calculations. Furthermore, the Naval Architect did not take the opportunity to discuss and explain the stability report and instructions with Captain [redacted] during or after the 2019 stability testing. This was a missed opportunity to identify any critical vessel vulnerabilities or inaccuracies in the stability instructions. The 2019 stability instructions were provided to the majority owner, who simply conveyed them to the Captain and did not seek the Captain's input on the completed instructions.

[153] The Naval Architect's failure to identify downflooding points was in addition to a number of other errors which impacted the stability report for the SCANDIES ROSE.

A more detailed analysis of stability is covered in section 5.4 of this report.

5.1.4. Navigation of the Vessel

5.1.4.1. Crew Navigation Watch Rotation

Based on an analysis of conflicting information, the Marine Board has determined that the Captain established a written watch list with one-hour watches for the crew and then he would stand a six-hour watch, then the rotation would commence again. This provided an opportunity for the crew to be off watch up to eleven hours, with the Captain off watch for six hours in a twelve hour period. It is not known what the precise watch times were as there were instances where watches seemed to start at times other than the times testified to by witnesses, and those start and stop times for watches were minor increments of not more than a half hour. During the off-watch periods the crew could rest, sleep, or perform any duties that were required of them while in the transit to the fishing grounds. This would have been a different scheme if the SCANDIES ROSE had reached the fishing grounds in the Bering Sea, where the vessel would have been engaged in crabbing.

Ultimately, survivor testimony suggests that the two crewmembers who had the least amount of experience with the vessel were back to back on the watch rotation. Though experienced fishermen, neither had sailed on the SCANDIES ROSE before nor served under the Captain to know and understand his expectations for the safe operation of the vessel. As the vessel departed on the voyage and in the worsening weather, the placement of these two men in the rotation lineup created a situation where there was a two-hour period with crewmembers unfamiliar with the unique characteristics for the SCANDIES ROSE, such as seakeeping qualities. The strategy of placing each of these crewmembers in slots between more experienced crew would have prevented this situation and spread the vessel experience to safeguard the vessel. The majority owner, an experienced and credentialed fisherman and mariner stated in testimony

> *I would just do that, and I would always leave -- in the logbook, I'd write down the watch schedule and who was going to do it so that I would space out experienced and less experienced people. And that, but that's just like a good practice, you know, bridge resource management, you know. Just, that's learning how to handle a crew, you know, and how you navigate safely from one point to another.*[154]

5.1.4.2. Standing Orders for the Navigational Watch

In testimony, persons who crewed the SCANDIES ROSE reported that the Captain may have maintained a written list of standing orders for the crew standing navigation watches. Below is an example of standing orders which are not dated and there is no way to know if these were the standing orders in effect on the accident voyage as the survivors did not see written standing orders.

[154] Captain [redacted] MBI Hearing Transcript, Pg. 1913

Scandies Rose Standing orders

1) Stay awake and alert
2) No reading or listening to music
3) Know your position at all times
4) Wake the Captain if you are unsure about anything pertaining to your watch
5) Watch the radar; wake the Captain if a vessel comes within _______miles of us.
6) Check engine room every hour

Figure 74 – This example was provided to the MBI as evidence of a typical SCANDIES ROSE Standing Orders from a previous voyage with date unknown (Source CG Exhibit 019, with Coast Guard mark up).

In the absence of clear standing orders, written or verbal, the crew did not wake the Captain as the conditions continued to worsen prior to the Captain's last watch. Any verbal orders similar to the contents of the example of standing orders contained in figure 74, above, need to be clearly communicated to all of the vessel crew and the intent understood. A verbal set of crew instructions for the navigation watch or standing orders don't appear to have been discussed when the crew met prior to departure. On standing watch, Mr. [redacted] testified

Q. Any -- yeah, any -- like were there particular times or expectations for making rounds or, you know, at what point to notify the captain?
A. I mean, yeah, if you're listing hard over or something, clearly you're going to, you know, wake the captain up. Or if you're accumulating a lot of ice, you know, what should we do about -- it's looking like it's getting a little bad or, you know, if the weather -- for me, personally, like I -- a lot of guys will wake the captain up. I don't much, like let the guy get his sleep. So a lot of times, guys will wake the captain up if the weather just starts coming from a different direction and you just got a shitty course and you want to turn into it a little bit to have it ride a little nicer[155]

Testimony from the survivors did not indicate that any member of the crew woke the Captain in their final watch periods late in the afternoon and in the early evening of the accident day, despite a steadily worsening situation on the SCANDIES ROSE. During these watches, there was increasing ice accumulation on the pot stack and the forward starboard side of the vessel and a list was developing on the vessel. Mr. [redacted] the last watchstander before the Captain took over for the final watch, in testimony stated

I think [redacted] got me around -- it was like 1730. And then I started watching it. And during my watch, the weather started coming up a little bit more, but it was already kind of crappy, but it started coming up a lot more. The wind started coming a lot more. And the waves started kind of coming quarterly. At first they were right off the bow, then they kind of started coming quarterly. So we were -- when we were taking spray, and we're taking good -- pretty good spray, and it was just spraying the starboard side really because that's where the waves were coming. And they got about halfway back for -- the pots were starting to ice over.[156]

[155] Mr. [redacted] MBI Hearing Transcript, Pg. 560
[156] Mr. [redacted] MBI Hearing Transcript, Pg. 1061

It is unknown if the Captain was awakened or called for his guidance or directions at any time during the voyage by any of the other crew members.

5.1.4.3. Voyage Track

The vessel departed Kodiak on the Captain's watch and went up through Whale Pass into Shelikof Strait and then took a southwest heading. This was the opposite track the vessel took when it returned to Kodiak on the previous voyage. After turning towards the southwest there is little deviation from this track based on the AIS information available up until approximately 9:45 p.m. on the accident night. There is also no deviation on the general speed on that same course line. The track was a more or less direct route to False Pass and then to the fishing grounds. With the prevailing winds and forecast, the Captain could have travelled a slightly longer distance but move more northerly and closer to the Alaska Peninsula's southern coast in case he needed to seek shelter after he passed the available shelters on Kodiak Island's north shore. The track shows he was committed to his goal of reaching the fishing grounds with his late departure.

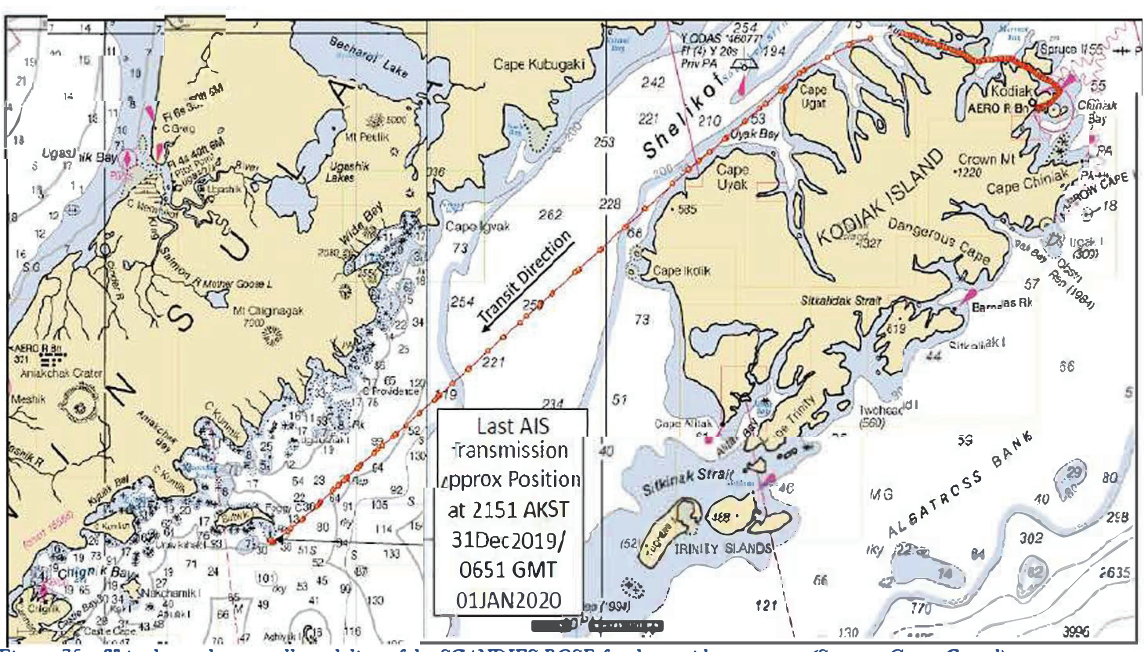

Figure 75 – This shows the overall track line of the SCANDIES ROSE for the accident voyage. (Source Coast Guard)

5.1.4.4. The Critical Turn to the Shelter of Sutwik Island

The turn to Sutwik Island was not part of the voyage plan and there is no way to determine if the Captain had planned for this type of emergency before departing Kodiak. One aspect of effective voyage planning is identifying risks and reducing risks through careful planning. Before undertaking the voyage, a captain would examine the available places of refuge along the route in the event of emergency or if he anticipated severe weather. Identifying these potential places of refuge would include the correct approach courses to minimize the dangers posed by hazards such as underwater rocks, reefs, submerged pipelines, and other dangers. As a consequence of this lack of planning, the

Captain of the SCANDIES ROSE was uncertain of the dangers posed by anchoring in the lee of Sutwik Island and he sought guidance from other captains.

When the Captain changed course to the starboard to seek the shelter of Sutwik Island, the time was approximately 9:45 p.m. and the SCANDIES ROSE was less than 5 NMs from the leeward side of the island which would afford shelter from the wind and seas that they were experiencing. As the vessel came into the lee of Foggy Cape—the eastern end of the island—and made the turn to starboard, the force of the supporting[157] winds and sea on the vessel that was listing to starboard were lost. Once that occurred, the vessel's list would have worsened and likely contributed to the vessel capsizing.

Shortly after the turn, the two survivors were jolted in their cabin by a sudden list harder to starboard than they experienced earlier. They immediately knew that the situation had become critical and Mr. [redacted] who ran to the wheelhouse, in testimony related

> *But then all the sudden, I rolled into my bunk, and just this sheer terror comes over me. Just I knew something was wrong. So I, I ran upstairs and I look at* [redacted] *and said what, what the (expletive)'s going on? What's going on? And he goes, I don't know what's going on. I said, I think we're (expletive) sinking. No (expletive) (expletive) we're sinking. Then I, then I look out the, the windows; they're iced over a little bit, but not a lot. And I'm just trying to figure out, how did it go from nothing to like the boat's literally like leaving us now.*[158]

5.2. Weather Forecasting and Actual Conditions Encountered

5.2.1. National Weather Service Forecast

As the SCANDIES ROSE got underway from Kodiak, the forecast presented the crew with a number of hazardous conditions for their upcoming voyage. The forecast would include gale force winds and associated seas as well as freezing spray and the danger of icing of the vessel. The NWS's OPC was issuing high seas weather charts depicting winds expected to be upwards of 45 to 50 kts between False Pass and Kodiak Island, AK. This area in figure 76, below, is a very strong low pressure system, but not uncommon in Alaska. With the center of the low pressure system just to the East of the area, this would make for NW winds and heavy icing potential.

[157] Supporting in terms of counteracting the increased listing of the vessel from icing or an unknown source.
[158] Mr. [redacted] MBI Hearing Transcript, Pg. 563

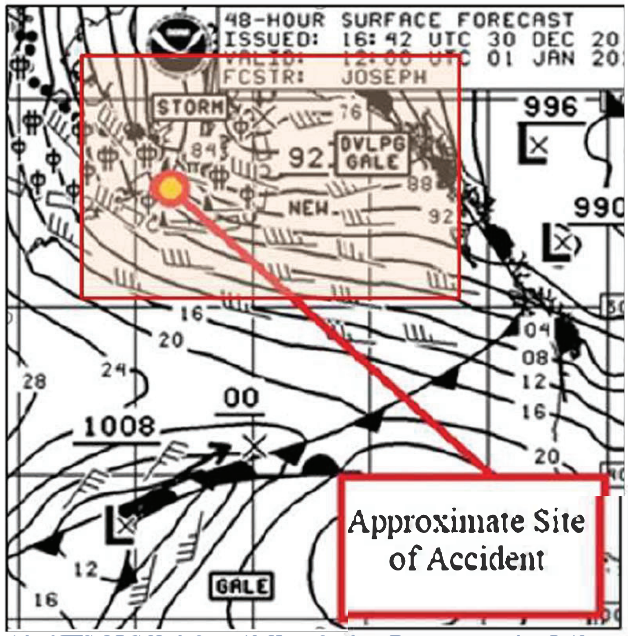

Figure 76 – Enlarged portion of the NWS OPC High Seas 48-Hour Surface Forecast issued at 7 42 a.m. AKST, December 30, 2019 thru 3 00 a.m. AKST, January 1, 2020. The approximate location of the storm is located in an area where the isobars are located close to one another and relatively close to the word "storm." As indicated by the shaded area in the red box. (Source CG Exhibit 028)

This was a winter weather forecast which mariners operating in Alaska were familiar with, as indicated in multiple Marine Board interviews. Discussions that Captain [redacted] had with others and his crew prior to getting underway acknowledged the dangerous forecasted weather but did not indicate that the Captain had a plan in place to reduce the risks associated with the weather.

The NWS and OPC provide full forecasts. They take current observations and the outputs from multiple weather prediction models and then a forecaster thinks critically about all of the information and provides a consolidated forecast. Weather forecasting is dependent on a number of possible data sources, including but not limited to satellite remote observations, ground radar, weather stations, and marine based observations. Marine based observations primarily include a limited network of marine weather forecasting buoys, pier weather stations, and a limited number of synoptic weather reports from ships. These vessels would be participating in NOAA's Voluntary Observing Ship Program, where ships would monitor the weather and provide reports that are considered vital to the NWS. The reliance on the experience and expertise of the forecaster is why the NWS's and OPC's graphical forecasts have a person's name on them, like the OPC forecast in figure 76, above.

The reason this is important is because each weather prediction model is different. The models utilize the same basic atmospheric equations, but they are set up differently. Some are global models, some are regional models, some are optimized for certain scenarios or locations, and they all make different assumptions and have different boundary conditions. Therefore, each model will give different outputs which are also not run continuously. A few times a day, the models have to be initiated and one model "run" is good for a certain number of hours in the future, but no model is good more than a few days out into the future as there is too much uncertainty that develops. Every six to twelve hours, the model is repeated again, and a whole new run is completed, which may or may not look anything like the output from the run before it. The output that the mariner ultimately sees depends on the initial conditions used and the complexity of the weather.

As an example, if in one scenario there are five weather prediction models and they all agree, then statistically, the forecast has a higher probability of being accurate. However, if there are five weather models and they all disagree, then statistically, the chance of predicting the weather accurately is much lower. In these latter scenarios, the forecaster will look at how the models are trending over time (meaning, the different runs) and see which ones are the outliers and it takes training and a really good understanding of the physics of weather to sort this all out. In places like Alaska where the dynamics are so unique and quite variable, this can be difficult without even adding in the maritime component. In Alaska, there are less coastal and maritime weather observations because of the enormity of the area, so most models perform worse out at sea where this accident took place.

The weather station buoys covering the accident area were very limited. There was one buoy in Shelikof Strait and another buoy, Albatross Bank – 104 NM south of Kodiak Island, AK. At the approximate time of the incident, the Shelikof Strait buoy reported a sustained wind of approximately 32 kts and gusts of about 40 kts. The buoy offshore, Albatross Bank, measured sustained winds of approximately 26 kts and gusts of about 36 kts, with a wave height of 14.7 feet. Interviews with captain of the PACIFIC SOUNDER indicate that Captain [redacted] had told him he was experiencing winds of 60 to 70 kts just before the sinking. The captain of the WESTERN MARINER also testified to the winds in this area, and how they come off the mountains and deep glacial valleys and cause intense and violent marine weather. If the accident evening winds were even approaching 60 kts, it presents compelling evidence that there is a need for additional weather stations in the form of shore or sea based stations to build on the existing weather reporting stations in the remote areas of Alaska.

5.2.2. Actual Weather Encountered and the Rescue Operations

The weather the SCANDIES ROSE encountered on the accident voyage exceeded the forecasted conditions in many ways, including the wind speeds reported by the Captain shortly before the vessel sank.

As the SCANDIES ROSE proceeded on course for False Pass, AK on December 31, 2019, the weather continued to deteriorate. Sutwik Island lies just south of a particular region of the Alaska Peninsula known by fishermen for particularly challenging meteorological conditions. Captain [redacted] testified that the glaciers on the Alaska Peninsula funneled heavy, freezing cold winds coming down the mountains in the area leading to Sutwik Island on what would be the SCANDIES ROSE's course. These conditions could frequently exceed the forecasted conditions and many mariners knew about these dangerous local conditions.

During the rescue evolution, the pilot made a decision to keep the swimmer "on the hook"[159] for his safety as the wind and sea conditions were so severe. The swimmer was only in the water for a few minutes on the first hoist, but the conditions were so cold that the air crew

[159] "On the hook" refers to a tactic where the rescue swimmer remains made fast to the helicopter's hoist cable, which was used because the weather was so dangerous and there was a possible risk of not being able to retrieve the swimmer safely if he was released from the hoist cable.

had to knock ice off the swimmer, including his goggles and snorkel, between the first and second hoist. By this point, the recorded temperature in Shelikof Strait had dropped below 10º Fahrenheit. The hoist operator (the flight mechanic) started to have issues with feeling in his fingers and the lead pilot had to take control of the hoisting system with the controls he had available as one of the pilots.

After the vessel sank, weather continued to play a key factor. There was significant wind, overcast conditions and driving snow contributing to limited visibility for the crew. The pilot of the helicopter who rescued the two survivors testified that this was the worst weather he had flown in while working up in Alaska.

5.2.3. Experimental OPC Freezing Spray Website

The OPC offers a free, internet based freezing spray predictor for mariners. This website is experimental in nature, offering two projected icing models from well-respected researchers on ice accretion. Since these models are purely experimental, the NWS has no archived models for the accident timeframe. The models could not be reconstructed from the stored weather information for the accident period. The survivors both testified that the last ice they saw before they went to bed was manageable and the last man on navigation watch before being relieved by Captain [redacted] testified

A.…When I took over from [redacted] the ice was -- it was just the first couple layers, like a inch or two maybe thick, and going about halfway back on the stack. On the starboard side.
Q. Right. And –
A. Everything else was in a glaze but not thick.
Q. And how far over the top of the stack? I'm trying to get a mental image of what portion of the stack had ice glazed on it when you took over from [redacted]
A. Just the bars on the pots on the starboard side, and a little-- and the web -- you could see through the web just a little bit. Like, you know what I mean?
Q. I do. Thank you. And so the pots that were in the middle of the stack and the pots that were on the port side were not iced at the time you took over from [redacted]
A. They weren't. They had a glaze on them, but not -- it wasn't thick because they weren't hitting the spray that the starboard side was. [160]

Subsequent analysis performed by the NTSB's investigation showed ice accumulation leading up to the accident time was extreme. Their estimates of ice accumulation was up to 1.6 inches per hour and a cumulative accumulation of ice between 6 and 15 inches in the final stages of the accident voyage. As previously mentioned in 5.1.1 of this report, several fishing vessel captains were interviewed during the hearings and none of them were aware of the experimental freezing spray webpage at the time of the accident.

[160] Mr. [redacted] MBI Hearing Transcript, Pg. 1152

5.3. Regulatory Framework and Policies

5.3.1. Alternate Safety Compliance Program

With the 2010 CGAA and the 2012 CGMTA, Congress mandated that the Coast Guard work with the commercial fishing industry to develop an Alternate Safety Compliance Program (ASCP) for "older" commercial fishing industry vessels such as the SCANDIES ROSE. The 2015 CGAA, published in February 2016, mandated that the Coast Guard analyze and report on the adequacy of regulations on fishing vessel safety by 2026. It further mandated the Coast Guard to develop an alternative safety compliance program if the Coast Guard determined the safety regulations to be inadequate.

The ASCP was scoped to apply to all commercial fishing vessels 50 feet or greater in overall length, that operated beyond three nautical miles from the baseline, were built prior to July 1, 2013, and were 25 years of age or older at the implementation of the program.[161] These older vessels were built prior to modern construction standards and, based on their age and condition, this increases the risks for the crews and the vessels. The objective of the ASCP was to require more stringent Coast Guard oversight, inspections, and training requirements for operators as a means to reduce the latent unsafe conditions on these older, higher risk vessels.

On December 1, 2014, the Coast Guard issued Marine Safety Information Bulletin (MSIB) 18-22 to remind the commercial fishing industry about safety and equipment requirements contained in the previous Coast Guard Authorization Acts, and that the once-voluntary Coast Guard dockside safety examinations would become mandatory starting in October 2015. The MSIB also highlighted a reminder of the impending creation and eventual implementation of the ASCP that had previously been announced to the public and the fishing community.

However, the ASCP, as mandated in the Acts, would require additional rulemaking in order to apply new safety requirements for older vessels and there was no time available between the announcement in the MSIB and the delivery date for the ASCP program to fully develop the program.

> *And so, in 2016, the Alternate Safety Compliance Program requirement acknowledged that older vessels required additional safety measures beyond those found in Part 28…The Coast Guard recognized that further development of an Alternate Safety Compliance Program was premature due to lack of alternative standards in the first place. And so that was the dilemma, the lack of standards to compare the Alternate Compliance Standard to.*[162]

As a result, on July 20, 2016, the Coast Guard issued MSIB 11-16, indicating that they were suspending development of the ASCP and would rely on existing regulatory and enforcement measures. The bulletin stated that the Coast Guard would instead work with CFSAC[163] and industry to develop an Enhanced Oversight Program (EOP) for commercial fishing vessels

[161] Mr. [redacted] MBI Hearing Transcript, Pg. 1212
[162] Mr. [redacted] MBI Hearing Transcript, Pg. 1212, 1213
[163] CFSAC was the name of the fishing safety Federal Advisory Committee at the time.

by January 1, 2017. The EOP would use existing Coast Guard authorities to attempt to provide greater safety initiatives for older commercial fishing vessels. In addition, the Coast Guard stated it would publish additional Voluntary Safety Guidelines for older fishing vessels. The EOP later evolved into the "Voluntary Safety Initiatives and Good Marine Practices for Commercial Fishing Industry Vessels."[164]

Also contained in the 2010 CGAA and 2012 CGMTA was an amendment to 46 USC §5103 (Loadlines) provision. The amendment mandated that the Coast Guard develop an Alternate Loadline Compliance Program (ALCP) in cooperation with the commercial fishing industry for vessels built before July 1, 2013 or those vessels that undergo major conversions. The program's intent is to address hull structural strength, watertight and weathertight openings and penetrations, stability, and sufficient freeboard for applicable vessels. At present, the Coast Guard has not started the development of this program.

These two alternate safety programs were modeled after the Alternate Compliance Safety Agreement (ACSA) program established in 2006. ACSA was produced and enacted for the BSAI and Gulf of Alaska freezer longliner and freezer trawler vessel fleet (head and gut fleet), following the losses of the F/V ARCTIC ROSE in April 2001 and F/V GALAXY in October 2002. Based on those investigations, it was discovered that approximately 60 commercial fishing vessels were going beyond minimal processing operations and should have met classing and loadline standards for fish processing vessels. Through cooperation with the commercial fishing industry, the Coast Guard developed a robust hull, machinery, and propulsion inspection program along with additional safety equipment and training requirements. Through the ACSA agreement, enrolled vessels would be exempt from full classification and loadline requirements and be permitted to continue to process specific NMFS fish product codes. This program was applicable only to this class of commercial fishing vessels. The SCANDIES ROSE did not fall into this inspection program.

5.3.2. Training Requirements for Commercial Fishing Vessel Operators

The 2010 CGAA added a subsection in 46 USC §4502 that requires an individual in charge of a commercial fishing vessel that operates three NMs beyond the territorial sea baseline to pass a training program and hold a certificate issued under that program. The requirement for establishing the technical competency for people operating and navigating commercial fishing vessels like the SCANDIES ROSE on the nation's waterways has not been fulfilled.

The 2010 CGAA provision stated that 46 CFR Part 28 had to be amended to set forth a requirement discussing a training program that addresses topical areas including, but not limited to, seamanship, navigation, stability, firefighting, damage control, safety and survival, and emergency drills. These training competencies require an individual to demonstrate the ability to communicate in an emergency situation and understand information found in navigation publications, vessel stability, and the significance of maritime weather's impact on vessel operations. The proposed training program would also have to acknowledge and give credit to an individual seeking this certification for recent past

[164] Mr. [redacted] MBI Hearing Transcript, Pg. 1213

experience in fishing vessel operations. Lastly, the CFR amendment would have had to address “recency” of knowledge, requiring the fishermen to attend some form of refresher training every five years.

As of the accident date, the regulations, policies, and procedures to put this training requirement and resultant certification in place had not been established despite considerable individual efforts by the members of the fishing industry working on various subcommittees of the then CFSAC to create these training programs and certification standards. During the hearing, the representative for CG-CVC-3 was asked about training and requirements for documentation of mariner training for commercial fishing vessels.

> *Q. So the Authorization Act, would that be a statutory requirement?*
> *A. It would, yes.*
> *Q. And did it mandate some form of certification? I heard that you mentioned the gaps and we are filling the gaps. But that then --*
> *A. Yes, yes.*
> *Q. Okay. So did it mandate actually producing some kind of documentation for the mariner that they were competent to operate the fishing vessels?*
> *A. … There is statutory language stemming from the 2010, '12 Auth Acts, and that was part of -- or is part of the reg project that we talked about that was -- is well detailed and that docket that was in the final rule in 2016 -- I'm scrolling back. But those initiatives were packaged in that Notice of Proposed Rulemaking project that we talked about a little bit earlier this morning. That has not come to fruition since the rule has not become final and it still is in abatement, as reflected on that unified agenda. But to add -- to respond to your question, yes, that – it addressed -- or it does address training. But until certain things make it to reg, there may be certain elements of that, that may not be self-implementing or self-enacting.*[165]

Enacting the provisions in the U.S. Code was embraced as tasking for the federally mandated CFSAC and significant work was conducted to meet the provisions in the 2010 CGAA. The CFSAC recognized the need to increase the safety of the commercial fishing industry in terms of essential areas directly relating to the safety of vessel operations including the critical element of vessel stability. Already established work products and recommendations would establish a training certificate that would be valid for five years after which some form of refresher training would be required to keep the certification current to stay abreast of changes in technology and practices.

A comparison between the fishing vessel crews and the NMFS “fishery observers” that could be working aboard the same vessels highlights a different approach to training requirements for the safety of personnel. These observers are not operating a vessel or engaged in fishing, but rather observing the fishing operations to ensure that fishing regulations are being adhered to. These observers are required to be trained and certified in a comprehensive list of

[165] Mr. [redacted] MBI Hearing Transcript, Pg. 1249

safety topics and at a minimum, active observers shall be required to attend a hands-on marine safety training course within three years of their initial marine safety training.[166]

The establishment of requirements for operator competency outlined in the 2010 CGAA may have closed the gaps that contributed to this casualty. As an example, in the hours prior to the accident as the vessel transited along its route, had the crew on watch in the wheelhouse recognized the significance of the severity of the weather in terms of ice accumulation on the vessel and then its inherent impact on the vessel's stability, they may not have minimized the risk of a "couple of degrees" starboard list and may have taken earlier action to alert the Captain. Earlier communication of risk may have meant earlier action to slow, change course to lessen the freezing spray, or to manually remove ice from the vessel to improve stability.

Pertaining to importance of safety familiarization for crew persons, the Marine Board determined that by current regulations, drill conductor training is required only for the person leading the drills or providing the instruction and that person is not required to be the master nor a member of the crew. A safety orientation is required to be given to each individual on board who has not participated in the previous drill nor received instructions. The orientation includes covering the emergency instructions and procedures required by 46 CFR 28.265. Additionally, monthly drills are required to be conducted on board the vessel as if there were an actual emergency and must include participation by all individuals on board, breaking out and using emergency equipment, testing of all alarm and detection systems, donning protective clothing, and donning immersion suits. The current regulations do not require the drill conductor to have any form of "recency" once he or she has gone through the drill conductor training, even though equipment and safety procedures may have changed over time. In the case of the SCANDIES ROSE, Captain [redacted] completed his drill conductor course in 2009 and there was no evidence that he had been to any refresher or supplemental training since then, as there was no regulatory requirement for him to do so.

5.3.3. Loadline Requirements for Vessels Engaged in Fish Tendering

The SCANDIES ROSE was a vessel that fished for cod and crab by pot and the vessel also worked in the capacity of a fish tender vessel during other times of the year. Loadline requirements for fishing vessels stem from 46 USC § 5102. Tendering is not actually engaging in fishing operations, but rather using the vessel to transfer the various catches between the other fishing vessels and the processing vessels or facilities. A "fish tender vessel" must be assigned a loadline unless it meets a wide range of exemptions, as shown in figure 77. Having a loadline would subject a particular vessel to a series of guidelines or regulations that would impact the vessel hull maintenance and watertight integrity. The SCANDIES ROSE was not required to comply with loadline regulations since it started tendering operations prior to 1983. The ALCP would not apply to the SCANDIES ROSE since it had not undergone a major conversion after July 1, 2013.

[166] NOAA's NMS Observer Safety Training Standards - https://media.fisheries.noaa.gov/dam-migration/observer_safety_training_standards_062020.pdf

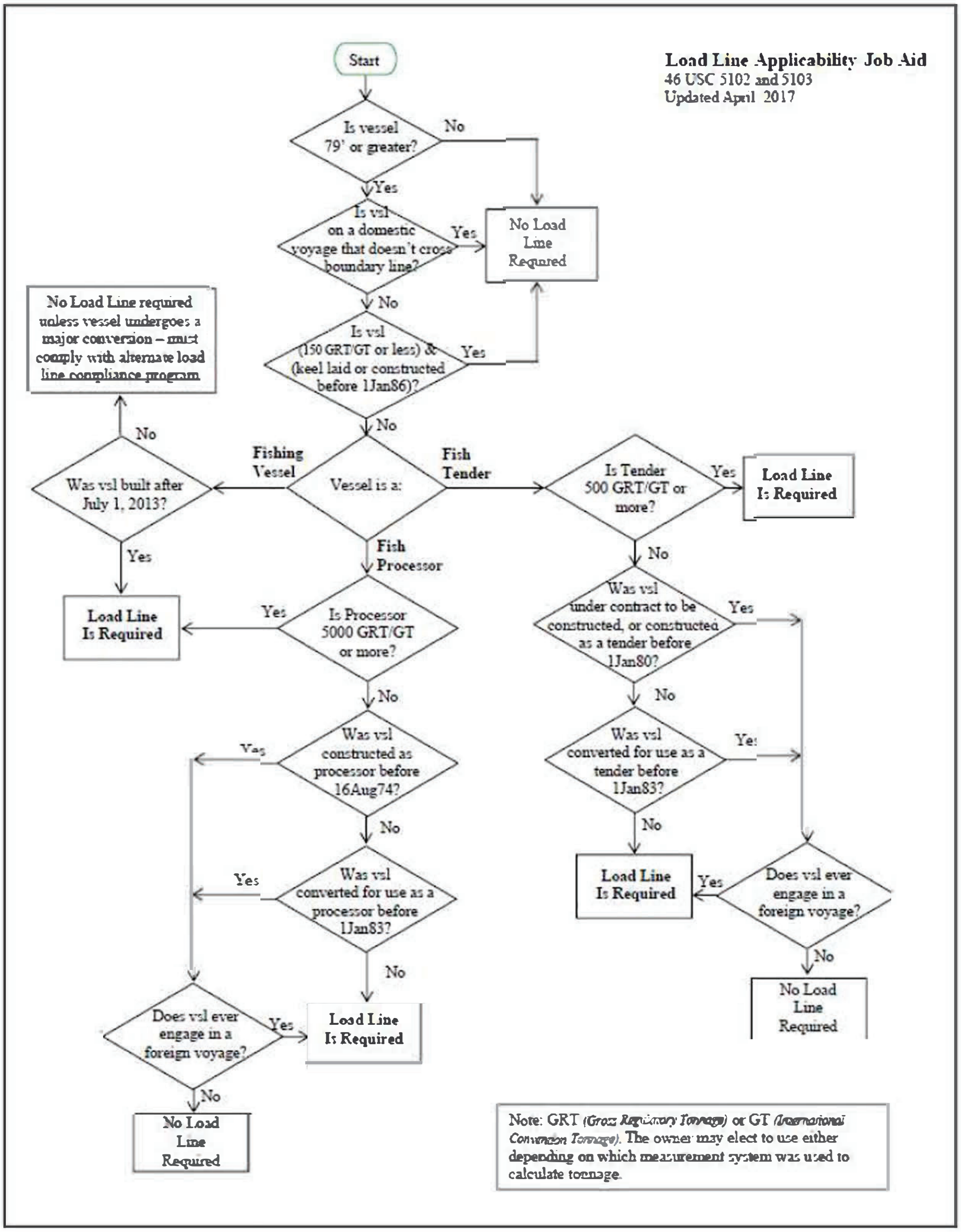

Figure 77 – Applicability job aid to determine applicability for loadline for fishing vessels. (Source Coast Guard).

Applying the loadline regulations is critical to fishing vessel safety because loadline standards are designed to address significant vessel characteristics such as a vessel's watertight envelope, strength and maintenance of the hull, watertight and weather tight closures, safe loading conditions, as well as measures of draft and trim. Had the SCANDIES ROSE been required to have a loadline or been enrolled in the ALCP, the requirements and oversight on the vessel would have been more stringent and may have resulted in measures that would have enhanced the survivability of the SCANDIES ROSE for the conditions encountered during the accident voyage. Since the SCANDIES ROSE was not required to have a loadline, and did not participate in a loadline program, the oversight of any structural watertight integrity issues was extremely limited at best. Repairs to the hull structure such as the closure of the starboard aft waste chute on the SCANDIES ROSE would have had a more stringent level of oversight under this program in order to maintain their condition of loadline and most importantly the safety of the vessel.

5.3.4. Dockside Safety Examination Program

The Coast Guard and Coast Guard-accepted or similarly qualified third party organizations perform dockside safety exams on Commercial Fishing Industry Vessels. The purpose of these dockside exams is to attest to a vessel's compliance with federal safety standards related to lifesaving equipment, immersion suits, signaling devices, vessel stability, bilge pumps, bilge alarms, firefighting equipment, first aid equipment and ground tackle sufficient for the vessel. The dockside exam's scope also includes requirements for emergency drills, instruction and safety orientation of all people on board. As mentioned above, the 2010 CGAA added specific training requirements for the individual in charge of a commercial fishing industry vessel that would directly focus on critical lifesaving and safety equipment; however, implementing regulations have not been developed by the Coast Guard.

Based on the circumstances of this accident, there is one critical area among several that is not covered in safety compliance oversight that might improve the chances of survival for persons in distress – the enabling of the DSC feature on the various types of marine radios. Because it is outside of the regulatory scope of the exam, most CFV examiners are not examining the proper configuration and functionality of the marine VHF radios to determine if the radios have the distress feature of the DSC system activated and available for use in a distress situation. A properly configured DSC VHF radio with a knowledgeable operator is an efficient and effective tool to communicate distress. Most commercial vessels are required to have DSC VHF radios and many recreational users voluntarily utilize marine VHF radios with the DSC feature properly configured for immediate use.

The most recent dockside exam that took place prior to the accident voyage was in October 2018, during which they received a safety decal. In October 2019, Coast Guard personnel once again attended the vessel for a Safety Compliance Check. During that compliance check, the examiner utilized a checklist and verified and attested to the vessel's compliance at that date. The 2019 Safety Compliance Check confirmed the SCANDIES ROSE continued to be in compliance as of October 2019.

In the case of the SCANDIES ROSE, two personnel were able to successfully don immersion suits, board a liferaft that successfully deployed by means of hydrostatic release, and survive. Ensuring the proper float free arrangement of liferafts and serviceability of all lifesaving equipment are all items well within the scope of the dockside safety exam program and that program has impacted the safety culture of the commercial fishing industry. If other systems of the vessel were incorporated into the oversight of the current dockside safety examination program, to include structural repairs, it will increase safety for of one of the deadliest professions in the nation.

5.3.5. Safety Compliance Check Program for BSAI Crab Fleet

In 1999, Marine Safety Office Anchorage[167] initiated voluntary dockside Safety Compliance Checks to assist in reducing fatalities and vessel loss within the BSAI crab fleet. In particular, the goal of the Safety Compliance Check was to deter vessels from overloading crab pots. These Safety Compliance Checks were traditionally completed in early October of each year, before the crab seasons open and this practice continues today. During the examinations, Coast Guard CFV examiners verify and document that the vessel has the required safety equipment and stability instructions. Prior to 1999, the Coast Guard did not conduct these pre-season stability checks or weigh the crab pots. Examiners began measuring and weighing pots after a 2017 marine accident involving the DESTINATION that occurred in the Bering Sea off of St. Paul Island, AK. The CFV examiner cross-references the pot weight and measurement information and the current loaded condition of the vessel with the vessel's stability instructions and will discuss the results with the vessel's captain.

Safety Compliance Checks, as envisioned and initially executed, involved collaborative dockside vessel visits using Coast Guard CFV examiners and ADF&G personnel. While ADF&G personnel conducted crab fisheries tank and pot checks, the Coast Guard would work with the vessel's captain to examine suitability of lifesaving equipment and compliance with the vessel's stability instructions to check for overloading. If the Coast Guard found vessels overloaded or without required stability instructions, they would issue the vessel a Captain of the Port (COTP) Order requiring the vessel to remain at the dock until the vessel corrected the safety deficiencies. Currently, the Coast Guard conducts Safety Compliance Checks independently from ADF&G personnel and only after a vessel volunteers to participate.

During Safety Compliance Checks, the CFV examiners document their exams on a Safety Compliance Check form that has been developed by Sector Anchorage. The form includes information such as pots allowed, pots loaded, stability instructions onboard and issue date, in addition to information on safety equipment. The form also includes a space to document noted deficiencies and when they are corrected.

Alaska state law[168] requires fishermen to contact the Coast Guard at least 24 hours in advance of leaving port if they are fishing for crab. There is no equivalent requirement or law for operators of vessels fishing for cod with pots which present the same level of risk. As the SCANDIES ROSE left on the accident voyage to go fishing for cod, there was no regulatory requirement for Captain [redacted] to notify the Coast Guard that the vessel was heading out to sea.

Coast Guard CFV examiners conducted Safety Compliance Checks on the SCANDIES ROSE from 2004 through 2019 and documented the Safety Compliance Check activity within the MISLE database. None of the vessel's historical Safety Compliance Checks noted violations or non-compliance with safety or stability requirements.

5.3.6. Credentialing and Licensing

[167] Marine Safety Office Anchorage is the predecessor of the Coast Guard's current unit, Sector Anchorage.
[168] Per 5 AAC 39.670, an operator of a vessel participating in an IFQ, CDQ, or Adak community allocation crab fishery in the BSAI area. Opilio crab fall under the applicability of this administrative code.

The commercial fishing industry operates thousands of vessels on the waterways of the United States as well as offshore waters. These vessels operate on the nation's critical waterways alongside tankers carrying hazardous cargoes, high capacity cruise ships, towing vessels, and in close proximity to critical infrastructure such as bridges, locks, and other infrastructure. The table below shows the requirement for some level of credential or certification to operate a vessel. The state requirement for Alaska is also included for recreational vessels as the accident occurred off the Coast of Alaska.

Requirements for Vessel Types as of January 2021

	Recreational Vessel	Uninspected Passenger Vessel	Small Inspected Passenger Vessel	Towing Vessel	Commercial Fishing Vessel Less Than 200 GRT	Commercial Fishing Vessel Greater Than 200 GRT
USCG Credential or License for Competency	No	✓	✓	✓	No	✓
Operator's License from State of ALASKA	N/A	N/A	N/A	N/A	N/A	N/A
Medical Examination for Medical Fitness	No	✓	✓	✓	N/A	✓
Drug and Alcohol Testing	No	✓	✓	✓	✓[1]	✓
Suitability Background Check	No	✓	✓	✓	N/A	✓
Minimum Age	N/A[2]	18	18	19/21[3]	16[4]	21

[1] Drug and alcohol testing is required post serious marine incident (SMI) only.
[2] Per the AK Office of Boating Safety, there are municipalities that have minimum ages, but the State of AK does not mandate a minimum age.
[3] 46 CFR 11.201(e) table outlining medical and physical requirements. To act as a deck hand the minimum age is 19. To get minimum licensing the minimum age is 21.
[4] Per AK state law, the minimum age is 16, unless the individual's parent is operating the vessel, then the minor can be employed on this CFV.

Figure 78 – Table showing the requirements for mariner to operate various vessel types under existing state and federal regulations as of the accident date up to and including January 2021. The column highlighted in yellow represents the regulatory standards applicable to vessels like the SCANDIES ROSE. (Source Coast Guard)

The maneuverability, navigation, seamanship, and safety concerns associated with commercial fishing vessels are the same as those for other vessels listed in the above table. Depending on the type and location of fishery, these concerns can be elevated on commercial fishing vessels given the extreme weather conditions and hazards associated with stability and ice. Yet, there is no requirement for licensing of personnel operating or forming part of the crew on commercial fishing vessels like the SCANDIES ROSE. Even a person operating an uninspected passenger vessel is required to hold a Coast Guard credential attesting to their competency to operate the vessel.

Other vessels in commercial service such as small passenger vessels, tugs, tankers, and container ships all require a certain level of minimum safe manning by mariners with Coast Guard issued credentials. A requirement to hold a Coast Guard issued MMC involves medical certifications and minimum age requirements. The credentialing process also requires a person to undergo a suitability assessment to determine if the individual has any issues that under federal law and regulations would prevent the issuing of a credential, for instance drug usage, drug convictions, or certain criminal activities. The goal of this program is to ensure that commercial mariners do not create a risk to the nation's waterways or natural resources when they operate a commercial vessel. There is no similar requirement for commercial fishing vessels under 200 GTs.

5.3.7. Coast Guard Stability Guidance

5.3.7.1. A Best Practices Guide to Vessel Stability

In the absence of formal credentialing standards, the Coast Guard has made efforts to educate commercial fishing vessel operators on operational considerations for vessel stability. In 2005, the Coast Guard published *A Best Practices Guide to Vessel Stability* for commercial fishermen.[169] While this guide does not comprehensively provide the reader with a knowledge base commensurate of formal training, it does provide explanations on basic stability issues. One such condition is the unsafe accumulation of ice.

Several fishermen interviewed throughout this investigation talked about the feel for the fishing vessel's movement beneath their feet, referring to how they could feel when a vessel was reduced in its stability based on the roll or recovery time for the rolling fishing vessel moving in the sea. In reality, mariners may not identify the early phases of stability reduction when stability may be compromised. For instance, accumulating ice has the same effect on a fishing vessel as if it was overloaded with pots that had been stacked above the main deck (above the vessel's original center of gravity). The loss of stability from ice may be subtle because, similar to overloading a vessel, the initial stability at small angles of heel are only slightly reduced. In other words, the crew may not notice a difference as the vessel rolls at smaller angles and returns. However, initial stability does not accurately encompass the vessel's overall stability as the ice begins to load the vessel, as shown in the figure below.

In figure 79, below, it is important to note that the bottom left images show icing. The ice is applied in the image uniformly and the example still illustrates the danger of ice accumulation. As the vessel continues to gain weight above the waterline, the list gradually worsens and the ability for the vessel to right itself decreases, leading to the potential for sudden and catastrophic capsizing. This image, while representing the negative effects of icing, does not take into account the dangers associated with the increased dangers of asymmetrical icing[170] on a vessel.

[169] *USCG Stability Reference Guide,* https://www.dco.uscg.mil/Portals/9/DCO%20Documents/5p/CG-5PC/CG-CVC/CVC3/references/Stability_Reference_Guide.pdf

[170] Asymmetrical ice accumulation is where more ice accumulates on one side of the vessel as opposed to an even distribution of ice and associated weight across both sides of the vessel.

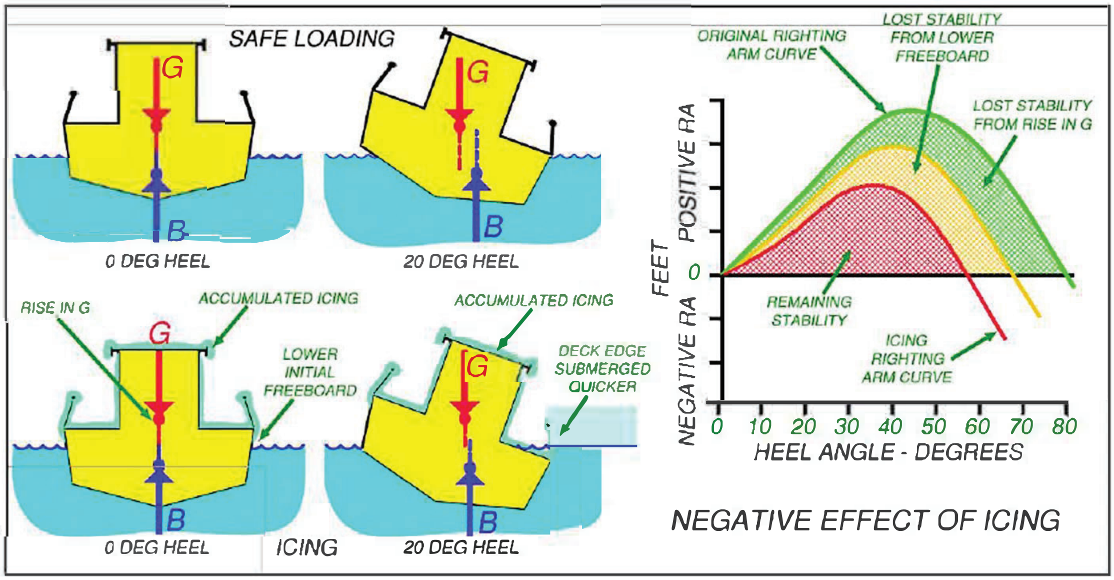

Figure 79 – An image taken from the Coast Guard's Stability Reference Guide showing the effects of icing on a vessel which can result in a loss of stability and the potential for capsizing. (Source USCG Stability Reference Guide, https://www.dco.uscg.mil/Portals/9/DCO%20Documents/5p/CG-5PC/CG-CVC/CVC3/references/Stability_Reference_Guide.pdf)

When icing conditions are encountered, the *Best Practices Guide to Vessel Stability* recommends immediately taking the following corrective actions:

> *If possible, alter course to return to warmer or protected waters.*
>
> *Steaming downwind reduces the speed of ice formation but use caution if the seas are very strong because stern seas increase the chance of broaching, boarding seas, or burying the bow.*
>
> *Secure all fishing gear below deck to minimize surfaces that ice can from on.*
>
> *Keep freeing ports clear of ice to allow rapid draining of water off the decks.*
>
> *Remove as much ice accumulation as is safe for the current weather conditions.*
>
> *Maintain radio communication with other fishing vessels and shore side on a regular schedule.*
>
> *All lifesaving equipment should be broken out and ready for use.*[171]

In the case of the SCANDIES ROSE, there is no evidence that steps were taken to alter course to more protected waters, to steam down wind, or change course to minimize icing in the earlier stages of the voyage. In addition, there is no evidence that steps were taken to remove the ice that accumulated on the pot stack at any point in the voyage. This is because the Captain determined it was too rough for his crew to manually break ice in the

[171] *USCG Stability Reference Guide,* https://www.dco.uscg.mil/Portals/9/DCO%20Documents/5p/CG-5PC/CG-CVC/CVC3/references/Stability_Reference_Guide.pdf, Pg. 49

current weather conditions and intended to wait until the vessel entered sheltered waters near the south side of Sutwik Island.

The Coast Guard's guidance pamphlet emphasizes that operating in icing conditions significantly reduces a fishing vessel's stability because the weight of the accumulating ice affects two crucial factors—the center of gravity and the freeboard.[172] First, the vessel's center of gravity rises rapidly from the weight of ice added high on the vessel. This is especially emphasized on vessels carrying high deck loads like crab pots. Second, the vessel's freeboard is reduced because, as ice accumulates, the additional weight of ice results in the vessel sitting lower in the water, increasing the likelihood that the deck edge may submerge at smaller heel angles. Icing also increases the surface area that wind may affect, where the wind force would exert its push. Increases in the projected surface area increase the wind heel of the vessel, which, coupled with decreased freeboard, significantly increases the probability of deck submergence. In the early phases of the SCANDIES ROSE's accident day, the force acting on the vessel caused by the wind was acting on the starboard side, the same side that the ice was building, but in doing so, it was counteracting the list caused by ice or any other source of listing.[173]

The accumulation of ice throughout the day of December 31, 2019 was considered relatively minimal by the survivors. When Captain [redacted] took the watch on or about 7:15 p.m., the survivor who was relieved referred to the vessel's icing several times as "a glaze" but also commented that it was an "inch or two maybe thick, and going about halfway back on the stack. On the starboard side."[174] Both survivors who had watch before the Captain's final watch considered this ice buildup as inconsequential. Analysis of the trackline data showed that the vessel did not take any significant course changes leading up to this point and the witness's testimony may verify that it would not have been deemed necessary up until this point. However, Mr. [redacted] testified that when he was relieved by the Captain, he asked the captain if he wanted him to have the guys go down and break ice off the bow[175] but he was told by the Captain that he was likely to pull into the lee of Sutwik Island to complete that task.

There was no other indication by witness testimony or trackline analysis that shows the Captain took measurable steps to mitigate any ice in accordance with the above guidance. It is also important to note that meteorological reports and testimony indicate the wind and weather was meeting the SCANDIES ROSE on its starboard side through most of the last 24 hours of its voyage. Captain [redacted] plan to turn north or starboard would be in direct conflict with the guidance to turn downwind to minimize ice accumulation. This is noted cautiously since the actual sea state and how the SCANDIES ROSE would dynamically interact with these seas if the Captain were to turn to port is unverifiable.

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[172] The *freeboard* is the vertical distance between the waterline and the highest watertight deck.
[173] The MSC provided a comprehensive model of the SCANDIES ROSE potential for asymmetrical ice accretion which can be viewed in the upper image of figure 110. Complete details can be found in CG Exhibit 138.
[174] Mr. [redacted] MBI Hearing Transcript, Pg. 1152
[175] Mr. [redacted] MBI Hearing Transcript, Pg. 1107

It is important to note that the SCANDIES ROSE had a deck heating system in the bow compartment. The deck heating system was a heater unit, believed to be a 60,000 watt heater, and its purpose was to reduce potential ice accumulation off the focsle deck.[176] Testimony was provided that prior to departure on the accident voyage, crewmembers activated the bow heater to melt snow off the deck and secured the forward compartment.[177] The capacity of the bow heater to reduce the total amount of ice accumulation on the bow is unknown.

The stability of the vessel was significantly compromised while the SCANDIES ROSE made its final turn towards Sutwik Island. The testimony indicated that when Mr. [redacted] was woken up, there was a significant heel to the vessel. Mr. [redacted] and Mr. [redacted] both testified that they did not hear any alarms going off on the bridge when they initially reached the wheelhouse and for the majority of the time they were in up on the bridge. At this point, the testimony suggests that the vessel was heeling approximately 20 degrees to starboard. The MSC Report indicated that submergence of the deck could happen at angle of heel as small as 30 degrees. The vessel's turn toward the island changed the wind's relative impact on the vessel. As a result, the wind which had been, in effect, propping the vessel up when the vessel was travelling in a southwesterly direction was now acting on the vessel's port side. The effect was a dramatic increase in the vessel's list. The observed, approximated heel of the vessel was very close to this point. Mr. [redacted] stated in testimony

> *At that time, I saw [redacted] coming out of the engine room again, and so I figured he was down there transferring fuel to fix the list. And then I ate my sandwich. I went back to bed, and started watching a movie. About a [sic] hour and a half maybe, about 9:30 or so, felt the boat go hard to starboard. My first instinct was we were going to turn around and start running with it to go break off bad sea, give us a little safer ride to go beat the ice off. That was my first instinct. Now, I was on the top bunk, so I told [redacted] to go see what's going on and -- because it's easier for him to get up. And he ran upstairs and yells down, [redacted] the boat is sinking. What? I jump up, and I try and get my pants on, and I -- try and get my socks on. I feel the boat rolling a little more. I'm like, oh, no.*[178]

5.3.7.2 Voluntary Safety Initiatives and Good Marine Practices for Commercial Fishing Industry Vessels

The Coast Guard updated engagement in overall fishing vessel safety in 2017 by releasing Voluntary Safety Initiatives and Good Marine Practices for Commercial Fishing Industry Vessels.[179]

The CFSAC met and published a response to the ASCP program and how it should apply to older vessels. The intention of this document was to provide minimum safe standards on commercial fishing vessels for various systems including but not limited to lifesaving,

[176] Mr. [redacted] MBI Hearing Testimony, Pg. 81
[177] Mr. [redacted] MBI Hearing Testimony, Pg. 556
[178] Mr. [redacted] MBI Hearing Transcript, Pg. 1067
[179] CG Exhibit 047

fire prevention, electrical, mechanical, flooding, and stability. As an example, the guidance discussed watertight and weathertight integrity standards for commercial fishing vessels, stating that every vessel should maintain an “at-sea policy for maintaining and verifying weathertight/watertight integrity and the status of such closures.”[180]

Despite the fact that the guidance was spearheaded by a group comprised of people representing the commercial fishing industry, it was unclear how much of this Voluntary Safety Initiative guidance was available and reached one of its intended targets, the crew and management of the SCANDIES ROSE. The two newest crewmembers could not account for any instructions or guidance provided by the Captain or other crew of the SCANDIES ROSE regarding maintaining watertight and weathertight integrity. Review of photos of the SCANDIES ROSE and interviews with the surviving and former crewmembers also indicated that the watertight door in the engine room was normally left open. Loose discipline on maintaining watertight and weathertight integrity while underway by keeping doors or openings unsecured would have left the vessel vulnerable to progressive flooding had there been an unknown and unaddressed source of water ingress.

5.3.7.3. Marine Safety Alert 11-17

Following the sinking of the DESTINATION, the Coast Guard released further guidance to the vulnerable fishing vessel fleet in Marine Safety Alert 11-17.[181] The Marine Safety Alert drew attention to stability concerns on fishing vessels. The document was a two-page document which brought attention to several key factors which impacted stability. It addressed concerns of vessel weight creep, the importance of maintaining watertight integrity, recommending operators weigh a sampling of their pots annually, and familiarize themselves with their stability instructions. The Marine Safety Alert really emphasized the importance of avoiding sailing through areas with freezing spray forecasted and to reduce topside gear when unavoidable. It also stressed the need for fishing vessels to renew their stability instructions periodically, recommending validation at least every five years.

This Marine Safety Alert provides concise guidance to fishing vessel operators to operate vessels safely. Unfortunately, none of the fishing captains interviewed during the MBI Hearing recognized or had previously seen the Marine Safety Alert. The mechanism for release and distribution of these documents may not readily reach the remote fishing communities in Alaska. Regardless, it was noted that the sinking of DESTINATION served as a reminder to some fishing vessel operators of the dangers inherent in this occupation, and many operators took proactive steps to re-evaluate their vessels’ stability. The SCANDIES ROSE Fishing Company LLC was one of these operators and new stability instructions were prepared in 2019, only months before the vessel sank.

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[180] U.S. Coast Guard’s Office of Commercial Vessel Compliance, Voluntary Safety Initiatives and Good Marine Practices for Commercial Fishing Industry Vessels, January 2017, Pg. 9

[181] CG Exhibit 046

Despite the fact that the guidance was disseminated by the Coast Guard through multiple channels, it was unclear how effective communication efforts were for these Marine Safety Alerts. In testimony, the Marine Board asked multiple captains whether they were familiar with this particular Safety Alert and none of them were aware of the document, its contents, or the available platforms on which the Coast Guard posts this and other essential safety notices.

5.3.8. Third Party Stability Training

Captains and crew of commercial fishing vessels such as the SCANDIES ROSE are not required to participate in formal stability training. The NPFVOA based in Seattle, WA, and AMSEA based in Sitka, AK, both offer Coast Guard accepted stability courses that tailor training to fishermen. The executive directors for both organizations testified that because these courses are not required by regulation or by industry standard, participation has been traditionally low. In addition to these two training institutions, other entities such as Fish Safe BC, located in Richmond, British Columbia, Canada, have also produced valuable information on stability for mariners. This organization produced a training video tailored for fishing vessel operators which can be used as a tool to train fishermen on stability and fishing.[182]

HYPERLINK: Enclosure (2) contains hyperlink (3) which is a video prepared to assist fishermen in dealing with stability related risks on fishing vessels.

One fisherman who was required to take a stability class to obtain a MMC testified that while learning about icing in class, he was surprised by the negative stability impact of even a small amount of ice accumulation. The same mariner suspected that other fishermen and vessel captains would come to the same realization and would benefit from the training.[183]

Following the sinking of the SCANDIES ROSE, Crawford Nautical School, also located in Seattle, WA, partnered with Mr. [redacted] the minority owner of SCANDIES ROSE, to develop a stability class specific to BSAI crab vessels. As of March 2020, the 8-hour class had been offered twice and was well attended according to the instructor. Two participating crab vessel captains testified that they would highly recommend the class, and one mentioned that he believed the class should be mandatory for all crab vessel captains. [184] In testimony, the Marine Board heard that during one of the stability courses, amongst even the very experienced captains in attendance, there was a varied range of answers regarding their understanding on what “heavy icing conditions” meant.[185] This gives the Marine Board concern regarding fishermen’s perceived margins of safety when it comes to stability and real-life icing conditions.

Stability instructions prepared by a naval architect can be a very complex document for anyone to read. In the basic form, it seems very simple; it outlines approved loading configurations for the vessel based on the operator’s input. The fisherman tells the naval

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[182] CG Exhibit 127
[183] Mr. [redacted] MBI Hearing Transcript, Pg. 672
[184] Captain [redacted] MBI Hearing Transcript, Pg. 166
[185] Mr. [redacted] MBI Hearing Testimony, Pg. 184

architect how they load their fuel and liquid tanks in different configurations, then the naval architect tells them how much gear can be carried and in what locations. These instructions are based on a static analysis, and typically only take into account the amount of icing required by the regulations. Additional ice, green water, and/or flooding water is not accounted for. At sea, when the vessel takes on an accumulated ice load or extra water on deck, it is difficult for the fishermen to understand how their vessel's stability may be changing and how rapidly it changes. Stability courses could help fishermen to better understand their stability instructions, the limitations of those calculations, and the adverse effects of the many different factors that can effect stability.

5.3.9. Significant Commercial Fishing Vessel Accident Analysis

During the course of the SCANDIES ROSE investigation, the Marine Board examined other historic major marine accidents involving commercial fishing vessels to determine if there was a common issue resulting in the loss of a vessel such as the SCANDIES ROSE. Since 2000, the Coast Guard has conducted 11 MBIs, the highest-level formal Coast Guard marine accident investigation. Of these 11 MBIs, six of them were devoted to the loss of commercial fishing vessels.

Figure 80 below lists notable fishing vessel casualties. With the exception of the F/V ALASKAN RANGER, a larger fish processing vessel which was part of the ACSA program, all of the vessels were uninspected commercial fishing vessels. All of the other commercial marine vessel types such as small passenger vessels, towing vessels, industrial vessels and others of the size and type of the SCANDIES ROSE of the U.S. are subject to some form of regulation or governmental oversight including a full marine inspection or examination regime.

Notable Fishing Vessel Casualties							
Name of Vessel	Date	Event	Result	Crew Size	Survivors	Deceased or Presumed Deceased	Missing
ARCTIC ROSE *	April 2, 2001	Flooding/Sinking	Loss of Vessel	15	0	15	14
ALASKAN RANGER *	March 23, 2008	Flooding/Capsize	Loss of Vessel	47	42	5	1
KATMAI *	October 22, 2008	Flooding/Capsize	Loss of Vessel	11	4	7	2
COSTA & CORVO	November 13, 2008	Sudden Capsize	Loss of Vessel	4	3	1	1
LADY MARY	March 24, 2009	Progressive Flooding	Loss of Vessel	7	1	6	4
NORTHWEST MARINER *	January 15, 1995	Capsize/Icing	Loss of Vessel	6	0	6	4
PACESETTER *	January 27, 1996	Presumed Capsize	Loss of Vessel	7	0	7	7
MISTY BLUE	December 4, 2017	Downflooding	Loss of Vessel	2	2	2	0
DESTINATION *	February 11, 2017	Capsize/Icing	Loss of Vessel	6	0	5	5
*** Occurred in Alaskan Waters**							

Figure 80 – The image above shows significant marine accidents involving commercial fishing vessels. These accidents were examined by the MBI during this investigation. (Source Coast Guard)

With the same exception, the ALASKAN RANGER, none of these vessels required plan review oversight and there was no requirement for the design and construction for any of the vessels. As the vessels aged over time, there was no prescribed inspection regime that would determine if there were issues with the material condition or the proper operation of critical equipment such as engines, hatches and openings, steering systems, bilge pump systems, wiring and electrical components.

Lack of oversight extended to the vessel personnel operating the vessel in terms of a verified competency to navigate the vessel on the congested waterways of the U.S., the medical fitness for personnel and in the case of the vast majority of vessel personnel, if those personnel were free from impairment from fatigue or from alcohol, drugs, or over-the-counter medications.

To that end, the only regulatory oversight these vessels receive is limited to an examination of the vessel's lifesaving and safety equipment and the requirement for drills and training prior to getting underway for the fishing voyage. In these cases, a Coast Guard or third party examiner would conduct a Dockside Safety Exam to determine if the vessel's lifesaving and safety equipment complied with existing regulations.

In the case of some of these accidents, it is difficult to rule out a series of potential contributing factors that may have contributed to the sinking and loss of life. In the case of the SCANDIES ROSE, the “doubler” repairs in earlier 2019 to the after starboard overboard chute cannot be ruled out as a potential point of hull failure. Certain areas of the hull could not be visualized during the underwater ROV evolutions due to the vessel lying on the bottom on its starboard side. Due to the size, type and class of the SCANDIES ROSE, there was no requirement for the SCANDIES ROSE owners to report the hull wastage issues with the starboard overboard chutes to the Coast Guard or to a Third Party. Neither was there a requirement for certified welding techniques and non-destructive testing after the repairs were made to ensure the sufficiency of the quality of those repairs which were made to the hull in or near the vessel’s waterline. The same can be said for all of the commercial fishing vessels listed in the table of major marine accidents.

Compared to other commercially operated vessels, the limited regulations, licensing, and oversight of the commercial fishing industry results in latent unsafe conditions resulting in risks to the crews of these fishing vessels which is especially magnified for vessels operating in the harshest of marine environments. This risk extends to the Coast Guard and other agency partners who then have to search for, tow, rescue, and respond to fishing vessel accidents.

During the hearing, the representative for the Coast Guard’s Office of Commercial Vessel Compliance (CG-CVC-3) was asked why the Coast Guard does not inspect commercial fishing vessels. That representative stated that

> *We act solely on our statutory authority, and that does not permit us to raise the level of inspections to that of other industry vessels. So I think my answer to that is we just have to interpret the statutory authorities that are given us to enforce. And that influences, you know, the requirements and applicabilities that we impose during our dockside exams.*[186]

However, the same representative gave testimony about regulatory progress the Coast Guard has made considering the Coast Guard Authorization Acts enacted over the ensuing years, in other words, a statutory requirement that called for regulated change for commercial fishing operations. The Coast Guard has had the Authorization Acts as a catalyst to create regulations but did not manage to enact regulatory requirements for a variety of reasons, including the push to deregulate in the years 2016 through 2020. During the MBI Hearing, the head of CG-CVC-3 was asked

> *Q. …it’s been over ten years and there’s been at least four to five individual Coast Guard Authorization Act statutes related to commercial fishing vessels. How many regulations have actually been developed and promulgated for commercial fishing vessels in that time?*
> *A. I will say, regulations as -- just to clarify, sir, regulations as reflected in 46 C.F.R.?*
> *Q. That's correct.*
> *A. And I would say in the past ten years, zero. And yeah, zero.*[187]

CG-CVC-3 has been engaged in some regulatory projects in the last decade. Completed

[186] Mr. [redacted] MBI Hearing transcript, Pg. 1244
[187] Mr. [redacted] MBI Hearing Transcript, Pg. 1231

rulemaking projects included Citizenship Waivers (Final Rule issued February 2014), Processors carrying and dispensing petroleum (Final Rule issued March 2016), and Requirements for vessels with registry endorsements (Final Rule issued September 2016). During the MBI Hearing, CG-CVC-3 was asked about a guiding framework to implement change for commercial fishing operations, a strategic plan. While CG-CVC-3 has a strategic plan, it did not include a provision to shift CFVs similar to the SCANDIES ROSE to an inspection regime similar to other commercial vessels.

> *Q. Does that plan include anything related to developing an inspection plan or campaign for these under 200-ton commercial fishing vessels that doesn't cover what's already in existence? For example, the material integrity of the hull. We've heard the Scandies Rose had some issues with the forward starboard chute that was cropped out due to porous welds. That type of inspection campaign, are there any plans for that?*
> *A. We did not, we did not have a line item to move uninspected fishing industry vessels to inspected fishing industry vessels. And going back to my previous comment, I think when we, when we review our statutory requirement guidelines, our current policies, our NAVICs, and trends, our live report of investigation results collectively, and we see patterns and indicators that may point us to consider going down certain roads of tighter regulation or just improving certain regulation that -- then we pursue those initiatives. But to have a blanket line item to transition from uninspected to inspected, no, we currently do not have that.*[188]

It appears that there is no deliberate push to mandate Coast Guard commercial fishing vessel inspections or even an industry voluntary fishing vessel inspection and maintenance regime that would enhance the safety of fishing operations. Thus, the fishing fleet will continue to age and face the risks associated with hull integrity and stability issues. At the same time, fishermen will still take to sea and attempt to manage the known and unknown risks associated with these older commercial fishing vessels which operate with latent unsafe conditions such as stability, hull integrity, steering and propulsion compromises that may result in tragedy.

5.3.10. United States Regulations for Commercial Fishing Vessel Stability

As the regulations are currently written, a commercial fishing vessel would be required to have its stability evaluated when the vessel is greater than 79 feet and the vessel is constructed after September 15, 1991, or when the vessel has been substantially altered after this date. The SCANDIES ROSE was greater than 79 feet but was constructed before September 15, 1991. Modifications were made to the vessel's superstructure after it experienced a fire in 1988 which may have resulted in substantial alternations to the vessel, though evidence indicates this work was completed before September 15, 1991.

There were additional modifications made to the forward part of the vessel around 1994/1995 with the addition of raising the focsle deck and the addition of a breakwater on the focsle deck. The regulations state that it is the owner's responsibility to ensure they select a qualified individual to conduct a stability test and that the owner needs to maintain the results

[188] Mr. [redacted] MBI Hearing Transcript, Pg. 1246

of that test. Per 46 CFR 28.510, a qualified individual would be "an individual […] with formal training in and experience in matters dealing with naval architecture calculations." In this case, Captain [redacted] testified that the Naval Architect hired to conduct the 2019 stability tests for the SCANDIES ROSE was a licensed Professional Engineer so he thought that he was certified and competent to conduct the required stability test and then to create the stability instruction for the vessel.

In general, after completing stability testing, a naval architect would provide a vessel with stability instructions, which typically are comprehensive documents provided to the owner with the results of the stability assessment and calculations which comprises important stability information for the vessel operator. This booklet fulfills the requirement for stability instructions. Per stability regulations, 46 CFR 28.530(d) and (e), these instructions should include up to 17 functional parts, such as:

- Simple loading instructions
- Simple loading diagram with instructions
- Stability book with sample calculations
- General description of the vessel, including lightweight data
- Instructions on the use of the information
- General arrangement plans showing watertight compartments, closures, vents, downflooding angles, and allowable weights
- Loading restrictions, such as diagrams, tables, descriptions or maximum KG[189] curves
- Sample loading conditions
- General precautions for preventing unintentional flooding
- Capacity plan or tank sounding tables showing tank and hold capacities, centers of gravity, and free surface effects
- A rapid and simple means for evaluating any specific loading conditions
- The amount and location of fixed ballast
- Any other necessary guidance for maintaining adequate stability under normal and emergency conditions

The above list is not exhaustive. There is a key statement in this regulation – the stability information content noted above "should" be provided to the owner and operator yet all of these items on the above list are not explicitly required. A vessel owner has the discretion to ask for the specific items he or she feels are important. This is significant because an owner is not generally the qualified individual who has a skillset in naval architecture or has some equivalent level of training and experience in stability.

In addition, 46 CFR 28.530(d) states

> *Units of measure, language, and rigor of calculations in the stability instructions must be consistent with the ability of the master or the individual in charge of the vessel.*

This is important considering the Captain of the SCANDIES ROSE did not have stability

[189] KG is the distance from the center of gravity (G) to the keel (K).

training and the stability instructions would have had to be carefully written so that a captain operating the SCANDIES ROSE could understand the intricacies of loading the vessel for the voyages into regions where the dangers of vessel icing were common.

The regulations address commercial fishing vessel requirements for stability evaluations. According to 46 CFR 28.535, the SCANDIES ROSE should have had its stability evaluated by inclining experiment. The regulations have a provision that allowed for the 2019 stability test to be conducted with a deadweight survey to validate the previously conducted lightweight result. When the inclining experiment is done, the regulations state that American Society for Testing and Material (ASTM) F1321 “may be used as guidance for any inclining test.” Again, the language in the regulations does not explicitly state that this standard must be used, which means there is no practical enforcement or quality control on naval architects performing these tests.

U.S. regulations address icing standards for commercial fishing vessels in 46 CFR 28.550. In general, they provide that the vessel’s loading conditions must be evaluated for specified ice loads if the vessel operates in latitudes north of 42^{o} North between November 15 and April 15. Alaska is above 42^{o} North. The ice load to be applied by the naval architect for stability evaluation is 1.3 inches of ice on any horizontal projected area and 0.65 inches of ice on any vertical projected area. There is also a provision that states that the ice load may be calculated at half of the above mentioned thicknesses for vessels that operate between 42^{o} North and 66^{o} North. The SCANDIES ROSE stability instructions appeared to apply the full ice load for a vessel operating above 42^{o} North.

The regulations do not explicitly call out applying ice to any gear or loads that are temporarily placed on the deck, however, it does have a generic statement that there is a way to calculate ice on non-continuous surfaces like rails, spar, and rigging with no sail affixed. Crab pots are not specifically mentioned. The crab pots with frames, mesh webbing, buoys and lines stowed inside of pots are stacked on deck when the vessel is transiting in various configurations, horizontally or vertically depending on the stowage plan the captain decides on. The Marine Board investigated the Coast Guard’s previous research regarding icing on commercial fishing vessels. The Marine Board is unaware of any scientific research which had been conducted by the Coast Guard to better understand how ice forms in and on stacked crab pots on commercial fishing vessels. Specifically, the amount of weight that ice adds to a crab pot or stack of crab pots and how ice forms on a stack of pots has not been researched by the Coast Guard. More importantly, the regulatory standards for icing on crabbing vessels operating at a latitude of 56^{o} North, similar to where the SCANDIES ROSE was operating, do not adequately address the safety of vessels carrying pots on deck in areas subject to freezing spray.

5.3.11. IMO Regulations for Commercial Fishing Vessel Stability

The Torremolinos International Convention for the Safety of Fishing Vessels (1977) was discussed at some length throughout the investigation. This convention, referred to as the “Torremolinos Treaty,” provides general guidelines for the safe design and operation of fishing vessels around the world. This convention was the first to articulate some requirement for calculating icing conditions for fishing vessels operating in far northern or southern latitudes. The United States is not signatory to this convention. As of 2019, 11 countries had ratified this document and 37 other countries had signaled their intent to ratify the most up to date version of the convention.

The icing condition language in this convention are similar to the regulations contained in 46 CFR Part 28.550, but there are two differences. First, the convention uses7.5 kg (approximately 16.35 pounds) per square meter on vertical projected areas while the U.S. regulation requires a more stringent 15 kg (approximately 33.06 pounds) per square meter. The second noted difference is that the U.S. regulation has a provision allowing for vessels to calculate ice at half the rate if they solely operate in the lower latitudes of icing, from 42º North to 66º-30' North. There is no intermediate range of latitude recognized in the convention.

5.3.12. Canadian Regulations on Commercial Fishing Vessel Stability

As part of the analysis, the investigation explored a comparable nation's fishing regulatory standards. In this effort, Transport Canada[190] was chosen since they have commercial fishing vessels operating in similar harsh marine environments to the SCANDIES ROSE. Transport Canada regulations are much more prescriptive regarding the stability requirements. Transport Canada Marine Safety and Security requires all large fishing vessels built after March 1967 to have a full stability assessments conducted. Vessels that are older than the March 1967 enter in force date, but which have been modified after that date, are also required to have a Trim and Stability book aboard.[191] These requirements apply to fishing vessels greater than 24.4 meters (approximately 80 ft) in length or 150 GTs. This means that the SCANDIES ROSE, if it was a Canadian fishing vessel, would have had to meet these stability requirements. A Canadian vessel to which these regulations apply must undergo an inclining experiment, similar to that required under U.S. regulation, and the results of that must be used to determine the stability characteristics of the vessel for several, specified conditions including:

- lightship;
- port departure;
- arrival at fishing grounds;
- half load;
- full load;
- worst operating condition affecting stability;
- worst operating with accumulated ice on topsides and rigging; and
- port after discharge of cargo with 10 percent of fuel, fresh water and stores remaining and accumulated ice on topsides and rigging.

[190] Transport Canada is the department within the Government of Canada responsible for developing regulations, policies and services of road, rail, marine and air transportation in Canada.

[191] Transport Canada Regulations: https://laws-lois.justice.gc.ca/eng/regulations/C.R.C.,_c._1435/page-2.html#h-516245

These specified conditions are then required to be included in the stability instruction provided to the operator or owner. The regulations set themselves further apart from the U.S. regulations by stating that these conditions must also account for all the different species they intend to fish for. The vessel owner or operator would be required to provide information to the naval architect to include the seasons of the year for the associated fishery, associated gear for fishery including pots and tackle, and other unique fish storage specifications that may impact the vessel's loading conditions.

U.S. regulations are more generalized with respect to the requirements for the stability instruction and uses broader language providing greater latitude for the naval architect providing the stability instruction. For example, the U.S. regulations require that the stability instruction provide the operator with "sample loading conditions" (46 CFR 28.530(e)(5)). This latitude disregards the intended audience of commercial fishing vessel operators who lack stability training. The Canadian requirements also have the advantage of promoting better standards for the development of the course content for future stability courses. When every mariner is given the same sets of fundamental conditions in their stability instructions, it facilitates stability course instructors' ability to provide better, focused curriculum for fishermen to follow.

5.4. SCANDIES ROSE Stability

5.4.1. Background of SCANDIES ROSE Naval Architect/P.E.

The stability evaluation of the SCANDIES ROSE was conducted by Mr. [redacted] a naval architect and professional engineer. Mr. [redacted] is licensed by the State of Washington Board for Professional Engineers and his license is currently valid. He testified that he had been performing work on vessels for over 30 years as a naval architect. He maintained the SCANDIES ROSE vessel design and stability files since roughly the 1980s and was able to provide the Marine Board some documentation for stability related work on the vessel with his associated notes.

As part of this investigation, Mr. [redacted] was questioned on the quality of his work related to a different vessel several years ago. The owner of the fishing vessel eventually sought a different naval architecture firm to get the MSC's approval and clearance from the Officer in Charge, Marine Inspection (OCMI) to operate. This vessel, which received Mr. [redacted] Professional Engineer's stamp, required over two years of work to bring the vessel into compliance with accepted industry standards. The use of a Professional Engineer's stamp is a form of certification stating that he or she had delivered a quality product that met all applicable industry and regulatory requirements. In this case, the other engineering firm reported Mr. [redacted] to the Washington Board of Professional Engineers based on questions on the quality of work he produced. The Washington Board of Professional Engineers opened an investigation into the work of Mr. [redacted] on the F/V SEA VENTURE; however, the final decision report cited ambiguity in the regulatory framework which meant they could not hold Mr. [redacted] accountable for errors in the quality of his work. The Board of Professional Engineers determined that there were no clear or substantial grounds to justify any action against Mr. [redacted] license.

In the spring of 2019, Mr. [redacted] was contracted by Scandies Rose Fishing Company LLC to update the stability instructions required by 46 CFR 28.530 for the SCANDIES ROSE. After conducting an inclining experiment and limited stability evaluation of the vessel, the Naval Architect produced and delivered new stability instructions to satisfy this requirement. As stated in 46 CFR 28.530(d), the stability instructions may include simple loading instructions, a simple loading diagram with instructions, and/or a stability booklet with sample calculations. Regardless of format, the stability instructions should provide straight forward, but ample guidance to the master on how to load the vessel.

The SCANDIES ROSE stability instructions, referred to as a "Stability Booklet" by Mr. [redacted] included "Instructions to the Master," tank characteristics, and several pages from a textbook which contained basic explanations of stability terms and practices. While the Stability Booklet also contained results of stability computer modeling for 11 different loading conditions, it did not include instructions on the use of this information, nor did it include a rapid and simple means for evaluating loading conditions beyond the sample conditions provided.

5.4.2. SCANDIES ROSE 2019 Stability Test

Based on witness testimonies, recent events such as the sinking of the DESTINATION provided the SCANDIES ROSE management enough concern or motivation to contract a professional engineer to verify the vessel's stability in 2019. In seeking a competent person to conduct this stability update, they contacted the person who had prepared the last stability instructions, Mr. [redacted] The previous stability instructions were prepared for the previous owner of the SCANDIES ROSE, and according to interviews with Captain [redacted] SCANDIES ROSE management had not worked with Mr. [redacted] in the past in performing work on the SCANDIES ROSE. The management opted to contract Mr. [redacted] because he had previous experience with the SCANDIES ROSE and already had the ship's files and, theoretically, familiarity with the vessel.

Testimony provided by Captain [redacted] and Mr. [redacted] gave perspective on the stability test conducted for the SCANDIES ROSE in 2019. The vessel was subjected to an updated inclining experiment to validate any changes to the vessel over the years. When Captain [redacted] was asked about his interactions with Mr. [redacted] he confirmed that Mr. [redacted] never conducted a walkthrough of the vessel to account for changes in the vessel since its 1988 stability test. Overall, testimony suggested that there may have been minimal conversation about the vessel in general and no detailed report that accounted for changes in weight or equipment for the SCANDIES ROSE was generated. Mr. [redacted] did not request any documentation for additions or changes to the vessel. Despite not taking changes to the vessel into consideration and limited interactions between the owner and the Naval Architect, the inclining experiment was completed. The primary operator of the SCANDIES ROSE, Captain [redacted] was the person most familiar with the unique characteristics of the vessel in terms of weight distribution but was not consulted for input into the stability assessment. In contrast, when Captain [redacted] had another engineering firm conduct an inclining test for the AMATULI the following year, he had a much more robust conversation about the changes to that vessel.

It is not unexpected to see incremental increases in vessel weight over the lifetime of its service. This is important because weight creep, when unaccounted for, could have detrimental impacts to the accuracy of the stability test's results. When he conducted the inclining experiment, Mr. [redacted] notes indicated five points on both the port and starboard sides of the hull along the hull where he would measure freeboard on both sides of the vessel before and after the inclining experiment. The notes and associated files only indicated that he completed a portion of all 10 draft readings. After the inclining, the Naval Architect departed the vessel, completed the calculations, and sent the owner a copy of the new stability instructions. Notably, the inclining experiment was conducted in April of 2019, before the principal maintenance period was completed in May of 2019 and any changes to the vessel during this maintenance period, such as changes to the crane setups, replacement of line cutting struts, application of 65 gallons of epoxy,[192] and any of the associated weight additions or reductions were unaccounted for.

During the hearing, Mr. [redacted] testified that there were some differences between his calculations and the MSC report that were most likely due to his not calculating for downflooding. He admitted that, while onboard the vessel, he had never visually inspected for the actual location of the engine room vents located on the second level behind the bridge stairwell, which would represent downflooding points. Instead, he based his assumptions of the condition of the vessel on his prior experience with this vessel, its sister vessel, and interactions with the owner and operator. With the significant changes noted to the vessel, including the modifications to the superstructure as noted in the vessel history included in the Condition and Valuation Survey, it would have been very important to verify the downflooding angle to set limits for the computer software stability models of the vessel.

As noted in section 5.3.10 of this report, the U.S. regulations for fishing vessels do not prescribe any requirements for how a stability test or inclining test needs to be conducted. However, the ASTM F1321-92 standard is an accepted industry practice for inclining tests. The scope of this standard addresses the phases of the test which includes the initial walk through and survey, the freeboard and draft readings, and conducting the inclining experiment. The walk through and survey part of the inclining experiment involves the naval architect taking a comprehensive inventory of the condition of the vessel. They should ensure that the tanks are either pressed full with liquid or completely empty with limited exceptions. The naval engineer should take note and consideration of the depth of the water, overall weather, wind, current, sea state, the location of the vessel, nearby traffic, and other contributors. During the walk through, the naval architect should ensure the crane is in place or will be appropriate for the experiment and ensure that movable items are secured and will not shift on board. Before and after the shifting of the sample weight, the freeboard or draft readings should be done at 10 different locations, five on each side, which are uniformly distributed about the side of the vessel. The experiment should have already identified the sample weight, where it will be placed, and to where it will be shifted during the experiment. The person conducting the experiment would shift the weight up to seven times and observe pendulum changes that indicate movement of the vessel and exactly how the weights shifted. During this last phase, the naval architect should record the weights of persons conducting the test and where they were during each test. The results of conducting the experiment

[192] CG Exhibit 111, Pg. 1 and 2

properly should give the naval architect consistent results to successfully evaluate the vessel's static stability in order to create comprehensive stability instructions.

The MSC Technical Report analyzed all of the supporting documentation for both inclining experiments done in 1988 and 2019, respectively. Mr. [redacted] and Mr. R. Merrill conducted the 1988 inclining experiment and Mr. [redacted] alone, conducted the 2019 inclining experiment. The MSC Technical Report noted deviations from ASTM applicable standards for conducting inclining experiments. Between the two inclining experiments, there were common deviations such as precision error, not taking enough freeboard readings, not recording all draft marks, and not including coaming heights or deck thickness into account for freeboard measurements. The MSC Technical Report noted that additionally in 2019, "no report, data sheets, or calculations are provided."[193] The conclusion in the MSC Technical Report is that both stability tests "fail to conform to the ASTM F1321-92 standard [for inclining experiments] and fail to provide a basis for the resulting lightweights and centers of gravity used in subsequent stability analysis"[194] of the Naval Architect.

5.4.3. Marine Safety Center's Analysis of the SCANDIES ROSE Stability

The Coast Guard's MSC is staffed with various types of engineers, including naval architects who are specially trained in performing stability assessments of vessels. On or about June 2013, the MSC published "Guidelines for Commercial Fishing Vessel Stability," to provide guidance on the review of commercial fishing vessel stability. The guidelines were directed at the commercial fishing vessel industry and were designed to help owners and naval architects understand the applicability of the regulations and highlight stability topics specific to fishing vessels. This document is unique in the sense that other guidelines provided by the MSC are directives to vessel designers and owners who require MSC approval for vessel construction or modifications. Commercial fishing vessels are generally not required to submit plans for review to the MSC. However, upon request from the OCMI, the MSC will review stability instructions from vessels that have been involved in a marine casualty, or upon request by the local OCMI when the attending marine inspector questions the seaworthiness of the vessel using their experience, training, and best judgment. This has been exercised several times following significant modifications to fishing vessels. The resultant MSC review of a fishing vessel's stability is returned to the OCMI in order to better inform them in their evaluation of the subject vessel.

Following the sinking of the SCANDIES ROSE, MSC staff, using information provided from the Naval Architect who completed the stability assessment of the vessel in 2019 and 1988 and information gathered by the Marine Board, completed a stability analysis of the SCANDIES ROSE, dated February 8, 2021. The MSC Stability Report included three appendices with loading conditions and also included and addendum on Asymmetrical Icing SCANDIES ROSE dated February 22, 2021.

HYPERLINK: Enclosure (2) contains hyperlink (7) which is a combined package consisting of the MSC's Stability Report for the SCANDIES ROSE, including three

[193] CG Exhibit 59, Pg. 48
[194] CG Exhibit 59, Pg. 33

appendices, and the MSC's addendum to the original report addressing asymmetrical icing.

The completed MSC report compared their results to that of the vessel's stability instructions completed in 2019. The report concluded that the 2019 stability assessment did not accurately model the vessel's poop deck and forecastle enclosed volumes and apparently neglected downflooding.[195] The analysis used the existing computer software model of the SCANDIES ROSE, pictures of the vessel, and all of the plans provided by the naval architect of the vessel. Upon initial examination, the original computer software data provided by the Naval Architect resembled the lines plan provided to the investigators. However, upon analyzing the lines plan when overlaid over a properly scaled recent photo of the vessel, the MSC was able to identify clear differences that would impact the results of the stability analysis. Photos of the SCANDIES ROSE taken in 2019 show that the transom and forward extent of the poop deck had less buoyant volume and the forecastle may have increased slightly in buoyant volume. The MSC concluded that the computed reserve buoyancy of the SCANDIES ROSE was approximately 1.8% less than what was shown in the Naval Architect's computer software model output that was used to render the stability instructions from 2019. The reduction of reserve buoyancy and inaccurate modeling of its location could potentially impact modeled righting arm curves for each loading condition, having a measured reduction in the vessel's natural ability to right itself from a heeling moment caused by wind, waves, or other external factors. This is just one example of the errors in the stability characteristics that were included in the Naval Architect's report.

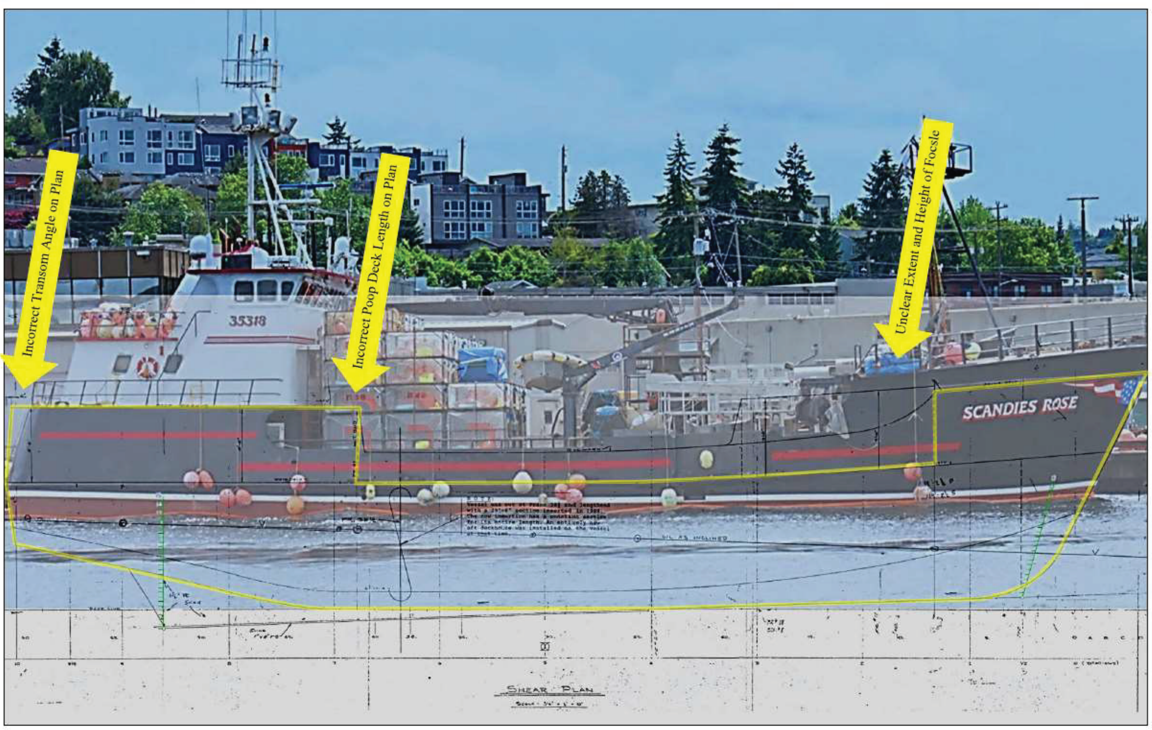


Figure 81 – 2019 Profile photograph of SCANDIES ROSE with Lines Plan profile overlaid with watertight envelope highlighted in yellow and large profile differences in the poop and forecastle called out. (CG Exhibit 059, Pg. 9)

[195] CG Exhibit 59, Pg. 91

The MSC analysis found that Mr. [redacted] 2019 stability assessment did not accurately model the bulwarks' height, and the instructions significantly under-predicted the superstructure windage area. The MSC Technical Report evaluated the windage area for the hull, superstructure, and the addition of pots. The model did not indicate number of pot tiers, but did show an extent, or height of crab pot loading which was shown to be approximately in line with the deck of the wheelhouse. The amended windage model contained in the MSC Technical Report was 34% greater than that seen in Mr. [redacted] provided model. This provides a significant impact on the wind heel criteria and would provide an 83% increase in the calculated heeling moment compared to the Naval Architect's provided report. This is significant and coupled with the accumulated ice loads would decrease the stability of the vessel.

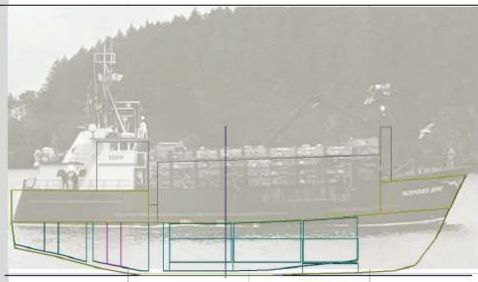
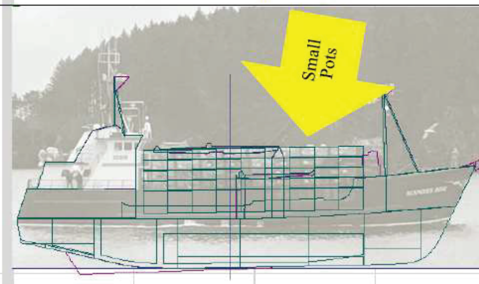
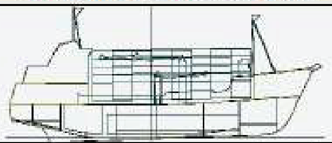
F/V SCANDIES ROSE Computer Model Comparison	Reference A - Provided GHS Computer Hull Model				CG MSC GHS Computer Hull Model			
Windage Surface Areas and Heeling Moments					 			
Windage Part	*Tiers of Pots*	*Average Height Above Waterline (feet)*	*Exposed Area (sq.feet)*	*Heeling Moment with 53 knot wind (foot-Long Tons)*	*Tiers of Pots*	*Average Height Above Waterline (feet)*	*Exposed Area (sq.feet)*	*Heeling Moment with 53 knot wind (foot-Long Tons)*
Hull Windage at 13.0' Draft	not noted	6.1	796.0	27.5	5	7.0	681.5	31.8
Superstructure Windage	not noted	11.0	1056.0	66.3	5	14.8	933.0	84.9
Crab Pot Windage	not noted	17.0	252.4	24.9	5	13.4	1211.2	100.2
Totals	not noted		2104.4	118.7	5		2825.6	216.9
Hull Windage at 13.0' Draft					4	7.0	681.5	31.8
Superstructure Windage					4	14.8	933.0	84.9
Crab Pot Windage					4	11.9	1005.1	74.5
Totals					4		2619.6	191.2
Hull Windage at 13.0' Draft					3	7.0	681.5	31.8
Superstructure Windage					3	14.8	933.0	84.9
Crab Pot Windage					3	10.2	816.7	52.6
Totals					3		2431.2	169.2

Figure 82 – Windage area comparisons between Mr. [redacted] provided electronic vessel model on the left, and the MSC Technical Report's representative model showing impacts of differences in the model for windage area impacts. (CG Exhibit 059, Pg. 29)

The MSC report noted "significant differences were observed when comparing […] tank capacities," "mathematical errors," and "significant errors and omissions in hydrostatic modeling" in the 2019 stability assessment.[196] The 2019 instructions included 11 sample vessel loaded conditions, all of which "failed to meet stability criteria," for at least one of the stability criteria when evaluated by the MSC. Figure 83, below, shows the initial loading conditions without regard to icing conditions and which stability criteria failed for each loading condition.

[196] CG Exhibit 059, Pg. 91-92

Model: MSC/Large Pots	Light ship Characteristics Source: MSC (Table 24)		
	Lightweight:	578.33	Long Tons
	Vertical Center of Gravity:	15.26	Feet above Baseline
	Longitudinal Center of Gravity:	0.52	Feet Aft of Amidships

Loading Condition	Light-ship Source	Hydro-Statics Model	Displace-ment (LT)	Trim (ft aft)	Minimum Freeboard (feet above waterline)	PATRICIA LEE Winter Loadline Height (feet abv waterline)	§28.565 Water on Deck	§28.570 Intact Righting Energy	§170.173(c) Alternate Intact Criteria	§28.575 Severe Wind and Roll
2019 Stability Book Condition 1: Max Consumables, 208 Large Pots, Holds 2 and 3 full	MSC 2019	MSC Large Pots	1109.26	-2.13	0.62	-0.74	FAIL	FAIL	FAIL	FAIL
2019 Stability Book Condition 2: 75% Consumables, 208 Large Pots, Holds 2 and 3 Full	MSC 2019	MSC Large Pots	1062.94	-1.54	1.08	-0.29	FAIL	FAIL	FAIL	FAIL
2019 Stability Book Condition 3: 50% Consumables, 208 Large Pots, Holds 2 and 3 Full	MSC 2019	MSC Large Pots	1049.71	-0.45	1.26	-0.14	FAIL	FAIL	FAIL	FAIL
2019 Stability Book Condition 4: 25% Consumables, 208 Large Pots, Holds 2 and 3 Full	MSC 2019	MSC Large Pots	1015.35	-1.87	1.51	0.14	FAIL	FAIL	FAIL	FAIL
2019 Stability Book Condition 5: 10% Consumables, 208 Large Pots, Holds 2 and 3 Full	MSC 2019	MSC Large Pots	988.89	-2.16	1.74	0.38	FAIL	FAIL	FAIL	FAIL
2019 Stability Book Condition 6: Max Consumables, Tendering, All Holds Full	MSC 2019	MSC Large Pots	1184.26	-3.82	-0.27	-1.51	PASS	FAIL	FAIL	PASS
2019 Stability Book Condition 7: 75% Consumables, Tendering, All Holds Full	MSC 2019	MSC Large Pots	1137.95	-3.20	0.29	-1.01	PASS	FAIL	FAIL	PASS
2019 Stability Book Condition 8: 50% Consumables, Tendering, All Holds Full	MSC 2019	MSC Large Pots	1083.69	-4.06	0.69	-0.52	PASS	FAIL	FAIL	PASS
2019 Stability Book Condition 9: 25% Consumables, Tendering, All Holds Full	MSC 2019	MSC Large Pots	1049.33	-5.45	0.80	-0.23	PASS	FAIL	FAIL	PASS
2019 Stability Book Condition 10: 10% Consumables, Tendering, All Holds Full	MSC 2019	MSC Large Pots	1022.87	-5.75	0.99	0.01	PASS	FAIL	PASS	PASS
2019 Stability Book Condition 11: Crabbing, 3 Holds Full, 168 Large Pots	MSC 2019	MSC Large Pots	1196.86	-9.05	-28.49	-6.47	FAIL	FAIL	FAIL	FAIL

Figure 83– 2019 loading condition[197] evaluation using MSC's hydrostatics model and MSC's calculated light ship weight and centers of gravity from 2019 with large crab pots modeled. (CG Exhibit 059, Pg. 84)

[197] Red colors in the boxes indicate that the condition failed regulatory requirements. Yellow indicates a failed alternative stability standard. The following alternative standards were considered by MSC: 1) 6" minimum freeboard is required in SCANDIES ROSE's stability instructions, but is not a CFR requirement; 2) International Load Line Convention is an alternate to Subpart E (according to 46 CFR 28.500, the entire subpart would not apply if the vessel had a load line), SCANDIES ROSE was not reviewed to this or issued a Load Line, but sister ship PATRICIA LEE was, and; 3) 46 CFR 28.570(c) allows uninspected fishing vessels like SCANDIES ROSE to meet the stability requirement for inspected vessels in Subchapter S instead of 46 CFR 28.570(a). It doesn't appear that Mr. [redacted] used this alternate standard.

MSC's analysis indicated that the estimated casualty voyage conditions, while nearly meeting all of the 2019 stability instructions, failed to meet regulatory stability requirements. Ultimately, the report concluded that the "magnitude and asymmetry of the icing during the casualty voyage was likely different than the symmetric" icing criteria referenced in the regulations, and that "this could have made the stability worse than calculated during the casualty voyage.[198] The MSC Technical Report specifically determined that the weight of icing found in the notes and files from the Naval Architect was 24% to 27% lower than what MSC modeled. This difference in weight is compounded if the SCANDIES ROSE had placed five tiers of crab pots on deck "because this ice weight is located at a high vertical center of gravity, it has a significant impact on SCANDIES ROSE's stability."[199] The Marine Board determined that the overall cumulative effects of errors in modeling the buoyant volume, windage area, pot distribution, and application of regulatory icing requirements put SCANDIES ROSE in a loading condition that could not produce the required restoring moment required to right the vessel. As a result, SCANDIES ROSE was in a potentially unsafe condition with respect to vessel stability at the time of departure and for the duration of the voyage. Compounding this scenario were the effects of off-center ice accumulation and icing weight that increased during the voyage and that exceeded regulatory assumptions.

The MSC report referred to the "Vents Fills and Sounding Tubes" drawing of the SCANDIES ROSE and compared these drawings to pictures of the SCANDIES ROSE to determine the potential downflooding points. These are important to evaluate to determine the critical thresholds of heel, or list, where progressive flooding would significantly deteriorate the stability of the vessel. The MSC analysis determined that the lowest downflooding point was at the engine room vents located behind the ladderwell leading to the pilothouse on either side of the vessel. During testimony, the representative for the MSC stated that these engine room vent trunks were downflooding points. If this is the case, downflooding into the vessel could initiate through one of the port or starboard vent trunks at "heeling angles as low as 30 degrees."[200] Mr. [redacted] testified that the downflooding point was the main engine vent stack and the vessel would not experience downflooding until a really high heeling angle. Mr. [redacted] file of notes on the vessel states heeling angle would have to be almost 90 degrees to allow water into the vessel. Specifically, he stated the following about the downflooding point

> *I asked the owner about the air intake for the engine room. That's normally where the downflooding point would be. He told me that it was up high, right behind the steps from the pilot house. I think it's in the side of the stack. It's real high, and maybe 2 or 3 feet off the fender line, so I didn't feel like it would be a factor and I didn't put it into the computer model.*[201]

The Naval Architect further admitted that he did not personally verify these intakes or check to see if there were additional possible downflooding points. As a result of his assumption on the location of the downflooding points, he did not include them in his stability calculations

[198] CG Exhibit 059, Pg. 92-93
[199] CG Exhibit 059, Pg. 25
[200] Mr. [redacted] MBI Hearing Transcript, Pg. 637
[201] Mr. [redacted] MBI Hearing Transcript, Pg. 1861

or booklet. Hockema Whalen Myers Associates, Inc. questioned the MSC's analysis on the basis of their assumption that the downflooding point was at these vents. They state in a letter to the Marine Board that the vent trunks could run to the center of the vessel prior to going into the engine room.[202]

During the course of this investigation, the Marine Board spoke with multiple people familiar with the vessel, and reviewed extensive documentary evidence to examine the vessel's history. The Marine Board concluded that the vent trunks most likely did pass immediately down vertically into the engine room and the MSC's analysis of an approximate 30 to 35 degree downflooding point is accurate. Based on the survivors' testimony, the heel of the vessel was approaching these angles by the time they mustered on the bridge to don immersion suits. The downflooding point identified by the MSC is shown in figure 84, below:

Figure 84 – Composite of images of ventilation system for interior spaced of the SCANDIES ROSE. On the far right starboard ladderwell to bridge with vent intakes shown behind the ladder that are referenced by the MSC Technical Report as being the downflooding point. Center and left, assumed downflooding point described by the Naval Architect in testimony at the Marine Board Hearing. (Source Fisherman Maritime Surveys Inc. photos, various years)

The MSC electronically modeled the downflooding point and the results of a 35-degree heel is shown in Figure 85, below:

[202] Exhibit CG 134, Pg. 7

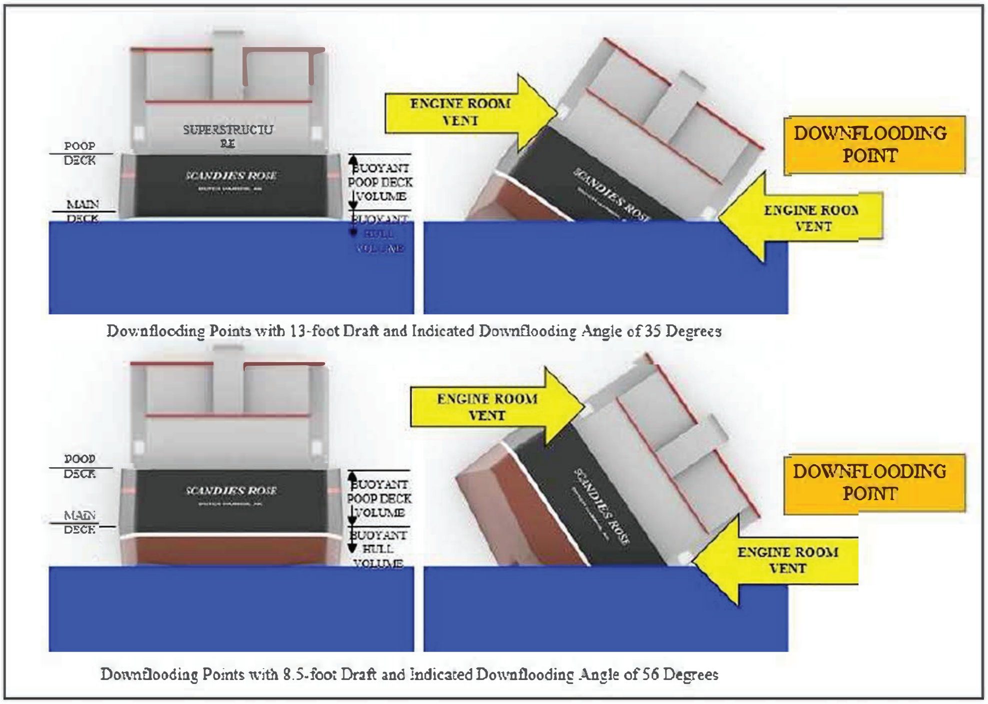


Figure 85 – Identifications of the SCANDIES ROSE for various drafts of 13.5 ft and 8.5 ft showing the effect on where the water might enter the air intakes for the engine room which the MSC identified as the "downflooding point." The Naval Architect that conducted the 2019 stability assessment discounted these flooding points without examining them as a potential point for flooding. He did not physically look at these intakes and assumed later when the SCANDIES ROSE sank that they led to the centerline of the vessel and would have negligible effect on potential downflooding. (Source Coast Guard)

The letter to the Marine Board from Hockema Whalen Myers Associates, Inc. also had a firm statement regarding apparent errors in the MSC's application of the regulations in way of applying icing conditions and the downflooding angle. To this point, a panel composed of three naval architects testified during the Marine Board Hearing. When discussing how ice regulations are applied to calculations, they did not have firm answers because the regulations are ambiguous. The panel admitted that naval architects have had to make assumptions or use their judgment to determine the safest and most practical way to apply the regulations. The current regulations are inadequate and fail to provide sufficient guidance.

5.4.4. SCANDIES ROSE Stability Instructions to the Master

The results of the stability analysis produced by the Naval Architect were summarized with a one page summary entitled the "Instructions to the Master." In the 12 separate instructions provided, the master is given a bare minimum of information to safely operate the vessel. These instructions were generated based on an inclining experiment that failed to meet ASTM F1321-92 standards and contained large errors noted in the MSC analysis. As was indicated in Section 5.3.10, these instructions should contain important items to help inform the master of necessary information regarding stability. Some of the things that are listed under the regulations could not be clearly found in the SCANDIES ROSE Instructions to the Master. For example, the instructions lacked guidance on how to use the information in the stability instructions. It also lacked basic characteristic information about the vessel, such as a general arrangement plan indicating the downflooding points, vents, allowable weights, and watertight closures. It also failed to provide lightweight data for the vessel. In totality, the Instructions to the Master that were provided only gave one clear statement regarding how the upper tier of pots should not obscure wheelhouse visibility and very generic advice on maintaining the stability which lacks specific, usable information.

With regards to crab pots, the master was informed that the SCANDIES ROSE could carry as many as 208 crab pots with an average weight of 835 pounds each. This number is only reduced to 168 pots if all three holds are flooded. At the time of the accident voyage, the vessel was carrying approximately 195 pots, so strictly based on the provided 2019 Instructions to the Master, the SCANDIES ROSE would have seemingly been safe for icing conditions up to the limits provided in the regulations previously mentioned. However, the Naval Architect's icing weight assumptions were inaccurate, as indicated in the MSC analysis. This results in uncertainty regarding the accuracy of safe pot loading totals noted in the Instructions to the Master.

At the time of the SCANDIES ROSE's last Safety Compliance Check in October 2019, the vessel was loaded with 185 pots. A sampling of the 7 ft x 8 ft x 34 in crab pots were weighed and were found to weigh 863, 799, and 800 pounds, respectively. This averaged out to 820.6 pounds per pot so by that measure, an operator of the SCANDIES ROSE would feel confident that they were acting in compliance with the Instructions to the Master document. However, the MSC found through spatial analysis of the deck area that the number of pots approved in the Instructions to the Master would not fit in four tiers of pots. In order to achieve this number of pots, they would have to add a fifth tier. The Instructions to the Master do not specifically limit the Master to four tiers and only states that the first tier of pots may be stacked on edge. However, closer analysis of the loading diagrams provided in the rest of the stability instructions only indicate four tiers and none of the tiers would go above the bottom of the wheelhouse windows. Placing a fifth tier of pots would obscure bridge visibility and add significant weight above the center of gravity for the vessel, negatively impacting the stability of the vessel.

5.4.5. Examples of Stability Instructions for Other Alaskan Crab Vessels

As part of the analysis, the Marine Board compared stability instructions products from different naval architect sources. After a formal request from the Marine Board, Hockema Whalen Myers Associates, Inc. provided the stability booklets/instructions for two different vessels, one produced prior to the sinking of the DESTINATION and one produced after the DESTINATION casualty.[203] For the scope of this analysis, the Marine Board focused on the F/V BOUNTIFUL's stability booklet and instructions which were generated in August 2019 before the SCANDIES ROSE's final voyage. The BOUNTIFUL shares some similarities to the SCANDIES ROSE in that it has an aft wheelhouse, was built in the 1970s, targets some of the same species, and operates in similar environments in Alaska. The BOUNTIFUL is approximately 36 ft longer than the SCANDIES ROSE, so the actual technical analysis conducted by the Hockema Whalen Myers Associates, Inc. is not addressed in this analysis as it would be inappropriate to compare the stability details for each set of stability instructions. However, the general content, format, and the instructions to the master will be addressed in this analysis.

[203] As a matter of record, these documents were combined and assigned as CG Exhibit 134.

While reviewing some of the differences between the SCANDIES ROSE and BOUNTIFUL stability instructions, it is important to understand the regulations for these documents. The regulations provided in 46 CFR 28.530(d) lists 13 items which may be found in the stability instructions. The regulation does not require any specific item below to be included and, in effect, leaves it to the judgment of the naval architect or owner requesting stability documentation. The list of items which may be included in the stability instructions, per 46 CFR 28.530(d), are as follows:

(1) A general description of the vessel, including lightweight data;
(2) Instructions on the use of the information;
(3) General arrangement plans showing watertight compartments, closures, vents, downflooding angles, and allowable weights;
(4) Loading restrictions, such as diagrams, tables, descriptions or maximum KG curves;
(5) Sample loading conditions;
(6) General precautions for preventing unintentional flooding;
(7) Capacity plan or tank sounding tables showing tank and hold capacities, centers of gravity, and free surface effects;
(8) A rapid and simple means for evaluating any specific loading condition;
(9) The amount and location of fixed ballast;
(10) Any other necessary guidance for maintaining adequate stability under normal and emergency conditions;
(11) A general description of the stability criteria that are used in developing the instructions;
(12) Guidance on the use of roll limitation devices such as stabilizers; and
(13) Any other information the owner feels is important to the stability and operation of the vessel.

The stability instructions provided for the BOUNTIFUL gave the captain clear guidance that was easy to read in just a couple of pages. At the end of that section, the company that produced the instructions had a signature line as indicated in the figure below.

OPERATOR SIGNATURE
By signing below, I acknowledge that I have read and understand the **Stability Instructions** contained herein. I further acknowledge that physical changes to the vessel and/or operational loads may adversely affect the vessel's stability, and those changes must be reviewed by a qualified Naval Architect.
(Signature and date of initial recipient/vessel's master)
(Signature and date of subsequent recipient/vessel's master)

Figure 86 – An excerpt from the instructions to the master of a Hockema Whalen Myers Associates, Inc. stability instructions requiring the recipient/vessel master to sign the document indicating he/she has read and understands the document. (Source CG Exhibit 134)

This signature line requires the master and the initial recipient of the stability instructions to attest that they have read and understand the instructions. It further warns them that "changes [to the vessel] must be reviewed by a qualified Naval Architect." This simple block puts the onus on the operator to understand the contents of the stability instructions and offers to make the naval architect available should the operator or captain not understand the details contained in the instructions.

The BOUNTIFUL stability instructions provide a very detailed list of changes that may affect stability, shown in figure 87, below.

CHANGES MAY ADVERSELY AFFECT STABILITY

Changes to the vessel may invalidate these instructions. A qualified Naval Architect must be consulted to determine whether stability has been adversely affected if any of the following changes are made to the vessel:

- Alteration of lightship weight or center of gravity. Refer to the Tracking Changes to Lightship Weight & Deadweight Loads page in this Stability Booklet for details of tracking weight changes.
- Increase in projected wind area.
- Alteration of the underwater shape or buoyant volume.
- Alteration of the watertight integrity.
- Alterations that result in a decrease in the angle of downflooding.
- Alterations of tank or cargo/fish hold arrangements.
- Reduction in freeing port area or an increase in bulwark height.
- Alteration of permanent ballast.
- Alteration of fishing methods or vessel service.

Figure 87 – An excerpt from the instructions to the master of a Hockema Whalen Myers Associates, Inc. stability instructions for the BOUNTIFUL. (CG Exhibit 134, Pg. 17)

These instructions are general guidance to the end-user, the operator, and owner of the BOUNTIFUL, and they are designed to give the vessel personnel an understanding of when they may need to reengage the naval architect to evaluate the validity of their current stability instructions. As stability of a vessel is dependent on so many variables, it would be unreasonable to provide an exhaustive list of reasons that stability instructions should be updated. However, this list at least provides the owner and operator some perspective on the complexity and dynamic nature of stability and advises them that they have a responsibility to engage a qualified naval architect to help determine if there are adverse effects or changes to the vessel and its overall stability.

The SCANDIES ROSE stability instructions, in contrast, had one singular statement: "No modifications to the vessel, such as adding or removing ballast or other weights is to be performed without first determining their effect on stability."[204] This vague statement lacked amplifying detail that could help an untrained mariner understand the implications of this broad guidance.

The requirements outlined in 46 CFR 28 state that the instructions to the master may include the lightweight data or, in other words, the unloaded displacement of the vessel. The stability instructions for the BOUNTIFUL list this in the first part of the instructions section as shown in figure 88, below.

	Crabbing		Pot Cod Fishing	
Displacement	1,066.21	Long Tons	1,047.21	Long Tons
Longitudinal Center of Gravity (LCG)	88.89	Feet Aft of Frame 0	88.04	Feet Aft of Frame 0
Transverse Center of Gravity (TCG)	-0.11	Feet off CL (-Port/+Stbd)	-0.11	Feet off CL (-Port/+Stbd)
Vertical Center of Gravity (VCG)	18.57	Feet Above Baseline	18.5[illegible]	Feet Above Baseline

Figure 88 – An excerpt showing lightweight characteristics from the Instructions to the Master of a Hockema Whalen Myers Associates, Inc. stability instructions for the BOUNTIFUL. (Source CG Exhibit 134, Pg. 17)

[204] CG Exhibit 036, Pg. 5

The information contained in this table is important for the safe operation of the vessel for any mariner as it is a snapshot in time of the vessel's recorded characteristics based on an inclining experiment. Of note, the table includes information for the different types of fishing that the BOUNTIFUL might be engaged in, crabbing or pot cod fishing. The SCANDIES ROSE did not meet the requirements of 46 CFR 28.535(d) as the incline test was not performed in accordance with ASTM standards. Additionally, the data in the accompanying information in the stability instruction never specifically called out the lightship characteristics and did not clearly define the centers of gravity. Instead, the stability instructions provide a table of hydrostatic properties based on the hull form and how much displacement in long tons is represented by different observed drafts and trim. The other values of the table provide some context to how that hull form acts in the water. This table, as shown in figure 89, below, requires a certain degree of training or coaching to understand, none of which was provided to the operator of the vessel.

19-05-13 10:01:45
GHS 6.44

Page 1

SCANDIES ROSE

HYDROSTATIC PROPERTIES
No Trim, No Heel, VCG = 0.00

LCF Draft	Displacement Weight (LT)	Buoyancy-Ctr. LCB	VCB	Weight/ Inch	LCF	Moment/ Deg trim	KML	KMT
8.500	578.11	1.37a	5.20	8.28	4.82a	1738.24	172.3	19.08
8.750	603.08	1.51a	5.34	8.33	4.89a	1769.76	168.1	18.76
9.000	628.19	1.64a	5.48	8.38	4.96a	1802.13	164.4	18.49
9.250	653.46	1.77a	5.62	8.43	5.03a	1835.38	160.9	18.26
9.500	678.87	1.88a	5.76	8.48	5.06a	1866.42	157.5	18.05
10.000	729.99	2.09a	6.04	8.53	4.92a	1899.51	149.1	17.57
10.250	755.66	2.18a	6.18	8.55	4.86a	1915.72	145.2	17.37
10.500	781.28	2.27a	6.32	8.55	4.97a	1911.86	140.2	17.19
10.750	806.96	2.35a	6.46	8.58	4.92a	1927.17	136.8	17.04
11.000	832.70	2.43a	6.60	8.60	4.86a	1942.68	133.7	16.89
11.250	858.52	2.50a	6.73	8.62	4.81a	1958.42	130.7	16.77
11.500	884.40	2.57a	6.87	8.64	4.75a	1974.38	127.9	16.66
11.750	910.34	2.63a	7.01	8.67	4.69a	1990.55	125.3	16.56
12.000	936.36	2.68a	7.14	8.69	4.64a	2005.95	122.8	16.47
12.250	962.45	2.73a	7.28	8.71	4.58a	2023.57	120.5	16.40

Distances in FEET.-------Specific Gravity - 1.025.-----------Moment in Ft-LT.
Draft is from Baseline.

Figure 89 – An excerpt from the 2019 stability instructions for the SCANDIES ROSE showing the hydrostatic properties associated with the modeled hull form. (Source CG Exhibit 036, Pg. 32)

The BOUNTIFUL stability instructions have a dedicated paragraph that speaks to ice loads. This is provided for the operator as a means to help understand the negative impact to stability and danger created by ice loads on a vessel. The purpose of this information is to explain how much weight an operator should account or assume for when determining their vessel stability condition while out at sea. This can affect both hull ice loads and pot ice loads for a particular vessel. Most importantly, it states the extremely dangerous nature of ice in bold letters, further directing the operator to take immediate action to remove ice.

In the timeframe prior to the loss of the DESTINATION and the SCANDIES ROSE, operators of commercial fishing vessels did not typically attend or receive specialized training on stability. Furthermore, the regulations did not require this training for most commercial fishing vessel operators. Thus, the best industry practice to provide instructions to the operator of the vessel on the use of the stability instruction becomes that much more critical. The BOUNTIFUL stability instructions included a detailed guide to help mariners follow how the tables should be used. The written instructions use an example to walk the user through how they are written and applied. These instructions are in figure 90, below:

INSTRUCTIONS FOR USE OF LOADING TABLES

1. These tables must be used together with the Stability Instructions contained in Section C of this booklet. The limitations in the Stability Instructions, particularly the fuel burn off sequence, must be followed
2. Determine fuel loading condition by sounding the tanks.
3. Choose the correct loading table. If icing conditions are present, possible or if operating in icing season, utilize the table for icing season. If icing is not likely, use the table for non-icing conditions.
4. Enter the appropriate table using the fuel condition and the current hold loading condition. If the fuel loading condition lands exactly on one of the table columns, use the pot loading column to the right.
5. The maximum number of pots that can be carried is shown in the box atthe intersection of the current fuel loading and hold loading conditions. The diagram below provides an example of the process for a trip with fuel oil loading range C to D and with Holds No. 2 & 3 full of frozen product.
6. If a voyage will span more than one fuel oil range (example consuming fuel oil over ranges C to D and D to E) then the maximum number of pots that can be carried is the lesser of the pot loads listed within those ranges.

Figure 90 – An excerpt from the stability instruction for the BOUNTIFUL showing the written instruction for using the loading tables. (CG Exhibit 134, Pg. 20)

The SCANDIES ROSE stability instruction mentions ice only two times. First, when stating that the vessel can carry "a total of (208) 835 pound crab pots" and that "this applies to icing or non-icing conditions." The second time is when the instructions state the master is responsible "to exercise prudent seamanship, giving consideration to the…ice conditions."[205] Otherwise, ice is only mentioned one more time in the entire stability instruction, where the Naval Architect scanned in two pages from an unknown source that provides limited additional guidance. In these pages, included in the appendix to the stability instruction, it states that "ice formation or carrying a high, heavy deckload reduces stability by raising the center of gravity. Overloading reduces stability by decreasing freeboard."[206] These instructions on icing are vague in nature and failed to effectively alert the master to the dangers of icing in the same manner as the more detailed and complete icing information provided in the BOUNTIFUL stability instructions.

In comparison, written instructions to the BOUNTIFUL operator are supplemented by a screen capture of a page from their stability instructions. The conditions for fuel oil are provided to show different ranges of consumption. The user is directed to follow a column and applicable rows to identify the number of pots they can carry in the applicable conditions. These are done for different fisheries evaluated for icing and non-icing conditions separately in the booklet, so the operator has a sufficient tool to explain how each condition affects their limits on pot carriage. This supplemental visual guidance is shown for reference in figure 91, below:

[205] Exhibit CG 036, Pg. 5
[206] Exhibit CG 036, Pg. 35

CRABBING – POT LOADING TABLE (NON-ICING CONDITIONS)					
TANKS	A 98% FO (139,522 Gal.)	B 72% FO (102,259 Gal.)	C 50% FO (71,732 Gal.)	D 32% FO (45,281 Gal.)	E 8% FO (10,962 Gal.)
FODB1.P/S	98%	Empty	Empty	Empty	Empty
FODB2.P/S	98%	Empty	Empty	Empty	Empty
FODB3.P/S	98%	58%	Empty	Empty	Empty
FOWT4.P/S	98%	98%	98%	75%	28%
FODB5.P/S	98%	58%	98%	50%	Empty
FOAT P/S	98%	58%	Empty	Empty	Empty
FODT.C	98%	98%	98%	98%	98%
HOTK.S & HOFWD.S	98%	50%	50%	50%	10%
LUBE.P (Fwd & Aft) & BOILER.S	98%	50%	50%	50%	10%
DIRTYOIL.C	10%	50%	50%	50%	98%
FWDT.P/S	100%	100%	100%	70%	15%
FWWT.P/S	100%	55%	28%	Empty	Empty

	LOAD CONDITION	Fuel Oil A to B		Fuel Oil B to C		Fuel Oil C to D		Fuel Oil D to E	
C-0	Hold No. 2: Empty Hold No. 3: Empty Crab Live Tank: Empty	Tiers	Pots	Tiers	Pots	Tiers	Pots	Tiers	Pots
		MD 8	294	MD 8	294	MD 8	294	MD 7	250
		PH 7	44	PH 7	44	PH 7	44	PH 5	35
		Total	338	Total	338	Total	338	Total	285
C-1	Hold No. 2: Empty Hold No. 3: Empty Crab Live Tank: Full Seawater	Tiers	Pots	Tiers	Pots	Tiers	Pots	Tiers	Pots
		MD 8	294	MD 8	294	MD 8	294	MD 8	286
		PH 7	44	PH 7	44	PH 7	44	PH 6	42
		Total	338	Total	338	Total	338	Total	328
C-20L	Hold No. 2: 125,000 lb frozen crab Hold No. 3: Empty Crab Live Tank: Full Seawater	Tiers	Pots	Tiers	Pots	Tiers	Pots	Tiers	Pots
		MD 8	294	MD 8	294	MD 8	294	MD 8	294
		PH 7	44	PH 7	44	PH 7	44	PH 7	44
		Total	338	Total	338	Total	338	Total	338
C-23	Hold No. 2: 125,000 lb frozen crab Hold No. 3: 125,000 lb frozen crab Crab Live Tank: Empty	Tiers	Pots	Tiers	Pots	Tiers	Pots	Tiers	Pots
		MD 8	294	MD 8	294	MD 8	294	MD 8	294
		PH 7	44	PH 7	44	PH 7	44	PH 7	44
		Total	338	Total	338	Total	338	Total	338
C-23L	Hold No. 2: 125,000 lb frozen crab Hold No. 3: 125,000 lb frozen crab Crab Live Tank: Full Seawater	Tiers	Pots	Tiers	Pots	Tiers	Pots	Tiers	Pots
		MD 8	294	MD 8	294	MD 8	294	MD 8	294
		PH 7	44	PH 7	44	PH 7	44	PH 7	44
		Total	338	Total	338	Total	338	Total	338
C-23LL	Hold No. 2: 125,000 lb frozen crab Hold No. 3: 125,000 lb frozen crab Crab Live Tank: Full Seawater Stbd Live Tank: Full Seawater	Tiers	Pots	Tiers	Pots	Tiers	Pots	Tiers	Pots
		MD 8	294	MD 8	294	MD 8	294	MD 6	235
		PH 7	44	PH 7	44	PH 7	44	PH 4	28
		Total	338	Total	338	Total	338	Total	263

1. This Loading Table is subject to the restrictions outlined in the attached **Stability Instructions**.
2. Abbreviations: (Gal.) Gallons, (Lb) Pounds, (LT) Long Tons of 2,240 Lb, MD Main Deck, (No.) Number, PH = Process House

For Icing Conditions, reduce the deck load as shown on the next page.

Figure 91 – An excerpt from the stability instruction for the BOUNTIFUL showing the visual reference to the instruction for using the loading tables. The mark ups in red are part of the BOUNTIFUL stability instructions on how to perform calculations. (Source Exhibit CG 134, Pg. 20)

Overall, the BOUNTIFUL stability booklet and instructions included all of the listed items in 46 CFR 28.530 with exception of instructions on the use of roll limiting devices such as stabilizers, likely because the BOUNTIFUL was not outfitted with them. The stability instructions for the SCANDIES ROSE as shown in finding of fact 4.2.165 of this report, in stark contrast, lack six of the 13 items listed in 46 CFR 28.530(d), and are scant in three others. The stability instructions provided by the Naval Architect were insufficient in the details necessary to safeguard the operation of the vessel with particular regard to the dangers of icing and the identification of downflooding points. The documents lacked the details and accuracy to allow the master of the vessel to make appropriate safety and loading decisions.

5.5. Effects of Commercial Pressure on Vessel Operation

5.5.1. Derby vs. Rationalized Fishing

The commercial fishing industry is impacted by a number of factors including, but not limited to, regulations, fishery season lengths, start dates, price for the catch, and overhead costs of vessel operations. These commercial pressures all had some effect on the SCANDIES ROSE, competing against the safety needs of the operation.

NOAA defines "derby" fishing/race to fish as "fishing conditions characterized by short seasons and severe competition for fish, often resulting in low profits and harvests that exceed sustainable levels."[207] Pacific cod is a fishery that is currently managed as a derby style fishery. Rationalization, on the other hand, is a term that generally describes a management plan that results in an allocation of labor and capital between fishing and other industries that maximizes the net value of production by setting quotas.[208] Crab rationalization set quotas for species like opilio crab and significantly reduces the commercial pressure in fishing operations.

During the MBI Hearing, an ADF&G representative provided testimony regarding the potential impact of commercial pressure on the safety of fishing operations regarding a fishery that went from derby to rationalized management

> *… when the shift in 2005 occurred from more of a limited access or derby-style fishery to rationalized fishery occurred…the number of boats participating in a fishery, substantially decreased. We went from an average of sometimes 250 to 300 boats, to what is now closer to 65 vessels that actively participate in the fishery.*
> *Q. So is one of the byproducts, the intended byproducts, of this shift to the quota system the improvement of the safety of operations?*
> *A. I think that was one of the primary drivers of shifting away from a derby-style fishery towards rationalization…one of the downsides of derby-style fisheries are vessels are functionally competing against each other. And so there's a tendency to push harder if the weather was poor, or conditions were such that was not conducive to being on the fishing grounds. But for fear of losing out on opportunity and catch, boats would oftentimes push to get there. So one of the primary motivators were to provide some stability for the fishery, flexibility for the fishers to be able to harvest their portion of the quota at a time that makes the best sense for them, and ultimately to improve safety within the fishery, among other things.*[209]

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[207] https://www.fisheries.noaa.gov/national/sustainable-fisheries/glossary-catch-shares
[208] [redacted]. Development of rationalization programs in the North Pacific groundfish and crab fisheries. (2003)
[209] Mr. [redacted], MBI Hearing Transcript, Pg. 966

The open season to fish Pacific cod has been shrinking over the years which has, in turn, created more pressure for any fishing vessels who have wanted to participate in that fishery. In testimony, the NOAA fishery witness stated

> *… the closure date in 2020 was January 15th. And that was the same in 2019. And that's the shortest season that we've seen for the fishery*.[210]

The SCANDIES ROSE left Kodiak, AK rigged to fish for cod using pots. Pacific cod does not historically fetch a lucrative price compared to fisheries like opilio crab, yet there was an incentive for the SCANDIES ROSE to get underway despite extreme inclement weather conditions. While there were no plans by Governmental agencies to establish a quota system for Pacific cod, there was speculation Pacific cod would become rationalized like the BSAI crab fisheries. Based on that speculation, the owners and operator of the SCANDIES ROSE planned to land a catch of cod in the first cod season in 2020, January 1 through January 15, and thus, establish a catch history.

The Marine Board examined how the potential of a future rationalization of the pot cod fishery created commercial pressure and may have impacted the decision makers of the SCANDIES ROSE. In the MBI Hearing, the majority owner was asked about the upcoming plan for the 2020 season

> *A.…we primarily focused on opilio, we'd like to get a quick start on opilio and neglected cod for several years.*
> *Q. … could you tell us why you chose to do that for several years and why you -- why the SCANDIES ROSE was going to shift to cod for that season?*
> *A. Sure, sure, we fish the crab because our main quota share owner, the person that we -- who provided probably 60 percent of our crab, didn't want us fishing cod. He wanted to get his opilio caught, so we would just -- and we needed that, we needed the crab to fish much more than we needed the relatively meager paycheck of cod. And the reason why we shifted this over the past year was because of the threat of rationalization, there's some -- a portion of the industry wanted to turn the cod fishery, Bering Sea cod fishery, into a quota, individual quota fishery, and since we didn't have any recent, very recent deliveries, we just thought it was prudent to go make a trip.*[211]

The SCANDIES ROSE Captain and the management company wanted to land a catch of Pacific cod in the beginning of the 2020 season in hopes that the record of landing that catch and other past catches of cod might lead to a quota if the Pacific cod fishery became rationalized. In establishing the catch history, the owners and operators of the SCANDIES ROSE would have improved their chances of guaranteeing quota. A quota in the future would translate into a longer season to fish in, thereby reducing commercial pressure in the long-term. When asked about the potential shift of the Pacific cod fishery to a rationalized program similar to BSAI crab fishing, the NMFS representative testified

[210] Ms. [redacted] MBI Hearing Transcript, Pg. 975
[211] Captain [redacted] MBI Hearing Transcript, Pg. 29

… in order for something to move into a catch-share program, it has to be, you know, reviewed and analyzed and approved by the North Pacific Fisheries Management Council. And in 2019, or 2018, industry did go to the council, some of them did, and asked that the fishery be moved into a quota-share program. The council, at that time, chose not to move forward with that action. And so, as of right now, there's no scheduled plan by the North Pacific Fisheries Management Council to move forward with a quota-share program for this fishery.[212]

Had the accident not occurred, the SCANDIES ROSE intended to land the single catch of Pacific cod, then re-rig the pots to fish for opilio crab—a more profitable fishery.

The opilio species shifted to a rationalized management system in 2005 as part of the BSAI crab fishery. Once that happened, NMFS issued harvesters (vessels and owners) a quota share of the ACL, which was based on their catch history and participation in the fishery during the previous years. The quota, also known as an individual fishing quota (IFQ), gave the harvester a guarantee to a percentage of the catch. Since each vessel now knew beforehand how much crab they could catch, this would help eliminate the competition between harvesters and mitigate the "race for fish." In other words, the rationalized system allowed the vessels to catch their quota at any point during the season potentially reducing the commercial pressure for fishing operations.

The Coast Guard's Report of Investigation (ROI) for the DESTINATION sinking contains the following language about fishing operations for crab and the importance of the change-over to rationalization.

Unlike in the Olympic system where operators would carry as many pots as possible to improve the ability to quickly locate and catch crab in the intensely competitive derby fishery, the CR system affords operators more time to harvest the catch. From a safety perspective, the extended season allows operators to take the time needed to prepare their crews and vessels, and to delay departure or shelter in protected areas to avoid hazardous weather conditions. It also means vessels need not hold maximum catching power and can significantly reduce the number of pots loaded onboard. Apart from carrying fewer pots, the number of pot lifts required decreased, allowing for a reduction in the fishery pace that affords crews more opportunity for rest and reducing fatigue.[213]

There is no single defined method to establish the allocation of quotas when a determination is made to shift a fishery from derby style fishing to a rationalized management system. In the case of fisheries that have been rationalized, multiple variables were factored into the distribution of quota shares. Some factors include past participation in the fishery, catch history, and number of landings. The factors considered in rationalization discussions vary from fishery to fishery. Catch history was one of the factors that influenced the decision of

[212] Ms. [redacted] MBI Hearing Transcript, Pg. 967
[213] Coast Guard's Report of Investigation into the Sinking of the Fishing Vessel DESTINATION, https://media.defense.gov/2019/Mar/03/2002095494/-1/-1/0/REPORT%20OF%20INVESTIGATION%20FISHING%20VESSEL%20DESTINATION.PDF

the SCANDIES ROSE owners and operator when deciding on the fishing plans for the accident voyage.

The plan for the SCANDIES ROSE was to fish in the Bering Sea for the first Pacific cod season of 2020 and pass on the second Pacific cod season later in the year. Since the Scandies Rose Fishing Company LLC did not have a recent delivery of cod, this first cod catch was important to the long-term plans of the SCANDIES ROSE Captain and the management company. The Marine Board believes that the last minute crew change which contributed to the delayed departure and the demand to get started cod fishing in the remainder of the short available window of time in the new year added significant pressure and impacted the decision making for the SCANDIES ROSE to get underway for the accident voyage despite the forecasted weather.

5.5.2. Resultant Pressure Due to Delayed Departure from Kodiak

Based on testimony, the plan was to have the vessel fishing for cod on or about January 1, 2020 when the season opened in the Bering Sea. The last minute changes in crewing of the vessel delayed departure and resulted in the vessel being "late" for arrival to begin cod fishing in the Bering Sea. Once crew finally arrived, the vessel again delayed departure for approximately six hours to get a fair tide to transit Whale Pass and then out into the Shelikof Strait.

Mr. [redacted] testified about the upcoming fishing season and how the weather and urgency to produce a catch record played into the Captain's decision to get underway instead of waiting for better weather.

> *Q. Okay. And so, speaking of weather, any discussion on weather prior to departure?*
> *A. Oh, yeah. We knew it was going to be bad.*
> *Q. Anyone express any concerns about --*
> *A. We all did. We all did. It was like, you know, it's kind of dumb to go out. This is a hurricane. But they -- the cod season started. It starts on January 1st, and we had like 3- or 4-day run. So we were already going to be late, and this might be the last derby year of the cod fisheries, so -- and they go off catch history so they get more quota. So it was really crucial to get there and get as much pounds as we could.*[214]

Identifying the final crew to be hired and getting the crew onboard for the voyage would delay the departure until the evening of December 30, 2019, and that would put arrival on the fishing grounds later than originally planned. As the vessel waited to depart, one of the survivors testified about overheard communications in the wheelhouse with the vessel management personnel about the delay in departure and the need to get the vessel out to the cod fishing locations in the Bering Sea

> *Q. Did you ever overhear a conversation while the boat was still in Kodiak between* [redacted] *and any of the* [redacted] *Management about getting out cod fishing?*
> *A. Yeah. He -- I don't know exactly who he was talking to, but a couple different times he was in the wheelhouse, and I was just -- I think I was filling out my contract, one, and he*

[214] Mr. [redacted] MBI Hearing Transcript, Pg. 1062

kept mentioning that he's under a lot of pressure to get out of town. Like, we got to get out of town. [redacted] *wants us out of town, is what he said specifically.*
Q. Well, I'm talking right now about a conversation. Did you overhear a conversation with someone about getting out of town? And who was this other person?
A. I don't -- I just overheard him say, like saying like, yeah, and we're leaving and, you know, just that kind of conversation. Again, I don't know if that was [redacted][215] *or* [redacted] *I was under the assumption that it was* [redacted][216]

It is the opinion of the Marine Board that the delayed departure caused by last minute crewing challenges and the plan to fish for cod created pressures on the Captain to get underway for the accident voyage rather than wait out the forecasted weather or seek shelter from the hazardous weather along the route.

5.5.3. Captain's Financial Investment in the Vessel/Fishing Operations

In the final days before the departure for sea from Kodiak, the Captain had made an arrangement to purchase the minority owner's share of the SCANDIES ROSE and had sent a check to the minority owner to cement the transaction as a down payment. All of the details for the final transaction were arranged as the SCANDIES ROSE departed Kodiak. The Captain wanted to have a greater say in the decisions relating to the operation and management of the vessel. With a greater share in the company, he would have that authority to have more influence in decisions affecting fishing and vessel operations.

Along with the Captain, all of the crew had a direct investment in the outcome of the voyage as their income would be derived from a share in the voyage, less the operating expenses for the trip such as fuel, provisions, and other expenses. The Captain's investment in the success of the accident voyage was now compounded by his plans and obligations in the purchase transaction.

5.5.4. Balancing Safety and Profit: Decision Not to Create a Deck Alleyway

Vessel operators have to balance safety and profit when making decisions which affect the safety of operations. One example of this is the loading of the SCANDIES ROSE. Loading to near maximum pot capacity against the concern for access to various points aboard the vessel was a decision the Captain faced. An alleyway allowing access from the superstructure forward to the bow of the vessel was not created when loading pots onboard for this voyage. In figure 92, below, aboard an unidentified crabbing vessel similar to the SCANDIES ROSE, the operator of the vessel created an alleyway to increase his crews' ability to more safely move fore and aft. This has been identified as a fairly common practice in the crabbing fleet which would also reduce the pot capacity by the number of pots needed to create the alley or alleyways. The alleyways are the width of the height of a pot lying on its side, creating an opening about three feet where the crew could walk through the pot stack and move safely fore and aft.

[215] Investigator's note – referring to Ms. [redacted]
[216] Mr. [redacted] MBI Hearing Transcript, Pg. 1141

Figure 92 – An alleyway in the lower tier of an unidentified commercial fishing vessel operating in an Alaskan winter. The red arrow points to the alleyway. View is looking toward the stern of the vessel. (Source CG Exhibit 093, with redactions and mark up)

Without an alleyway on deck, the SCANDIES ROSE crew could not walk forward and aft on the main deck but would have to move fore and aft over the top of the exposed pot stack. This could only be accomplished safely in more favorable weather and sea conditions and was an evolution that was still associated with some level of risk. Even getting forward to use the ground tackle or other equipment on the bow would be difficult in an emergency. One of the survivors who loaded the pots testified about loading the SCANDIES ROSE and differentiated between other boats who had created an alleyway or alleyways

> *A. So basically any space on deck was filled, you know, and that's actually -- to, to go back to what you asked me about the other aft house boat I worked on, this was different to me because once you stack this boat out, there's no alleyway. And like, on the Wizard, for instance, they have a way to actually come in to the gear room into the house. This boat, once you stacked it out, you had to climb up over the stack to even get back to the house. There was no, you know, pass through.*[217]

The decision to load the vessel's crab pots without creating a means for the crew to safely go forward was a latent unsafe condition that led to significant consequences which impacted subsequent decisions on the accident voyage. The lack of an alleyway left no way for the crew to accurately assess the ice that was accumulating or to gain rapid access to the forward parts of the vessel to clear the ice from the most heavily iced portions of the vessel and the pot stack. As the heavy freezing spray continued to negatively affect the vessel's stability, and believing that he could not send the crew over the top of the pot stack to safely break the building ice, the Captain decided to wait until reaching shelter to address the icing.

[217] Mr. [redacted] MBI Hearing Transcript, Pg. 539

5.5.5. NIOSH Recommendations and Commercial Fishing Operation Safety

Various entities make recommendations to improve the safety for commercial fishing operations such as the one undertaken by the SCANDIES ROSE crew. Despite the soundness of these recommendations, they come at a cost in terms of expenses and time. This sometimes inhibits owners and operators from putting those recommendations into practice.

One governmental group, NIOSH, uses the marine accident data provided by the Coast Guard and other sources to identify the causes of marine accidents and then analyzes that data to make recommendations to the commercial fishing industry. In 2017 they published a summary of the CFV accidents that occurred in Alaska. The following recommendations, extracted from the NIOSH proposed recommendations in that 2017 accident summary, if put into practice, would have in all likelihood increased the chances for the survival of the SCANDIES ROSE and its crew.

> *Take a marine safety class at least every five years. Safety training for fishermen is available, affordable, and saves lives. All fishermen should learn and know how to use basic lifesaving equipment like immersion suits, life rafts, EPIRBs, and fire extinguishers to improve their chances of survival in an emergency.*[218]

Based on the records obtained by the investigation, only three of the seven-person crew had attended any type of safety training classes over the years preceding the accident. Periodic training would have potentially involved refreshing the memories of the crew with critical training for vessel emergencies and refreshing their memories on the details of survival equipment, such as the contents of the equipment stored in a liferaft and other important items.

None of the crew had attended any stability training. Stability is an essential factor for the safety of any vessel operation. The fundamentals of stability, downflooding points, dangers of an unidentified list, and icing are even more essential when fishing far from rescue in an environment where icing and extremes of weather are routine. The NIOSH recommendations continue

> *Ensure watertight integrity of the vessel. The hull and through-hull penetrations should be regularly inspected and maintained. Doors and hatches should remain closed while underway, especially in rough seas. Maintain and test high water alarms before each trip.*[219]

There was testimony by one of the survivors that the after hatch to the starboard pipe alley below the main deck was left open when the vessel was underway. Furthermore, the NIOSH recommendations state

[218] https://www.cdc.gov/niosh/docs/2017-171/pdf/2017-171.pdf, Pg. 6
[219] https://www.cdc.gov/niosh/docs/2017-171/pdf/2017-171.pdf, Pg. 6

Maintain proper watch. Vessel owners and operators should create fatigue management policies and use watch alarms to prevent groundings and collisions.[220]

The Captain of the SCANDIES ROSE on the accident voyage did not effectively communicate standing orders to the vessel crew. This was especially important in the fact that two of the crew had never worked with the Captain or on the vessel before. Additionally, the survivors talked about the effects of the workload and fatigue associated with the loading. One of the survivors was so fatigued that in post-accident analysis his level of fatigue would have affected his decision making to the level of his being, or nearly being, legally intoxicated.

NIOSH also addressed stability and made recommendations on this topic, stating

Adhere to stability instructions (if applicable). A naval architect should be consulted periodically to review safe loading limits of the vessel. Vessels should always be loaded in compliance with their stability instructions.[221]

The owner of the vessel did adhere to this recommendation in getting a new stability document and the included instructions to master contained in that 2019 stability instructions. However, the instructions prepared by the Naval Architect contained errors and the "instructions" were vague. The Naval Architect gave the majority owner, the recipient of the 2019 stability document, an opportunity to comment on the contents of the document. There is no evidence that the owner asked for the instructions to be clarified or more detailed in regards to the maximum pots to be carried and the effects of icing that would most likely be encountered in the conditions that the SCANDIES ROSE would crab in.

5.6. Captain as Operator / General Work Experience

5.6.1. Regulatory Requirements and Experience

Captains of commercial fishing vessels operating beyond the boundary line of the tonnage of the SCANDIES ROSE do not require any form of certification, credential, or other qualifications to determine the level of competency to carry out their responsibilities and duties, with the possible exception of a Federal Communications Commission (FCC) Radio Operator's License to operate the vessel radios.[222]

Captains engage in fishing with these vessels in the harshest of marine environments, generally far from any potential rescue forces. These fishing vessels are generally complex vessels, in essence, small ships with sophisticated electronics, equipment and other systems. Like the captains, there are no requirements for the persons serving as ad hoc engineers.

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[220] https://www.cdc.gov/niosh/docs/2017-171/pdf/2017-171.pdf, Pg. 6
[221] https://www.cdc.gov/niosh/docs/2017-171/pdf/2017-171.pdf, Pg. 6
[222] The FCC Radio Operator's Permit is a once in a lifetime card that requires passing a test to obtain this permit. This is required if the vessel has a Single Sideband Radio.

5.6.1.1. The Captain was a highly experienced Alaskan commercial fisherman and was well respected by the fishing community. He had been working as a fisherman for his whole career. He had been captain of several other vessels. Testimony from the majority owner described him as a "great Captain, and great fisherman."[223]

Several other witnesses talked about Captain [redacted] in a similar manner. He was highly experienced in working in Alaskan waters with those unique challenges. Testimony would indicate that he was intimately familiar with the operation of all of the equipment on the vessel.

5.6.2. Familiarity with the Accident Route

The SCANDIES ROSE typically operated out of Dutch Harbor, AK up into the Bering Sea. During the course of the accident year, the vessel had been from the Bering Sea down to Kodiak, down to the Seattle area for maintenance work, back to Dutch Harbor, and then from the Bering Sea to Kodiak after the early 2019 crab season. The trip from the Bering Sea to Kodiak was made on generally the same track as the accident voyage but in the opposite direction. Fishing vessel captains who were interviewed in the MBI Hearing said that Captain [redacted] was very familiar with the waterway, the Shelikof Strait and to the west. Multiple fishing vessel captains testified that freezing spray and strong frigid winds blowing out of the bays and from the glaciers to the north in the Aleutian Chain created a situation where a vessel could very rapidly begin to gather dangerous icing.

An examination of the route was carried out with information supplied by other fishing vessel captains to determine what would constitute adequate anchorages in the prevailing weather the SCANDIES ROSE encountered in the Shelikof Strait and to the west, heading to Sutwik Island.[224]

For the timeframe of the accident voyage, there was a heavy freezing spray forecast in effect. Surviving crewmembers reported light icing and glazing ice on their respective early watches on December 31, 2019. On the Captain's six-hour watch which was believed to be from 8:00 a.m. until 2:00 p.m. on the accident day, there were good anchorages available offering protection from the reported northwest wind as indicated in figure 93, below. Despite the options for refuge early in the day and worsening weather conditions, the vessel maintained course and speed. The RUFF & REDDY, heading in the same direction as the SCANDIES ROSE, had sought the shelter of Nakchamik Island less than 30 NM to the west of Sutwik Island early in the morning on the accident day due the icing they were experiencing.

Based on the Captain's experience, he should have considered areas along his route to find safe shelter from the severe weather that was forecast to include heavy freezing spray. With areas of safe refuge previously identified, he could have communicated to the crew different waypoints along the route that would be critical for decision making. The Marine Board could not uncover any information about a plan, any communication with the crew about areas of refuge, or any actions taken to seek shelter until the evening of December 31, 2019,

[223] Mr. [redacted] MBI Hearing Transcript, Pg. 767
[224] Exhibit CG 137, Shelter and Anchorage Correspondence Post SCANDIES ROSE Hearing_Redacted

when the Captain assumed the navigational watch and the determination was made that it was too dangerous to send the crew out to remove ice. At that point when the Captain opted to seek the shelter of Sutwik Island, the vessel was already in a dangerous stability condition, listing heavily to starboard.

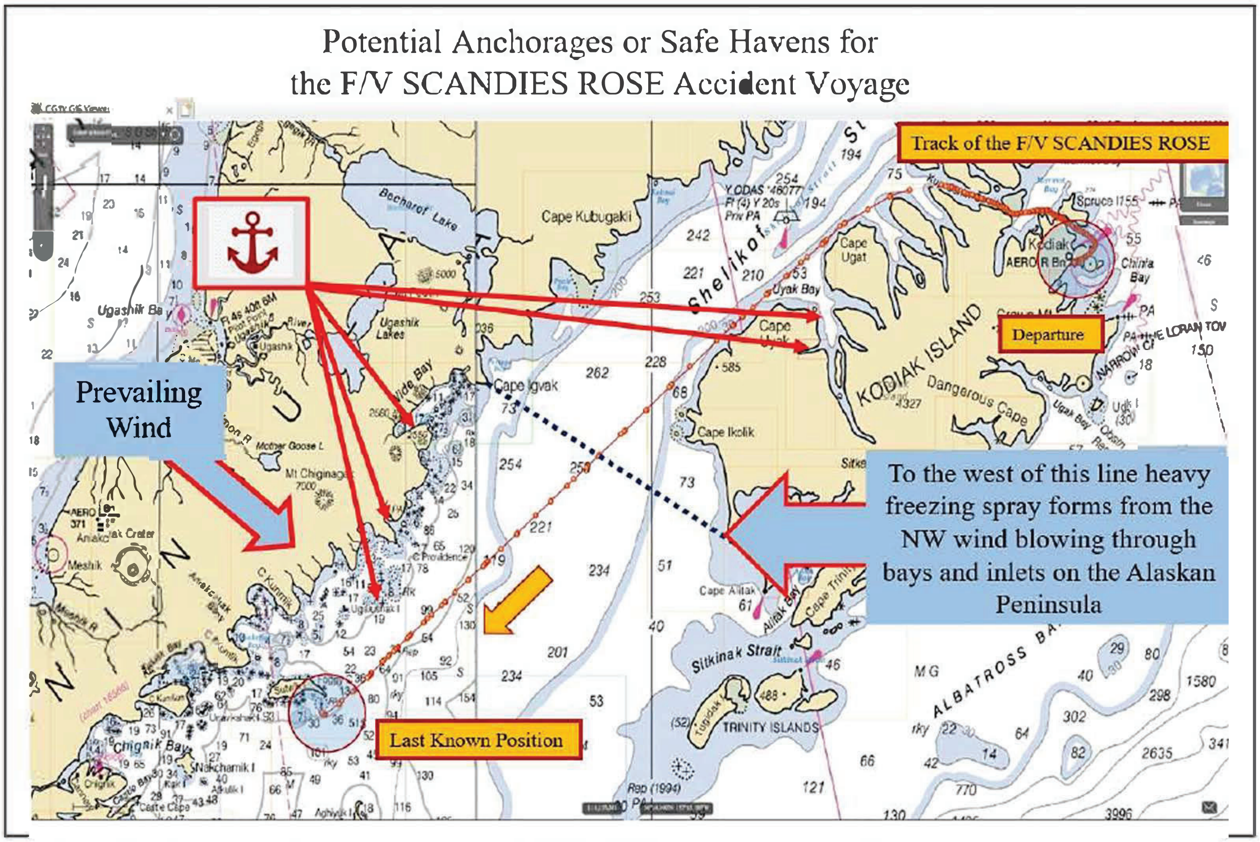

Figure 93 – Nautical chart showing the route of the SCANDIES ROSE on the accident voyage. Positions are marked representing reportedly good anchorages in northwest winds similar to the weather the SCANDIES ROSE was experiencing on the accident voyage. Other bays or inlets along the track were reported to offer poor anchor holding ground in the northwest winds the SCANDIES ROSE encountered. (Source Coast Guard)

5.6.3. Pre-departure Required Training and Drills

Based on testimony, Captain [redacted] was well respected when it came to safety. In the case of the required drills and training, he had completed Drill Instructor training in 2009 and led the pre-departure training and instruction prior to the vessel departing Kodiak on December 30, 2019.

Through testimony, the surviving crewmembers explained that the survival suits, EPIRB, flares, general alarm, and liferafts were all discussed in the onboard training prior to departure. They both testified that only the newest crewmember, Mr. [redacted] was tasked to demonstrate putting on a survival suit as part of the training while the rest of the crew observed. The Captain also instructed the crew on the use of the marine radios to make a "mayday" call in an emergency. Both survivors noted the Captain's hesitancy in testing of the EPIRB during this training citing his concern about sending an active distress signal. Of particular concern is the testimony by survivors that neither of them saw any lights activate on the EPIRB during the Captain's attempted test of the device. Based on the Captain's training and the training of both of the survivors, the Marine Board makes note that anyone with the Drill Instructor training or basic safety training should have been aware the proper testing procedure for the EPIRB and known that a successful test would have been accompanied by a flash of the LED light.

Additionally, both of the survivors incorrectly identified the location of the EPIRB in testimony and during interviews immediately after the incident. Both men stated that the EPIRB was located on the starboard side of the vessel aft of the wheelhouse. Effective pre-departure training should have imprinted the location of the EPIRB in the memory of the crew eliminating this potentially dangerous mistake. Vessel photos and post-accident ROV footage show the EPIRB location on the port side of the vessel. During the emergency, both survivors exited the port side aft-facing door from the wheelhouse and they were a short distance from the EPIRB's mounting location. If the EPIRB was in the housing unit, it may have been possible to reach the EPIRB and release it from its housing. This would enable the survivors to keep this vital piece of survival equipment with them as they abandoned ship.

5.6.4. Confidence in the Vessel

The SCANDIES ROSE was a large, well maintained Alaskan crabbing vessel. It had withstood the rigors of the Alaskan environment since it was built in 1978. Former crewmembers portrayed their confidence in the vessel and described the SCANDIES ROSE as a "Cadillac," a "battleship," and an "incredible platform."[225]

The DESTINATION which was lost in icing conditions in the Bering Sea near St. Paul's Island in February 2017 was 98.6 feet in length and had a forward house with the pots carried aft of the superstructure. In contrast, the SCANDIES ROSE, originally built as the ENTERPRISE, was 130 ft long aft house vessel with the crab pots on the main deck forward of the superstructure.

When responding to a question about the weather forecast and the crew's discussion of the weather prior to departing, Mr. [redacted] referred to the vessel as a "tank" stating

> *A. We were all kind of just talking about it. Like, oh, great, it's going to be -- this is going to be fun, you know, and just like, you know, everybody was kind of apprehensive to go into it. I mean, but -- and then again, that boat should have been a tank and should have been able to withstand that weather. I've been in worse weather, and I mean, it was pretty bad, but it should have been able to make it.*[226]

Mr. [redacted] was asked to recount if Captain [redacted] had ever made comment on the SCANDIES ROSE's ability to handle severe inclement weather. He recalled that Captain [redacted] said, "she's a great boat. She's a tank. Go through the weather."[227]

[225] Mr. [redacted] Mr. [redacted] testimony, MBI Hearing Transcript, Pg. 702
[226] Mr. [redacted] MBI Hearing Transcript, Pg. 1100
[227] Mr. [redacted] MBI Hearing Transcript, Pg. 1141

The Captain and crew relied on their belief that the SCANDIES ROSE was a capable of withstanding the forecasted weather which included heavy freezing spray. The Marine Board believes that this confidence in the vessel directly contributed to the Captain maintaining course and speed despite worsening conditions and ice accumulation. Additionally, the Marine Board does not believe that the Captain or crew were aware of the stability vulnerabilities which were later examined and explained in the MSC Stability Analysis.

5.7. Owner's Responsibilities

5.7.1. Repair, Upkeep, and Maintenance of the SCANDIES ROSE

A number of witnesses attested to the fact that the SCANDIES ROSE was a well-maintained vessel and effort was made to regularly haul the vessel and have a condition and valuation survey conducted at regular intervals. The evidence bears this out based on the history of repairs and maintenance that was included in the survey. The owner stated that a maintenance budget was not maintained but that needed repairs were identified and addressed when they were called for.

As the direct representative and an owner, Captain [redacted] notified vessel management of maintenance items that needed to be addressed as well as any supplies that were needed and this information was conveyed by the vessel manager to the majority owner who would evaluate and approve repairs. The vessel manager kept track of the work list and then the authorized repair list for the shipyards or external vendors.

An example of this was the repairs to the overboard waste chutes on the starboard side of the hull conducted by a welding company in early 2019. Later after heading to sea, the Captain notified the shore side managers that the repairs leaked, specifically near the forward starboard chute welds. The Captain texted the manager and majority owner photos with descriptive labels on the image while the vessel was at sea and in one of the text messages he mentions "thru the splash zone that we applied to keep from sinking last winter" and "I thought this had been repaired in the shipyard."[228] It is the Marine Board's opinion based on available evidence that the Captain was referring to the April 2019 repair work performed at dockside by Aztec Welding in Seattle. The owner then arranged for a Kodiak based welder to board the vessel at the dock and repair the leaks identified in the photos of the forward overboard waste chute on the starboard side.

There is no evidence or testimony that, upon notification of weld failures near the forward chute, anyone examined the early 2019 repair where the aft waste chute was closed off to the deck and the side of the hull with the use of welded doubler plates. This closure of the aft overboard chute was carried out by the same welder who did the welding work on the forward chute which would later have to be repaired in Kodiak by a certified welder and subjected to non-destructive testing. Captain [redacted] text messages sent ashore in November 2019 focused on the leaks coming from the forward starboard chute. The Kodiak welder cropped out the wasted metal along with the suspect porous welds and fabricated a new overboard chute, fitted it in place, welded it up and then conducted a non-destructive

[228] Exhibit CG 112, Text Messages from [redacted] Showing Void and Chute

penetrating dye test to verify the quality of the work. The welding and the follow on non-destructive testing (NDT) was done by an ABS certified welder.

Examination of the evidence, condition and valuation survey, vessel history, and invoices for recent repairs indicated that the vessel was routinely hauled out for maintenance and that repair and preventative maintenance issues were addressed as needed.

5.7.2. Company Support Personnel for SCANDIES ROSE Maintenance

At one point in testimony, a representative from Lovric's Shipyard described the vessel manager as the Port Engineer. The vessel manager did not have any marine engineering expertise to fill that position. The company had once employed a Port Engineer who passed away prior to the 2019 dry-docking. This impacted the repairs conducted to the overboard waste chutes on the starboard side that were conducted in early 2019 at Lovric's Shipyard. In the absence of a Port Engineer, the vessel majority owner supervised the repairs for the vessel. He did not ask for or require NDT of the welding work. The work originally done by Aztec Welding turned out to be unsatisfactory and allowed seawater to leak through the welds into the starboard pipe void. The crew of the SCANDIES ROSE, on a voyage in late 2019, had to enter the void and pump seawater out that was found leaking into the interior of the vessel. On November 4, 2019, the Captain sent images ashore via text message showing the extent of the leaking seams on the starboard forward overboard chute. Once the problem was identified, the company took action to resolve the issue with the forward starboard chute when the vessel reached Kodiak. There is no evidence that the work that had been performed by the same welder to close off the after chute in early 2019 was examined to determine the integrity of that repair. However, only a crewmember was left to oversee the repairs to the forward chute.

5.7.3. Guidance to Personnel Operating the SCANDIES ROSE

The Company provided some guidance to personnel employed on the SCANDIES ROSE, including written emergency instructions and oil transfer procedures. In addition, the company also ensured that the Captain and crew had stability instructions for the SCANDIES ROSE and there was guidance contained in documents that comprised the pre-season paperwork such as the Drug and Alcohol and Sexual Harassment policies. However, aside from this, there is little evidence that the company provided specific guidance to the personnel operating the vessel. There was no formal written guidance on procedures to operate the vessel, on navigation watchstanding, engine room or deck operations, fatigue reduction guidelines, or similar written procedures. These operations were stipulated by the Captain, generally verbally, and they could change based on who was serving in that role.

Management gave the Captain latitude to operate the way he wanted to run the vessel and did not provide written operating procedures for him to follow even in a general sense. Examples of areas where there was no guidance for the operation of the SCANDIES ROSE would be the loading of crab gear, the watch schedule, and voyage planning when heavy weather would be encountered. Absent standard guidance or procedures, the management team (remaining owners and vessel manager) did not know how the challenges of the voyage would be handled and the risks minimized to ensure the safety of the crew and vessel as the SCANDIES ROSE headed to sea. This was completely left to the discretion of the captain.

5.7.4. Training for the SCANDIES ROSE Crew

With the exception of the required onboard drills and pre-departure training in lifesaving operations, the company did not provide additional training for the crew. The onboard drills and pre-departure training are regulatory requirements. As part of employment, the company did not require crew to attend or be certified in any specific training related to the operation of the vessel. Additionally, the company did not require any of the crew for this voyage to have a Coast Guard MMC. Individual crewmembers could get training and instruction at facilities such as AMSEA, NPVFOA, and possibly other training institutions like the Crawford Nautical School on their own and at their own expense. The Marine Board was not able to find any evidence that any of the crew had attended the stability training courses that were offered at these training organizations.

One crewmember was required to be a "Drill Conductor" and the Captain had attended and completed that training in 2009. The two survivors had also attended Drill Conductor training, both more than five years prior to the accident. There is no specific requirement to recertify at a periodic interval for this training despite changes in technology and techniques that may have occurred over time. The Captain's training in 2009 satisfied and fulfilled the requirement for him to conduct the pre-departure training and drills.

5.7.5. Crewing the SCANDIES ROSE for Government Charters

The SCANDIES ROSE was occasionally chartered by government agencies for research work. During these charters, the vessel manager would have had to place a Coast Guard credentialed captain aboard instead of Captain [redacted] who did not hold a Coast Guard credential. The majority owner talked about these government charters in his testimony

> *And occasionally, I mean, on two separate occasions I ran the SCANDIES ROSE when there were Alaska Department of Fish and Game charters, because in their -- in their charter documents they require a licensed captain and* [redacted] *not --* [redacted] *was not licensed, I was, so I went up and ran the boat for those 35-day charters on several occasions.*[229]

Another witness, the captain of the WESTERN MARINER who is also a credentialed mariner testified

> *It's just a requirement for -- probably for the government insurance. I've done a lot of research -- I've done a lot of research programs that, you know, every -- if anybody's going to send their people on a boat, they want to send them with a licensed master.*[230]

This charter requirement ensured that a mariner who was medically fit and deemed competent through the Coast Guard credentialing process was operating this commercial vessel while government passengers or contractors were aboard. As an example, the majority owner, Captain [redacted] held a 1600 ton Oceans Master credential with a number of STCW endorsements.

[229] Captain [redacted] MBI Hearing Transcript, Pg. 23
[230] Captain [redacted] MBI Hearing Transcript, Pg. 947

5.7.6. Company Drug/Alcohol Policy and Pre-employment Drug Screening

Part of the process of employment was for prospective company employees to complete paperwork which included a contract stipulating all the details of the duties as well as the share of the catch. Additionally, there was paperwork for medical history, sexual harassment policy, a background check, direct deposit, and other documentation.

As part of the process, employees reporting to the vessel for the season were to be drug screened. In the case of the SCANDIES ROSE, there was no requirement for the crew to be drug tested under regulation as part of a pre-season employment package. Under regulation, the crew would be subject to post casualty drug and alcohol testing after a SMI such as the sinking of the SCANDIES ROSE. The crew was also required to sign a one-page company Drug and Alcohol Policy. Crewmembers would need to sign and date the policy. The penalty for violating the policy could be discharge as stipulated in the terms and conditions in the contract. The entry for violating the drug and alcohol policy stated:

> *Violation of the Vessel's attached Alcohol and Substance Abuse policy. Prior to entering into this Agreement and immediately during the term of this Agreement, Crew Member must inform Skipper regarding any prescription drugs he/she is taking.*

The policy and contract had strong language as to the use of drugs and alcohol onboard and the penalties for a person violating the policy. Prior to signing the contract and reporting to Kodiak, crewmember [redacted] submitted to a drug test conducted and certified by a laboratory with documented results sent to the vessel manager. The last person to join the crew, Mr. [redacted] was tested aboard the vessel with an off-the-shelf five panel home drug test kit. In the case of Mr. [redacted], the test results were reported, by the Captain, to be negative for all of the drugs tested. A series of photos were sent to the vessel manager via text message prior to departure showing the test sample, comments and the results. An analysis of the text string by the Marine Board was not able to confirm negative results in this test.

After the sinking of the SCANDIES ROSE and rescue of the two survivors, the owners were required to conduct post-accident alcohol and drug testing since this accident was a SMI. The hospital would not conduct testing because that testing was not in line with the hypothermia treatment protocol. In attempting to comply with the requirements for drug testing, the vessel manager who was in the Seattle area asked the Captain's sister to assist her locally in Kodiak to acquire drug testing kits commercially. At-home style drug test kits were purchased at a store and the two survivors produced samples utilizing those kits. When examined according to the test kit manufacturer's instructions, the results showed that Mr. [redacted] sample was negative for all five drugs tested and Mr. [redacted] sample showed positive for marijuana. These test results were transmitted to the vessel manager but the test and results were not further certified by a certified laboratory. Instructions in the kit recommend that the sample be sent to a certified laboratory to verify the accuracy of the test results. This was not done. The results of these tests have not been disputed in this investigation.

In a post hearing interview, one witness was asked if he knew how Mr. [redacted] could test negative with a home test kit and then after the voyage that same individual could test positive with a similar test kit.

> Q. *... do you know why Mr.* [redacted] *would've tested positive for THC after he was rescued?*
> *A. Yeah, I can give you the honest answer on that. He told -- because I know him, they were talking about it and he told* [redacted] *-- I think he even* [redacted] *that, you know, he had smoked marijuana back home and that he wasn't going to be able to pass. He told her that multiple times, he told me, he also told* [redacted] *that and then when he got the pass -- you know, a wink and a nod pass because* [redacted] *wants to go fishing, he was even surprised because he told* [redacted] *that he was not going to -- he had just smoked weed down in Seattle, you know, the day before we came up. So that, clearly, as you probably know, stays in your system for quite some time. It doesn't just go away, so that would be my assumption there as why he tested positive. I never smelled any weed from him at all.*[231]

During the MBI Hearing, the majority owner testified about the difficulty in finding crew in the Pacific Northwest that did not use marijuana.

> *So, if we've had one guy who we know really well, we would send him up there and let him ride the boat up to Alaska, and say we're going to test you as soon as you get there. And until you get there, you can't take a watch. You can't -- you know, you can clean up the galley and you can do that, but you can't run the cranes or do any of the equipment. And we'll test you as soon as you get there. And you better pass, or else we're going to be out for a plane ride. And you're going to come right back.*[232]

The Marine Board does not believe there is enough evidence to suggest that the failed post-casualty drug test for one of the survivors indicating a positive result for the presence for THC was a direct contributing factor for the cause of this accident. However the Marine Board does note this as a "finding of concern" for the safety of operations of commercial fishing vessels. This survivor was filling a safety sensitive position as a navigation watchstander who was responsible for the safety of the entire crew and vessel while the vessel was underway at sea.

5.7.7. Oversight of the Crew for Medical Fitness by Management

Based on the size and tonnage of the SCANDIES ROSE, there was no regulatory medical fitness requirement for the crewmembers. None of the crew were required to hold a Coast Guard credential, nor did any of the crew hold a Coast Guard issued credential. If the Captain in particular had a Coast Guard credential he would have had to pass a rigorous medical examination at five-year intervals to obtain a Merchant Mariner Medical Certificate (Med Cert).[233] As part of the process of acquiring a Med Cert, the Captain's physical and detailed questionnaire would have been reviewed by medical professionals at the Coast Guard's

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[231] [redacted] CG Exhibit 136, Post MBI Interview, Pg. 47
[232] [redacted], MBI Transcript, Pg. 1592
[233] 46 CFR Part 10, Subpart C

National Maritime Center (NMC). If the gross tonnage of the SCANDIES ROSE was more than 200 GT, then the captain would have had to hold the appropriate Coast Guard credential and valid Med Cert which would have required him to meet the medical fitness requirements.

The owners of the SCANDIES ROSE had a procedure and a requirement for the crew to notify management of medical issues that might impact the safety of operations as well as prescription and over the counter drugs that an individual was taking when they joined the vessel. As part of the pre-season employment paperwork, the owners relied on the crew to fill out a two-page self-assessment document on their own medical conditions. They were also required to fill out a document allowing the release of medical information so that the vessel manager could follow up on any of the medical issues that were a concern to them. Those documents were signed by the crew and they could be provided to their medical provider for follow up information. On the accident voyage, all of the crew filled out this paperwork but this was not effectively received by vessel management personnel until after the vessel was at sea. This did not give any time for vessel management to accurately assess any issues identified and documented on the provided forms. In addition, this was a self-certification allowing crew members to omit any issues that might be prejudicial to their employment for the fishing season.

As part of this investigation, the medical forms for the accident voyage crew were reviewed. The results of that examination were that one crewmember was a diabetic and required insulin to control his diabetes. The Captain acknowledged wearing glasses, hearing issues, color blindness, frequent difficulty sleeping, and a heart condition described as a murmur. Management did not have any time to analyze any adverse impact from these medical conditions based on the pace of loading and the final crewing of the SCANDIES ROSE. In the course of testimony, the majority owner was asked if he was aware of these medical conditions for the accident voyage crew and, with the exception of his knowledge of the Captain's color blindness, he was not aware of these potentially risky medical issues.

The Coast Guard has a rigorous program for medical screening for mariners operating commercial vessels who hold credentials issued by the Coast Guard.[234] For a detailed explanation for medical competency, in general, for the commercial marine industry, see section 5.8.5. of this report. When specific conditions have been identified and resolved, the NMC may issue a Medical Certificate with a waiver that is required to be adhered to while the mariner is working. One example stipulated in the MMC booklet might be that the individual must carry a spare set of glasses; another might be that the mariner gets an echocardiogram at specified intervals for any related heart condition; yet another might be a requirement for the use of a continuous positive airway pressure (CPAP) machine while sleeping aboard the vessel.

The rigorous medical oversight of the personnel working on the vast majority of commercial vessels is similar to the medical oversight in other modes of the transportation system such as rail, air, and road transportation. However, because there are no Coast Guard credential requirements for commercial fishing vessels under 200 GTs there is no medical oversight. In

[234] COMDTINST M16721.48, Merchant Mariner Medical Manual

the course of this investigation, there were several commercial fishing vessel captains interviewed who operated vessels of similar size and type as the SCANDIES ROSE that, in fact, did hold valid Coast Guard credentials.

The managers of the SCANDIES ROSE and the Captain of the vessel had the means to examine the medical issues of the crew and to follow up with the medical providers should any medical issue be identified that might impact the safety of vessel operations on the accident voyage. However, the pressing need to load, crew, and depart for the fishing grounds resulted in the documents not being available to the vessel manager until after the vessel was underway and did not allow time for the manager to review or mitigate the risks posed by any medical issues before the vessel was at sea. The majority owner when talking about the issue of diabetes of one of the crew in testimony stated

> *Q. …prior to the accident, at what point did you become aware that one of the crew was insulin dependent?*
> *A. Did not. I did not become -- you know, if I would have found -- known that, I probably wouldn't have -- I probably would have put the kibosh on that. Yeah, at least I would have -- that would have been one that necessitated a call to a doctor, because I'm not that familiar with, you know, diabetes and the various problems with insulin.*[235]

The minority owner stated in testimony,

> *Q. Okay. Are there red flags though? So from the skipper -- from the skipper forms or from medical forms for the crew, if they do disclose a condition of some sort, does that play into the calculus of risk management for insurance?*
> *A. Well, I think it would play into that from the vessel owner's standpoint because that is one -- you know, we ask for a medical history questionnaire. And obviously if you look at the medical history questionnaire, and I'll make up a scenario, and it says I'm diabetic (indiscernible) you know, and I need insulin daily. Well, that's probably a conversation we would have with that captain and crewman saying this is probably not the job for you because what if we lose power, and your insulin can't stay refrigerated. You might want to look at something that's more shore-based versus being 30, 40 days out to sea at a time. So things like that absolutely we take into consideration and have that conversation.*[236]

Although the medial fitness issues detailed in the medical questionnaires for some of the crew members on the SCANDIES ROSE posed a risk to the vessel's operations, the issues identified were not a direct contributing factor and cause of this accident. This finding about the lack of effective oversight of the medical condition of commercial fishing crews is a "finding of concern" for the safety of operations of commercial fishing vessels in general.

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[235] Captain [redacted] MBI Transcript, Pg. 1949
[236] Mr. [redacted] MBI Hearing Transcript, Pg. 192

5.7.8. Contractor Support of the SCANDIES ROSE

The owners of the vessel engaged numerous contractors to support the operation of the SCANDIES ROSE. The Marine Board focused on work done by the Marine Surveyor, Naval Architect (Qualified Individual), and Welding Contractors in the year prior to the accident.

5.7.8.1. Marine Surveyor

The owners engaged the same highly experienced Marine Surveyor for the condition and valuation surveys dating back to at least 2001. The Surveyor conducted surveys at periodic intervals with the last one conducted in April, May, and June of 2019. The survey allowed the Surveyor to examine the vessel while the vessel was out of the water for maintenance. The scope of work did not include material and hull testing or operational testing of equipment. The survey makes a note about the scope of the inspection.

> *Extent of Inspection:*
> *1. The vessel was surveyed while hauled out and subsequently while afloat.*
> *2. The vessel engines and motors were not run or tested in any way, other than a visual inspection of the equipment and mounts.*
> *3. The water, fuel, oil and ballast tanks were not entered or inspected in any way.*
> *4. Sea suctions, valves and fittings were inspected internally as far as visible.*[237]

The surveyor maintained a running list of the equipment repairs, additions, and modifications on the vessel going back to 1998. There was hull thickness gauging conducted in 2003 and in 2012. Issues identified in those tests of the hull integrity were addressed. It is important to note that the purpose and scope of these surveys is not to verify compliance with any minimum standard.

Unlike an inspected vessel, the SCANDIES ROSE was not subject to regulatory oversight by the Coast Guard or an entity acting on behalf of the Coast Guard, such as the American Bureau of Shipping (ABS). Regulatory oversight generally includes examination of the material condition of the vessel hull and machinery, firefighting and safety equipment, personnel training, and emergency drills.

5.7.8.2. Naval Architect

The Naval Architect who attended the SCANDIES ROSE as the Qualified Individual specified under the stability regulations for commercial fishing vessels created stability reports for the vessel in 1988 and in mid-2019. The majority owner testified that he decided to conduct an update of the stability information and have a stability assessment conducted based on the stability issues raised after the sinking of the DESTINATION in the Bering Sea in February 2017.

[237] CG Exhibit 004, Pg. 35

After the incline test was completed, the majority owner received the report and relied on the Naval Architect, a professional engineer, for the accuracy of the calculations contained in the report and Instructions to the Master document. In testimony, the managing owner stated

> *Q. …Were there any issues or concerns that you had with the stability report that you received in 2019?*
> *A. No.*
> *Q. No?*
> *A. No. I mean, I'm a fisherman, I'm an educated fisherman, but I'm not a naval architect or an engineer.*[238]

In response to a question in testimony, the owner stated

> *Q. … in this letter it just says, "was a bit heavier," quote/unquote, but was there any correspondence, whether verbal or written, email, where he, where the PE indicated to you what a bit heavier was? Did he ever tell you what, by how much heavier?*
> *A. No, he did not, and I didn't ask.*[239]

Weight creep is a serious concern for vessel stability especially if the lightship weight is increasing for unknown reasons. Over a vessel's lifetime, modifications, changes in equipment, and the addition of gear add weight which changes the stability characteristics of the vessel. The DESTINATION ROI makes this statement which also speaks to the lightship weight increase

> *Without conducting a reassessment or updating the originally issued stability instructions to reflect these modifications and address weight creep, the vessel's loading constraints and operating restrictions became inaccurate and obsolete.*[240]

In the case of the SCANDIES ROSE, the Naval Architect brought the unexplained weight changes to the owner's attention. This should have triggered follow up discussions between the two parties to ensure that the increased weight was accurately accounted for in the final stability instructions. Additionally, there is no information available to determine if the owner(s) had a detailed discussion about this aspect of the stability instructions with the Captain.

Despite the managing owner's best intention in getting a new stability assessment and instructions in 2019, the Naval Architect's failure to conduct a complete and accurate incline experiment in accordance with ASTM standards, failure to verify downflooding points, and vague instructions to the master did not accurately reflect the stability characteristics of the SCANDIES ROSE.

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[238] Captain [redacted] MBI Hearing Transcript, Pg. 67
[239] Captain [redacted] MBI Hearing Transcript, Pg. 1941
[240] Coast Guard's Report of Investigation into the Sinking of the Fishing Vessel DESTINATION, https://media.defense.gov/2019/Mar/03/2002095494/-1/-1/0/REPORT%20OF%20INVESTIGATION%20FISHING%20VESSEL%20DESTINATION.PDF

5.7.8.3. Welding Contractors for 2019

While the vessel was in Seattle in mid to late-April 2019, arrangements were made to have a welding contractor, Aztec Welding, attend to the two starboard waste chutes, one fore and one aft. The plan was to rebuild the forward chute and to close off the aft chute. Both these chutes penetrated the main deck and also the side of the vessel above but close to the waterline. Aztec Welding personnel completed the welding work but did not conduct NDT as a quality assurance measure to validate the integrity of the welds.

In testimony, the vessel manager explained that in order to have NDT conducted for this particular type of work, she would have needed to request it from the welding contractor. With the absence of a Port Engineer, there was a skill set gap in the company and the vessel manager said that she did not request NDT be completed on the work being done to the starboard forward or aft chutes. During the MBI Hearing, the majority owner was asked about this welding work and he testified

> *A. ...But I was the one who ultimately said that, you know, let's hire Aztec.*
> *Q. So you said, let's hire Aztec, but did you check the work? Did you accept the work?*
> *A. Well I'm not a -- you know, in retrospect, we should have -- you know, I don't know why they didn't have nondestructive testing there. That was a, that was a mistake on my part. We certainly should have had it. But then the boat went up, and I didn't hear a thing about that void until* [redacted] *was coming in from king crab.*[241]

In the fall of 2019 while the vessel was underway having engaged in king crab season, the crew identified seawater leaking into the starboard pipe alley that was between the fish holds and the vessel hull which required attention. The crew of the SCANDIES ROSE had to go into the void to pump out seawater that was seeping through in the area of the starboard forward overboard waste chute. The Marine Board was unable to determine if any member of the crew checked on the condition of the welds of the aft blanked off starboard overboard chute to ensure its watertight integrity after the leaks were identified where the forward chute repairs were made.

On November 4, 2019, Captain [redacted] sent ashore cell phone labeled photos showing the rust-stained seams and requested a complete repair for this area of the hull, deck, and chute structure. When the SCANDIES ROSE reached Kodiak, arrangements were made to have a marine welding contractor make repairs and fabricate a new forward chute. The welding contractor, Highmark Marine Fabrication LLC, relied on American Bureau of Shipping certified welders and the accompanying procedures. Once they were able to remove the wasted steel back to good metal, the welder cleaned and prepared the vessel surfaces for fit up and welding. The welder then measured and built a new starboard forward chute, then welded it in place. After the welding was complete, the welds were inspected and a dye-penetrant NDT was completed in compliance with ABS standards.

[241] Captain [redacted] MBI Hearing Transcript, Pg. 1922

The work and subsequent NDT testing attested to the quality of the welding work replacing the starboard forward overboard chute.[242]

Figure 94 – SCANDIES ROSE on the blocks May 2019 at Lovric's Shipyard, Anacortes, WA. "Starboard waste chute" highlighted, with inset photo showing repaired waste chute as viewed from onboard the vessel, looking outboard. Inset photo, lower right, displays the completely rebuilt starboard waste chute as repaired later in 2019 by High Mark Marine certified welders in Kodiak, AK. (Source [redacted])

In the post-accident ROV underwater survey that was conducted, one of the several areas of concern was the starboard side of the vessel. With the vessel resting on the starboard side, it was not possible for the ROV to visualize the starboard side of the hull and, in particular, the areas of concern near the forward and aft overboard chute locations.

5.8. Human Factors

5.8.1. Pressure on the Captain to Sail

The business organization of the vessel management company and the relationship between the Managing Owner and the vessel Captain was such that there was ambiguity on who played what role in directing the movements of the vessel. This created direct and indirect pressure for Captain [redacted] to get underway on the accident voyage. During testimony, Captain [redacted] was asked to explain his relationship to vessel operations. On multiple occasions, Captain [redacted] asserted that the vessel's Captain was in charge of all actions or decisions related to vessel operations, but when asked if he was in a position to override operational decisions for the SCANDIES ROSE, he answered

> *A. Not a formal veto, but...*[redacted] *agreed that we should do it because we couldn't pass up the opportunity, if there was going to be rationalization, we would not want to be aced out of a fishery, a fishery that Scandies Rose had a tremendous history in, a long term history.*
>
> *If* [redacted] *would've then said to me well, I'm not fishing cod, I would've said well, actually, I kind of do have veto power at that point and I'll bring in another captain to fish cod and then you can get the boat back for opilio, but that would never happen.*[243]

According to the managing owner, the SCANDIES ROSE was going to fish for one trip of cod in order to make a delivery of that fish and establish a catch history and then immediately switch to fishing for opilio crab. The reason given was because the main quota

[242] The invoice date for the work performed by Highmark Marine was November 22, 2019.
[243] Captain [redacted] MBI Hearing Transcript, Pg. 33

share owners wanted the SCANDIES ROSE to fish for that species as it is a higher priced catch.[244] The managing owner was well aware of the Captain's fishing plan which was to stay in an area not known to be optimal for Pacific cod but instead, off of Akutan Island on the southern opilio crabbing grounds where there was still good cod fishing. This had a two-fold purpose—so that Captain [redacted] could get his cod catch in and also assess whether they could stay low in the Bering Sea close to Akutan Island and Trident Seafood's base. The managing owner had agreed with Captain's [redacted] fishing plan and reasoning, stating that the company would prefer to fish on the east side of St. George Island towards Akutan and Unimak Islands because there were fewer vessels fishing that area as the fishing had not been as good in previous years. Captain [redacted] indicated that Captain [redacted] was prospecting and making a short cod trip and he was hoping to find opilio crab at the same time as the pots were down for cod so he could stay south in the Bering Sea rather than transit to the fishing grounds northwest of St. Paul Island, which would have cost both time and fuel and would have reduced the voyage profits.

This was an important factor in the decisions of Captain [redacted] as he was a part owner of the SCANDIES ROSE and, as mentioned earlier, was in the process of purchasing additional shares from the minority owner. In purchasing these shares, Captain [redacted] was taking on additional debt but was also going to be able to have more say in decisions and collect more of the potential payoff from profit earned from fishing operations. On December 19, 2019 the Captain and Mr. [redacted] began negotiating for the purchase of his share of the vessel. The minority owner who was selling the shares testified that he received a call from Captain [redacted] on December 30, 2019, to finalize the sale of his share and that Captain [redacted] was "excited" and "he wanted to buy the shares for the boat for he and his son."[245]

The recent increase in the financial investment in the SCANDIES ROSE would have added additional pressure on and motivation for Captain [redacted] to get out on the fishing grounds to actively fish in the short available window to catch cod. At that point, every dollar earned meant something, because it meant he could pay off the debt and put more money into his investment. Captain [redacted] had a prearranged agreement with the majority owner, Captain [redacted] to make at least one cod delivery at the start of 2020 to establish a catch history on a fishery that did not historically make a significant profit. Captain [redacted] would have felt even more pressure to get this fishery over with so he could get to the more fiscally attractive opilio crab fishery.

5.8.2. Fatigue

The effects of physiologic fatigue on human performance and alertness are well documented. The IMO, which governs the majority of international maritime shipping, makes the following statement describing fatigue:

> *A state of physical and/or mental impairment resulting from factors such as inadequate sleep, extended wakefulness, work/rest requirements out of sync with circadian rhythms*

[244] Captain [redacted] MBI Hearing Transcript, Pg. 100
[245] Mr. [redacted] MBI Hearing Transcript, Pg. 165

and physical, mental or emotional exertion that can impair alertness and the ability to safely operate a ship or perform safety-related duties.[246]

Furthermore, the IMO states:

> *Fatigue is a hazard because it may affect a seafarer's ability to do their job effectively and safely. Importantly, fatigue affects everyone regardless of skill, knowledge and training. The effects of fatigue can be particularly dangerous in the transportation sector, including the shipping industry. All stakeholders should be alert to the factors which may contribute to fatigue, and make efforts to mitigate and manage the risks posed by fatigue.*[247]

The operation of the fishing vessel SCANDIES ROSE and other commercial marine vessels is similar in nature in terms of maneuvering, navigation, and basic seamanship. Similarly, fatigue impacts mariners on any vessel in the same manner. Life on a vessel such as the SCANDIES ROSE includes stress, exposure to extreme environmental conditions, strenuous manual labor, irregular eating and hydration habits, and other factors. These all contribute to overall fatigue and set the baseline for the recovery periods necessary to operate vessels safely. Sleep and resting is the essential physiologic process that counteract fatigue for personnel. At present, there are no work/rest regulations applicable to CFVs less than 200 GTs to reduce the risks posed by fatigued crews and, more importantly, prevent the degradation of critical decisions made by the crews.

A fatigue analysis was conducted in support of this investigation using a Fatigue Avoidance Scheduling Tool (FAST). The analysis examined sleep/wake (also referred to as work/rest) schedules provided by survivors, and interpreted for the Captain, in order to determine whether the basic physiologic elements (sleep duration, stability, sustained wakefulness, and time-of-day) were within appropriate tolerance limits on the accident voyage. It would be assumed that the rest of the crew that loaded the SCANDIES ROSE for the voyage would have had a similar impact from fatigue. The analysis for Mr. [redacted] one of the two survivors, demonstrated the mounting effects of long work periods and short sleep as the crew prepared to get underway for the accident voyage.

[246] IMO MSC.1/Circ.1598 24 January 2019 – Guidelines on Fatigue, Pg. 1
[247] IMO MSC.1/Circ.1598 24 January 2019 – Guidelines on Fatigue, Pg. 1

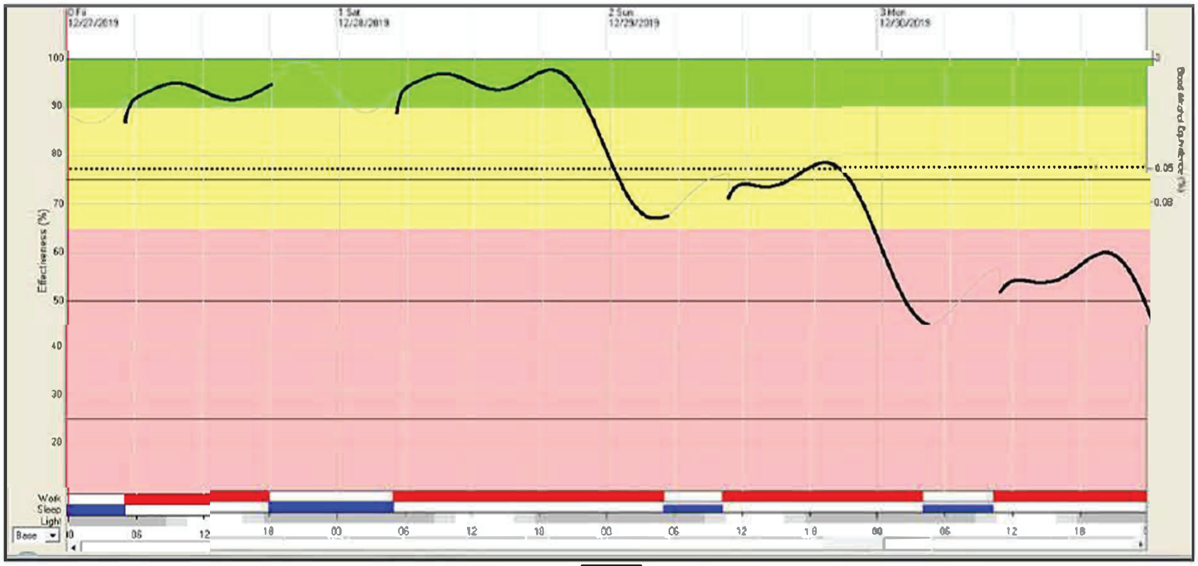


Figure 95 – FAST Analysis documenting the level of fatigue for Mr. [redacted] *based on his work/rest history examined in this investigation. (Source Coast Guard)*

The analysis, conducted by the Coast Guard's Office of Safety and Environmental Health, assumed good "effectiveness" level on day 1 as there was no previous data to consider. Even in the best case scenario, by the end of day 2, the member's effectiveness decreased as the sleep period was short and taken in periods of the day when the biological clock was not prepared for sleep. The analysis indicated that, at this point, an expected consequence on alertness and performance is comparable to someone under the influence of alcohol—at this level of 'effectiveness' this crewmember "would be expected to perform as well as someone with a blood alcohol equivalence of .05" as noted in figure 95, above.[248] Once the vessel got underway and was in transit to the fishing grounds, the analysis recognized that the member had more of an opportunity to get more rest, but some of those hours were not during hours when the body is used to sleeping so the sleep was not considered restorative. The analysis concluded that "any member who experienced a work schedule similar to Mr. [redacted] probably all the crew who participated in the preparation of the boat, would have experienced similar alertness and performance consequences."[249]

A FAST analysis for Captain [redacted] used second-hand information provided by survivors and witnesses who engaged Captain [redacted] prior to and during the voyage accident. Figure 96 shows the anticipated "effectiveness" levels for the vessel Captain assuming he had a more normal work day when in port but then stood six hours of watch and six hours off watch when the vessel was underway. This model was developed for a seven-day period to show the downward trend of effectiveness over time. This "six on/six off" schedule is common practice in commercial maritime world of work. However, that schedule is recognized to contribute to sleep debt since the longest main sleep period is approximately 5.5 hours. This is because while two sleep periods are possible over a 24-hour period, neither is long enough to accommodate 'full' sleep restoration.

[248] Coast Guard's Office of Safety and Environmental Health Fatigue Analysis SCANDIES ROSE, CG Exhibit 139
[249] Coast Guard's Office of Safety and Environmental Health Fatigue Analysis SCANDIES ROSE, CG Exhibit 139

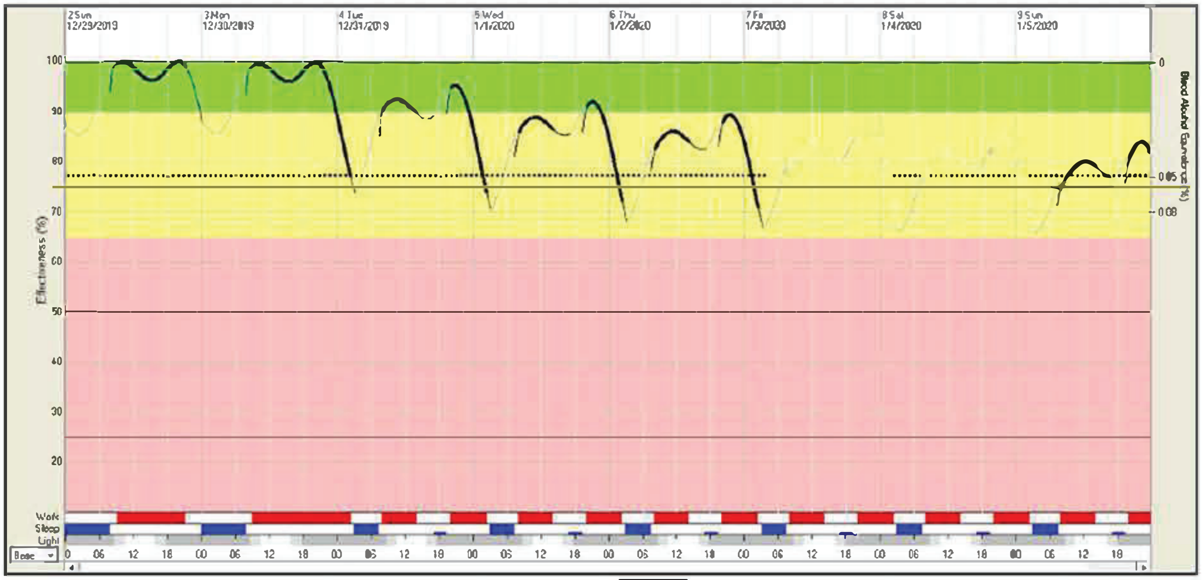


Figure 96 – FAST Analysis documenting the level of fatigue for Captain [redacted] *based on the information available to this investigation. (Source Coast Guard)*

The result of the effects of fatigue cannot be precisely determined but may have resulted in an impairment of the critical decision-making during the voyage transit for both the Captain and crewmembers during worsening weather and may have contributed to the failure to seek timely safe refuge before the vessel experienced a catastrophic loss of stability. It may also have contributed to the failure to recognize the dangerous conditions developing such as ice accumulation on the pot stack or other potential sources of list and their resulting consequence on the vessel—the decrease in stability. This delay in identification of the danger to the vessel and lack of further action to mitigate the loss of stability put the vessel and her crew further in extremis.

5.8.3. Failure to Identify and Mitigate Ice Accumulation

The exact amount of ice the SCANDIES ROSE crew observed during the accident voyage transit is unknown, but evidence indicates the vessel most likely accumulated excessive ice from freezing spray conditions. Modeling done by the NTSB produced estimates with an accumulation of ice between 6 to 15 inches on the vessel and associated crab pots at a rate of up to 1.6 inches per hour during the heaviest periods. The crew failed to associate the accumulating ice and the risks it posed to the vessel's stability in the later stages of the vessel's voyage. If there were other sources for the increasing starboard list, the crew did not investigate and identify those potential sources.

The goal of getting to the cod fishing grounds potentially caused Captain [redacted] to experience "fixation" in his role of operating the vessel. Fixation is a human factor where an individual is focusing all their conscience attention on a limited number of factors to the exclusion of all others. Once the decision was made to depart regardless of the dangerous forecasted weather, they maintained course and speed into steadily worsening conditions, bypassing a number of safe and protected areas where the vessel could have sheltered. Survivors did not recount discussions with the Captain about the possibility of sheltering, slowing, or changing course to avoid icing, but the decision was made to maintain course until the turn to the lee of Sutwik Island.

The Captain and crew were fixated on getting to the cod grounds, relying on their previous experiences, expectations, and confidence in each other without real-time assessment of onboard conditions. The crew relied heavily on the Captain's experience and trusted his decisions. Likewise, the Captain trusted the crew with operating the vessel regardless of his previous experience with them. Without watchstanding instructions or specific guidance to the crew on when to alert the Captain, the crew was left to their own judgement. Any one of them could have noted the deterioration of conditions or the beginning of icing during their watch and notified the Captain. The Captain could then have immediately assessed the situation and taken action to ensure the safety of the vessel and crew, including mitigation of icing. When the Captain took his final watch, he was immediately faced with dealing with a vessel that had a sustained list to starboard from an unidentified source, with freezing spray coming onto the starboard side and gale force winds on the starboard bow.

At no point during the transit did Captain [redacted] have the crew manually break ice off the pot stack in an effort to manage the vessel's stability.

Based on testimony, there was minimal ice build-up on the pot stack with estimates given of a maximum thickness of ice of 2 inches. From the vantage point of the wheelhouse windows on the starboard side of the vessel, the viewer forward would only be slightly higher than the forward top of the pot stack. During the subsequent ice accretion testing conducted at the U.S. Army Corps of Engineers testing facility in Hanover, NH on behalf of the Coast Guard RDC, it was difficult to measure the thickness of ice on a crab pot because the icing removes the frame of reference, the solid steel frame of the crab pot. Figure 97, below, illustrate the difficulty of accurately identifying the thickness of ice on a crab pot in the testing chamber. On board the SCANDIES ROSE, from the wheelhouse to the forward end of the pot stack was a distance of approximately 50 to 65 ft and it would be difficult to determine the thickness of the accumulated ice once a white sheet of ice began to cover the pots.

Figure 97 – These images demonstrate the difficulty in determining the thickness of ice in crab pots being subjected to freezing spray in a -15° F chamber during the ice accretion testing in September 2021. Left, a three pot stack with a significant accumulation of ice. Right, a ruler that is used to accurately measure the thickness of ice that uses the bottom of the three foot high crab pot as a point of reference to measure the thickness of the ice accurately. (Source Coast Guard)

Captain [redacted] had a number of potential opportunities to mitigate the risk of ice accumulation as a source of negative stability throughout the accident voyage. Despite numerous weather warnings, the unexplained list, observed heavier weather, and crew suggestions, he did not take action to mitigate ice accumulation.

Pressing onwards with the voyage in the early evening, the time for action to reduce this ice accumulation became increasingly limited as the vessel's list continued to increase to starboard. The options of reducing the list caused by icing or other potential sources were limited. Changing course, slowing earlier in the voyage or seeking shelter from the elements, or identifying and mitigating any other source of the list other than icing were becoming no longer viable options at this point in the transit. Captain [redacted] did not appropriately recognize the risk posed by the accumulating ice, acting wind forces on his vessel, and resulting loss of stability of the vessel and continued to make phone calls to friends. During this time, the list to starboard continued to grow. It was not until hours later that Captain [redacted] recognized the potential risk to his vessel as exemplified by the phone call made to the PACIFIC SOUNDER at approximately 9:15 p.m. Even at that point, when the vessel was experiencing a 20-degree list to starboard, he did not fully recognize the seriousness of the situation, declaring an emergency on the vessel and calling out the crew to prepare for immediate action, including the worst case to abandon the vessel. The Captain of the PACIFIC SOUNDER recalled that conversation, stating

> *And then we got into talking about Sutwik Island there and the bay. He was heading for the south side there. He was somewhere near the island. But then we discussed a bunch of other things, too, Christmas and fishing,…he estimated he'd probably be two-and-a-half days late because he had to get, get up behind the island and break ice and needed to get up behind and the wind was going 60, 70 knots, 20 degrees. And he was making his way up there, but -- so that's -- so that – we were discussing that. And he also told me that he had 195 pots on and had just recently done a new stability report on the vessel. And then we chatted about some other stuff. There was no urgency in the call at that time. And talking about him, he had just bought some more shares in the vessel and talked about the upcoming cod season and where I was fishing and, you know, things like that.*[250]

Captain [redacted] failed to determine the exact cause of the worsening vessel list. The evidence points to the ice buildup as a contributing factor to the vessel's starboard list. The off-going watchstander testified that he did not do a round of the engine room so he could not confirm the material condition of that space at approximately 7:15 p.m.. After Mr. [redacted] went below, he stated that he saw the engineer coming out of the engine room and assumed he was transferring fuel to correct the list but did not communicate with him to verify. As the Captain's last navigation watch commenced and starboard list increased, and Captain [redacted] focused on getting to the lee of Sutwik Island, he neglected to identify the cause of the list and to attempt to reduce the continued effects of the heavy freezing spray building on the vessel. At the time, the strong winds were acting on the vessel's starboard side, essentially

[250] Captain [redacted] MBI Hearing Transcript, Pg. 799

propping it up and counteracting the real list of the vessel caused by the building ice accumulation or other possible cause of list on the starboard side.

Not taking the opportunity to identify, navigate to, and anchor in a sheltered area, as other vessels did, earlier in the day to avoid anticipated deteriorating weather and heavy freezing spray and subsequent ice accumulation, placed the vessel in a considerably reduced stability condition that ultimately resulted in a catastrophic loss of stability.

It is unclear if taking action and manually removing the accumulated ice weight from the pot stack and superstructure of the SCANDIES ROSE at 7:15 p.m. would have stabilized the vessel's stability condition enough to keep it from capsizing on the accident night or if the situation was already too far in extremis at that point of the voyage. However, Captain [redacted] made an error in decision-making based on an inaccurate expectation that he could make it to the shelter of Sutwik Island. This human error, inaccurate expectation, is a factor when an individual expects to perceive a certain reality and those expectations are strong enough to create a false expectation of a certain reality. In this case, he expected that if he could just make it to the lee of Sutwik Island he would be better positioned to have his crew get out on deck and manually break ice off the pot stack. However, in making a starboard turn towards the lee of Sutwik Island without previously determining the cause of the list, Captain [redacted] put the 60-70 kt northwest winds on the SCANDIES ROSE's port side in the course of turning, which further exacerbated the starboard list and was most likely the catalyst for downflooding and sinking.

As the weather conditions and vessel stability deteriorated, he did not take timely action to reduce the ice load or discuss the last ditch option of removing some of the chains securing the crab pot stack and dump some of the pots over the side to reduce topside weight.

5.8.4. Misperception of Environmental Factors and Developing List

The Captain and crew misperceived environmental factors acting on the vessel when the strong winds on the starboard side counteracted the listing of the vessel to starboard. It should have been apparent to any of the crew that the source of the starboard list was not the wind and the listing was due to some other cause. The pronounced list that eventually developed late in the accident day began to occur gradually as the weight of the ice built on the forward starboard side of the vessel. The stability instructions to the master warned

> *Always determine the cause of any list before taking corrective action*[251]

In the case of the SCANDIES ROSE, it is most likely that the primary cause of the list was the accumulation of ice on the starboard, forward portion of the pot stack. However, it is possible that the accumulation of water and ice on the deck inside the vessel's bulwarks decreased the freeboard and seriously increased the list that led to a dangerous angle of heel that allowed downflooding into the engine room. It is also possible that there were other causes of the list which were not identified or addressed by the Captain or crew. Based on the

[251] CG Exhibit 036

MSC analysis of the SCANDIES ROSE, that angle for the loaded draft would be approximately 35 degrees.

In another major marine accident, the American steam ship EL FARO which was sunk in a hurricane in October 2015, the initial listing of the ship was not identified and acted on by the crew on watch. The crew persons on watch did not identify the slow building of a list up to approximately 4-degrees to starboard during the final stages of the accident voyage. It was only after a crew person not on watch came up on the bridge and mentioned the list of the ship, initially attributed as wind heel and a new mate, the Chief Mate came on watch that the sustained list and the potential danger of this list became apparent. Onboard the SCANDIES ROSE there does not appear to be a correlation between the reported two degrees of list and the weight of the icing, both on the starboard side by the last two watchstanders before the Captain took the final navigation watch. A discussion then took place about the icing but not about the cause of the list.

Ultimately, the failure to identify the source of the list led the Captain and crew to make decisions without complete information. In this case, simply sending someone to investigate all spaces on the vessel could have identified potential flooding sources that may have been mitigated without putting crew in danger from the outside elements.

5.8.5. Medical Conditions for the Accident Voyage Crew

In almost all cases, commercial mariners other than those operating fishing vessels less than 200 GT are required to have a detailed physical to enable them to hold a credential or license. This ensures the medical fitness of these individuals to ensure the safety of vessel operations on critical waterways of the United States and far at sea. The required physical is performed by a medical doctor and entails a thorough medical examination, detailed medical history and listing of all prescribed medications as well as over the counter medications and supplements. There can also be a testing of physical ability to perform the duties of the rating or license, such as using a fire hose, dragging a person, opening and passing through small openings like hatches and scuttles. The determination of medical fitness for most ratings other than First Class Pilots is at an interval of five years on renewal of the credential.

In the case of credentialed mariners, medical conditions that pose a risk to operations such as cardiac conditions, epilepsy, vision, hearing and other conditions are closely scrutinized and determinations are made if that mariner can safely work on a vessel and in those cases waivers and special conditions may be imposed. In the more serious cases of medical conditions a person would be denied a credential. As a more typical example, in the case of a mariner with poor eyesight and prescribed eyeglasses, the waiver that is printed in the credential may require the mariner to carry a second pair of those glasses when onboard a vessel. Prescribed medications that impair functioning are carefully scrutinized and a determination is made if that mariner can safely operate or serve on a vessel while under the effects of this medication. In the case where a medical certificate is required for a mariner, the Coast Guard will then issue or add the appropriate documentation to the mariner’s credential after a full determination has been made of the individual’s medical fitness to serve.

Neither the crew nor the captain of the SCANDIES ROSE were required to hold any mariner's credential and were, therefore, not required to undergo any medical vetting to ensure that they could safely operate onboard a vessel. The Captain of the SCANDIES ROSE reported that he had frequent difficulty sleeping on the self-certifying forms supplied by the vessel manager. He also had a host of other medical issues and on December 30, 2019, he went to a Kodiak based medical facility with a skin condition and was treated. Another crewmember listed a medical condition, diabetes, for which he was insulin dependent. The managing owner as well as the vessel manager, whose primary responsibility was to manage personnel records, were not aware of these medical conditions for the crew of the vessel, with the exception of the Captain's color-blindness. Despite the late arrival of the forms for the accident voyage, the company was not aware of significant medical conditions of several of the crewmembers based on medical forms previously submitted. It is not known if these crew medical evaluation forms and the accompanying medical release for further information forms were ever used as a proactive management tool for ensuring the safety of the SCANDIES ROSE operations. Without a determination of medical fitness for service by a medical professional, there is no way of determining if a listed medical condition, or use of over-the-counter medications or supplements, may have contributed to the accident.

Medical conditions that affect safety of operations and safety of the crew of commercial fishing vessels which operate far from shore in a historically dangerous marine environment are not presently evaluated by medical professionals working on behalf of marine employers for vessels similar to the SCANDIES ROSE. This creates a latent unsafe condition for an entire fleet of vessels, and while not a direct contributing cause to this accident, this is a "finding of concern."

5.8.6. Potential for Impairment of the Crew of the SCANDIES ROSE

The commercial fishing vessel industry is not broadly subjected to drug and alcohol testing as a preventative safety measure. By regulation, commercial fishing vessels over 200 GT require Coast Guard credentialed mariners in certain positions such as masters, mates, and chief engineers. Those vessels are required to have a drug and alcohol testing program in place for crewmembers.[252] The requirements for drug testing include pre-employment, random testing of the crew, post-casualty, and reasonable cause. For CFVs under 200 GT, there is no requirement for a marine employer to establish a drug/alcohol testing program. However, CFVs of this gross tonnage still have to meet post casualty drug and alcohol testing requirements as described by 46 CFR 4.06.

The Coast Guard has evaluated the use of substances that may alter or impair human performance, decision making, and judgment and formulated policies such as NVIC 04-08 (C-2 to Medical and Physical Evaluation Guidelines for Merchant Mariner Credentials). The Coast Guard's posture on all substances that may impair cognitive abilities such as drugs, alcohol, or medications or the use of dangerous drugs is summed up in the quote from the NVIC

[252] Crewmembers as defined by 46 CFR 16.105

The nature of shipboard life and shipboard operations is such that mariners may be subject to unexpected or emergency response duties associated with vessel, crew, or passenger safety, prevention of pollution and maritime security at any time while aboard a vessel.[253]

In the case of the SCANDIES ROSE, there were no required Coast Guard credentialed personnel for the vessel nor were there any credentialed crew onboard at the time of the accident. Thus, the owner was not required to have a drug-testing program in place. However, the company did proactively require pre-employment drug testing. The Marine Board reviewed evidence attesting to the two new crewmember's pre-employment drug tests. One of the pre-employment tests was completed at a certified laboratory. The laboratory results documented clear indication of [redacted] first crewmember. The other crewmember was tested onboard using a home test kit. Based on testimony from the vessel manager and evidence submitted to the company in way of photos from the Captain over text message, the crewmembers' drug test reportedly indicated [redacted] [redacted] [redacted] for which were tested. However, the Marine Board was unable to confirm the test results using the photographic evidence or testimony provided.

The company did attempt to meet the post-casualty drug testing requirement to the best of their ability given the remote location and limited testing facilities. To meet the requirement, the company utilized home test kits that were administered at a private residence. Evidence shows that the same crewmember who was tested onboard for pre-employment, using similar home test kit, [redacted] post-accident. The post-accident tests were not DOT approved and were not conducted under laboratory conditions. Furthermore, the [redacted] was not validated as recommended by the manufacturer of the test kit.

Due to the results of the post-accident drug tests, the Marine Board cannot rule out the possibility that one of the crewmembers, who stood a navigational watch, may have been impaired during the accident voyage.

5.8.7. Lack of Established Vessel Procedures

The Marine Board could not locate any written procedures to be used on the vessel (formal or informal) specifically for the safety of operations. Some safety related procedures would include watchstanding, voyage planning, and others. A good example is a procedure for ensuring watertight integrity was maintained which was also part of the stability instructions to the master, created in 2019. Some examples on the accident voyage would include creating an alleyway in the pot stack to access the bow, closure of watertight doors or hatches such as the hatches to the pipe alley voids that run alongside the holds, and donning of immersion suits by entire crew during the pre-departure training. There is no evidence that there were established procedures for ensuring the watertight integrity of the vessel.

During the accident voyage, at least one hatch, the after one into the starboard pipe void, was reported to have been left open while the SCANDIES ROSE was underway. However, the hatch should have been normally closed to maintain watertight integrity for such a large

[253] Coast Guard NVIC 04-08 (CH-2), dated April 25, 2016, Pg. 73

space in the interior of the vessel and to remain in compliance with the stability instructions for the master dated May 29, 2019.

> *The master, of the vessel is responsible for maintaining watertight integrity at all times and to exercise prudent seamanship, giving consideration to the season of the year, weather, sea and ice conditions.*[254]

5.8.8. Verification of Crew Competency

Within the [redacted] Management/Scandies Rose Fishing Company LLC organization, the identification and hiring of crew persons was almost exclusively done by the Captain in this case for the accident voyage. In testimony, the managing owner stated that while he did have "ultimate veto power," hiring of crew was "really up to the captain."[255] The vessel manager plays a role in the pre-hiring administration, though that responsibility was shared with the Captain and the details on who does what is not clearly defined in any written procedure. In testimony, the vessel manager further explained about hiring

> *I do some vetting and he does some vetting. And usually it's he calls me and says hey, [redacted] -- I want to hire [redacted] get him hired. And if he hires them off the dock, then he'll do all the paperwork and send it to me.*[256]

This shared roles and responsibilities for hiring of crewmembers extended to processes like pre-employment drug testing, which in the case of non-Coast Guard credentialed mariners was a proactive policy of Scandies Rose Fishing Company LLC. If a new potential crewmember was hired in advance of a fishing trip and there was enough time, the vessel manager will send them to a certified drug testing location if one was available. However, if this was a last minute hire or the drug testing facility was not available such as in a remote location in Alaska, the company would and did utilize over the counter home drug testing kits to meet the company requirement for pre-season drug testing.

Leading up to the accident voyage, there was significant discretion given to the SCANDIES ROSE Captain in his selection of the crew. Two new hires got on board and they did not receive familiarization for onboard systems including the vessel's navigation equipment. From the time these new crew members were hired to the time of the accident, there were few interactions between the survivors and the Captain. One survivor testified

> *I didn't really have too many interactions. I mean, it was -- I could count on one hand the amount of times I was actually in the same vicinity speaking around or at -- or with him.*[257]

[254] CG Exhibit 036
[255] Captain [redacted] MBI Hearing Transcript, Pg. 40
[256] Ms. [redacted] MBI Hearing Transcript, Pg. 124
[257] Mr. [redacted] CG Exhibit 136, Post MBI Interview, Pg. 13

Despite having never sailed with them before, Captain [redacted] assumed that the new crewmembers had the knowledge to stand the navigation watches and utilize all the navigation related equipment in the wheelhouse. Mr. [redacted] testified

> *Q. ... so would you say that approach, was that any different than any other experiences you've had on a fishing vessel or is it kind of a similar attitude towards the weather?*
> *A. No. If I put it this way, you know, I've had people ask me, why didn't you say something, like, you know, suggest that maybe we shouldn't leave, you know? And I, I always laugh about that. I'm like, that's not what you're hired for. You're hired as, you know, like I said, from the neck down. And you get that reputation as being that guy that didn't have, you know, the, the balls, if you will, I guess, to go. That sticks with you, and good luck getting a job on another boat. So no one's, no one's ever brought that up. You don't, you don't do that.*[258]

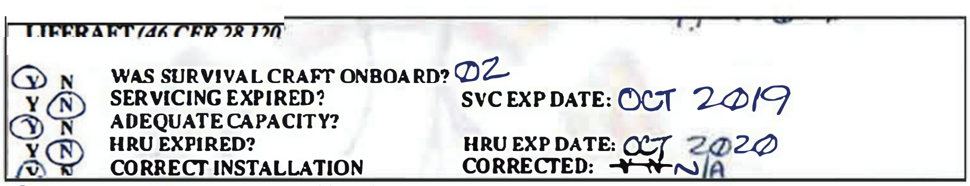
Standing a navigation watch while underway with the crew below and asleep is an essential operational and safety related duty. It requires familiarization and a level of understanding of the Captain's expectations before assuming such duties.

The other crew had served with the Captain and on the vessel and there was a presumption that they knew what the expectations were for standing the navigation watches based on the time they served aboard and the familiarity with the vessel and its equipment. Due to the pressure of getting underway to the fishing grounds late, Captain [redacted] did not ensure that the two newest crewmembers had enough understanding of the vessel itself, the equipment, or the potential impact of the hazardous weather and icing that might affect the SCANDIES ROSE. Neither survivor testified that the Captain assessed their competency to stand a navigation watch.

5.9. Adequacy of Lifesaving and Relevant Safety Equipment

5.9.1. Stowage and Access to Survival Rafts

The SCANDIES ROSE received a Safety Compliance Check conducted by the Coast Guard on October 11, 2019. The examiners used the Sector Anchorage Safety and Compliance Check form. A portion of that form is shown in figure 98, below:


LIFERAFT (46 CFR 28.120

Y N WAS SURVIVAL CRAFT ONBOARD? 02
Y N SERVICING EXPIRED? SVC EXP DATE: OCT 2019
Y N ADEQUATE CAPACITY?
Y N HRU EXPIRED? HRU EXP DATE: OCT 2020
Y N CORRECT INSTALLATION CORRECTED: N/A

Figure 98 – The liferaft portion of the October 11, 2019 Safety Compliance Check. (Source CG Exhibit 038, with clipped portion displayed)

The form directs the inspector to check the liferafts and their launching apparatus. The SCANDIES ROSE carried two eight-person liferafts, which was double the required number of rafts and was a proactive decision by the vessel operators or owners. During the safety

[258] Mr. [redacted] MBI Hearing Transcript, Pg. 549

compliance check, it was noted that the liferafts were compliant, but one of them would be due for servicing soon and arrangements were later made to have that raft serviced. That raft was serviced and ready for shipment December 1, 2019. Both rafts were compliant for the accident voyage. The Hydrostatic Release Unit (HRU) was not expired, and the rafts were installed correctly.

The successful deployment of both of the rafts during the sinking event was attributed to the proper servicing and mounting of the rafts on top of the wheelhouse of the SCANDIES ROSE. In mounting these self-deploying rafts, it is critical to ensure that the raft painter[259] is affixed according to specifications so the weak link will break and release the raft, as designed, as the vessel sinks. Failure to properly install and configure the associated releasing gear could result in the inflated raft being drawn downward with the sinking vessel and potentially being rendered useless by improper mounting in the storage bracket. In testimony, Mr. [redacted] the liferaft technician, made the following statement with regards to the criticality of properly tying the painter to the vessel

> *We try to show them, but they hook up that liferaft to that hydrostatic, that vessel goes down, and it's 2 o'clock -- those vessels happen to go down very, very quickly, and it's never on a nice day, you know, 8 o'clock, you know, 6 o'clock in the afternoon; they've got time. It's usually very dark, extreme weather, they have to act very quickly. And if they secure that painter line to the vessel, and that vessel goes down, that liferaft will go down with that vessel. So knowing where to -- how to cut -- your knife, cut yourself free, that's a major, that's a major thing that they have to know.*[260]

Both of the two eight-person canopied liferafts deployed properly and floated to the surface following the capsizing and sinking of the SCANDIES ROSE. Once at the surface, they were ready for boarding with a sea anchor deployed and the water bag stabilization below the raft bottom keeping them upright with the exterior canopy flashing light marking their locations. Fortunately, after the sinking, the rafts and the survivors drifted to a point in relative close proximity to each other allowing both survivors to board the same raft using the attached boarding platform to assist the survivors getting into the raft. The other raft was found empty by the helicopter when it arrived on scene. Based on the evidence and the witness statements, it is believed that the SCANDIES ROSE was in compliance with regulatory requirements regarding the Stowage and Access of the Lifesaving Equipment outlined in 46 CFR Part 28.

5.9.2. Survivor Raft Canopy Light Failure

One survivor recalled that at first the liferaft he was in was illuminated by an interior light and that about ten minutes after boarding the raft the light went out. Both liferafts were serviced at a servicing facility in compliance with the regulations for maintaining and inspecting the rafts. Certification was issued attesting to the servicing of the rafts. It is unclear why the light failed in the 30 ft seas and high winds, but the raft was subject to extreme external forces when the vessel sank. The Coast Guard pilot that testified in the hearing stated that the unoccupied raft was located by its canopy flashing light. Once in the raft, the survivors could open the survival equipment pack which had a D-cell waterproof

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[259] A "painter" is a towing or tie-up line for a small boat.

[260] Mr. [redacted] MBI Hearing Transcript, Pg. 1172

flashlight and spare bulb and batteries. This flashlight was used by the survivors to locate emergency supplies and then to signal, with a side-to-side motion, the searching rescue helicopter.

5.9.3. Use, Stowage, and Access to Survival Raft Equipment

Both survivors expressed concerns regarding the difficulty of accessing the survival equipment package and its contents located by the canopy door into the raft. The liferaft was half full of seawater, the night was dark, and the environmental conditions severe. With the force of the sea and wind trying to overturn the raft, some of the objects in the bag sank to the bottom of the raft and some items floated, making it hard for the survivors to get what they needed.

Figure 99 – Image showing the raft equipment bag, indicated by the yellow arrow that is lashed to the floor of the raft near the boarding area. On the left side of the figure there is an example of a D-cell flashlight stored in an equipment bag. (Source Marine Safety Services, Inc.)

One of the survivors suggested using light emitting diode (LED) type lighting for the supplied lighting devices to ensure a greater reliability of the lights and more illumination in the raft which could increase the potential for detection by rescuers. LED lights generally use less electrical power and are more robust than incandescent bulbs.

The survival raft had six hand flares, four parachute rocket flares and two floating smoke signals. Mr. [redacted] testified that he had significant problems working the rocket flares with his immersion suit gloves on. In general, he stated that it was next to impossible to use almost anything in the survival kit with the immersion suit on. To remove a part of the immersion suit to give a wearer more dexterity with their hands would have defeated the protective and insulating properties of the immersion suit. Mr. [redacted] testified that he was eventually able to fire off the rocket parachute flares despite the difficulty.

5.9.4. Contents of Survival Equipment Package

According to the most recent Coast Guard dockside examination and vessel liferaft records, the SCANDIES ROSE's route consisted of Coastal Waters, traveling 100 NM beyond the boundary line with a seven-person crew. This required the vessel to be equipped with at least one SOLAS A eight-person liferaft. Each liferaft maintains a "SOLAS A" equipment pack. The vessel was equipped with two SOLAS A 8-person liferafts.

The survival equipment pack is contained inside the folded liferaft near the canopy entrance and once the liferaft is inflated, can be accessed by the survivors. The survival pack is intended to help the occupants survive for a short duration of time prior to rescue and is not intended for survivors to experience a long duration at sea. Standard SOLAS A equipment contents include:

Life Raft Equipment in SOLAS A Raft **Scandies Rose was equipped with this type of raft and equipment** NOTE :Items in **BOLD** are mentioned in testimony			
Sea Anchor(Automatically Deployed)	Floating/Heaving Line (Length 100 ft.)	Rain Water Collector	Floating Knife
Waterproof Equipment Bag	Raft Use Instructions	Individual Thermal Protective Aids (2 ea.)	Paddles
Manual Inflation/Bilge Pump	Repair Clamps (6 ea.)	Adhesive & Patch Repair Kit	Sponges (2 ea.)
Graduated Drinking Cup	Fishing Kit	Can Opener	Seasick Bags (1 Per Person)
Water Storage Bag	Thermal Protective Aid	Signal Mirror	First Aid Kit
Signaling Whistle	Anti-Seasickness Pills (6 Per Person)	Spare Sea Anchor	Food Ration (10 Kilo-Joules Per Person)
Drinking Water (6-20 Person Capacity – 1½ Liters Per Person)	Bailer	Spare Flashlight "D" Cell Batteries (3 ea.)	Spare Flashlight Bulb
SOLAS Parachute Distress Signals (4 total)	**SOLAS Red Handheld Distress Signals (6 total))**	**SOLAS Smoke Signal (2 total)**	**Waterproof Flashlight**

Figure 100– Table discussing the requirements for a SOLAS A pack as found in the SCANDIES ROSE liferafts. (Source Coast Guard)

Many of the current requirements for survival craft equipment were developed in the 1950s and 1960s and have not been significantly updated since they were published. There have been significant improvements in survival products, including personal locator beacons (PLBs) or transponders for the rafts, which would greatly improve the odds of detection and survival.

There is a current proposed rule (USCG-2020-0107-0001), addressing changes needed for survival craft equipment changes. The rule primarily focuses on small passenger vessels inspected under CFR Subchapters T and K, but the current proposed rule also addresses the contents of SOLAS A equipment packs. The proposed rule highlights the fact that the specifications for the survival craft packs are outdated to the point where they are more cumbersome for manufacturers than they are beneficial. As such, the proposed rule will deregulate the type approval (specifically Coast Guard approval) of inflation/bilge pumps, compasses, first-aid kits, fishing kits, hatchets, knives (including jackknives), mirrors, sea anchors, and emergency drinking water. The new regulation would align some of these items with standards found in International Life Saving-Appliance (LSA) Code[261] by incorporating by reference applicable International Organization for Standardization (ISO) standards. If the manufacturer can meet those applicable ISO standards for the product, they would be able to use them in the liferaft. The traditional Coast Guard type approval would no longer be listed in the regulations for certain items listed as equipment in the rafts and this process might result in improvements in survival equipment design.

5.9.5. Visual Signaling Devices

Shortly after entering the raft and gaining access to the survival equipment storage bag, the survivors fired off three and then a fourth rocket flare with parachute. They struggled in the dark, waist deep water to find one of the flares that sank to the bottom of the raft floor. The Survivors recounted that they did not see or hear any nearby vessel when they fired the flares; and with that, they had used all of the most powerful night distress flares. The survival equipment bag also had six hand-held red flares that they could have used to attract attention but in their testimony they did not seem to be aware of these additional flares that they could have used.

Approximately four hours after boarding the raft, the survivors saw a bright white light in the vicinity of the other unoccupied raft, a distance away. Initially, the survivors thought this was the masthead light of a ship and they began to wave the battery-operated flashlight from side to side to attract the potential rescuer's attention. The crew of the Coast Guard rescue helicopter had determined that the other raft was empty and the co-pilot spotted the unmistakable side-to-side motion of the light that the survivors were waving. This signal stood out as one being made by people. An object with a fixed light in the 30 ft seas would have risen and fallen and not indicated survivors signaling to attract the attention of the rescuers.

5.9.6. Immersion Suits

The immersion suits on the SCANDIES ROSE were equipped with a whistle, strobe light, reflective material, and an inflatable high rider ring to provide increased buoyancy for the wearer's upper body. The suits were stored in a cabinet in the wheelhouse and there were also two suits located in the Captain's cabin as stated in the Condition and Valuation Survey dated 2019. The SCANDIES ROSE was equipped with six adult universal, three jumbo, and

[261] The International Life-Saving Appliance (LSA) Code is an IMO publication dealing with the manufacturing, testing, maintenance and record keeping of life-saving appliances.

one intermediate immersion suits. The extra-large "jumbo" immersion suits were stored in a green bag while the other suits were in orange bags.

Prior to leaving Kodiak, the crew had participated in the required drills and one person was instructed to put on an immersion suit. As the new crewmember onboard, Mr. [redacted] was directed to demonstrate the proper donning of a survival suit while the rest of the crew observed. There is ambiguity in the guidance and regulations when discussing pre-departure drills revolving around the "donning" of immersion suits. In the case of the SCANDIES ROSE, only one crewmember practiced donning the immersion suit and it is not known when the last time other crewmembers actually donned an immersion suit.

Figure 101 - Composite of photos of one of the survivor's actual survival or immersion suit. The yellow arrow indicates the manual inflation tube for inflating the bladder to assist upright floatation. Mr. [redacted] is wearing the suit in this demonstration. (Source CG Exhibit 103 composite with mark ups)

The proper donning of an immersion suit takes time and training to ensure that the suit is put on quickly and properly to ensure survival in an emergency. When a vessel is listing severely or sinking, there may not be ample time for the crew to assemble, understand the nature of the emergency, put on the immersion suit, and then, with restricted motion, move to a point where they can abandon the sinking vessel. This was the case on the SCANDIES ROSE, when the vessel suddenly lurched to starboard at twenty degrees without warning. The crew was left to put on the suits while struggling to find any horizontal surface or means of supporting themselves, like wedging themselves against a fixed bridge chair. Once in the suits, they would have to climb up a sloping deck and escape the wheelhouse.

Based on the testimony of the survivors, each of the survivors properly donned the correct size immersion suit and ensured that they were properly closed up to prevent hypothermia as per instructions. The purpose of a survival suit is to protect the wearer and insulate that person from dangerous cold-water immersion while affording floatation. To assist with the flotation there is an air bladder in the upper torso area of the suit that would be manually inflated after the person entered the water. This puts the wearer in a more upright position and provides additional buoyancy. The suits are made of neoprene and fully encapsulate the wearer except for portions of the face to protect the wearer from the effects of hypothermia.

The survivors noted that manual dexterity was limited while wearing the suit. The ability to use a person's hand to open items in the equipment bag and grasp objects is severely compromised, as the suits have a three-finger mitten style hand covering which is permanently connected to the arm structure of the suit. The tradeoff between dexterity and hypothermia protection is a design challenge and these suits conform to existing regulations in terms of design and construction. However, the survivors were able to get to the inventory of the equipment pack, launch flares, and signal the rescue helicopter with a flashlight. It appears they successfully completed these tasks despite the difficulty with manual dexterity and the immersion suits functioned as intended protecting them from moderate to severe hypothermia.

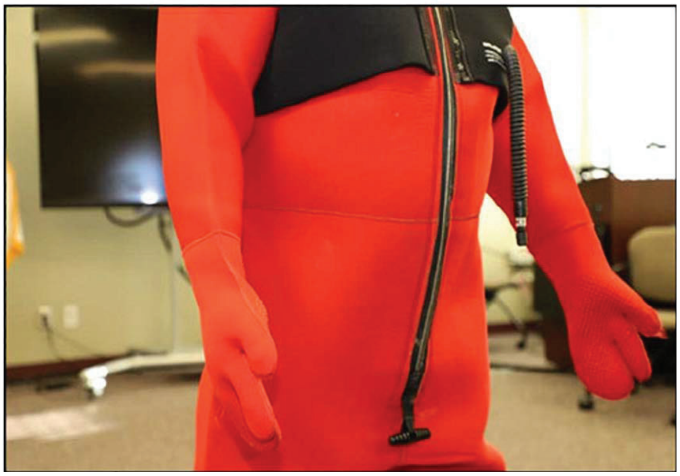

Figure 102 – SCANDIES ROSE survival or immersion suit showing the three-finger glove which is attached to the neoprene arm of the suit. The three-finger glove protects the hand from hypothermia but compromises manual dexterity for tasks like opening buckles or activating flares. (Source CG Exhibit 103)

The proper sizing, donning, and wearing of the survival suits ensured the survival of the two survivors after being in a water-filled liferaft with 10° Fahrenheit air temperature and 38° Fahrenheit seawater temperature for four hours and then the flight back to Kodiak in an unheated helicopter cabin. They were treated at a local hospital for mild hypothermia and released without being admitted. Mr. [redacted] properly demonstrated donning his immersion suit post-accident for the Sector Anchorage Investigation division and again in the presence of the Marine Board. Mr. [redacted] also properly donned his immersion suit in the presence of an investigating officer in Kodiak, AK. These were both the same immersion suits that they used the night the SCANDIES ROSE sank. In demonstrating the wear of these suits and examining the suits, the Marine Board was able to confirm that the suits were both in good condition, and appropriately sized for each of the survivors.

5.9.7. Emergency Position Indicating Radio Beacon (EPIRB)

Based on the safety compliance check and other evidence, the SCANDIES ROSE had an EPIRB aboard that was compliant with regulations. The vessel managers did successfully submit the application to NOAA to register their EPIRB, complete with the required information, and the EPIRB data was maintained in the NOAA database. This data included shore side telephone and email contacts and other critical information for the SCANDIES ROSE to assist rescue forces.

The SCANDIES ROSE EPIRB was not located. It was not located on the surface of the water or in the underwater ROV survey. The February 2020 ROV survey discovered the EPIRB storage bracket empty with no sign of the EPIRB or its painter or lanyard. Examining the ROV photos did not provide any conclusive evidence to suggest what happened to the EPIRB during the accident.

Figure 103 – Image of the empty EPIRB housing mounted inside the top rail on the port side behind the wheelhouse of the SCANDIES ROSE taken during the ROV underwater survey mission and photographed at the angle the EPIRB bracket was found on the seafloor. (Source CG Exhibit 008)

The EPIRB on the SCANDIES ROSE was stored in a plastic housing attached to the handrail behind the wheelhouse on the port side. The EPIRB would have activated in either of two ways: (1) when it was released automatically using the installed hydrostatic release unit when the vessel sank, or (2) manually activated by the crew by removing the EPIRB from the bracket and pressing a button to activate. In either method, once activated, the EPIRB would establish a link with the satellite and transmit a distress signal to shore that would indicate the distressed vessel's name and geographic location as well as other information.

The two survivors indicated in their testimony that the Captain of the SCANDIES ROSE may have tested the EPIRB prior to getting underway although their testimony as to the extent or success of the test is unclear. The EPIRB device has a self-test function and when that self-test is initiated there are LED lights which alert the tester that the unit is functioning correctly. Also, when a device like this one is tested it sends the test to a satellite and then to shore where that self-test can be noted in computer data records, such as those maintained by NOAA. There is no evidence that this self-test was done immediately prior to departure. One witness mentioned that the Captain was worried that he accidentally sent a distress signal during the testing during some earlier time.

The lead Coast Guard safety inspector for the SCANDIES ROSE's Safety Compliance Check in October stated that he saw the EPIRB and the hydrostatic release for that device were within expiration date.

On the night of the accident, the EPIRB did not transmit a distress signal for the SCANDIES ROSE. Witnesses speculated that the Captain of the SCANDIES ROSE or one of her crew may have brought the EPIRB into the wheelhouse as they prepared the crew for abandoning the vessel. If the EPIRB was in the wheelhouse at the time of the sinking, it would have been activated by immersion in the surrounding seawater, but it would not have had the clear line of sight from the antenna that it needs for the electronic distress signal to reach a satellite. Based on testimony that indicated that the SCANDIES ROSE sank rapidly on its starboard side and then finally bow up, a plausible explanation as to why there was no EPIRB distress signal received would be that the EPIRB was entrapped in the wheelhouse or was caught up in the vessel debris as it sank.

5.9.8. Personal Locator Beacons (PLB)

Several high profile distress cases of recent years have highlighted the use of PLBs as a means to rapidly locate people in distress in the marine environment. Both, the Coast Guard and the National Transportation Safety Board have advocated for the use of the devices in recent high profile accident safety recommendations. Currently, these devices are not a mandatory safety item for any commercial or recreational vessels. As far as the investigation can determine, no member of the SCANDIES ROSE crew owned a PLB as part of their personal safety equipment, nor were any issued by the operator of the SCANDIES ROSE for crew use.

PLBs are small, lightweight, portable homing beacons that operate like a simpler version of an EPIRB. PLBs are designed to be worn by a person, affixed to a person's immersion suit, life jacket, or work vest, and are registered through the FCC to an individual. A PLB is activated manually by the user in an emergency and operates in a similar fashion to the EPIRB with an emergency signal being sent via satellite and it sends a homing beacon signal on 121.5 MHz. That homing signal would be received aboard ships or aircraft which would then create a line of position using the homing signal leading to the person in distress. Some newer model PLBs also contain an internal GPS chip, which can pinpoint the PLB and the person needing assistance to within approximately 100 meters. PLBs can expedite the time and effectiveness of rescue. The average cost of a PLB is in the range of approximately $350.

Figure 104 – On the left, is an ACR Electronics Inc. version of a PLB that could have been carried by the crewmembers on the vessel. On the right of the same image is an EPIRB of the type and manufacture that was carried on the SCANDIES ROSE. The figure gives a perspective as to the size of the devices in comparison to one another. (Source Coast Guard)

In testimony, the SAR Program witness talked about PLBs and how they provide distress alerts to rescue forces

> *And PLBs, which are Personal Locator Beacons, which are basically -- any commercial or any private person can purchase these and own them. Once you've registered them that helps the Search and Rescue Satellite-Aided Tracking System identify who the person in distress is. When the device is turned on or activated, approximately every 50 seconds, it sends a signal, which is received by one of these many satellites that are around the globe. When a satellite receives that signal, it transmits it to the associated local user terminal, and then transmits that to the mission control center, which determines the location of the distress alert and transmits it to the appropriate rescue coordination center.*[262]

If at least one of the survivors abandoned the vessel with a PLB and activated the device, a Rescue Coordination Center ashore would have received the PLB distress signal with its precise location. Acting on that information and other information, the aircraft and vessels that were dispatched to make the rescue would have been able to home in on the location of the PLB, and that survivor, even in darkness and in severe weather. The use of a PLB would most likely have reduced the time required to effect the rescue and more importantly the time that any survivors would have been exposed to the frigid and severe marine environment.

[262] Mr. [redacted] MBI Hearing Transcript, Pg. 1531

5.9.9. Digital Selective Calling (DSC)

Condition and Valuation Reports for the SCANDIES ROSE included photographs of the vessel's communications equipment. Figure 105, below, shows two VHF radios mounted on the overhead console of the wheelhouse starboard operating station. Both of these radios are models equipped with the DSC feature as indicated by the red "distress" plastic cover on the push button that would then activate the DSC alert. The Marine Board found no evidence that these radios noted figure 105, below, were set up and properly configured with the SCANDIES ROSE's Maritime Mobile Service Identity (MMSI) number[263] and with a GPS input to provide positional information if the feature was used in a distress situation.

Figure 105 – Marine VHF radios above the starboard control station on the SCANDIES ROSE. The red arrows indicate the location of the DSC buttons on each radio. Each radio was manufactured with the DSC feature built in, but there is no evidence that this feature was properly configured with MMSI number and GPS input for use in an emergency. (Source CG Exhibit 004, with mark ups)

If the DSC is properly configured on the vessel's marine VHF radio, the mariner hits the red DSC button, then the MMSI number of the vessel along with the vessel's geographic coordinates will be received by nearby vessels and shore based VHF towers. The DSC feature gives the mariner a potential opportunity to egress a sinking vessel while still continuously broadcasting an emergency signal over VHF versus requiring the individual to stay at the operating station on the vessel and transmit a "mayday" message. The SCANDIES ROSE's initial "mayday" call was transmitted to the Coast Guard directly and received on HF. If the DSC feature had been an option for the SCANDIES ROSE, the Captain would have been able to press the button in addition to the "mayday" call and then turn his focus on alerting the crew, donning survival suits, and abandoning the vessel.

AIS systems use the same marine band on the radio, VHF, to transmit AIS signals from ship to ship as well as ship to shore. As an example of the radio range potential for DSC use, the Marine Exchange of Alaska was asked to locate an AIS vessel target with an AIS base radio station that would have been operational when the SCANDIES ROSE sank. The signal reception distance of the Marine Exchange AIS system can be increased by the height of

[263] MMSI are numbers used maritime DSC, AIS, and certain other equipment to uniquely identify a ship or coast radio station (Coast Guard Navigation Center)

their terrestrial radio sites, something that may be a limiting factor in other places in the country.

In support of the Marine Board, the Marine Exchange of Alaska, identified a vessel's AIS signal, the commercial tug POLAR STORM, and the Marine Exchange's site antennas picked up an AIS ship target in July 2021 close to where SCANDIES ROSE sank off Sutwik Island.[264] To illustrate the potential propagation of DSC based VHF radio signals figure 106, below, shows that one of the Marine Exchange of Alaska sites at Pilot Point received the VHF/AIS radio signal for the tug POLAR STORM at a distance of 67.11 NM with an antenna with a height of 40 ft. It is unclear what the meteorological conditions were, or time of day the Marine Exchange of Alaska successfully received this message. Pilot Point is the site due North of POLAR STORM on the Bering Sea side of the Alaska Peninsula and it is indicated by the orange arrow in figure 106.

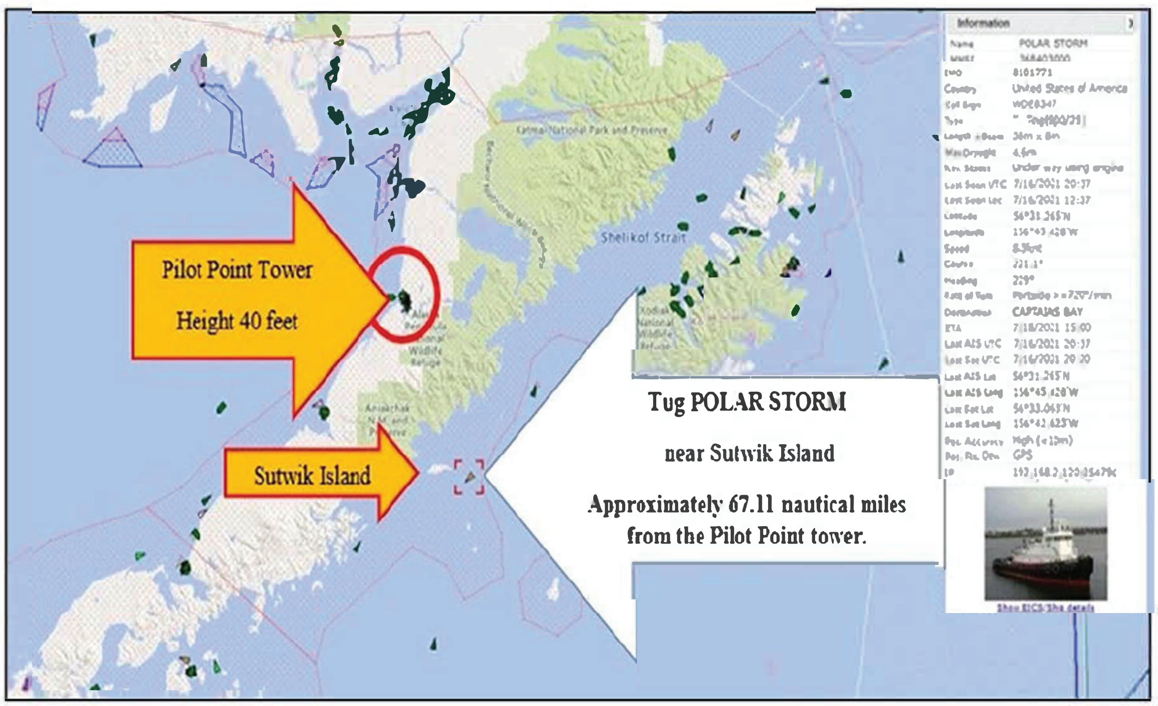

Figure 106 – Position of the POLAR STORM derived from a VHF based AIS signal and received at a Marine Exchange of Alaska 40-foot-high radio tower at Pilot Point, 67.11 nautical miles north of the POLAR STORM. The height of the radio antennas on the POLAR STORM are approximately the same as on the SCANDIES ROSE. This illustrates the potential for VHF based DSC distress alerts to be received by vessels and shore stations. The green symbols on the chart are AIS equipped vessels. (Source Marine Exchange of Alaska, with mark ups)

Digital Selective Calling is not a mandatory requirement for smaller commercial fishing vessels in Alaska like the SCANDIES ROSE. The FCC Public Notice dated 2016 states **(bolding and red highlight added by the Marine Board for emphasis):**

> *The Wireless Telecommunications Bureau reminds* ***owners and operators of fishing vessels (i.e., commercial vessels that catch and/or process fish and other marine life) of 300 gross tons and upward, and small passenger vessels (i.e., ships that transport seven***

[264] The POLAR STORM was a commercial tug with an antenna height at approximately the same height as the SCANDIES ROSE.

to twelve passengers for hire in the open sea or any adjacent tidewater of the United States), that they must upgrade to VHF radiotelephone equipment that includes digital selective calling (DSC) capability no later than January 20, 2016. These vessels are exempt from the VHF-DSC carriage requirement until one year after the United States Coast Guard (USCG) notification to the Commission that shore-based Sea Area A1 coverage has been established.

On January 20, 2015, USCG notified the Commission that it had published a notice in the Federal Register declaring ***Sea Area A1 within twenty nautical miles seaward of the territorial baseline along the East, West, and Gulf coasts of the United States****,* ***excluding Alaska****,* ***and including Hawaii, Puerto Rico, Guam, the Virgin Islands of the United States, and the Northern Mariana Islands of Saipan, Tinian, and Rota. Consequently, the exemptions from the VHF-DSC carriage requirement for fishing vessels and small passenger vessels operating in those areas expire on January 20, 2016.***

The Coast Guard Navigation Center on its website[265] makes the following statement about DSC capabilities

The U.S. Coast Guard offers VHF and MF[266]/HF radiotelephone service to mariners as part of the Global Maritime Distress and Safety System. This service, called digital selective calling (DSC), allows mariners to instantly send an automatically formatted distress alert to the Coast Guard or other rescue authority anywhere in the world. Digital selective calling also allows mariners to initiate or receive distress, urgency, safety and routine radiotelephone calls to or from any similarly equipped vessel or shore station, without requiring either party to be near a radio loudspeaker. DSC acts like the dial and bell of a telephone, allowing you to "direct dial" and "ring" other radios, or allow others to "ring" you, without having to listen to a speaker. New VHF and HF radiotelephones have DSC capabilities.

The CG website **(bolding and red highlight added by the Marine Board for emphasis)** goes on to say:

*****The Coast Guard urges, in the strongest terms possible, that you take the time to interconnect your GPS and DSC-equipped radio. Doing so may save your life in a distress situation! Before interconnecting your radio & GPS consult the owner's manuals.***

The SCANDIES ROSE is a commercial fishing vessel less than 200 GTs and operated in Alaska, which is specifically excluded from the provision requiring that the vessel have its marine VHF radio capable of DSC functionality despite the fact that the region experiences some of the most severe and hazardous weather environments in the world. Requiring the simple activation of the DSC feature on the existing marine VHF radios would significantly improve the emergency communication capabilities for vessels that operate in extreme

[265] Coast Guard Navigation Center Website DSC Page - https://www.navcen.uscg.gov/digital-selective-calling
[266] Medium Frequency

environments such as the Bering Sea. Furthermore, equipping and training the crew on vessels such as the SCANDIES ROSE and other fishing vessels of similar size with DSC enabled radios would significantly increase the network of potential DSC relay stations and supplement the growing number of Marine Exchange of Alaska radio receiving towers equipped to receive DSC transmissions along the Alaskan Coast.

5.10. Survivability Factors

5.10.1. Environment

The accident occurred in December 2019, in winter conditions where air temperature was 10° and water temperature was approximately 38° Fahrenheit. These temperatures magnified the risk of operating in this hazardous environment due to the risk of cold water exposure. The U.S. Coast Guard Addendum to the United States National Search and Rescue Supplement, COMDTINST M16130.2F, describes the effects of cold water shock

> *Sudden immersion into cold water stimulates a large aspiratory gasp response (involving one to several breaths) that may be followed by hyperventilation plus substantial increase in blood pressure and heart rate. If entry into the water involves complete head-under submersion, the gasp reflex could result in immediate drowning. Subsequent hyperventilation will normally diminish within seconds to minutes but could be increased and exaggerated due to emotional stress and panic. Uncontrolled hyperventilation can cause numbness, muscle weakness or even fainting, leading to drowning. Either of these respiratory responses can lead to aspiration of water into the lungs; panic, with subsequent drowning. Cold shock can occur in water colder than 20°C (68° F) with symptoms increasing as water temperature decrease to freezing. Healthy individuals may succumb to cold shock through uncontrolled respiratory responses, while those with underlying cardiac disease may experience sudden death due to cardiac arrest or ventricular fibrillation (uncoordinated heartbeats).*[267]

With the reported environmental conditions at the time of the accident, the crewmembers of the SCANDIES ROSE would most likely have experienced cold water shock if they were unprotected by immersion suits. Exposed to seawater in a heavily listing, sinking vessel and the possibility of sudden immersion in the frigid sea water, they would not have had the manual dexterity to don the immersion suit in time to prevent the onset of hypothermia and risk of death.

Once the cold seawater flooded the vessel's inner compartments and living quarters, the crew's survivability chances were minimal. The crew would have most likely experienced cold shock and cold incapacitation. Cold shock and severe hypothermia would have impacted the crewmembers who were unable to egress the SCANDIES ROSE within minutes.

If not wearing an immersion suit or entering into a deployed liferaft, the crew's chances of survival was severely limited without immediate assistance and rescue. Quickly donning the

[267] U.S. Coast Guard Addendum to the United States National Search and Rescue Supplement, COMDTINST M16130.2F, Pg. 3-89, section 3.7.2.1

suit and making preparation to abandon the vessel, when necessary, is a fundamental requirement to ensure survivability. Had the Captain identified the emergency and alerted the crew when the list began to increase, the entire crew may have had more time to don immersion suits and prepare to abandon ship, increasing their chances for survival.

5.10.2. Crew's Inability to Abandon the Vessel

As the SCANDIES ROSE listed further and further to starboard, the vessel continued to lose buoyancy. With the vessel already in an at-risk stability condition from heavy ice accumulation and potentially other sources of negative stability, the vessel could not recover from the catastrophic stability loss with uncontrolled downflooding. Within a matter of minutes, the vessel started to capsize and sink. According to survivor testimony, there were no alarms sounded until after the mayday call was sent nor were general alarms raised to alert the crew to the developing emergency early enough to prepare for the possibility of abandoning the vessel. Those minutes would have been critical to make ready all lifesaving equipment, don immersion suits, and alert rescue forces. The Captain failed to identify when his vessel was initially in danger from the compromised stability resulting in the crew having very little time, if any, to react and abandon ship.

It is a challenge for any mariner to conduct emergency broadcast radio calls, don an immersion suit, and deploy the liferaft or EPIRB all within a matter of minutes in an emergency situation. The extreme list to starboard made the circumstances and ability to egress from the wheelhouse extremely difficult, if not impossible. While the SCANDIES ROSE was able to transmit a distress call on HF radio, other lifesaving equipment was either not utilized or partially utilized, most likely because of the lack of reaction time the crew had between the delayed identification of the SCANDIES ROSE's emergency situation by the Captain to the time the vessel capsized and sank. One survivor recounted how difficult the list of the vessel made it for crewmembers to don immersion suits

> [redacted] *was on the port side, the far port side.* [redacted] *was ... on the port side right by the door. And then* [redacted] *was trying to sit down and get his suit on, and I'm looking for a spot to put mine down, and I put it down, and I see that the boat's just too much at a[n] angle, and I'm going to slide. So I jump up into the bench, and I used the armrest as a foothold and stable… as soon as I did that,* [redacted] *comes sliding by me. And as soon as I did that, I get it on about halfway, my—the armrest breaks, so I kind of slide down…So I just started climbing up. I grabbed the middle armrest, and that breaks, and just -- I'm grabbing whatever. I don't even know what I was grabbing. I was just grabbing whatever to get out.*[268]

It is probable that the remaining crewmembers were also hampered by the severe angle of list when it came to putting on their immersion suits and subsequently egressing from the vessel's wheelhouse.

5.10.3. Limited Survival Time Without Immediate Assistance and Rescue

[268] Mr. [redacted] MBI Hearing Transcript, Pg. 1068-1069

With the exception of the Honolulu Search and Rescue Region (SRR), the Coast Guard's Alaska distance to travel to sites of distress is almost five times greater, and the time from launch to on-scene for rescue is two times greater than the rest of the Coast Guard.

In this case, search and rescue units did not arrive to the SCANDIES ROSE LKP until approximately four hours after the initial mayday call. Because cold incapacitation without protective measures can cause death within 5-30 minutes, the crew's chances of survival was severely limited without immediate assistance and rescue. Due to the approximately 400-mile roundtrip transit from Air Station Kodiak to the search area, the on-scene endurance of responding MH-60 helicopters was expected to be approximately one hour. The CGC MELLON was 185 NM to the SCANDIES ROSE LKP when diverted with an estimated 16-hour transit making best speed in the prevailing weather conditions. The MH-65 assigned to CGC MELLON was not fully mission capable at the time of the accident and was located at Dutch Harbor, AK. Had the helicopter been fully mission capable, its transit at maximum speed would have exceeded 1 hour and the 370-mile round trip would have fully expended the aircraft's fuel capacity, leaving little fuel to conduct search activities on-scene.

The weather on-scene the evening of December 31, 2019, was poor and delayed the CG-6038's ability to launch after D17 Command Center initiated the SAR case. Once the CG-6038 was on scene at the SCANDIES ROSE's LKP, the aircrew was limited in their ability to search due to adverse weather including visibility, wave height, winds, aircraft system reliability, and de-icing of the rescue swimmer after being hoisted from the first liferaft. Despite these challenges, the CG-6038 was able to successfully locate and rescue two survivors on their first flight. Unfortunately, no other crew or debris were ever located during the SAR response.

5.11. Accident Elements that were not a Direct Cause of the Accident

Determining compliance with established Coast Guard SAR standards is outside the scope and mandate of the Marine Board's investigation. Assessments regarding the effectiveness of any Coast Guard's SAR response is a function of the SAR Coordinator. The SAR Coordinator for the Juneau SRR and others in the SAR chain of command, may initiate a SAR case study consistent with COMDTINST M16130.2F, as a case review was conducted with limited scope.

5.11.1. SAR Resources

For the vast majority of the Juneau SRR, there is no Bravo-0 SAR response capability. Because of this, the Coast Guard relies on numerous other government agencies (OGAs) and other maritime partners to effect some level of SAR response. OGAs were not requested during this response due to the extreme weather conditions. The MH-60 helicopters and HC-130 aircraft that Air Station Kodiak operates are the most highly advanced and capable aircraft that the United States Coast Guard utilizes. The MH-65 aircraft is a short-range aircraft, and based on the geographic challenges of the Alaska operating environment, in Alaska these helicopters are utilized mostly as a deployed helicopter on an Alaska Patrol

(ALPAT) Cutter.[269]

In December 2019 and January 2020, the CGC MELLON was the cutter assigned to the area to conduct an ALPAT and it had an MH-65 assigned to it. However, at the time of the marine accident, the helicopter was in Dutch Harbor, AK and was not fully mission capable. However, even if the MH-65 had been fully mission capable and on board the CGC MELLON at the time the vessel was directed to make way at best speed to the SCANDIES ROSE's LKP, the helicopter's fuel capacity and range would have limited it from launching, flying to the search area, conducting a search for any length of time, and being able to safely return either to the CGC MELLON or a land based refueling station that could adequately support the helicopter.

5.11.2. SAR Readiness

In the Coast Guard's response to this marine accident, the first response asset, CG-6038, was delayed in their response to the incident. This was associated with measures taken to identify and mitigate the significant risk of this particular rescue mission. The CG-6038's Aircraft Commander on the initial rescue flight indicated that the risk management discussions and crew brief were longer than normal and required low-visibility route planning as a result of the severe weather conditions. Additionally, the fuel load was reassessed and the aircraft fuel tanks were topped off to maximize the aircraft's endurance. The Aircraft Commander commented in this testimony:

> *So we were trying to come up with a good route based on – we used the Windy app, ForeFlight, which is a program on our electronic flight bag, which is an iPad that we use for flight planning multiple routes to try to give us the most time on scene. And so we kind of spent some time coming up with that and then doing a good, you know, risk management discussion with the crew. And then we determined we needed to add fuel to the aircraft, so we ended up basically holding -- or adding the maximum amount of fuel that we can carry with the weight that we had, and with that, I mean, that time adds up. And then, once we get in the aircraft, with this weather that we're flying through, we had to do multiple checks in the aircraft with our blade de-ice/anti-ice equipment, which adds a little bit of time. And then just with the location of where the helicopter ramp is, when the weather's bad, a lot of times we'll taxi out to the main runways, which is a little bit of a haul to get out to the runways to depart.*[270]

Available Coast Guard SAR resources in Western Alaska include air resources from Air Station Kodiak with five HC-130 fixed wing long-range aircraft and six MH-60 medium range helicopters. Coast Guard Cutters also patrol the region, including a 378-ft cutter capable of launching and recovering a MH-65 helicopter. Historically, during a typical opilio crab season, or depending on the number of commercial vessels operating in the western Bering Sea region, Air Station Kodiak operates a Forward Operating Location (FOL) out of Cold Bay, AK with one MH-60. The Cold Bay FOL is opened in the fall and winter based

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[269] An ALPAT is a Coast Guard term for a patrol of waters West of Kodiak, the Alaska Peninsula, the Maritime Boundary Line, Aleutian Islands, Bering Sea and Strait.
[270] LT [redacted] MBI Hearing Testimony, Pg. 1473

around the crabbing seasons. In October, a MH-60 is stationed at the FOL for a month or until the BSAI crabbing fleet reach 90% of the proposed catch or if the fleet reduces to less than 10 vessels. In mid-January, the Cold Bay FOL is stood up for the opilio crab season. The MH-60 operating out of Cold Bay can reach crab vessels operating in the region on the first sortie. There was no MH-60 operating in Cold Bay at the time of the SCANDIES ROSE sinking since the FOL in Cold Bay was not staffed at the time, which is typical for the period of time from November to January. The FOL stood up on January 9, 2020.

5.11.3. Search and Rescue Operations

The SCANDIES ROSE was able to put out one mayday call. It was extremely difficult to hear and had significant background noise and static. The COMMDET Kodiak watchstander heard that call and answered with no results. They then hailed the SCANDIES ROSE on an average of every 30 to 60 seconds for the next hour, with no success, to establish any communication to get a better location. Due to an error in the transposition of the coordinates from the first helicopter on-scene, a search model was built for an area north of Sutwik Island, which was used by the second MH-60, CG-6037. According to the SAR witness, the position was passed incorrectly. The second set of searches were based off of the D17 Command Center modeling the position of the second liferaft north of Sutwik Island based on the issue with the transposed position information. Given the on-scene weather conditions, the erroneous position would have placed the raft in a drift pattern opposed to the prevailing weather around the northeast tip of Sutwik Island.

Additionally, Sector Anchorage should have never been assigned as the SAR Mission Coordinator for this case, or had primary control of the SAR operations. The LKP for the SCANDIES ROSE clearly fell outside of Sector Anchorages SAR response AOR and in a region that JRCC Juneau retains SMC. The CDO at D17 should have taken extra effort to plot the position, and verify whose SAR geographic AOR the case fell in. The shift of SMC between D17 and Sector Anchorage took valuable attention for the SAR planners and created confusion at Air Station Kodiak, which led to delays.

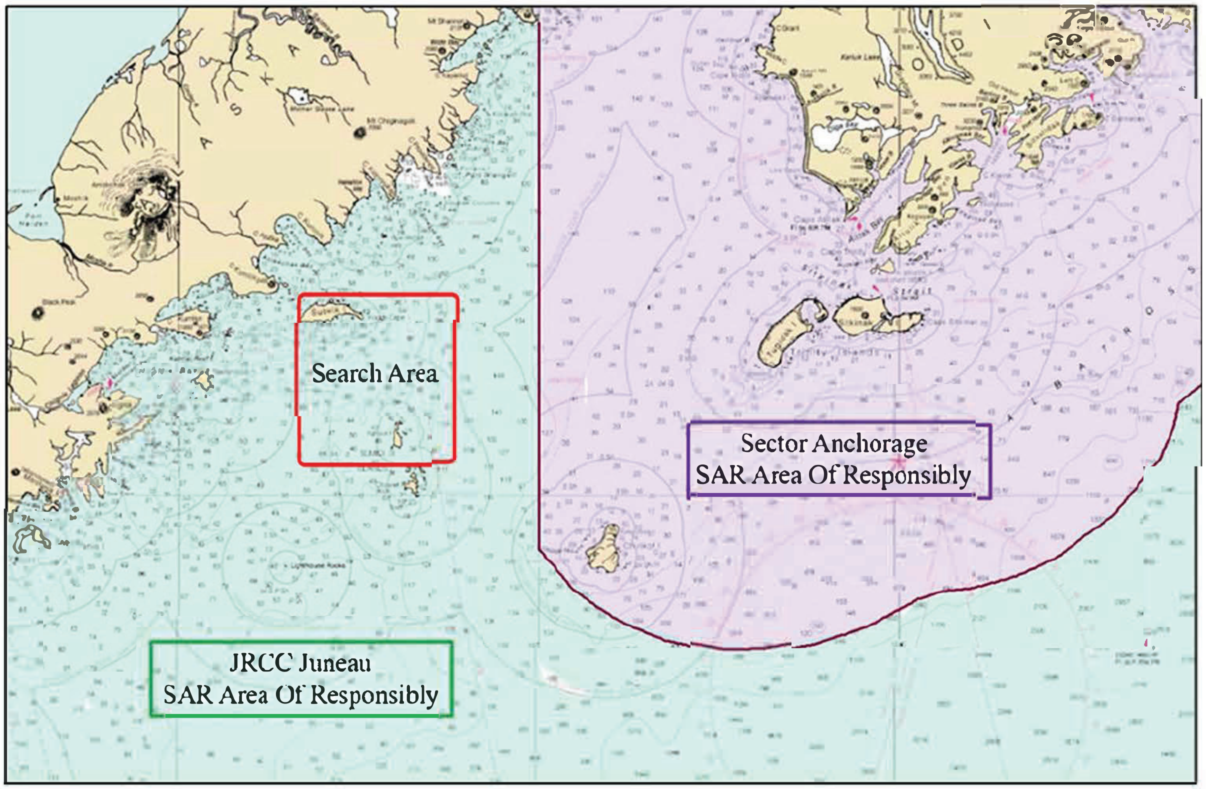


Figure 107 – Search and Rescue Areas of Responsibility in relation to Search area. (Source Coast Guard)

5.11.4. Radio Communication Gaps

The Coast Guard is not aware if the SCANDIES ROSE sent a mayday call over VHF-FM, or utilized the possible DSC option to alert their distress situation. While R21 has significant gaps in the Coast Guard's ability to hear distress calls in the Juneau SRR, this was not a factor in this accident. The crew successfully made a call on HF radio that was almost immediately received by COMMDET Kodiak.

The current R21 AK system does not meet Sea Area A1 radio coverage for VHF FM. There are significant gaps in the baseline system, but additionally there are significant gaps due to maintenance, physical distance between radio towers, and system capabilities. The limited VHF-FM radio coverage coupled with a lack of cellular telephone coverage degrades communications capabilities in the Juneau SRR. For this reason, the HF radios that the Coast Guard maintains are vital to the Coast Guard SAR mission in Alaska. As in this case, at the time of the accident, the Coast Guard maintained an active listening watch on the HF radio network and answered high frequency calls.

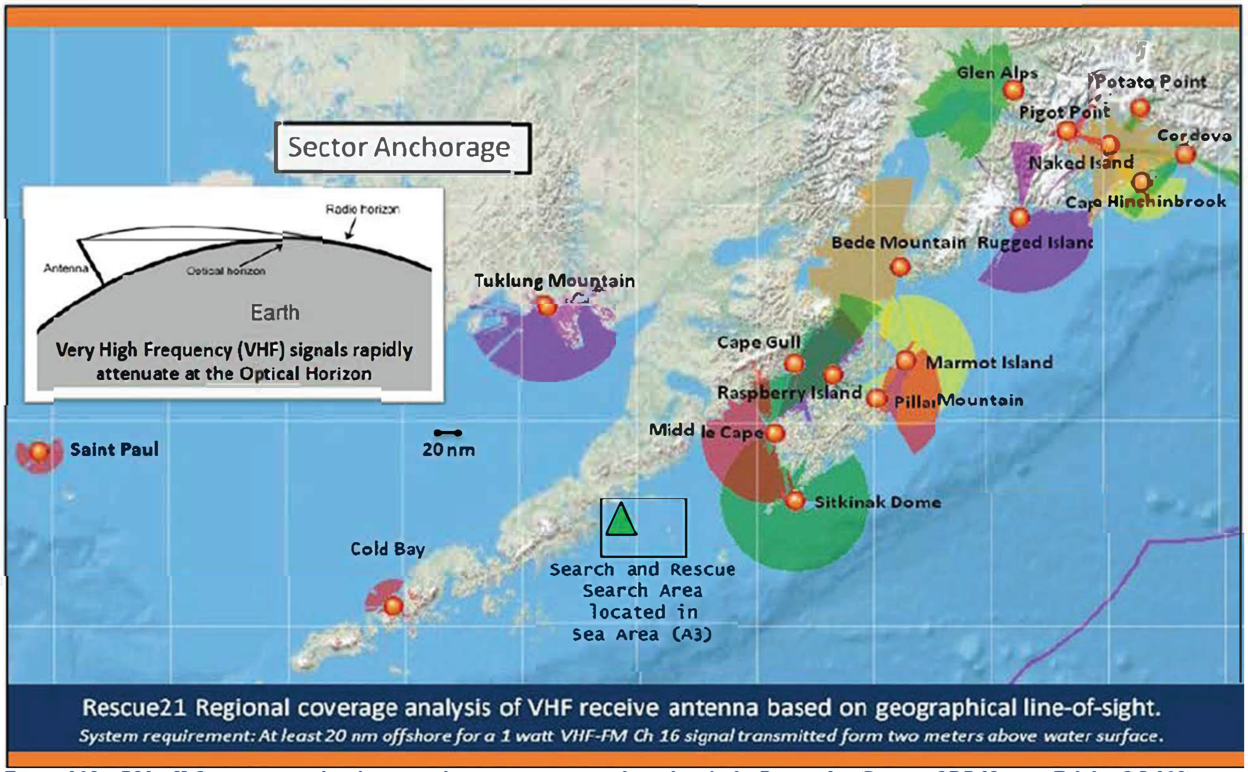


Figure 108 – R21 AK Coverage graphic depicting the gap in coverage along the Alaska Peninsula. (Source CDR Nassar, Exhibit CG 109)

During the SCANDIES ROSE accident there was no SAR Satellite-Aided Tracking (SARSAT) activation, the EPIRB signal, and the watchstander at COMMDET Kodiak was the only person to hear the mayday call on the HF radio. Even if the R21 system in Alaska is upgraded to meet Sea Area 1 requirements,[271] HF radio guards would still be required due to the long distances between the communication sites and the fishing activities offshore. It is this Marine Board's opinion that disestablishing or degrading the current VHF or HF systems without a suitable replacement would put lives at risk.

5.12. Crab Pot Ice Accretion Study

5.12.1. Initial Field Ice Accretion Experiment on CGC POLAR STAR

A field test was conducted aboard a Coast Guard ice breaker, the CGC POLAR STAR, using fresh water spray under non-controlled environmental conditions. Initial results from this test were introduced during the Marine Board Hearing. The results of this field test precipitated further study on ice accretion on crab pots. Additional details on this field test are contained in section 7.2.2 of this report.

[271] The Coast Guard defines Sea Area A1 as those areas where more than ninety percent of the area within 20 nautical miles seaward of the territorial baseline along the East, West and Gulf Coasts of the United States, excluding Alaska, and including Hawaii, Puerto Rico, Guam, the Virgin Islands of the United States and the Northern Mariana Islands of Saipan, Tinian and Rota, is within coverage of Coast Guard VHF Coast Stations that provide both a continuous watch for Digital Selective Calling, or DSC, distress alerts on Channel 70 and a capability to respond to distress alerts.

5.12.2. Coast Guard Formal Crab Pot Ice Accretion Study

The Marine Board formally requested that the Coast Guard Research and Development Center (RDC) examine the feasibility of conducting ice accretion testing on the formation and weight of ice on crab pots in a series of scientific experiments. The Marine Board provided input on the testing to the RDC, who then created a testing plan and a matrix for the testing of single and multiple crab pots of approximately the same size as the pots used on the SCANDIES ROSE and other Alaskan crab vessels. The RDC reached out to the U.S. Army Corps of Engineers' Cold Regions Research and Engineering Laboratory (CRREL) which is located in Hanover, NH to determine if that facility had the capability to conduct the ice accretion study. The facility had two testing chambers which could accommodate both the crab pots and the environmental parameters necessary for the testing. The RDC acquired three crab pots and the associated gear that would fit inside these pots to replicate the pot configuration carried on the SCANDIES ROSE. These pots would be slightly smaller than the SCANDIES ROSE pots, sized 6 ft x 6 ft x 36 inch while the SCANDIES ROSE pots were 7 ft x 8 ft x 34 inch in size. The steel, round-stock framed pots were configured in the same manner as the pots carried on board the SCANDIES ROSE.

Three weeks of testing took place in September 2021 at the CRREL Hanover, NH facility with facilities staff conducting the setup, spraying, and weighing of the pots using a wireless load cell. The RDC staff took measurements of the thickness of the ice forming on the pot frame at approximately 30-minute intervals during testing. The chambers were kept at -15° Fahrenheit and the saltwater used for simulating freezing spray was kept at approximately 30° Fahrenheit.

One of the aspects of freezing spray that the SCANDIES ROSE would have encountered were the effects of gale force wind and heavier water droplets from the interaction of the vessel and the breaking seas which would have created ice on the pots and the vessel itself. The facility could not replicate a wind tunnel effect, an important aspect in vessel icing, or the larger water droplets that might be formed when a vessel pounded into the sea and created sea spray. To conduct this testing, an oscillating nozzle was used to direct a pressurized saltwater spray directed at either the top, side, or corner as indicated in the testing plan for the type of testing required. Single pots or double or triple pots stacked vertically were used in the tests and the weight, thickness, and formation of ice in the vertical pot stack was also recorded. A representative of the NSTB attended one of the day's tests and witnessed the testing methodology.

Figure 109 – Testing at the CRREL facility in Hanover, NH in September 2021. In this composite of testing photos, top left two technicians enter the smaller of the two test chambers to set up for two vertical pot stack testing. Top right one of the pots with the associated gear being maneuvered into the test chamber. Lower, left a single pot after removal from the chamber showing the formation of ice on the single pot. Lower right inside the larger chamber with a triple pot stack hanging from the load cell. In the foreground are the two oscillating sprayers directing saltwater spray onto the triple pot stack based on the configuration requirements in the test plan matrix of tests. (Source Coast Guard)

During the testing, the weight of the pots was continuously monitored and recorded and ice thickness was manually measured at half-hour intervals at twelve points around the top of the pot framing. Two tests were conducted where pots were covered with polystyrene tarpaulins to compare results of ice accretion with uncovered pots.

5.12.3. RDC Crab Pot Ice Accretion Testing: Preliminary Observations

The formal results of the RDC Ice Accretion Study has been published as a Rapid Evaluation and Analysis of Critical Technologies (REACT) Study.

HYPERLINK: Enclosure (2) contains hyperlink (8) which is the RDC's Ice Accretion REACT study report.

Some of the preliminary findings are provided here for illustration purposes.

One of the aspects of this series of experiments was to determine the thickness of ice created by a saltwater spray on crab pots on a vessel. The two survivors testified about ice they saw form on the vessel and the crab pot stacks from their vantage point in the wheelhouse of the SCANDIES ROSE. Onboard the vessel, the distance from the wheelhouse to the forward pot stack would have been approximately 65 ft. At the conclusion of one of the tests on the triple pot stack, the stack was moved outside the chamber and placed approximately 45 feet from the camera and the camera would look at the top of the stack from an angle roughly simulating the viewing angle from the SCANDIES ROSE wheelhouse. In figure 110, below you can see the difficulty of accurately determining the thickness of ice when there is no reference point for the frame of the pots. One can also see an example of how the ice formed vertically in a stack of pots in the test chamber, and, in addition to the accretion on the frame, developed overhanging icicles of three-foot length.

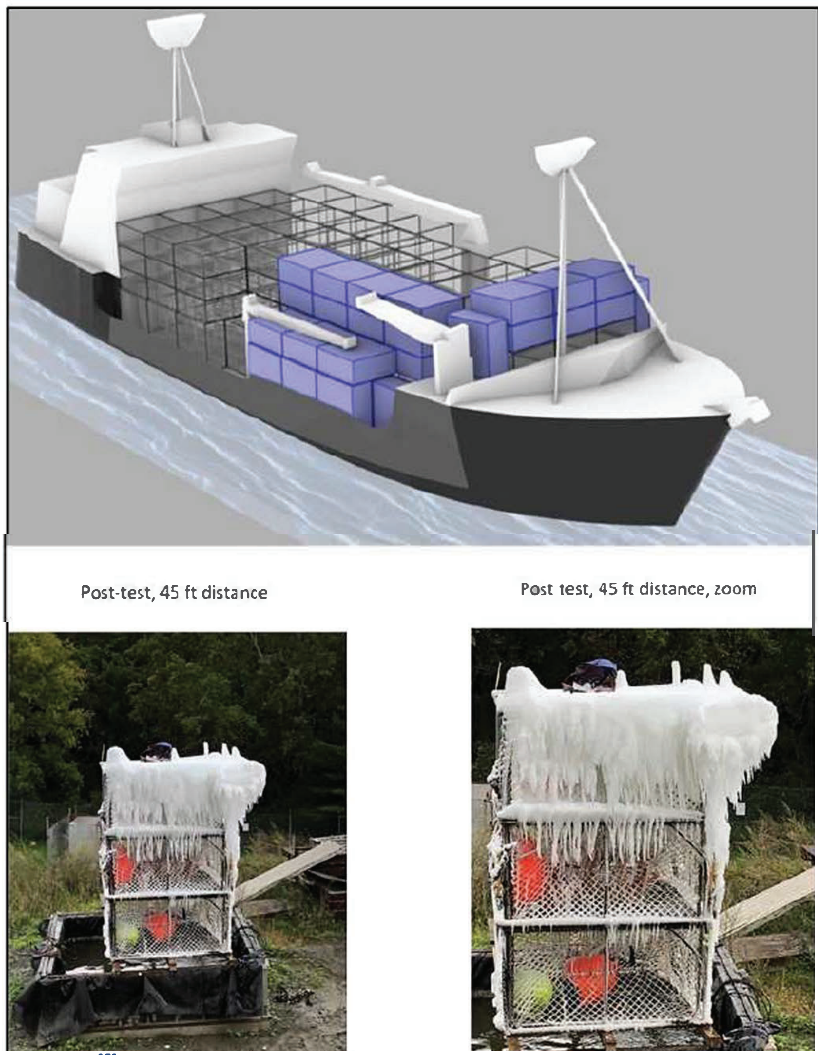


Figure 110 – Top, MSC Model[272] of the SCANDIES ROSE which shows distance from the wheelhouse to the forward parts of the vessel and the potential ice load for 24 of the crab pots onboard which would have had the highest exposure to heavy freezing spray, indicated by the purple color. Below left, a triple pot stack when viewed at a distance of 45 feet showing the thickness of ice. Below right, a close up at the same distance showing the type of ice that formed vertically on the mesh and inside the pots. (Source Coast Guard)

[272] CG Exhibit 138, MSC Analysis of Asymmetric Icing SCANDIES ROSE

Examples of some of the weights and thickness measurements on the pots and the elapsed time of the various tests are contained in figures 111 and 112, below.

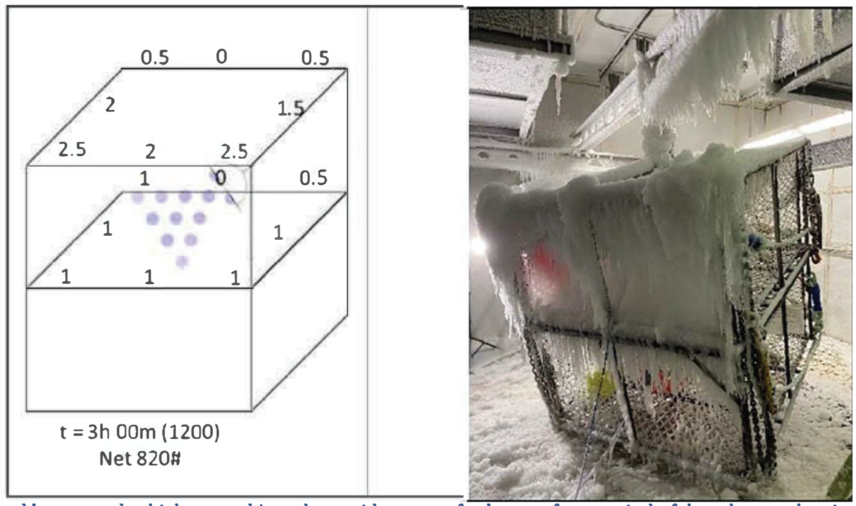


Figure 111 – A double pot stack which was subjected to a side spray of saltwater for a period of three hours, showing a net weight gain of 820 pounds and extensive amount of external ice which included ice on the suspending chains attached to the overhead load cell. In the diagram at the left top, one can see the thickness of ice on top of the pot frame and along the bottom frame as indicated by the associated measurements in inches. (Source Coast Guard)

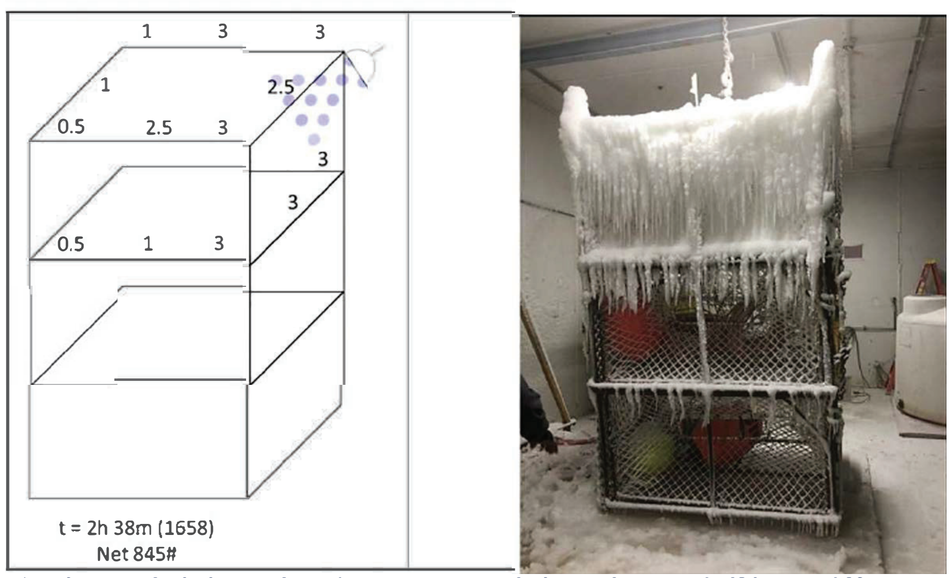


Figure 112 – A triple pot stack which was subjected to a corner spray of saltwater for a period of 2 hours and 38 minutes, showing a net weight gain of 845 pounds and the suspending chains attached to the overhead load cell. In the diagram at the left top, one can see the thickness of ice on top of the pot frame and along the bottom frame as indicated by the associated measurements in inches. (Source Coast Guard)

6. Conclusions

6.1. Cause of the Casualty

6.1.1. The initiating event for this casualty occurred when the SCANDIES ROSE maintained course and speed in deteriorating and dangerous weather. The Captain of the

SCANDIES ROSE failed to seek refuge as the freezing spray, which was forecasted, and ice continued to form on the vessel during the morning of December 31, 2019. At approximately 11:30 a.m. the vessel continued on its course and speed to the fishing grounds. All of the actions and decisions made by Captain [redacted] that caused the SCANDIES ROSE to continue on the intended voyage as opposed to seeking a safe harbor along the route travelled cannot be precisely determined, as the Captain perished in the accident and he did not communicate his reasoning to the surviving crew. Based on the available evidence and analysis, the causal factors were:

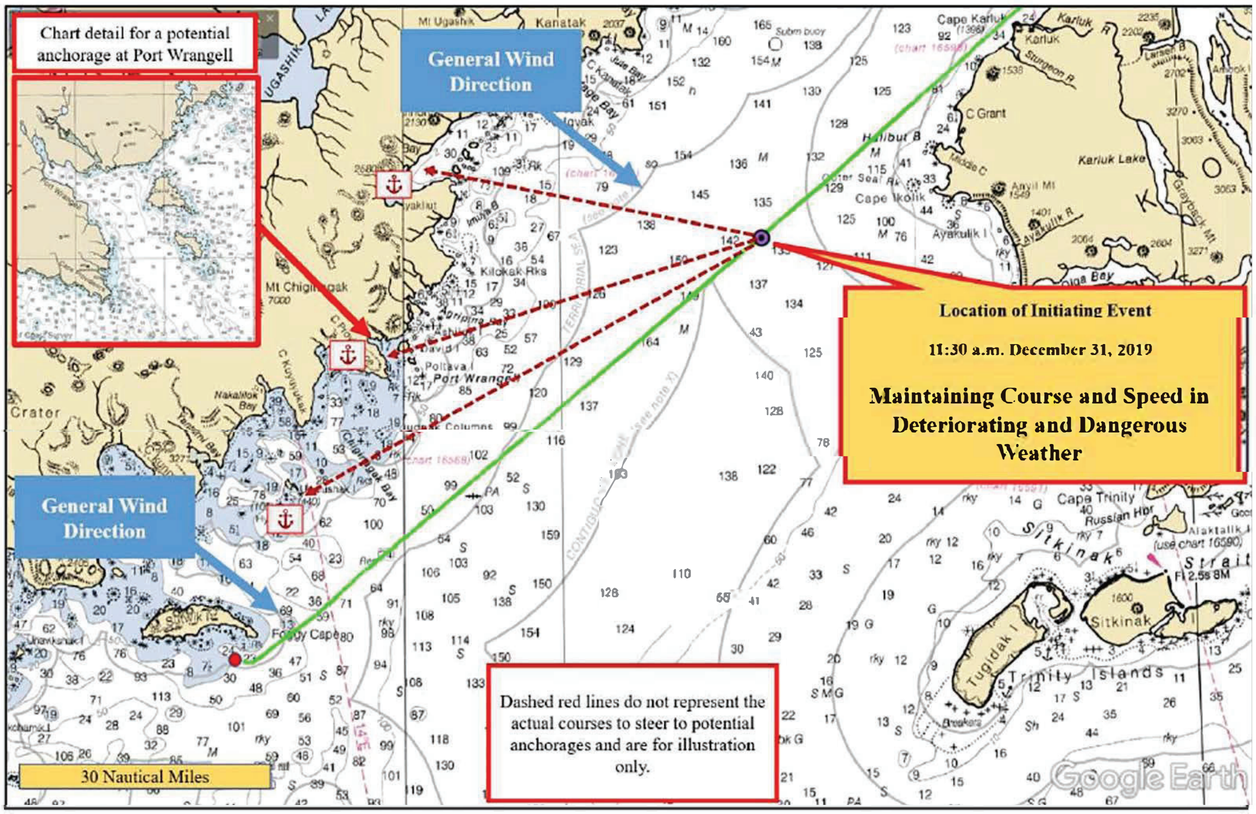


Figure 113 – Location of the "Initiating Event" for the accident, the decision point where the Captain of the SCANDIES ROSE maintained course and speed towards False Pass, despite the dangerous anticipated weather, phone call to the AMATULI, ice having formed on the vessel and pots and daylight to observe his vessel. The red dashed lines indicate potential points where the SCANDIES ROSE might have anchored due to the weather and ice formation which would have afforded the vessel protection from the ice formation. (Source Coast Guard)

6.1.1.1. The Captain had to contend with a delayed departure from Kodiak and then rushed in order to meet perceived catch and delivery expectations. Internal and external stressors created a situation causing Captain [redacted] to press to get to cod grounds to catch and land cod in order to establish a catch history in the event rationalization discussions began again for this species.

6.1.1.2. The SCANDIES ROSE maintained course and speed into weather of increasing severity. The vessel transited into a forward or beam wind on the starboard side of the vessel with air temperatures of approximately 12° Fahrenheit, which caused ice to build, and no widely recommended practices were utilized to reduce ice load accumulating on the vessel.

6.1.1.3. The Captain of the SCANDIES ROSE directed his crew to proceed on its voyage through an area between Shelikof Straits and Sutwik Island that was known by other fishermen to have unique winter environmental conditions which contributed to even greater accumulation of ice than the forecasted conditions.

6.1.1.4. The Captain did not exercise prudent judgment and seamanship in seeking a place of refuge when faced with the worsening weather conditions as other vessel captains had done. The Captain of the SCANDIES ROSE did not attempt to get into the safety of any of the sheltered areas along the strait that could have provided safe refuge. The decision to seek shelter was not made until later in the evening of the accident day when the weather had seriously deteriorated and the icing had substantially impacted the vessel's stability.

6.1.2. Based on stability instructions available to him, the Captain of the SCANDIES ROSE continued to operate the vessel in a loading condition which was, unknowingly to him, not in compliance with safe operating limits despite the loading condition being within the allowances for pot load, fuel, water, and other weights listed in the stability instructions developed in 2019.

6.1.2.1. Based on post-accident analysis of the loading conditions and corrected modeling for the SCANDIES ROSE, the Captain was sailing in a condition with marginal stability even in the absence of additional topside weight such as ice.

6.1.2.2. The stability instructions were prepared by the Naval Architect who conducted an incomplete inclining experiment and applied the inaccurate results to the stability documents created for the SCANDIES ROSE and those who operated it. The Naval Architect failed to verify the accuracy of multiple variables necessary to produce accurate stability instructions for the SCANDIES ROSE. In failing to do this, the Naval Architect, a state certified Professional Engineer, created a latent unsafe condition for the vessel.

6.1.2.3. The Captain departed Kodiak aware of forecasted heavy freezing spray warnings issued by the NWS and with a crew that was most likely impaired by fatigue. That impairment compromised their ability to recognize the dangers imposed by the buildup of ice and then avoid the buildup of ice and remove the ice accumulations on the vessel while enroute to the fishing grounds.

6.1.2.4. The breaking seas, as the weather intensified, threw seawater droplets and created a heavy freezing spray creating ice on the vessel. Weather forecasting was accurate in terms of warning of gale force weather and heavy freezing spray and this important information was available to the crew through a variety of sources.

6.1.3. Following the failure to seek timely refuge, the Captain directed or allowed the vessel to continue the transit to the southwest with worsening weather and seas creating a freezing spray along their intended track. As ice accumulated on the vessel, with a high probability of increased ice accumulation on the starboard side, the vessel's center of gravity continued to shift upwards and to starboard. This caused a list to develop to starboard. This was coupled with reduced overall stability and reduced righting energy in the actual vessel characteristics as described in the MSC Analysis of the SCANDIES ROSE. Causal factors contributing to the reduction in stability were:

6.1.3.1. There is no evidence that the cause of the list to starboard was identified or was of concern to the crew. It should have been obvious to the navigation watch that something was seriously wrong with the condition of the vessel. The vessel listing a "couple of degrees" into a strong wind did not make sense and would require immediate corrective action. The SCANDIES ROSE was transiting in a southwest direction and the wind was acting against the vessel's forward starboard side, lending to the illusion that the list was minor in nature, a "couple of degrees," when in fact there was a dangerous situation developing onboard the vessel.

6.1.3.2. The rate of ice accumulation in the frigid environment was increasing as the sea state worsened and the winds increased.

6.1.3.3. The crew at the navigation watch and then the Captain of the vessel failed to appreciate the risks of how heavy freezing spray would impact the SCANDIES ROSE's stability or they lost situational awareness of the vessel's position in proximity to the area of predicted weather conditions through which the vessel was to travel. After the SCANDIES ROSE exited the Shelikof Strait they no longer had available places of refuge on the vessel's port side.

6.1.3.4. Based on the available evidence, the Marine Board concludes that the initial estimates made by the crew of the accumulation of ice and the initial reports of vessel listing were accurate, but the severity of the list was underestimated.

6.1.3.5. Evidence indicates that the most likely source of the list was the weight of ice, predominately on the vessel's starboard side. However, the Marine Board cannot rule out the possibility of downflooding of seawater into the vessel from some undetermined source.

6.1.3.6. Even with a reported list of approximately two degrees to starboard, the crew and captain neglected to take proactive steps to validate the source of the list or rule out other contributing sources of the list such as ingress of water. First, this was because there was no safe way to access the bow of the vessel as there was no walkway built into the pot stack arrangement. Visibility from the wheelhouse to effectively observe the pot stack was significantly reduced by the height of the pots and the distance and angle of observing the forward area on the vessel. Second, this was because the crew failed to thoroughly investigate the watertight integrity of the engine room space or other interior compartments such as the starboard pipe alley to rule out flooding, despite the fact that this was supposedly part of the navigation watch duties.

6.1.3.7. Despite vessel management being proactive in getting an updated 2019 stability test, the vessel was provided a substandard stability instruction based on incomplete information and a stability test not conducted in accordance with approved methods and standards. This new stability instruction was found to have significant inaccuracies in several assumed conditions.

6.1.3.8. The Captain of the SCANDIES ROSE failed to recognize or resolve the height of pots being loaded with the associated diagrams provided in the stability instruction. By loading pots to heights above the windows of the pilot house, the Captain accepted undue risk with regard to the vessel's overall stability, access to forward parts of the vessel, and visibility from the wheelhouse.

6.1.3.9. The stability instructions lacked clarity or detail on how icing posed a potential risk to the vessel or how icing was to be applied to the vessel and pot stack to maintain stability. The stability instructions failed to give proper guidance on the detrimental effects of the very real potential for asymmetric accumulation of ice which was a risk to the vessel in heavy freezing spray conditions.

6.1.4. The stability of the vessel continued to degrade and the starboard list increased to 20 degrees. Causal factors associated with the loss of stability were:

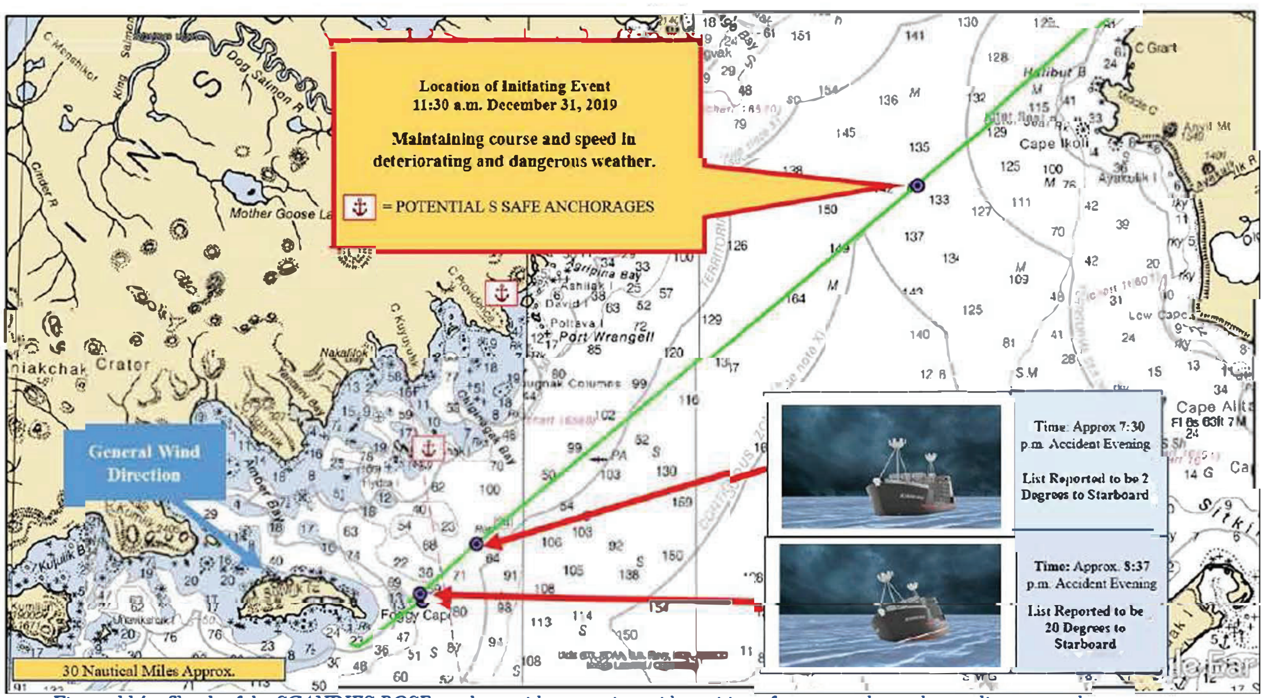


Figure 114 – Track of the SCANDIES ROSE on the accident evening with positions for reported two-degree list reported at approximately 7 00 p.m. and then the list of approximately 20 degrees reported at approximately 8 37 p.m. on the accident evening. Insets show the RHINO computer model visualization of the listing vessel superimposed for illustration purposes. (Source Coast Guard)

6.1.4.1. The Captain and crew failed to acknowledge and address that the change in list which went from "a couple of degrees" to the next reported measurement of list of 20 degrees to starboard was an emergency situation.

6.1.4.2. The aggregate accumulation of potentially asymmetric ice weight on the pots by this point likely exceeded the quantity which is required to be evaluated for stability using the “shoebox” method of a uniform coating of ice on the vessel as outlined in current stability regulations and standards.

6.1.4.3. Based on the available evidence, it is the opinion of the Marine Board that ice formed asymmetrically on the SCANDIES ROSE and the associated pots and gear, the precise extent of this uneven load cannot be determined.

6.1.4.4. The accumulation of ice on the starboard side may have partially blocked the freeing ports, reducing the ability for sea water to drain from the deck as designed. This would have increased water on deck with negative impacts to the overall stability.

6.1.4.5. The SCANDIES ROSE Captain informed the PACIFIC SOUNDER’s Captain of the 20 degree list during a phone call but, even at that point, seemed to lack a sense of urgency about the vessel’s stability condition. The stability condition of the vessel coupled with the hazardous marine weather created an emergency situation that he failed to recognize. The Captain of the SCANDIES ROSE took no action to wake the crew to muster in the wheelhouse, sound any alarms, investigate the source of the list, or take actions to reduce the list. Had he taken these actions, he would have given his crew valuable time to attempt to save the vessel or prepare to abandon the vessel, if necessary.

6.1.4.6. It is unknown if the increase in list was solely due to asymmetric ice accumulation on the starboard bow/side of the pot stack or to some other source of flooding such as hull failure, hull damage, or from a watertight opening that was inadvertently not secured.

6.1.4.7. Based on testimony from one survivor, the engineer exited the engine room. It is unknown if the Captain of the SCANDIES ROSE directed the engineer to transfer fuel/liquids or whether he or a crewmember investigated all possible causes of the vessel’s list. Any attempt to correct the list using a potential transfer of liquids did not result in a positive impact to the vessel’s stability and should not have been attempted until the cause of list was identified.

6.1.5. The SCANDIES ROSE Captain, on watch and at the helm, made a critical decision to turn to starboard and seek protected waters in the lee of Sutwik Island. Soon after the turn, the vessel listed even further to starboard and experienced a loss of maneuverability.

6.1.5.1. When the vessel made the sharp turn to starboard the west/northwest winds previously acting on its starboard side were now acting on its bow or its forward port side. These winds, in concert with the heavy seas, had previously been buttressing the vessel, causing the illusion of a lesser list, in effect propping the vessel up. When the dynamic forces from the winds began to act on the port side, the vessel’s true list was felt and the wind force most likely significantly exacerbated the list to starboard, exerting the force of the 60-70 kt wind on the vessel's port side. This was evidenced by the sudden and dramatic lurch to starboard described by a survivor.

6.1.5.2. The ice accumulation on the vessel increased the surface area for applied wind force.

6.1.5.3. With a heavy and sustained list to starboard, the vessel's underwater hull profile changed and likely reached the point where the propellers and rudder approached the surface of the water. The listing vessel would create a situation where the propeller and rudder would not work as designed and there is a possibility of loss of propeller force and cavitation in the large seas with the significant list.

6.1.5.4. External wind and wave action caused an increase to the heeling or capsizing energy from the environment. The vessel did not have enough righting energy to overcome these forces.

6.1.5.5. Decreasing the speed of the vessel changed the inherent dynamic stability of the vessel. The loss of propeller thrust would put the vessel at the mercy of the sea at a critical moment. This action was very dangerous in the already compromised condition of stability. This was exacerbated when the Captain pulled the throttles into the neutral position.

6.1.6. Subsequent to the vessel's loss of maneuverability, the vessel experienced a catastrophic and unrecoverable loss of stability and then buoyancy. Within minutes, seawater flooded the vessel's inner compartments causing the vessel to capsize. Causal factors contributing to the vessel sinking were:

6.1.6.1. Excessive water on deck and associated free surface effect.

6.1.6.2. The uncontrolled ingress of water into the interior of the vessel.

6.1.6.3. Uncontrolled downflooding and flooding into the engine room from the air vent intakes under the starboard ladderwell that were, by this point, under water.

6.1.7. As the vessel was lying at a severe angle and was actively flooding, two crew were able to exit the wheelhouse. They were on the port exterior side of the vessel when a wave washed them off the hull and into the sea. Causal factors contributing to the two crewmembers being washed off the vessel's hull were:

6.1.7.1. Severe wind and wave action acting on the survivors on the side of the listing vessel as it was already in a sinking condition.

6.1.7.2. Despite the difficulty in moving to evacuate the wheelhouse while wearing an immersion suit, the suits functioned as designed and insulated the two survivors from the worst effects of hypothermia.

6.1.7.3. The crewmembers recalled that they were outside the wheelhouse and were walking on what would have been the upper port side of the vessel so there were no designed safety points to stay with the vessel.

6.1.7.4. As the vessel began to sink, the survivors were swept into the sea.

6.1.8. Subsequent to the vessel's flooding and capsizing and crewmembers being swept off the vessel and into the frigid waters of the sea, the vessel sank with the remaining five crewmembers missing and presumed deceased. Causal factors contributing to the loss of life were:

6.1.8.1. The Captain failed to identify and take action when the vessel's stability condition reached a point where there was a sustained list to starboard into the prevailing wind. This denied the crew the opportunity to either investigate the list or prepare for the worst case, abandoning ship together with immersion suits worn and with the proper survival equipment including the EPIRB.

6.1.8.2. The late identification of the distress phase of the accident provided limited time and ability to take emergency action. This would include making more than one mayday radio call for assistance, activating the EPIRB, the entire crew donning immersion suits, deploying the liferaft, abandoning the SCANDIES ROSE and entering the liferafts.

6.1.8.3. Any crewmember trapped within the vessel would have succumbed by drowning.

6.1.8.4. Had any crewmembers, other than the survivors, been able to egress from the vessel, their survival time would have been extremely limited due to the effects of hypothermia.

6.2. Violations of Law by Credentialed Mariners: There were no credentialed or licensed mariners working on the SCANDIES ROSE at the time of the accident, thus, there were no acts of misconduct, incompetence, negligence, unskillfulness, or willful violation of law by a credentialed mariner that contributed to the casualty.

6.2.1. While not a credentialed mariner, the Captain of the SCANDIES ROSE failed to exercise prudent seamanship leading up to the accident voyage in the loading of the vessel in failing to build an alleyway to allow safer access to key areas of the vessel. He further failed to exercise prudent seamanship during the accident voyage by not taking early and deliberate action to prevent the dangerous accumulation of ice, failing to seek shelter when hazardous weather conditions persisted, imprudent to assign newly assigned deckhands to stand the navigational watch during an exposed segment of the voyage where the weather was expected to be deteriorating, and by failing to alert the crew of the stability emergency so that they could take timely action to effectively abandon the vessel.

6.3. Violations by Members of the Coast Guard or other federal, state or local agencies: There were no acts of misconduct, incompetence, negligence, unskillfulness, or willful violation of law by members of the Coast Guard or other federal, state, or local agencies that contributed to the casualty.

6.4. Violations Subjecting Parties to a Civil Penalty:

6.4.1. There is evidence that the marine employer was in violation of 46 CFR 4.06-20 by failing to ensure that post casualty drug testing was conducted in accordance with appropriate specimen collection requirements set forth in said subsection and 49 CFR part 40. In addition, the specimens that were collected were not handled and shipped in accordance with 46 CFR 4.06-40. However, based on the evidence and the totality of the circumstances of the case, the Marine Board recommends that no enforcement action be taken against the marine employer for this violation.

6.5. Violations of Criminal Law: This investigation did not identify violations of criminal law.

6.6. Need for New or Amended Laws/Regulations: This marine casualty represents the need to amend existing regulations. Specific recommended changes to regulations are outlined in section 8 of this report.

6.7. Unsafe Actions or Conditions that Were Not Causal Factors in this Casualty:

6.7.1. The majority owner, the operations manager and the vessel Captain of the SCANDIES ROSE failed to adequately ensure that the vessel was operated without the impairing effects of drugs (cannabinoids (marijuana)).

6.7.2. The majority owner, the operations manager, and the vessel captain of the SCANDIES ROSE failed to address the serious issue of workplace fatigue with the attendant consequences on critical decision-making for at least one of the navigation watchstanders.

6.7.3. There were communication issues between the searching units and SAR coordinators, most notably the inaccurate location for the second search pattern. These were ultimately resolved and had no impact on locating the survivors before the suspension of the search activities.

6.7.4. The majority owner, the operations manager and the Captain of the SCANDIES ROSE failed to adequately ensure that the vessel was operated by a crew that was medically fit to perform their duties. The crew's self-certifying questionnaires contained in the employment paperwork listed some medical conditions that could adversely impact any vessel operations and none of these medical conditions were reviewed by a competent medical authority.

7. <u>Actions Taken Since the Incident</u>

7.1. Coast Guard Search and Rescue

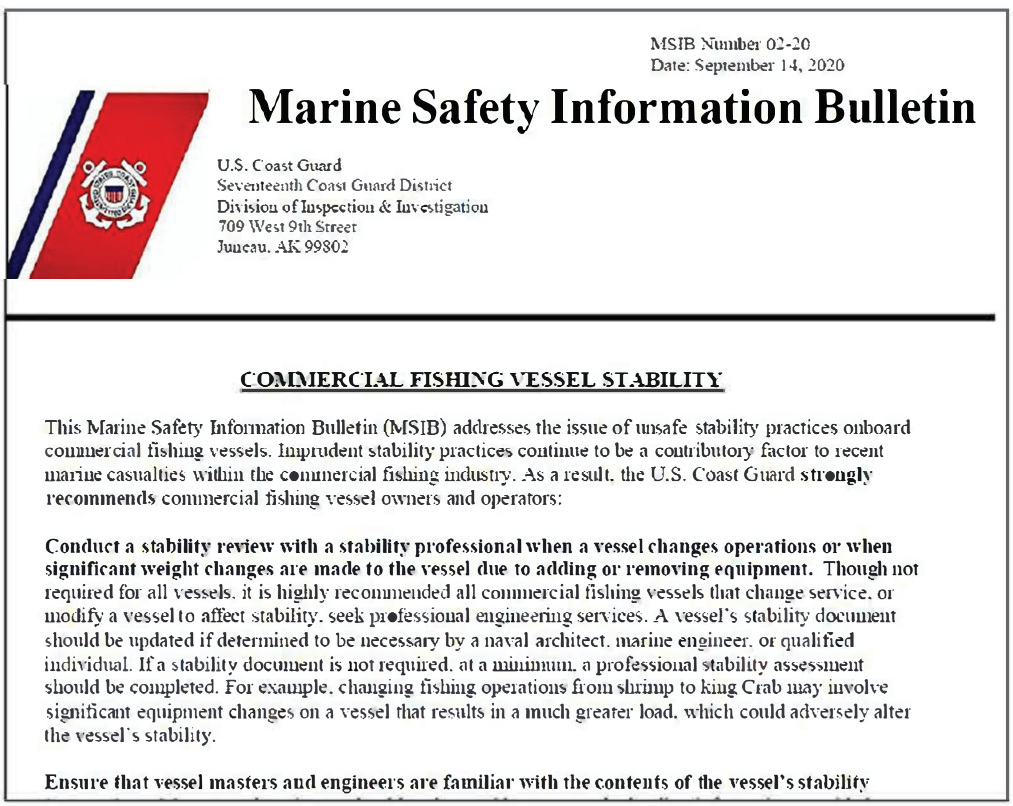
7.1.1. Coast Guard SAR Review

As a result of this incident, and consistent with COMDTINST M16130.2F, the Juneau SAR Coordinator/D17 Commander directed a SAR Case Review to examine limited aspects of the Coast Guard SAR response to the sinking of the SCANDIES ROSE. This included the alert and distress phases of the accident. The recommendations of this report will be made available to Coast Guard senior leadership as a means to enhance and improve the Coast Guard SAR System.

7.2. Coast Guard Prevention

7.2.1. Marine Safety Information Bulletins

7.2.1.1. D17 crafted and distributed MSIB 02-20 on November 25, 2020 to raise awareness on the importance of stability on fishing vessels.



MSIB Number 02-20
Date: September 14, 2020

Marine Safety Information Bulletin

U.S. Coast Guard
Seventeenth Coast Guard District
Division of Inspection & Investigation
709 West 9th Street
Juneau, AK 99802

COMMERCIAL FISHING VESSEL STABILITY

This Marine Safety Information Bulletin (MSIB) addresses the issue of unsafe stability practices onboard commercial fishing vessels. Imprudent stability practices continue to be a contributory factor to recent marine casualties within the commercial fishing industry. As a result, the U.S. Coast Guard **strongly recommends** commercial fishing vessel owners and operators:

Conduct a stability review with a stability professional when a vessel changes operations or when significant weight changes are made to the vessel due to adding or removing equipment. Though not required for all vessels, it is highly recommended all commercial fishing vessels that change service, or modify a vessel to affect stability, seek professional engineering services. A vessel's stability document should be updated if determined to be necessary by a naval architect, marine engineer, or qualified individual. If a stability document is not required, at a minimum, a professional stability assessment should be completed. For example, changing fishing operations from shrimp to king Crab may involve significant equipment changes on a vessel that results in a much greater load, which could adversely alter the vessel's stability.

Ensure that vessel masters and engineers are familiar with the contents of the vessel's stability

Figure 115 – Screen capture of a portion of MSIB 02-2 released by D17. (Source Coast Guard)

7.2.1.2. This Marine Board worked with CG-INV, CG-CVC, and CG-ENG to craft a MSIB titled "Improving Fishing Vessel Stability" as urgent notification to the maritime community regarding stability and icing threats during winter fishing operations. MSIB 01-21 was released on January 19, 2021. The safety information bulletin provided the CFV industry with vessel stability best practices and emphasized the importance of vessel owners and captains understanding, updating, and confirming the accuracy of their vessel's stability instructions.

Marine Safety Information Bulletin

Commandant (CG-5PC)
Attn: Inspections and Compliance Directorate
U.S. Coast Guard
2703 Martin Luther King Jr Ave SE, Stop 7501
Washington, DC 20020

MSIB Number: 01-21
Date: January 19, 2021

E-Mail: HQS-DG-lst-CG-INV1@uscg.mil

Improving Fishing Vessel Stability

It has been three years since the release of USCG Marine Safety Alert (MSA) 11-17. Since then, additional commercial crab fishing vessels have sunk, resulting in losses of life due to stability related conditions. In addition to the information communicated in MSA 11-17, this bulletin is intended to be informational to assist mariners in identifying ways to improve their stability awareness. Please note that it is the vessel master's responsibility to maintain satisfactory stability at all times.

Stability is the tendency of a vessel to rotate one way or the other when forcibly inclined. Operators can significantly reduce the risk of capsizing by performing the following actions:

Figure 116 – Screen capture of a portion of MSIB 01-21 released by Coast Guard Headquarters. (Source Coast Guard)

7.2.2. Informal Ice Formation Testing Onboard a Coast Guard Cutter

As the investigation progressed it was apparent that there was a need to determine the weight of ice that formed on the SCANDIES ROSE's crab pots via a scientific experiment that would reproduce the voyage's environmental conditions to the extent possible. In the interim and while awaiting setting up a scientific experiment, an opportunity presented itself aboard the Coast Guard Icebreaker POLAR STAR which was heading to the Arctic. Through joint coordination between the Marine Board, the Coast Guard's RDC, Sector Anchorage, Marine Safety Detachment Unalaska, and the CGC POLAR STAR, a crab pot and gear of the size and type that the SCANDIES ROSE would have carried on the accident voyage was borrowed for an informal field experiment. While the CGC POLAR STAR was underway in the Arctic, a non-scientific experiment was conducted where the pot was placed on the ship's open deck and a hose with a spray head would spray freshwater on the pot for a period of 72 hours in winter conditions.

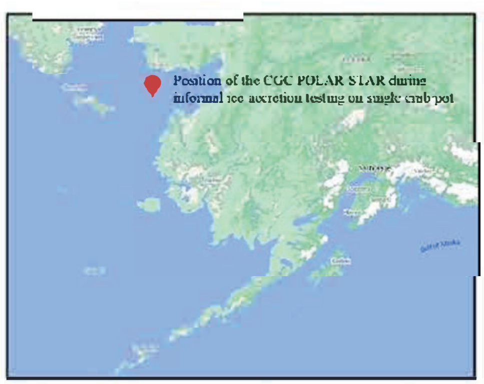


Figure 117 – The symbol on the map indicates the position of the Coast Guard's POLAR STAR when they were conducting the onboard single crab trap icing informal test. The test used freshwater over a 72-hour period with ambient air temperature at approximately 15° Fahrenheit. (Source Coast Guard)

At the end of the time period, the pot was broken free from the deck and suspended from a ship's crane with a load cell in the lifting rig capable of weighing an object up to 3,000 pounds. The dry weight of the crab pot and gear at the start of the experiment was just under 1,000 pounds. At the conclusion of the 72-hour period, the pot encrusted with ice exceeded the capacity of the 3,000 pound scale. This non-scientific study was discussed in the MBI Hearing and would lead to a formal scientific study conducted by the RDC.

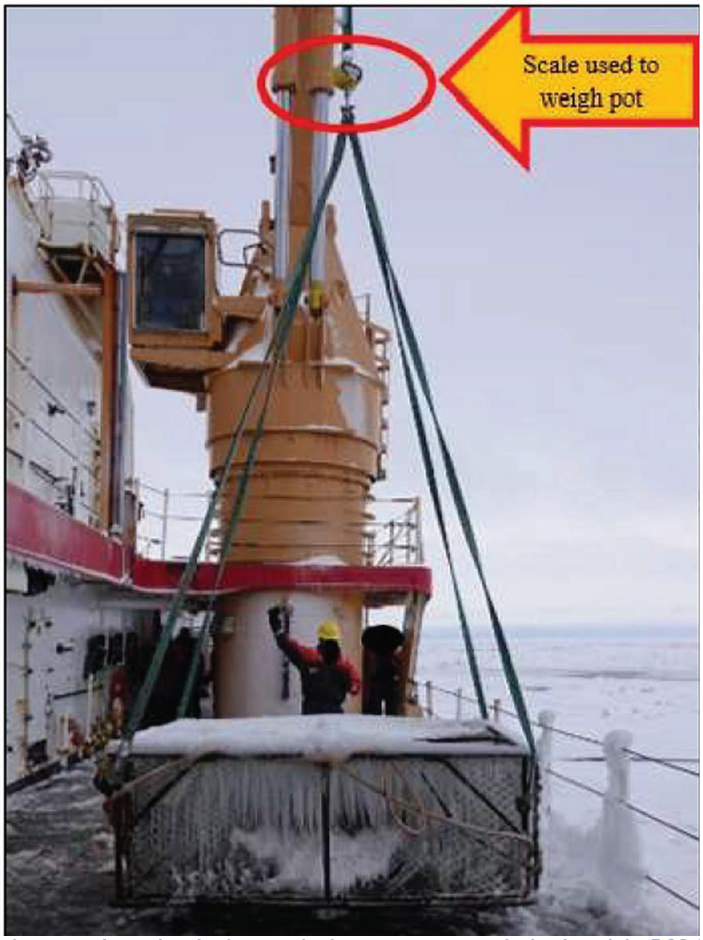


Figure 118 – The crab pot that was subjected to the freezing freshwater spray is weighed onboard the POLAR STAR at the conclusion of a 72-hour period. The yellow arrow points to the scale mounted in the lifting apparatus. (Source Coast Guard)

In late December 2020, the RDC began to formulate the plans to conduct the scientific tests. Information on that testing is contained in Section 5.12 of this Report.

7.2.3. SCANDIES ROSE Crab Pot Retrieval Efforts

The owners of the SCANDIES ROSE coordinated efforts to search for and successfully locate the wreckage of the SCANDIES ROSE. In September 2020, the Coast Guard coordinated with NOAA assets in an effort to retrieve some pots from the debris field. Recovery efforts were unsuccessful.

7.2.4. Wreck Information Broadcast and Charting

The Coast Guard published and broadcast information on the location of the SCANDIES

ROSE wreck and worked with NOAA to publish the wreckage location on the appropriate nautical charts for the area.

7.3. Actions taken by Industry Partners

7.3.1. Marine Exchange of Alaska

7.3.1.1. The Marine Exchange of Alaska is a vital link in the Search and Rescue network in Alaskan waters. On any given day, 60% of all marine vessels in Alaska are outside of the Coast Guard's search and rescue response standard in terms of the voice radio alerting capabilities. The Marine Exchange of Alaska acts as a significant partner in providing situational awareness in communications during search and rescue situations through its AIS network which encompasses a greater portion of the Alaska maritime area. Without this partnership, search and rescue operations would be significantly degraded.

7.3.1.2. Since the SCANDIES ROSE casualty, the Marine Exchange completed an in-house research and development project that focused on a DSC receiver system that they have started to install at some of their 131 Marine Safety Sites (antenna sites). As of August 2021, the Marine Exchange of Alaska has installed 13 DSC receivers and plans to install one receiver at each of their sites as they visit them for routine or unplanned maintenance. The receivers will alert watchstanders audibly and visually when a DSC distress alert is triggered, which would pinpoint the distressed vessel's geographic position if the MMSI is properly registered. These are the same AIS antenna system locations used by the Marine Exchange of Alaska for AIS vessel monitoring and Coast Guard units in Alaska have access to this AIS data provided by the Marine Exchange.[273]

[273] As of November 2021, testing of this function has not been completed. The Marine Exchange of Alaska has indicated that once they have conducted enough testing and analysis of their system and alerts, they will activate this function for the Coast Guard command centers.

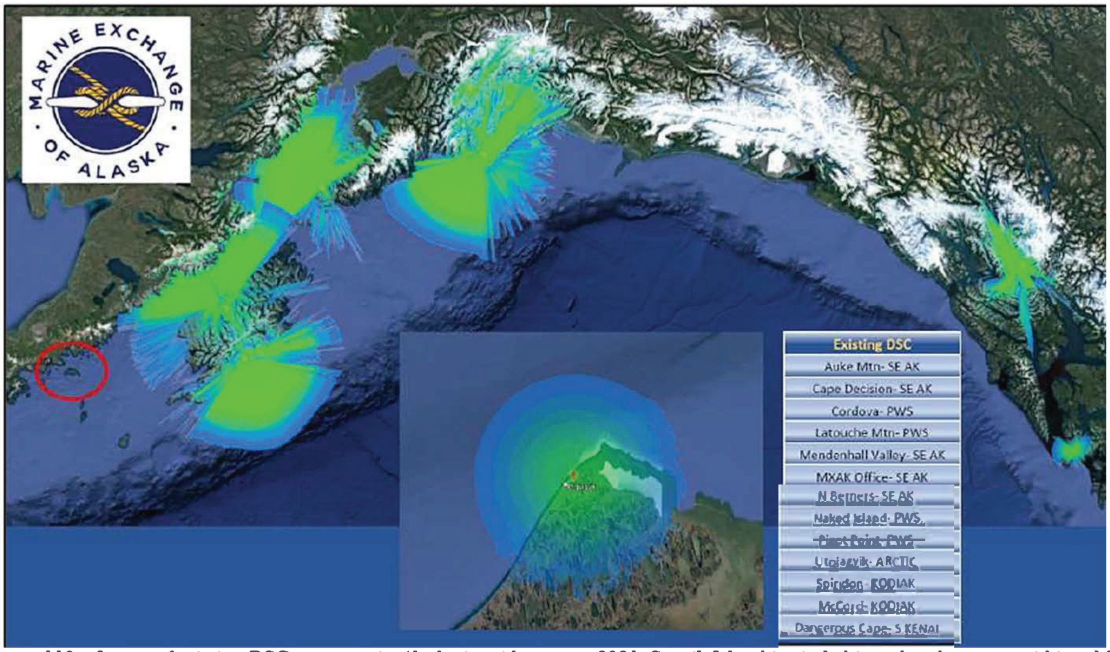


Figure 119 – Image of existing DSC coverage in Alaska in mid-summer 2021. Sutwik Island is circled in red and was not within a Marine Exchange DSC reception area at the time of the accident. (Source Marine Exchange of Alaska, with Coast Guard mark up)

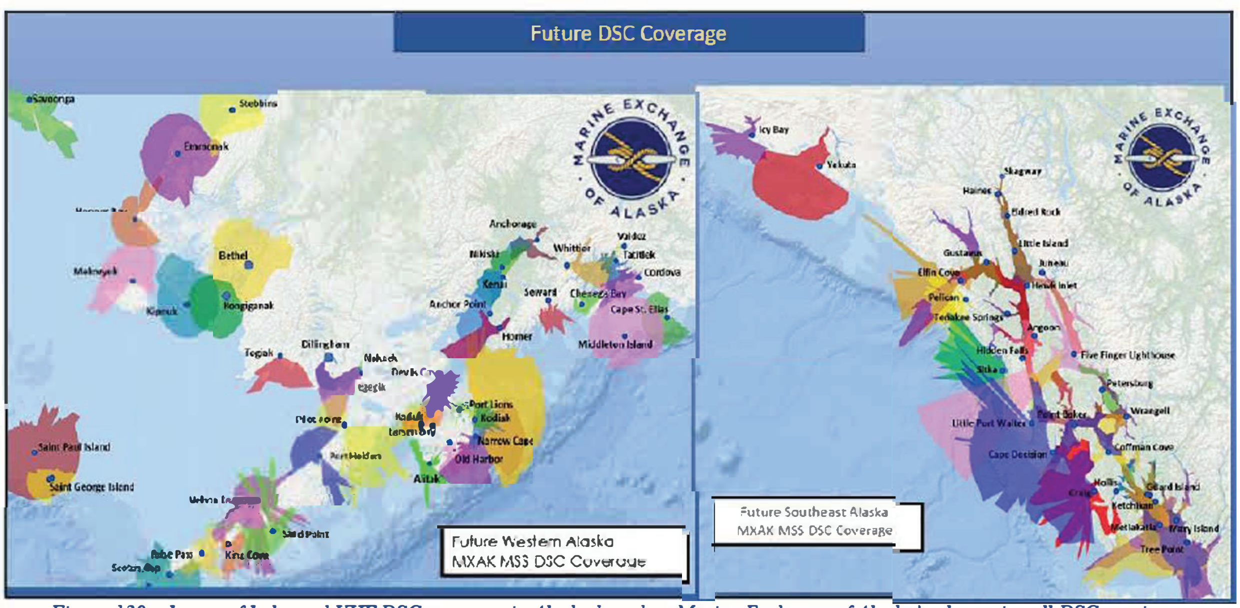


Figure 120 – Image of l planned VHF DSC coverage in Alaska based on Marine Exchange of Alaska's plan to install DSC receivers on their existing antenna sites. If all DSC receivers are installed as intended, the area in which the SCANDIES ROSE marine accident occurred will have DSC coverage. (Source Marine Exchange of Alaska)

7.3.1.3. The Marine Exchange of Alaska is concurrently conducting a research and development project on VHF-FM Voice over Internet Protocol (VoIP) for some of their Marine Safety Sites, mainly in areas which are known CG R21 coverage gaps. The Marine Exchange of Alaska is currently working with several commercial providers, hoping to have a VoIP system beta test ready for the Coast Guard to witness by fall of 2022.

8. **Recommendations**

8.1. Safety Recommendations

8.1.1. Recommend that the Commandant of the Coast Guard partner with the National Commercial Fishing Safety Advisory Committee (N-CFSAC) to establish a working group to draft and accept a Task Statement addressing safety of Commercial Fishing Vessels of less than 200 GTs. The Task Statement should specifically address the issues raised by this marine casualty, the total loss with fatalities of the SCANDIES ROSE, as well as the similar losses of the DESTINATION and LADY OF GRACE,[274] caused by vessel icing leading to a loss of stability. The Task Statement should address the following items:

8.1.1.1. In conducting the tasking, review the multi-year statistics (provided by the Coast Guard) regarding commercial fishing vessels of less than 200 GT accidents or losses that resulted in fatalities, injuries, or property damage. Major marine casualties in addition to this one, such as the loss of the DESTINATION, NO LIMITS, and other fishing vessels with multiple fatalities and vessel losses should be reviewed to provide the background information necessary to conduct the tasking and then make informed recommendations to the Coast Guard.

8.1.1.2. Examine and make recommendations to the Coast Guard on best practices to reduce and mitigate the negative consequences caused by the misalignment of state and federal regulations regarding drug laws legalizing the recreational or medical uses for drugs also classed as dangerous drugs by federal law and applicable transportation related statutes. This is critical for the safety of operations and creating an environment for vessel personnel to work in a drug-free workplace, with special emphasis on critical safety sensitive jobs such as navigation and engineering duties to bring fishing vessels into alignment with other commercial vessels. Develop recommendations that include testing for pre-employment, routine, and reasonable cause.

8.1.1.3. Examine and effectively disseminate recommendations for best practices to ensure full crew access to all parts of a vessel to allow for safe vessel operation. This task should address and examine things like a means to access all areas of the vessel and allow the crew to safely move fore and aft to remove ice, inspect the vessel, and operate critical equipment like the vessel's anchors and similar gear that does not require the crew to climb over the pot stack (for example, in the case of a vessel carrying pots, nets or similar devices to create pathways for access).

8.1.1.4. Examine and make recommendations to the Coast Guard on a way to widely distribute PLBs at minimal expense. Ensure availability and access for crewmembers of these critical lifesaving devices which could be acquired by consortiums, associations, or other organizations for distribution to vessel crews through federally funded grant programs or other programs.

[274] Coast Guard's Report of Investigation into the Sinking of the Fishing Vessel LADY OF GRACE https://www.dco.uscg.mil/Portals/9/DCO%20Documents/5p/CG-5PC/INV/docs/documents/LadyOfGrace.pdf

8.1.1.5. Establish best practices for standard procedures and guidance for crew standing navigation watches. This should include a detailed crew orientation for each unique vessel, including the operation of critical equipment and establish clear and easily understood watchstanding orders to protect the safety of the vessel for its applicable operations. This could be accomplished as a standardized form or checklist.

8.1.1.6. Evaluate and provide a comprehensive list of recommendations to the Coast Guard, in the form of best practices (NVICs, policies, training), or amended or new regulations, regarding stability considerations which may pose severe risk to the safety of a fishing vessel such as icing, loading, the need for stability instructions, and vessel modifications. As part of this task, review the Coast Guard's current level of oversight, provide recommendations on its adequacy, and specify needed changes to areas of the fishing safety program that need additional attention.

8.1.1.7. Evaluate and provide recommendations to the Coast Guard for best practices to address the high degree of risk associated with fishing vessel operations and how the acceptance of risk is prevalent and accepted in the fishing industry. Specifically, the Marine Board recommends the committee focus on topics including icing, heavy weather avoidance in voyage planning, and formalizing the navigation watch duties via onboard familiarization and written standard orders to ensure the safety of vessel during its transit and during fishing operations.

8.1.1.8. Evaluate and provide recommendations to the Coast Guard to ensure the most effective means to widely disseminate critical safety information for the commercial fishing industry. This Marine Board investigation revealed that current means are not effective at making it to a large portion of the commercial fishing fleet.

8.1.2. Recommend that the Commandant of the Coast Guard clarify the existing language in the requirements contained in 46 CFR 28.270(b)—participation in drills—regarding "donning" immersion suits. The regulatory intent was to have each member of the crew physically put on an immersion suit to satisfy the requirements of the regulation. More importantly, the intent was to get the tactile experience and increase crewmember ability to rapidly and properly don the suit in extreme conditions.

8.1.3. As previously noted in the DESTINATION ROI, recommend that the Commandant of the Coast Guard amend 46 CFR 28.550 - Icing, to clarify that the vessel's stability instructions to the master should indicate that when freezing spray forecasts or conditions exist, the vessel may experience icing conditions that dangerously compromise the vessel's stability and that captains shall consider delaying departure from port, or if already underway, seek protected waters or take immediate action to reduce or mitigate ice accumulations.

8.1.4. Recommend that the Commandant of the Coast Guard, specifically, CG-CVC, collaborate with marine training institutions like the NPFVOA and AMSEA seeking to amend their curriculums as appropriate for operating areas with icing conditions. The effort should increase the focus on the dangers of icing and other potential sources for loss of stability and provide for recommended best practices to reduce icing or causes of loss of stability. This could include protective measures such as dropping gear overboard when in dangerous stability condition, not getting underway in the face of severe weather, or seeking shelter if already underway.

8.1.5. Recommend that the Commandant of the Coast Guard, specifically the MSC, create a mechanism to track quality related issues pertaining to stability work involving professional engineers/naval architects. Develop a formal mechanism to provide feedback to regulatory bodies overseeing naval architects and professional engineers after identifying deficiencies in the quality of work that affect vessel safety.

8.1.6. Recommend that the Commandant of the Coast Guard, specifically CG-5P and other applicable offices determine the real-life icing effects on commercial fishing vessels, specifically the asymmetrical nature of accumulation on the vessel and pots, and amend 46 CFR 28.550 to improve the margin of safety for vessels operating in such harsh environments. The RDC Ice Accretion on Crab Pots REACT Report is a baseline study and can serve as a starting point for this effort to build more effective regulatory icing standards.

8.1.7. Recommend that the Commandant of the Coast Guard develop regulations that require commercial fishing captains of documented vessels operating beyond the boundary line attend and complete an accepted stability training course. Doing this would align the regulations with the 2010 CGAA which added a subsection in 46 USC §4502 that required an individual in charge of a commercial fishing vessel that operates three NMs beyond the territorial sea baseline to pass a training program and hold a certificate issued under that program.

8.1.8. Similar to the recommendation made in the DESTINATION ROI, recommend that the Commandant of the Coast Guard amend 46 CFR Part 28 to require CFV owners and captains implement vessel policies to address crew rest, work hours and fatigue. Implementing regulations to require fishing vessels to implement vessel policies reflecting the basic principles of the Coast Guard's Crew Endurance Management System (CEMS) or similar practices that can be used to identify and control crew fatigue risk factors.

8.1.9. Recommend that the Commandant of the Coast Guard, specifically, CG-CVC and CG-ENG, promptly produce and disseminate a Marine Safety Information Bulletin or Safety Alert discussing a best marine practice to ensure a means of access to all parts of a fishing vessel, such as an alleyway through the pot stack or along one side of the stack, while the vessel is underway/operational in inclement conditions. In doing so, fishermen will have a safer way to maintain a clearer picture of the materiel and stability condition of their vessel in icing conditions and can take steps to mitigate negative forces before the loss of stability becomes catastrophic. The Coast Guard should collaborate with marine training institutions like the NPFVOA and AMSEA in ensuring widest distribution of this message to the commercial fishing industry.

8.1.10. Recommend that the Commandant of the Coast Guard promote the use of a properly installed and configured Digital Selective Calling feature on marine VHF radios throughout the maritime regions of the U.S. aboard all vessels, as this will enhance the saving of life and property and the potential timeliness of rescue in marine emergencies. This safety initiative to promote the widespread use of VHF marine radios DSC features should be added to the scope of duties, checklists, and job aids used by Coast Guard personnel and Coast Guard Auxiliarists conducting marine safety related outreach to the marine community, including the recreational boating community.

8.1.11. Recommend that the Commandant of the Coast Guard, specifically CG-CVC in partnership with N-CFSAC, promote and encourage CFV owners and captains to attend training classes in safety and navigation related subjects such as those offered by various training institutions such as the NPFVOA and AMSEA.

8.1.12. Recommend that the Commandant of the Coast Guard, specifically CG-761, examine and close the AIS and R21 coverage gaps that exist in Alaska to ensure the effectiveness of Coast Guard operations as well as meet national security requirements. As efforts to reduce coverage gaps in D17 partially rely on the work of industry partners, it is strongly recommended that Coast Guard initiatives include collaboration with existing industry partners and utilization of already available communications technology, such as the AIS/DSC capabilities of the Marine Exchange of Alaska.

8.1.13. Recommend that the Commandant of the Coast Guard, specifically CG-SAR and PACAREA reexamine SAR readiness and mission response standards to improve chances of recovery. While an abbreviated SAR case study has been conducted by the Coast Guard for this accident, the unique demands and challenges posed by this accident and similar accidents in remote Alaskan waters require that a full scope SAR case study with recommendations for improving Coast Guard rescue operations.

8.1.14. Recommend that the Commandant of the Coast Guard continue outreach efforts to improve dissemination of the message to the maritime community to address the misalignment between state and federal drug laws. It is critical to reinforce the message that the use of dangerous drugs, positive drug tests, or actual impairment may lead to enforcement actions at the state or federal level up to including criminal prosecution.

8.1.15. Recommend that the Commandant of the Coast Guard, specifically CG-5P elicit expertise from marketing and advertising professionals to better disseminate important safety information, such as "A Best Practice Guide to Vessel Stability, Second Edition" which is available on the CG-CVC-3 website. In addition, this knowledge should be implemented to other aspects of the CFVS Program to meet mandates of the Commercial Fishing Vessel Safety National Communications Plan.[275]

8.1.16. Recommend that the Commandant of the Coast Guard, including but not limited to CG-5P and CG-SAR, partner with marine industry to promote the wearing and use of PLBs. Conduct education and outreach to promote availability and benefits that increase chances of

[275] The Commercial Fishing Vessel Safety National Communications Plan is intended to establish a standardized framework of communications that will make sharing and disseminating information between the U.S. Coast Guard and commercial fishing industry easier.

survival and rescue. Such outreach efforts can include developing safety alerts, establishing Coast Guard presence at Maritime Expos or events that draw the maritime community, attending industry workshops, or hosting local industry days with CFV owners, operators, and crew.

8.1.17. Recommend that the Commandant of the Coast Guard, specifically CG-CVC, conduct effective and widespread outreach to educate mariners on abandon ship procedures to ensure proper deployment and device activation of the EPIRB allowing it to transmit the distress alert signal which would result in the receipt of the distress signal by rescue forces.

8.1.18. Recommend that the Commandant of the Coast Guard direct Coast Guard investment in modernizing the VHF land-based assets in D17 to meet Sea Area 1 requirements with special attention to design parameters enabling that communications equipment to handle the extremes of the Alaskan environment. Additionally, the Coast Guard must ensure that the HF radio program remains in place and operational in the D17 AOR to support an effective SAR program.

8.1.19. Recommend that the Commandant of the Coast Guard work with IMO and the liferaft manufacturing industry to examine and consider the improvement of lighting on liferafts and other survival equipment. This would include the use of the newest available lighting technology (i.e. LED lighting, laser flares, and beacons) to increase the range of detection, illumination, reliability of lamps leading to an increased amount of interior/exterior lighting, and increasing the probability of survivability and rescue.

8.1.20. Recommend that the Commandant of the Coast Guard accept and implement the recommendations contained in the SCANDIES ROSE SAR Case Review.

8.1.21. Recommend that the Commandant of the Coast Guard, specifically CG-5PC release a Safety Alert regarding the value gained in properly configuring a marine VHF radio to enable the use of a DSC alert and provide users with the necessary steps configure the DSC function.

8.1.22. Recommend that the Commandant of the Coast Guard direct the appropriate Headquarters office(s) to implement the provisions of the 2010 CGAA and 2012 CGMTA relating to commercial fishing vessels.

8.1.23. It is recommended that the Commandant of the Coast Guard, specifically CG-CVC working with the SCANDIES ROSE Marine Board, develop a user-friendly abbreviated version of this report containing key findings of this report and containing relevant information from the DESTINATION ROI and the RDC's Ice Accretion on Crab Pot Report in text and image form content, where appropriate. This printed and digital guide would be developed for the purpose of widespread distribution to the appropriate segment of the commercial fishing industry (cold water operating environments).

8.2. Administrative Recommendations

8.2.1. In absence of applicable regulations, recommend that the commercial fishing industry voluntarily adopt requirements outlined in 46 CFR Part 57 for the use of certified marine welders when conducting work on steel hull commercial fishing vessels. Use of procedures outlined in the Coast Guard's NVIC 7-68 (Guidelines for steel vessel hull repair) and American Welding Society (AWS) Standards for Welders are accepted best practices to determine that quality repairs have been completed.

8.2.2. Recommend the National Weather Service make forecasting as well as existing models on freezing spray and icing more operationally available and easily accessible to the maritime community. It is critical that the NWS enhance their weather products to incorporate applications such as the experimental freezing spray forecast and create easily accessible, user-friendly interfaces to improve vessel safety.

8.2.3. Recommend the National Weather Service incorporate the data provided by the AIS based weather sensors, maintained by Marine Exchange of Alaska, into the forecasting models for the Alaska region.

8.2.4. Recommend the National Weather Service explore and investigate a means to update the weather message content in all appropriate National Weather Service products to provide an explanation of statements such as "Freezing Spray" and "Heavy Freezing Spray" conditions, providing information that is found in the National Weather Service Glossary, on the potential rate of ice accumulation from freezing spray in inches per hour for each classification of freezing spray. Providing this information facilitates mariners' ability to appropriately manage the risk from freezing spray along their intended route.

8.2.5. Recommend that NOAA and the Marine Exchange of Alaska, in conjunction with any other applicable governmental or non-governmental organizations/stakeholders, enhance partnerships to establish a more extensive network of reliable weather stations in coastal regions to gather more accurate weather information for the transportation industry in the remote regions of Alaska.

8.2.6. Recommend the Federal Communications Commission examine and amend existing regulations where required and revise FCC Public Notice DA 16-63. This change should require any commercial vessel be equipped with a VHF marine radio that has a properly configured DSC feature with an interconnected GPS, MMSI programmed, and ready for immediate use including within the State of Alaska (which is presently excluded) and adjacent waters. The Marine Exchange of Alaska has installed DSC receivers on its AIS towers since the accident, and is continuing to expand that network. These additional DSC receivers would enable receipt of DSC distress alerts and potentially facilitate a reduction in the time it takes for Coast Guard and other rescue forces to reach vessels distress.

8.2.7. Recommend that the State of Alaska implement a new measure in the Alaska Administrative Code, where appropriate, to close the safety gap where crabbers participating in the Bering Sea/Aleutian Islands IFQ Crab Fisheries Management Plan are required to report to the Coast Guard prior to departing port and vessels with similar gear are not required to report. In Section 5 AAC 39.670 - (7) an operator of a vessel participating in an IFQ, CDQ, or Adak community allocation crab fishery in the Bering Sea/Aleutian Islands area must notify the United States Coast Guard at least 24 hours before departing port when carrying crab pot gear; whereas the same vessel when fishing with modified crab pots of the same size for groundfish and, facing the same vessel stability risks, are not required to make these safety related reports prior to departure.

8.2.8. Recommend that the Washington State Board of Registration for Professional Engineers and Land Surveyors be provided with a copy of this ROI and examine it for information relating to the quality and accuracy of the stability work performed by the P.E./Naval Architect who conducted the stability testing and provided the stability instructions for the SCANDIES ROSE in 1988 and 2019 and continues to conduct stability work on vessels throughout the West Coast.

8.2.9. Recommend that the Commandant of the Coast Guard provide widest dissemination of this report throughout the CFV industry to include:

8.2.9.1. Coast Guard District Fishing Vessel Coordinators

8.2.9.2. To training institutions (AMSEA, NPFVOA, and others) for use as a case study. The purpose is to reach the intended audience of commercial fishing vessel crews, owners, and operators of and communicate the importance of taking timely and effective action at the first sign of emergency, to take action and maximize the chances of survivability for vessel and crew.

8.2.9.3. Major fishing vessel associations in the Pacific Northwest and Alaska.

8.2.9.4. In this case, it is critical that Commandant reach out to the WA State regulating body for naval architects and Professional Engineers.

8.2.10. It is recommended that the participating crews of Air Station Kodiak and the CGC MELLON be commended for their search and rescue efforts after the loss of the SCANDIES ROSE.

8.3. Although not a direct contributing factor to this accident, the investigation revealed the following issues warranted being classified as **Findings of Concern**:

8.3.1. Crew medical conditions that affect performance in the dangerous operations of commercial fishing vessels are not identified and assessed to determine conditions that may affect critical vessel operations. This investigation revealed that a [redacted] person was insulin dependent and the [redacted] had vision, heart, hearing and other medical problems which could have been greatly exacerbated in the challenging maritime environment of Alaska and other similar areas. Owners may attempt to assess fitness for service by the crew but the commercial pressures of fishing operations may preclude management oversight of these risks to vessel operations. In this case, the managing owner was not aware of the scale of medical issues with the SCANDIES ROSE crew as it departed on the accident voyage. There is no requirement for medical fitness to operate a vessel of the size and type as the SCANDIES ROSE.

8.3.2. One crewmember on the SCANDIES ROSE boarded the vessel and was tested for drugs. It was reported that the results for all five drugs tested in this home drug test kit came back as negative. However, after the rescue, the same crewmember was tested for the same five drugs and the results were positive for marijuana, THC. That crewmember was in a safety sensitive position, operating the SCANDIES ROSE as the navigation watch and stood the last watch on the accident night before the Captain took the watch. It is the opinion of the Marine Board that the initial test for this crewmember was most likely positive but, due to the pressure to get underway with a full complement of crew, the results were reported as negative. In the Marine Board hearing, the owner made the following statement:

> *"Yeah, zero tolerance. Zero tolerance, especially --especially for, you know, meth or opiates. You can't have anything. Nowadays with pot, you almost can't find a crew member who hasn't had some pot, and pot sticks in your system for a long time, but you still have to be -- you know, you just can't have somebody who's showing up on the test. The only exceptions I've ever made is if somebody failed in Seattle, I'd let them ride the boat up and say, you know, we're going to test you again in Kodiak or Dutch Harbor, whenever we get there, and if you don't pass that, you're on a plane coming home."*[276]

Other than post casualty testing, there is no explicit requirement to provide a drug and alcohol free workplace onboard a vessel of the size and type as the SCANDIES ROSE unless the crew have a Coast Guard license or credential.

8.3.3. Fatigue at sea has a dangerous and debilitating effect on decision-making. One of the survivor's work-rest history was analyzed and he was found to be impaired by fatigue to the level of legal intoxication by alcohol. The other deckhands worked together to load the boat and there is the likelihood that they all were at sea for a period where they could not make up the sleep deficit on the voyage to the fishing grounds. It was not possible to accurately assess the fatigue level for the Captain. Despite the uncertainty of fatigue's impact on this accident, research has shown that fatigue leads to errors in decision making and decreased motor skills. There is no requirement for establishing a work routine to reduce the effects of fatigue when operating a vessel of the size and type as the SCANDIES ROSE.

8.3.4. Companies that operate fishing vessels without developed written procedures and have multiple employees and operators may create situations that lead to latent unsafe conditions in terms of misunderstanding the roles and expectations for important duties. It is recommended that companies should consider developing written procedures to operate their vessels safely with due regard to the intended service and fishery of the vessel and ensure that all employees within the company are thoroughly familiar with these policies and procedures.

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[276] [redacted], MBI Hearing Transcript, Pg. 78

8.4. Recommend this investigation be closed.

[redacted]

GREGORY A. CALLAGHAN
Captain, U.S. Coast Guard
Chairman, Marine Board of Investigation

Enclosure(s): (1) Marine Board of Investigation Convening Order/Subsequent Changes
(2) SCANDIES ROSE ROI Hyperlinks

Enclosure (2)

List of Hyperlinks for F/V SCANDIES ROSE Report of Investigation

Hyperlink No.	Items	Type	Hyperlink
1	Animation of the SCANDIES ROSE Voyage	.mp4	SCANDIES ROSE Voyage Animation
2	CG Exhibit 085 - Distress call from the SCANDIES ROSE, 1 minute 38 seconds in length	.mp3	SCANDIES ROSE Mayday Call 1 min 38 seconds
3	CG Exhibit 127 - Fish Safe BC Stability Video	.mp4	Fish Safe BC Stability Video
4	CG Exhibit 132 - Pre-Hearing Interview Transcripts	.pdf	NTSB Pre-Hearing Interview Transcripts
5	MBI Hearing Transcripts	.pdf	Combined MBI Hearing Transcripts
6	CG Exhibit 136 - Post-Hearing Interview Transcript	.pdf	Post MBI Hearing Interview, Mr. Lawler
7	MSC Stability Report complete with Appendices	.pdf	MSC Stability Report, Addendum and Appendices A,B and C
8	Coast Guard REACT Ice Accretion on Crab Pots Report	.pdf	RDC's REACT Report "Ice Accretion on Crab Pots"

Note: Hyperlinks 1, 2 and 3 are relatively large files and will take time to load on your browser.