



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**



MISLEACTIVITY NUMBER: 7100250



16732/20-090
DEC 02 2020

MEMORANDUM

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

02 Dec 2020

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 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

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

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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]

#

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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.


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



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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.



Tom G. Allan Jr.
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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**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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**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	█	Presumed Dead
Deckhand 1	Male	█	Presumed Dead
Deckhand 2	Male	█	Presumed Dead
Deckhand 3	Male	█	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.

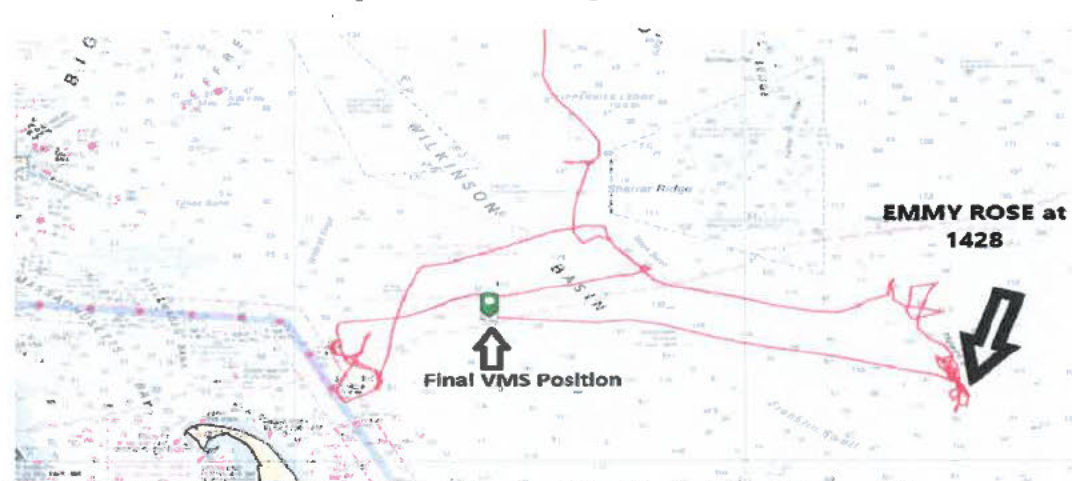


Figure 3: EMMY ROSE position at time of call on 22 November 2020 to Fisherman's Wharf, Gloucester, MA.

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 $42^{\circ} 18' 53.1''\text{N}$, $069^{\circ} 33' 7.14''\text{W}$ 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 initial unconfirmed position was at $42^{\circ} 15' 12''\text{N}$, $069^{\circ} 36' 24''\text{W}$.

4.1.11. At 0130, the first confirmed EPIRB position was received from position $42^{\circ} 16' 12''\text{N}$, $069^{\circ} 38' 18''\text{W}$, 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 vicinity 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.

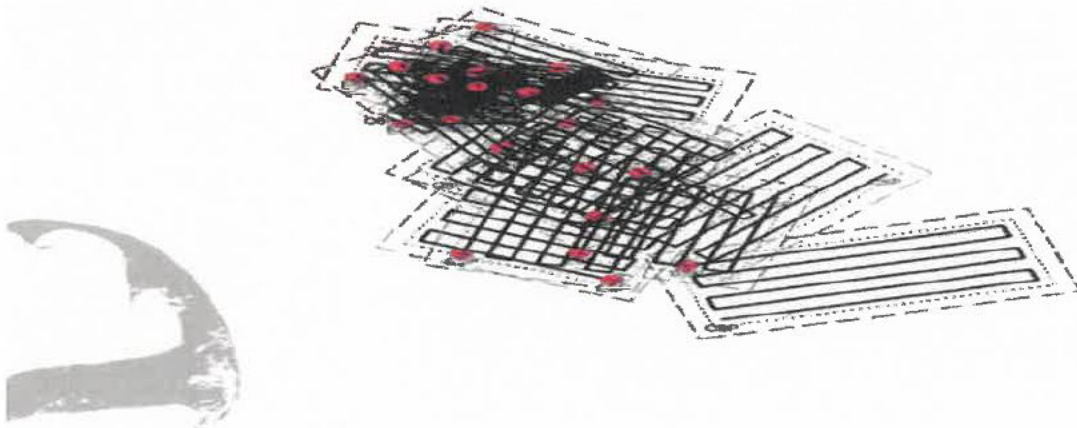


Figure 6: Search patterns completed by Coast Guard Search and Rescue units.

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 BOATAARON & 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 could n’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 EMMYROSE. 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

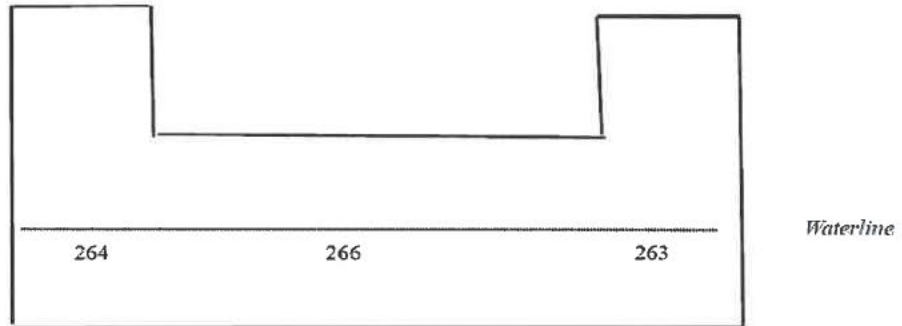


Figure 10. Stern ultrasonic test readings taken during evaluation, Aug 2019. Image courtesy of Marine Safety Consultants.

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 13:50	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 09:08	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	330795	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	20200815 00:15	08:00:00
Emmy Rose	330795	20200808 20:09	20200815 04:30	6 06:20:48
Emmy Rose	330795	20200805 18:54	20200906 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.

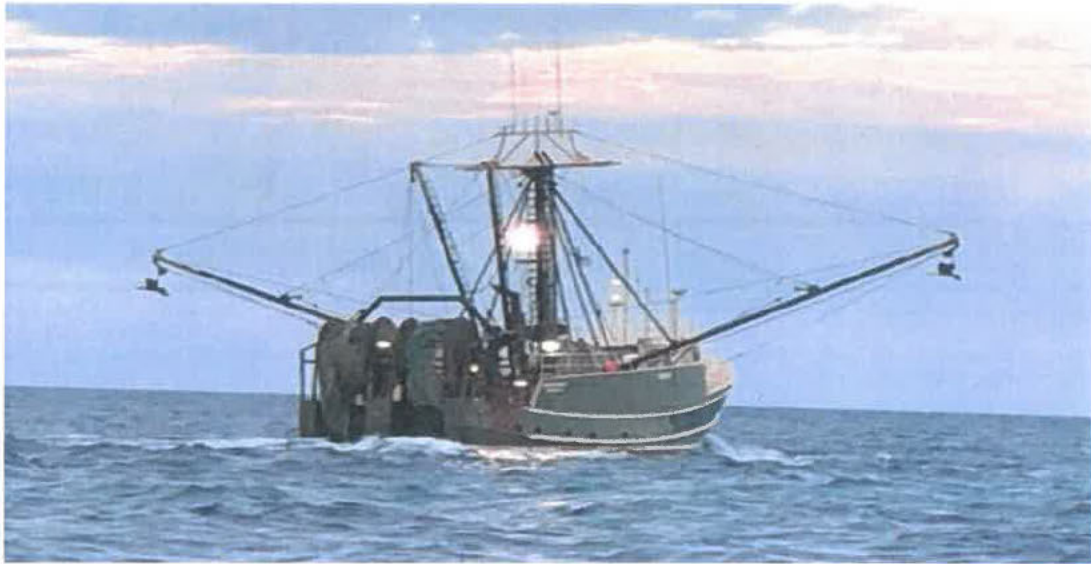


Figure 13: EMMY ROSE departing Portland Harbor.

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 cross tree with cradles for the port and starboard outriggers.

4.6.7. The haul back area aft is fitted with 36 1/2" 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.

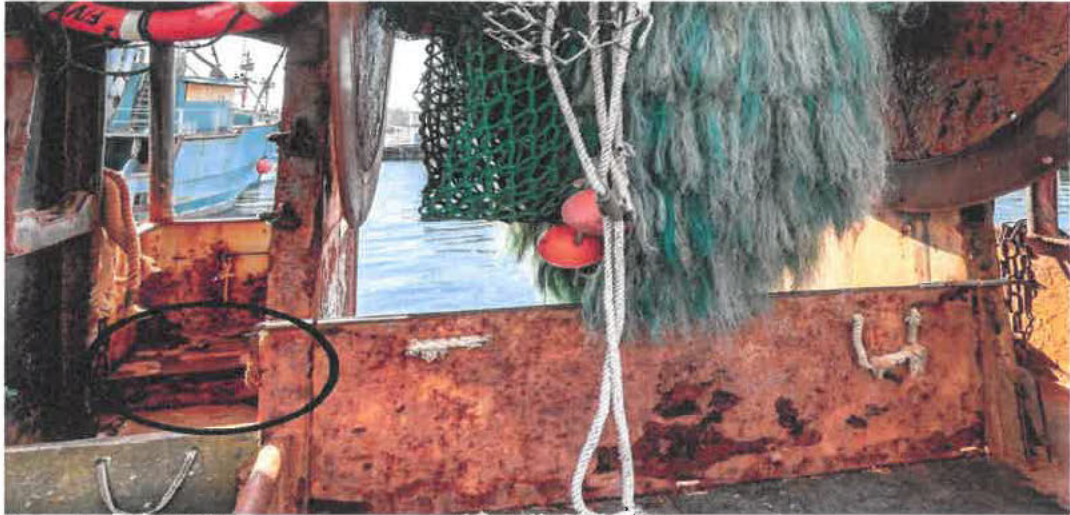


Figure 21: EMMY ROSE lazarette. Image courtesy of Atlantic Brokerage, 2019.

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.

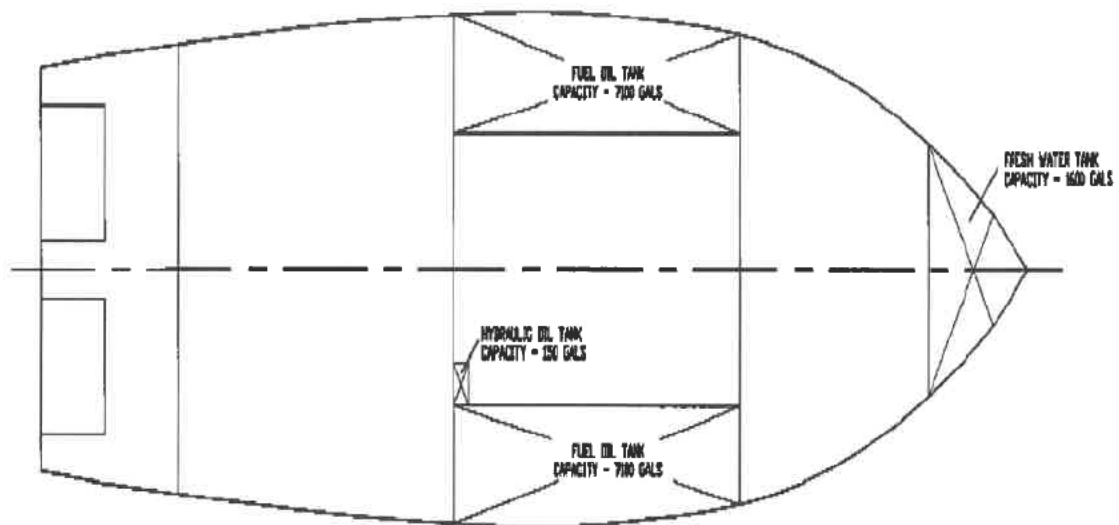


Figure 29: EMMY ROSE tank capacity plan. Image courtesy of Thomas M. Farrell Naval Architects, 2002.

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).

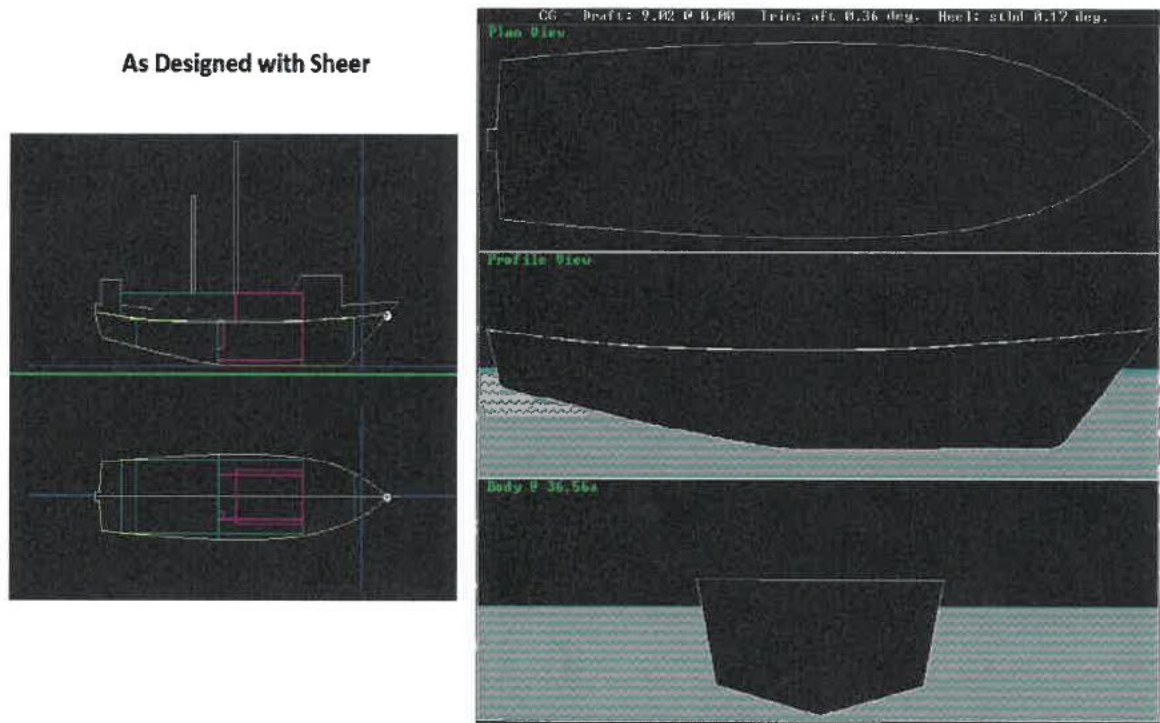


Figure 34: MSC recreation of EMMY ROSE as designed with sheer.

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 $\frac{1}{4}$ tank between port and starboard fuel tanks.
- 4.9.4.5. Loading condition 11 represents a fuel load difference of $\frac{1}{2}$ 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 capsizes, 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 capsized. 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.

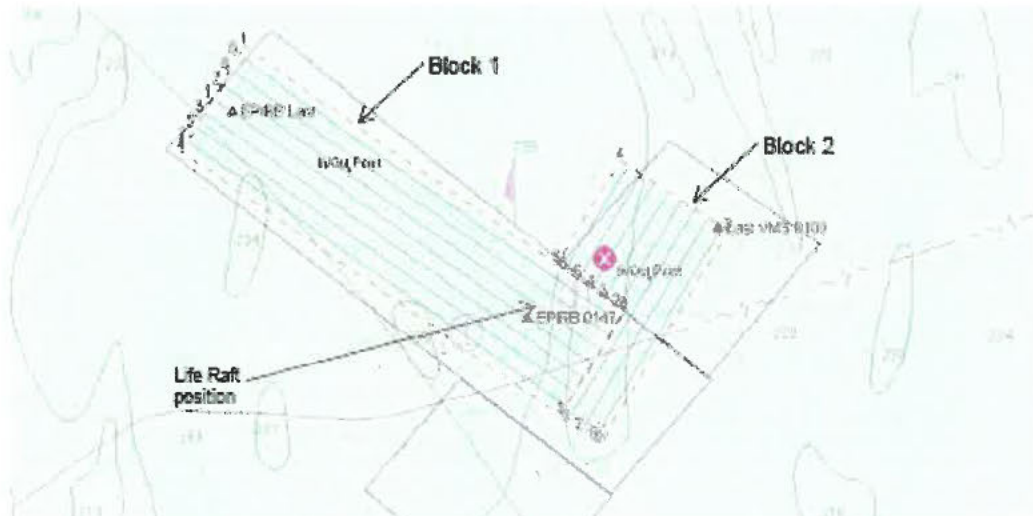


Figure 35: Chart of MIND Technology's survey Blocks (red dashed lines) and survey line plan (blue lines) in relation to the Last VMS position of the EMMY ROSE, EPIRB position at 0147 and the last EPIRB position at 0302. The NTSB proposed search blocks are presented as purple lines. Image courtesy of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

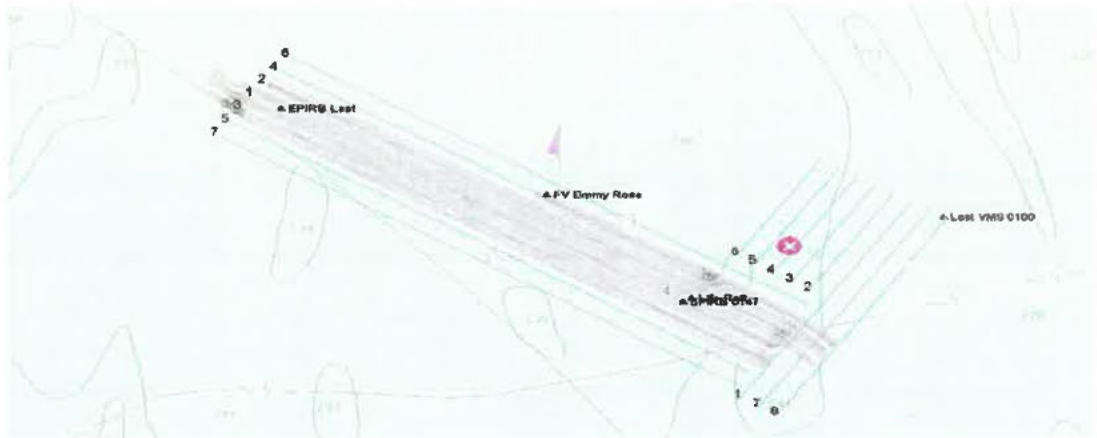


Figure 38: 110 kHz side scan sonar mosaic of 4 lines covered in Block 1 to locate the EMMY ROSE (location identified w/ flag). Image courtesy of Kline Technologies

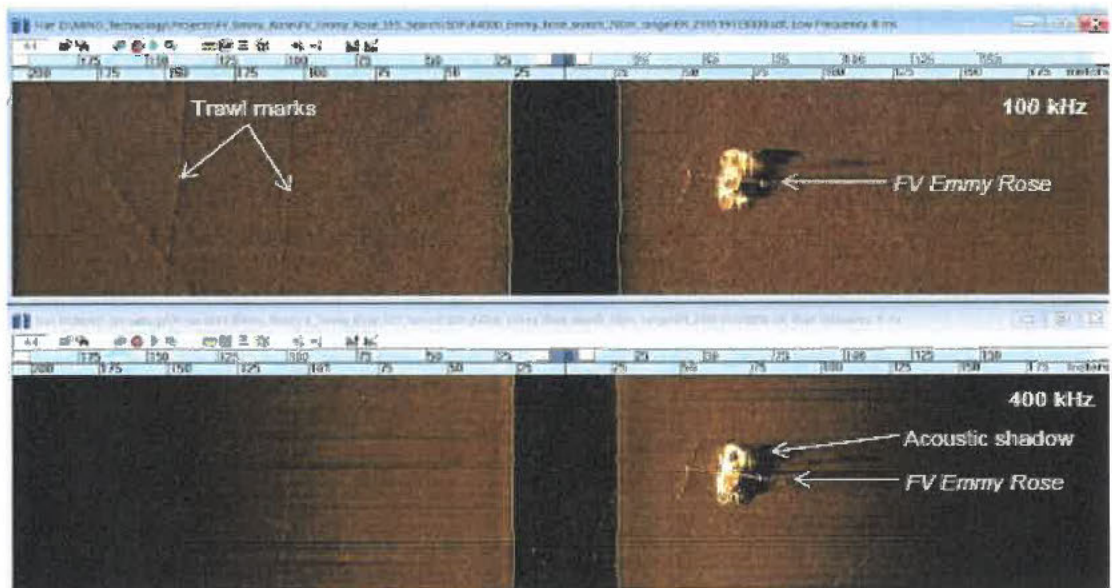


Figure 39: Klein 4000 (100 kHz & 400 kHz; 200 m scan range) imagery with the first contact with the EMMY ROSE. Image courtesy of MIND Technology, 2021.

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.

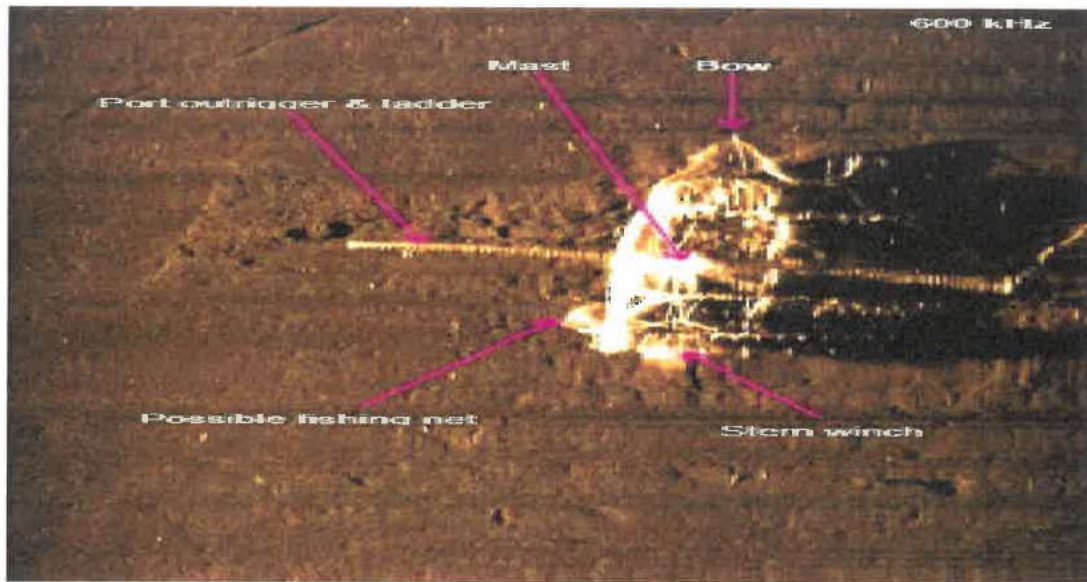


Figure 40: Prototype Klein 4K-SVY 600 kHz (75 m scan range) imagery of the FV EMMY ROSE lying upright on the seafloor with the port and starboard outriggers deployed. No vessel damage is visible. Image courtesy of MIND Technology, 2021.

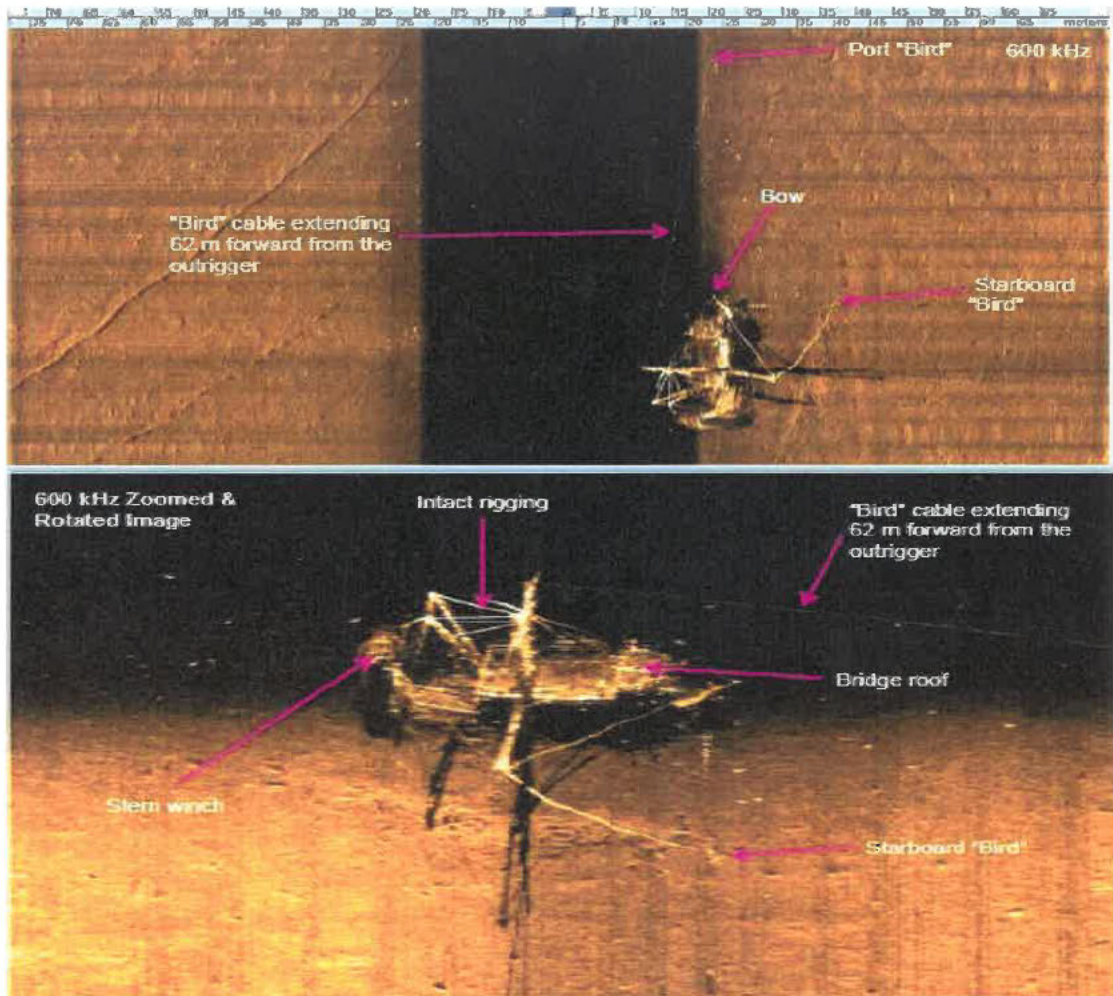


Figure 41: Prototype Klein 4K-SVY 600 kHz (75 m scan range) imagery of the EMMY ROSE with the towfish flown almost directly over the wreck. Image courtesy of Klein Technologies.

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.

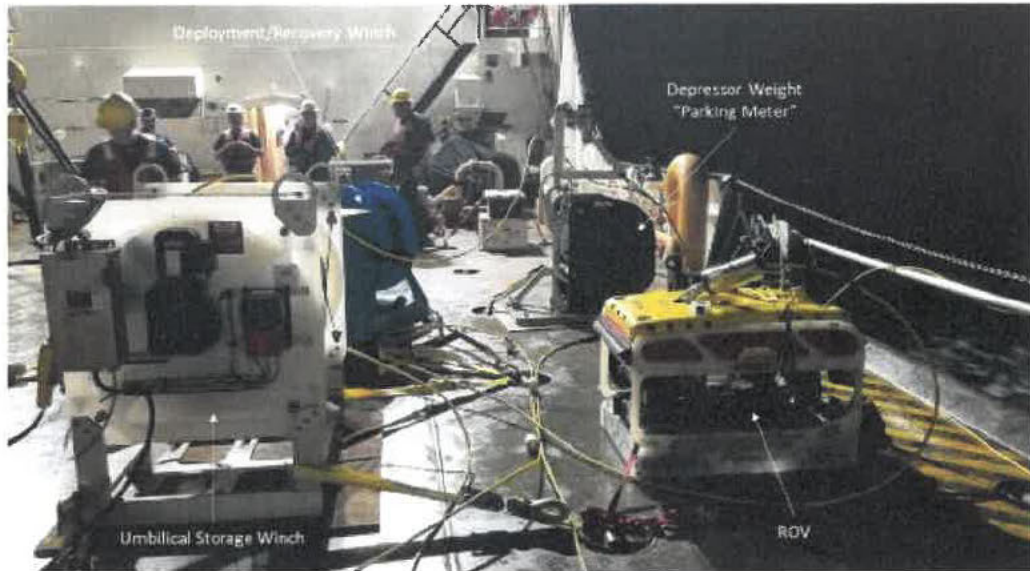


Figure 44: Equipment layout on the deck of the CGC SYCAMORE. Image courtesy of WHOI, 2021.

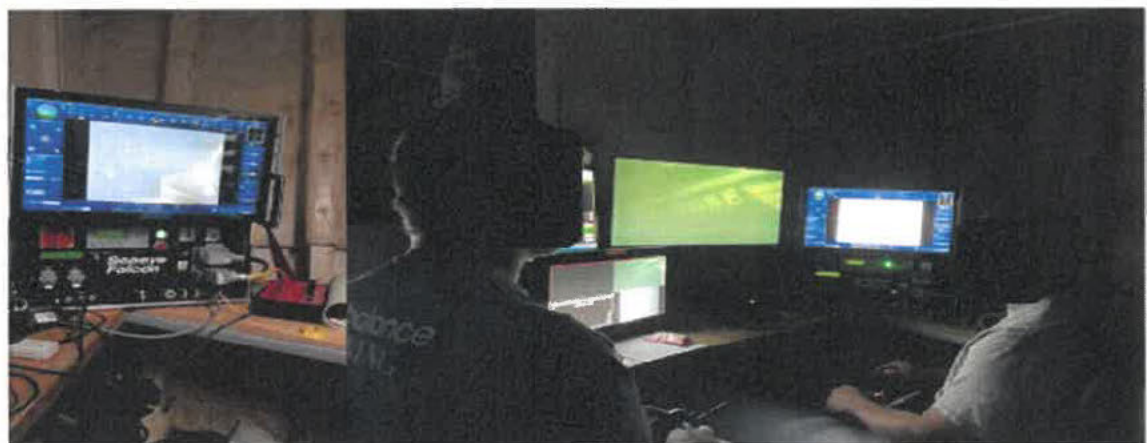


Figure 45: ROV pilot station aboard the CGC SYCAMORE. Image courtesy of WHOI, 2021.

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.

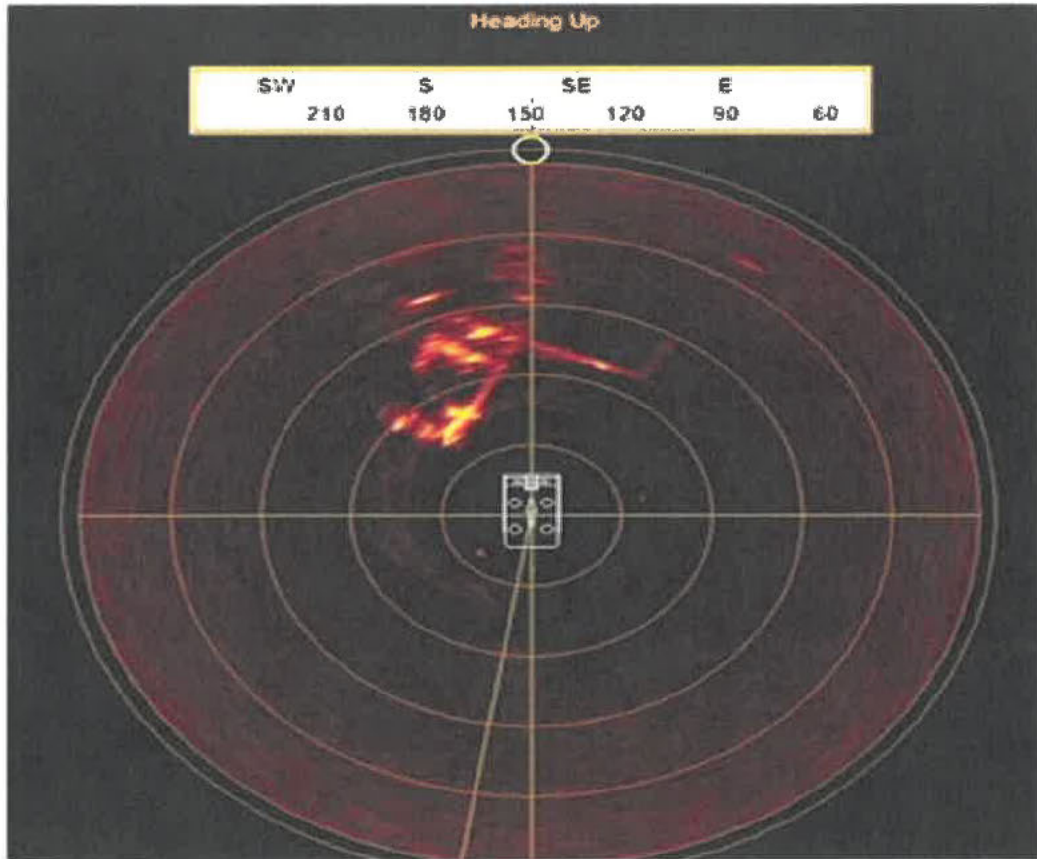


Figure 46: ROV sonar image of the EMMY ROSE. Image courtesy of WHOI, 2021.

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 stem 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.

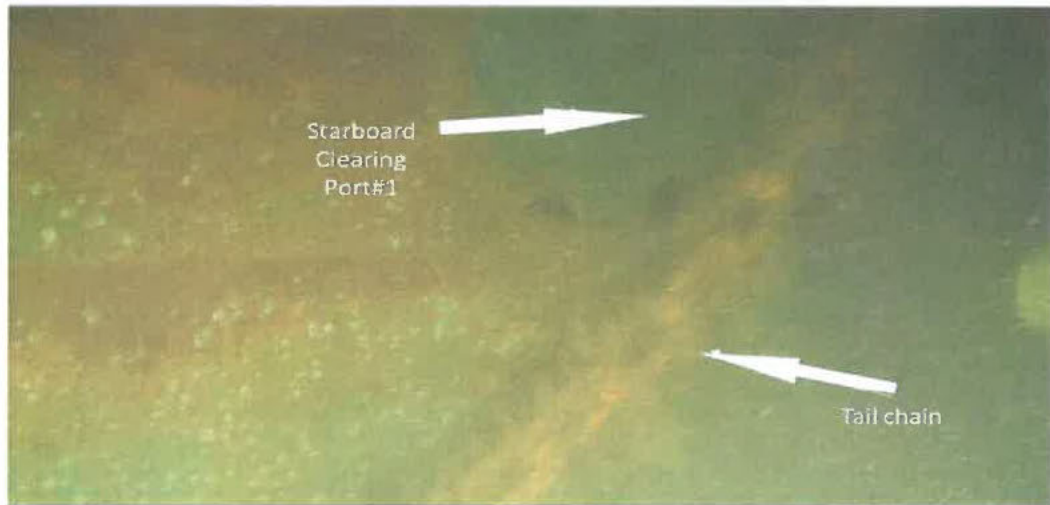


Figure 52: Starboard side clearing (freeing) port #1, tail chain visible. Image courtesy of WHOI, 2021.



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

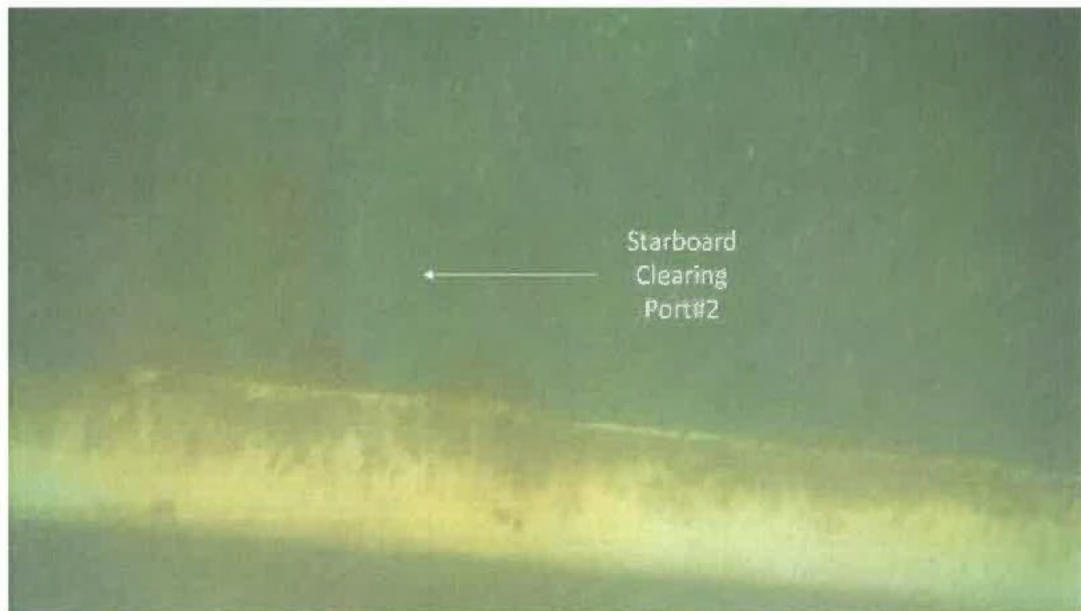


Figure 54: Starboard clearing (freeing) port #2. Image courtesy of WHOI, 2021.

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

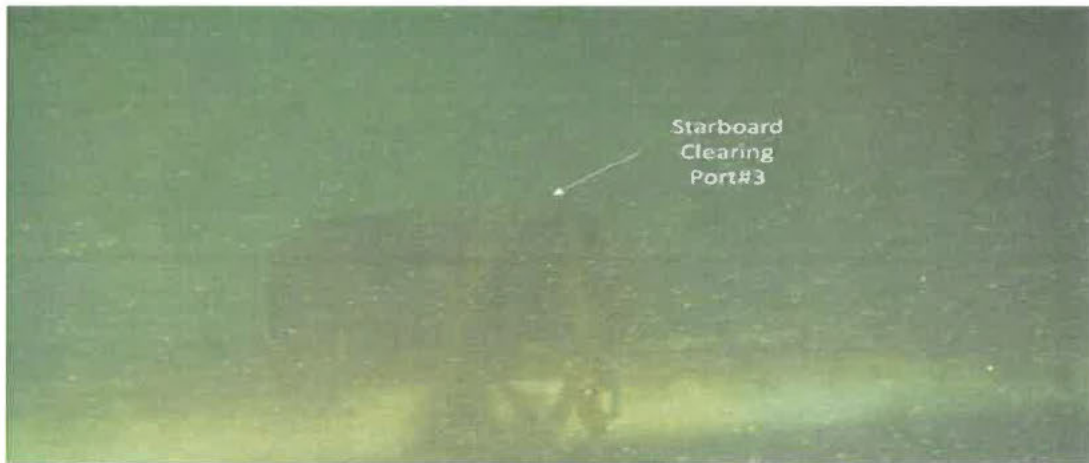


Figure 56: Starboard clearing (freeing) port #3. Image courtesy of WHOI, 2021.

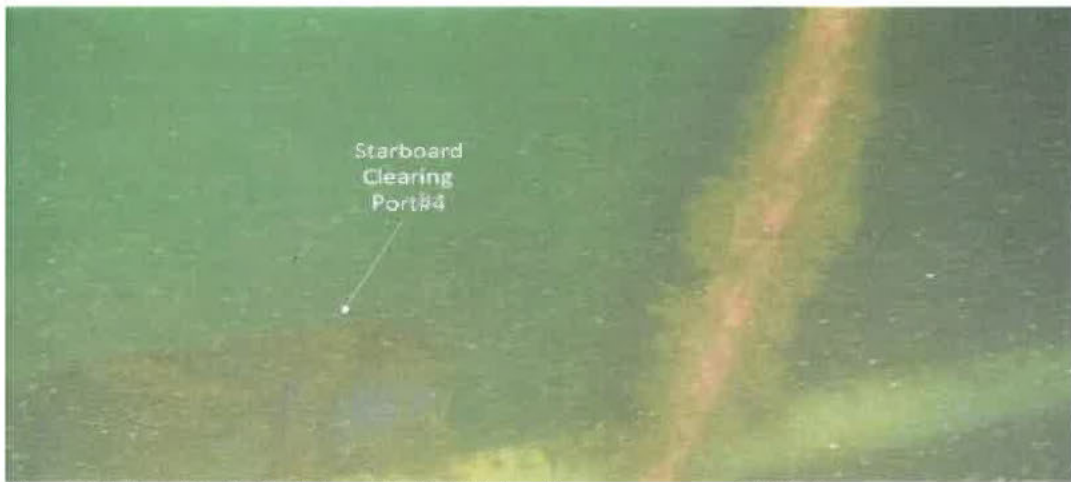


Figure 57: Starboard clearing (freeing) port #4 of the EMMY ROSE. Image courtesy of WHOI, 2021.



Figure 58: Stern of the EMMYROSE. 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.

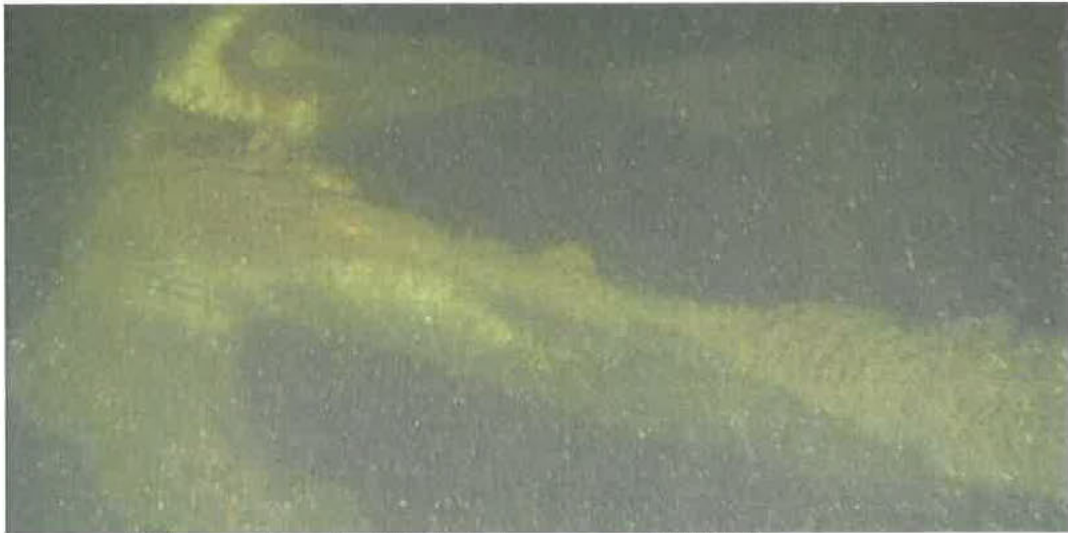


Figure 60: End of the port outrigger of the EMMY ROSE. Image courtesy of WHOI, 2021.

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.

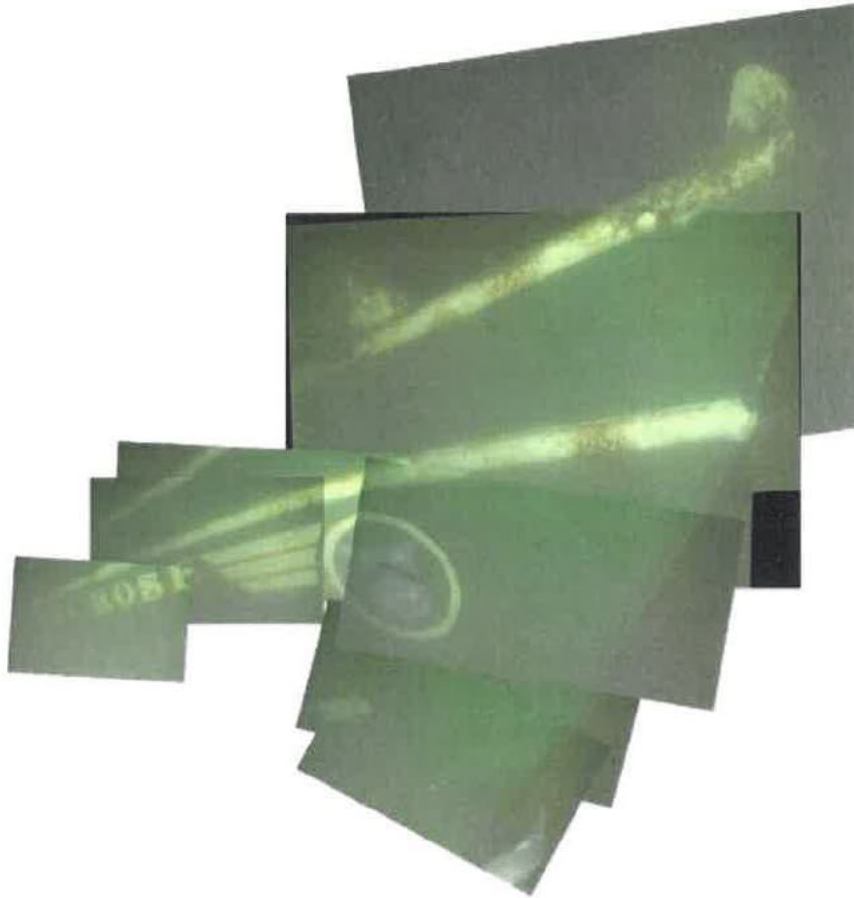


Figure 61: Starboard side bow of the EMMY ROSE. Image courtesy of WHOI, 2021.

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.

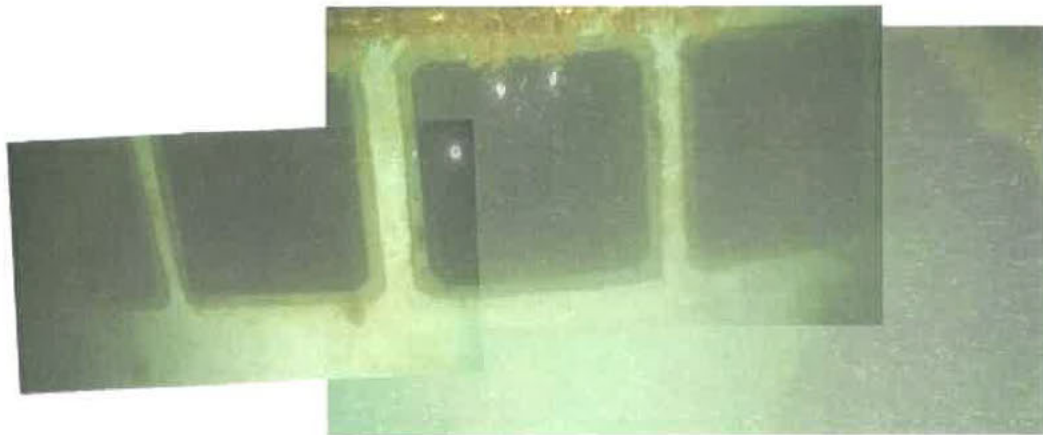


Figure 62: Pilothouse windows of the EMMY ROSE. Image courtesy of WHOI, 2021.

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.

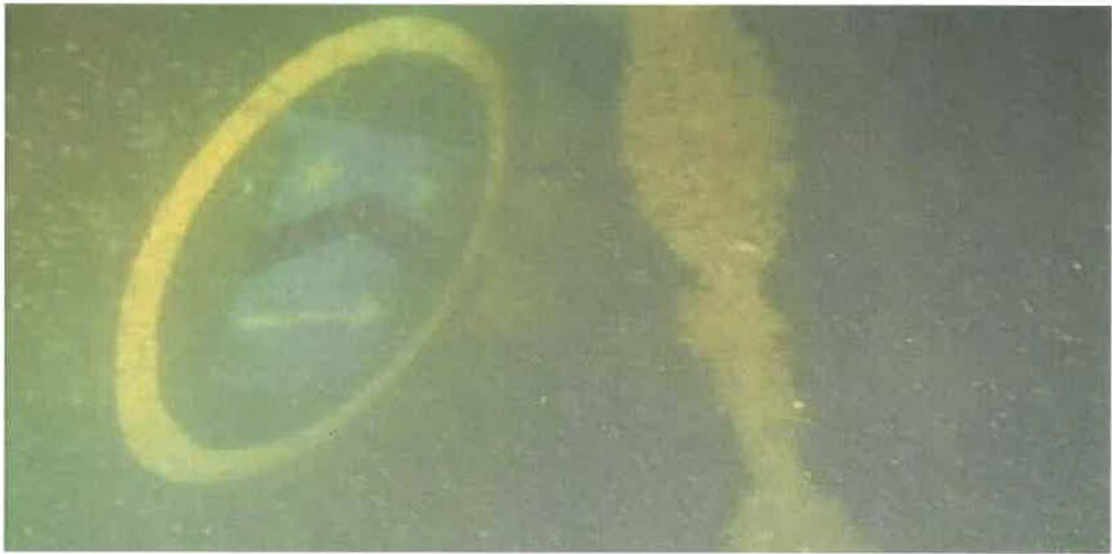


Figure 64: Port side bow with chain hanging over crest of the EMMY ROSE. Image courtesy of WHOI, 2021.

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.

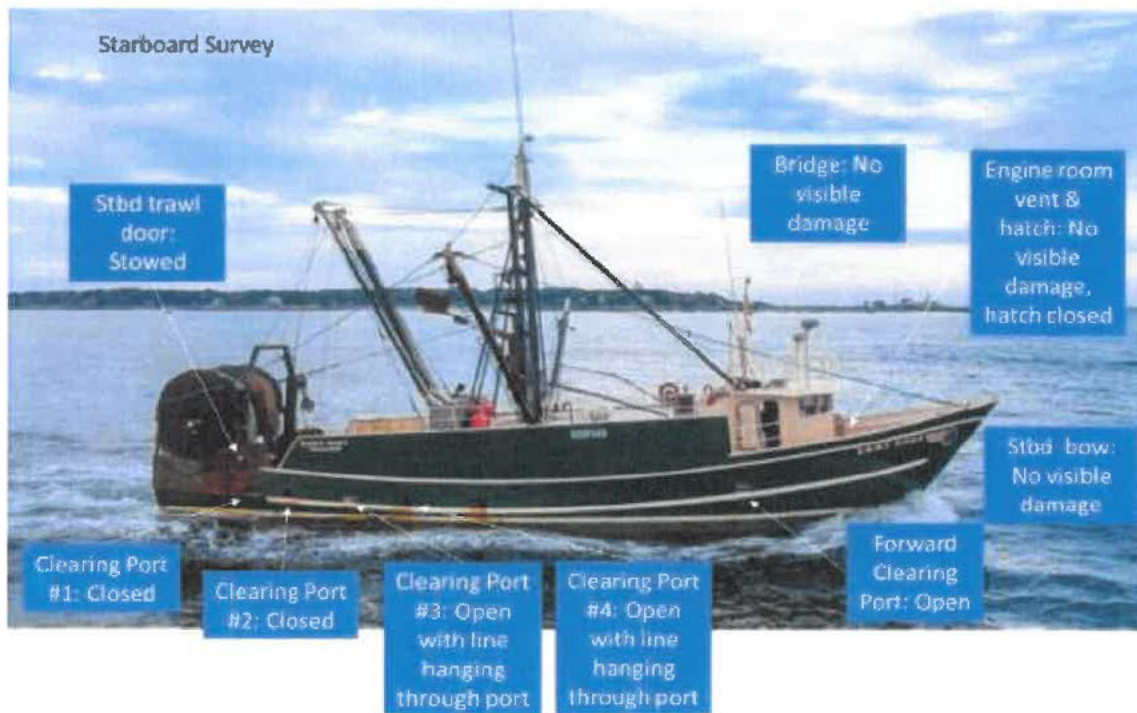


Figure 68: Starboard side ROV survey results of the EMMY ROSE. Image courtesy of WHOI, 2021.



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 $42^{\circ} 18' 53.1''$ N, $069^{\circ} 33' 7.14''$ W on a course of 277° at 7 knots. The vessel was located on the seafloor in position $42^{\circ} 19' 8.106''$ N, $069^{\circ} 37' 50.766''$ 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.

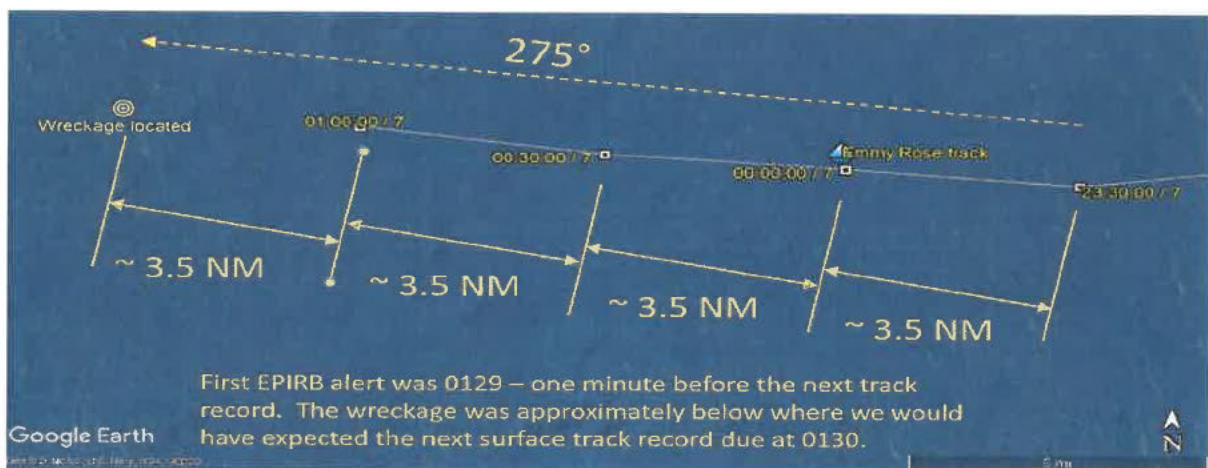


Figure 70: EMMY ROSE track line relative to vessel location on seafloor. Courtesy of NTSB, 2021.

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 indicate 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 steering 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.

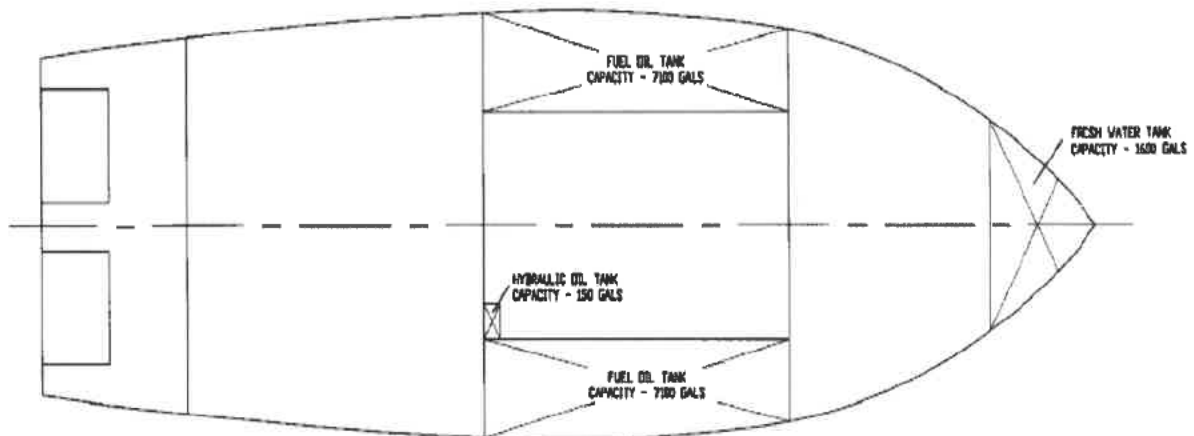
While we cannot conclusively identify any one event or action as the key cause. The facts and evidence collected indicate the most probable event and cause of the casualty is a loss of

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 awakened 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.

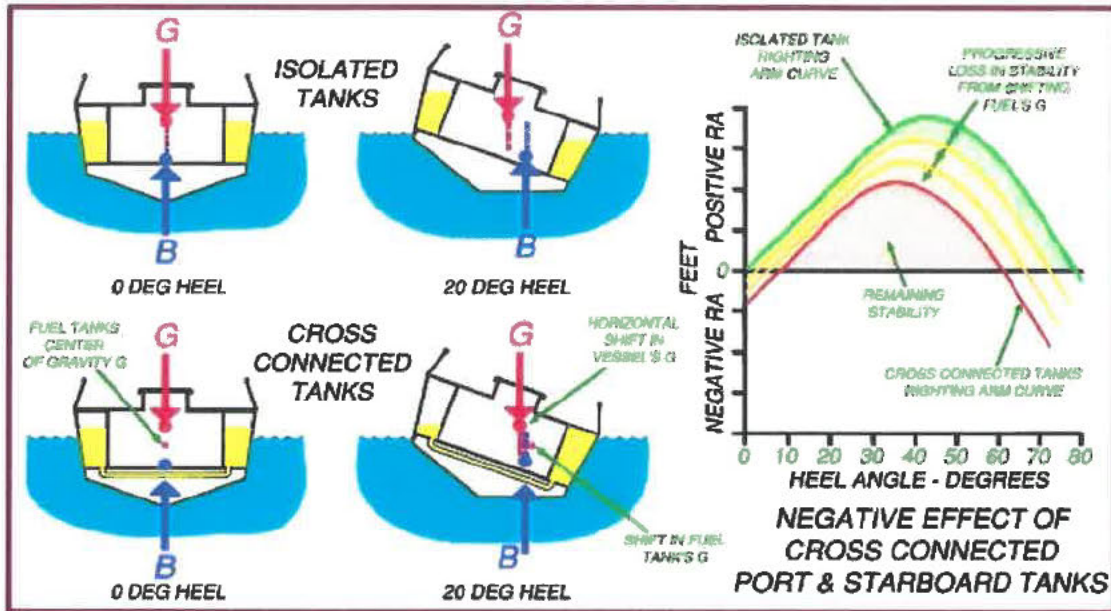


Figure 73: Negative Effect of Cross Connected Port and Starboard Tanks. Image courtesy of "A Best Practices Guide to Vessel Stability- Second Edition", USCG.

A shifting of the vessel's catch within the fish hold is another possible cause for a vessel's 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.

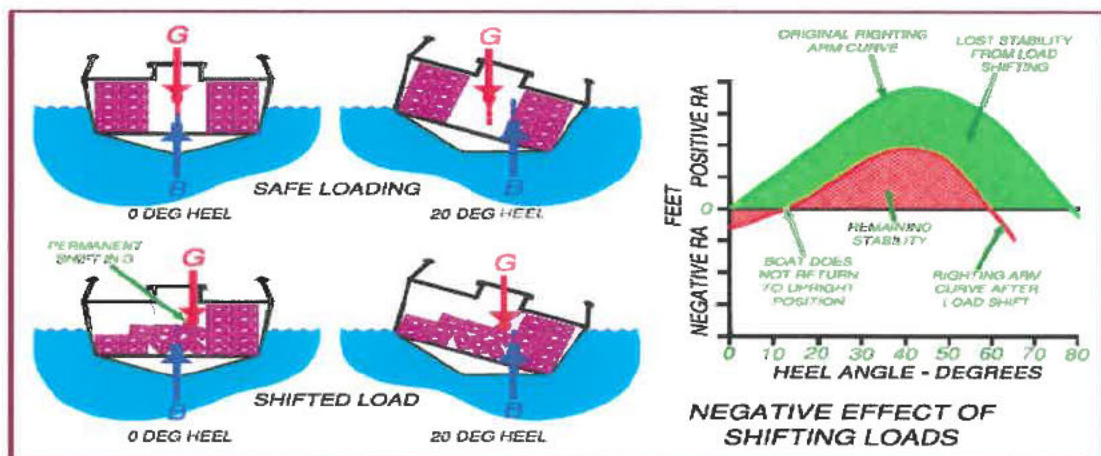


Figure 74: Negative effects of shifting loads. Image courtesy of "A Best Practices Guide to Vessel Stability- Second Edition", USCG.

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: $\frac{1}{4}$ difference and $\frac{1}{2}$ 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 from 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.

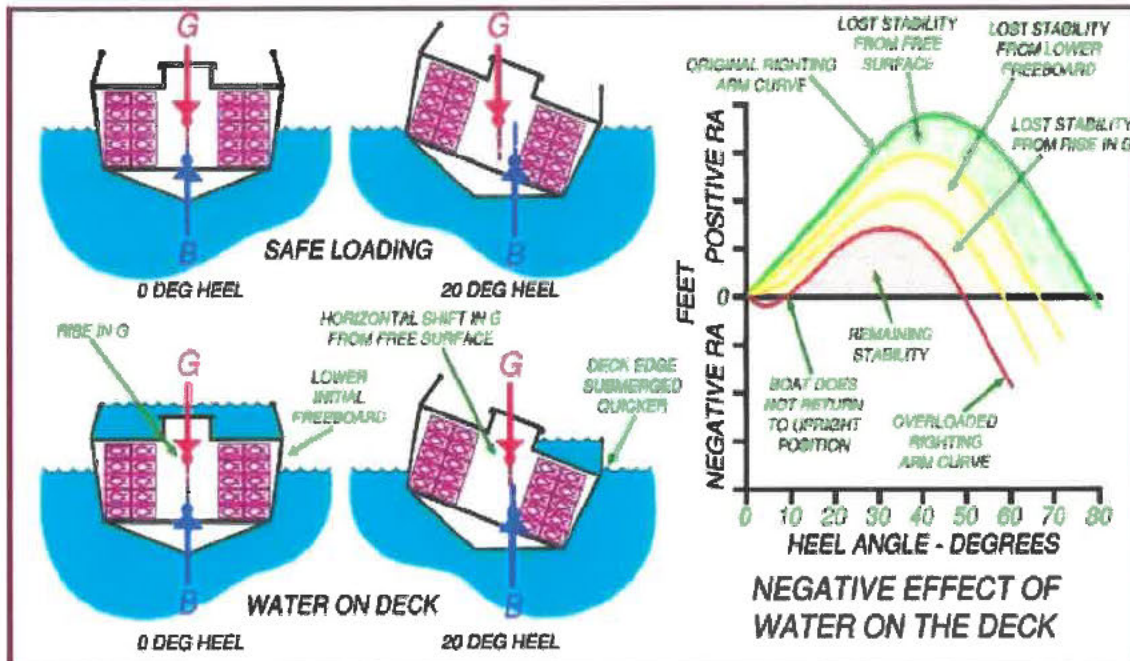


Figure 76: Negative Effect of Water on the Deck. Image courtesy of "A Best Practices Guide to Vessel Stability - Second Edition", USCG.

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 capsizing, 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 $\frac{1}{2}$ and $\frac{1}{4}$ 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).

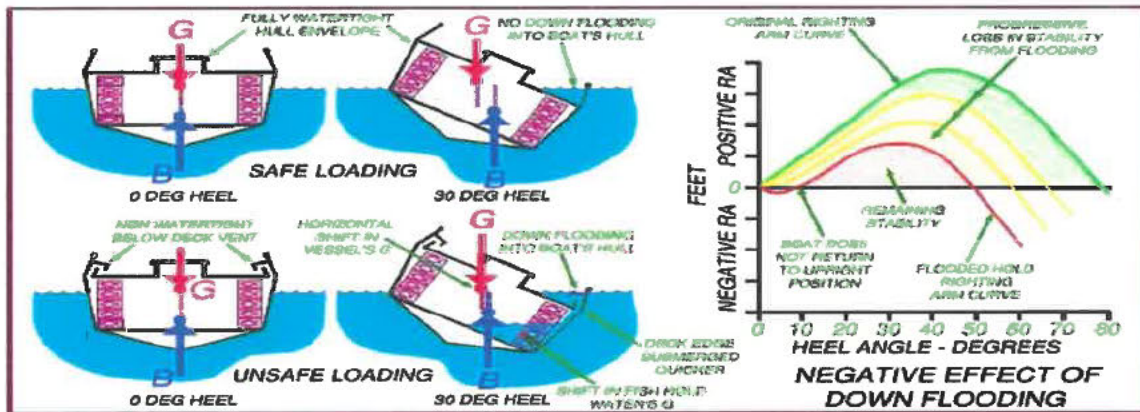


Figure 77: Negative Effect of Down flooding. Image courtesy of "A Best Practices Guide to Vessel Stability- Second Edition", USCG.

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.

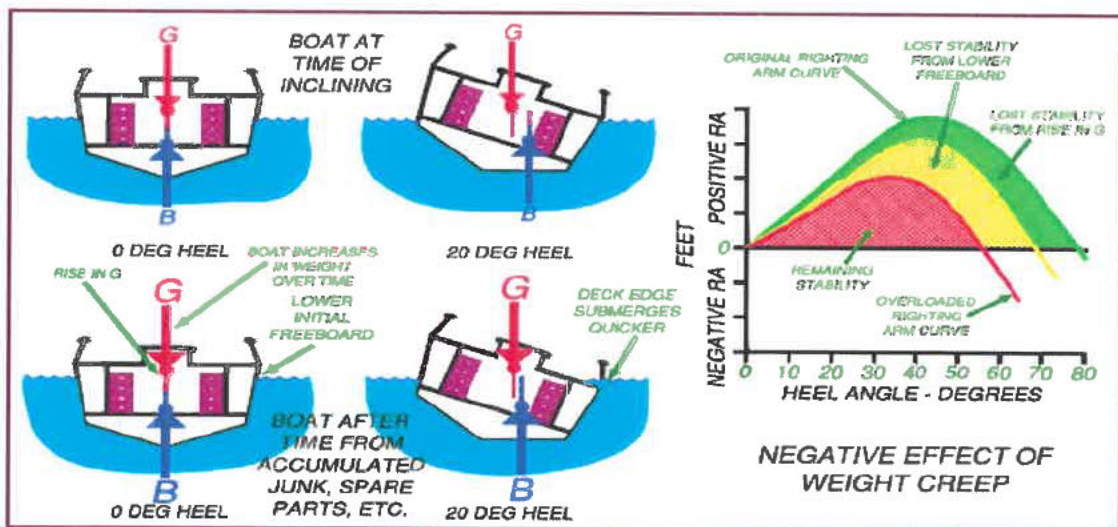


Figure 78: Negative Effect of Weight Creep. Image courtesy of "A Best Practices Guide to Vessel Stability-Second Edition", USCG.

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.

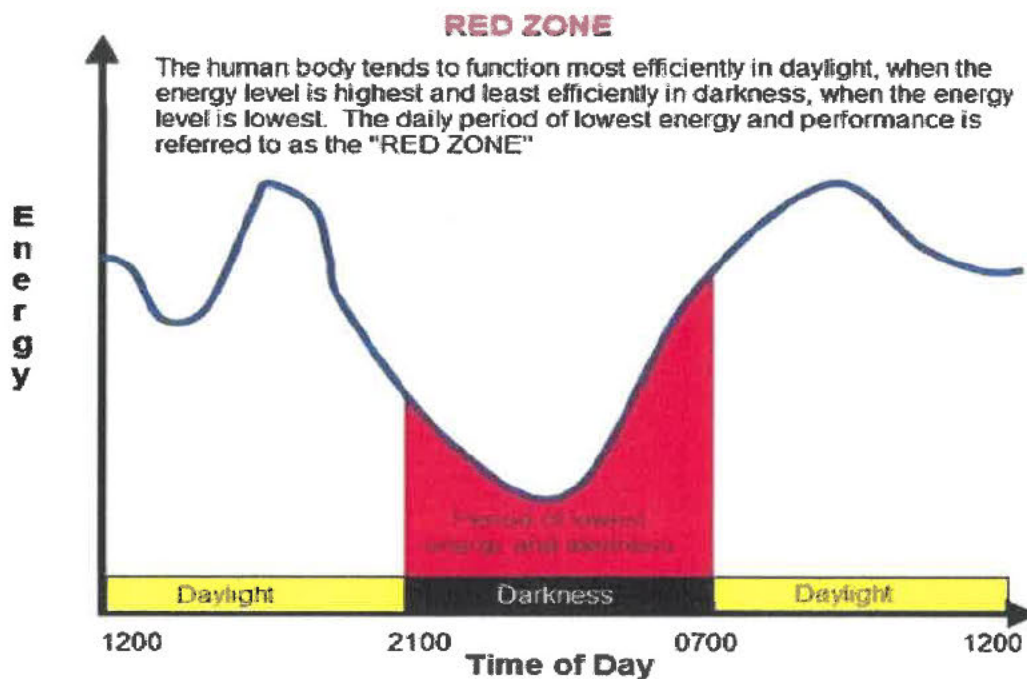


Figure 79: Fatigue energy levels throughout the day. Image courtesy of FishSafeWest.info.

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