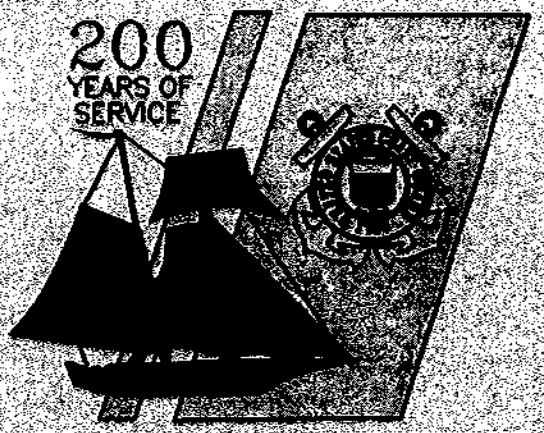

MARINE CASUALTY REPORT

Uninspected Fish Processing Vessel

ALEUTIAN ENTERPRISE

Flooding, capsizing, and sinking in the Bering Sea on March 22, 1990, with nine persons missing and presumed dead

U.S. COAST GUARD
MARINE BOARD OF INVESTIGATION REPORT

Technical Report Documentation Page

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15. Supplementary Notes

16. Abstract

At approximately 1:30 pm on 22 March 1990, the ALEUTIAN ENTERPRISE, a fish processing vessel with a crew of 31 operating in the Bering Sea, was attempting to haul a large catch of fish on board when the fishing net snapped, dropping a large volume of fish on deck and causing the vessel to list to port. With cargo holds nearly filled to capacity, the vessel listed further to port as the captain and chief engineer unsuccessfully attempted to correct the situation. Processing personnel, upon discovering water entering the processing deck through side openings, exited the area to abandon the ship. With the port stern settling and the vessel rolling to port, the captain sent a Mayday to nearby vessels and activated the general alarm, which did not sound. He proceeded below decks to warn the crew and then abandoned ship. The vessel subsequently capsized and sank at approximately 1:40 pm in about 400 feet of water. Nearby fishing industry vessels recovered 22 persons from the water and liferafts. A subsequent search by Coast Guard aircraft and fishing vessels in the immediate area failed to recover additional personnel. Nine persons are missing at sea and presumed dead.

The Commandant concurred with the Board's conclusion that the apparent cause of the casualty was the failure of the fishing net while being hauled aboard and the subsequent release of a large volume of fish on deck, which quickly shifted to port. The rapid shift of weight increased an existing port list, submerged port side processing deck through-hull openings, and resulted in rapid progressive flooding and subsequent capsizing of the ALEUTIAN ENTERPRISE.

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16732/ALEUTIAN
ENTERPRISE

APR 7 1991

Commandant's Action

on

The Marine Board of Investigation convened to investigate the circumstances surrounding the capsizing and sinking of the uninspected fish processing vessel ALEUTIAN ENTERPRISE in the Bering Sea on 22 March 1990 with multiple loss of life

The report of the Marine Board of Investigation convened to investigate the subject casualty has been reviewed and the record, including the findings of fact, conclusions and recommendations, is approved subject to the following comments.

CAUSE OF THE CASUALTY

I concur with the Board's conclusion that the apparent cause of the casualty was the failure of the fishing net while being hauled aboard and the subsequent release of a large volume of fish on deck which quickly shifted to port. The rapid shift of weight increased an existing port list, submerged port side processing deck through-hull openings, and resulted in rapid progressive flooding and subsequent capsizing of the ALEUTIAN ENTERPRISE.

COMMENTS ON CONCLUSIONS

Conclusion 32: The ALEUTIAN ENTERPRISE was not constructed to ABS standards nor was it classed by ABS.

Comment: I partially concur with this conclusion. While the vessel was not ABS-classed, it is possible that it may have been designed to ABS standards. The investigative record does not specify the standards to which the vessel was constructed.

Conclusion 36: Captain Siemons probably did not read the vessel's T&S Report prior to the capsizing. If he did, he did not understand it. Captain Siemons did not recognize that the buoyant volume, lightship characteristics, and general operating procedures of the vessel were substantially different than those represented in the T&S Report. The vessel's fuel transfer procedures, codend size, deck loads were varied substantially

from those represented in the T&S Report. He could not have achieved an actual draft and trim that agreed with the load conditions listed.

Comment: I concur with this conclusion. The Trim and Stability Report requires some knowledge of stability for correct interpretation. To a master with little knowledge of stability it could appear that the vessel met the stability criteria in all loading conditions. The effects of changes in loading and equipment, or procedures to calculate other loading conditions were not provided. The Trim and Stability Report did not point out that comparison of actual and calculated drafts should be made to verify accuracy of the loading condition. Navigation and Vessel Inspection Circular (NVIC) 5-86 provides guidance concerning the need for additional stability analyses after modifications to a fishing industry vessel.

Conclusion 54: The pictorial stability information described in NVIC 5-86 makes it difficult for the captain to determine when he is exceeding the limits of stability since it does not describe the maximum allowable draft, trim or VCG, nor does it provide limiting loading conditions. Because loading occurs at sea, a fishing vessel captain must have the limitation of loading in simplified form.

Comment: I concur with this conclusion. The pictorial stability information presented in NVIC 5-86 is intended for smaller, less complicated vessels with few tanks and loading conditions. The use or lack of use of pictorial stability information did not contribute to this casualty.

Conclusion 64: There is evidence of violation of 18 USC 1115, Misconduct or neglect of ship officers, on the part of AAFC and Captain Siemons. This matter has been referred to the Commander, Thirteenth Coast Guard District for possible referral to the U.S. Attorney.

Comment: I concur with this conclusion. There is sufficient evidence to warrant criminal investigation under 18 USC 1115.

Conclusion 65: [redacted] a processor on the ALEUTIAN ENTERPRISE, was not granted status that would allow him to be legally employed in the United States.

Conclusion 66: There is evidence of violation of 8 USC 1324a on the part of AAFC for illegally employing an alien. This matter has been referred to the U.S. Immigration and Naturalization Service.

Comment: I concur with these conclusions. 46 USC 8103(i) requires that each unlicensed seaman on a fishing industry vessel engaged in the fisheries in the exclusive economic zone be a citizen of the United States, an alien lawfully admitted for permanent residence, or an alien allowed to be employed by theImmigration and Naturalization Act. Accordingly, this matter warrants further investigation by the Immigration and Naturalization Service.

Conclusion 59: The Coast Guard's at-sea fishing vessel boarding program is limited to fisheries law enforcement and the safety equipment requirements of 46 CFR Subchapter C. The program is not broader in scope because of limited resources and training.

Comment: I partially concur with this conclusion. To clarify, our at-sea boarding program was never intended to fully support all regulatory enforcement programs, including those which require extensive technical expertise or which are more appropriately accomplished in port.

Conclusion 63: In order to obtain a loadline, the ALEUTIAN ENTERPRISE would have had to be fitted with automatic non-return fittings and positive closures in the through hull openings on the processing deck.

Comment: I concur with this conclusion. In addition, there were other fittings or areas which would have necessitated repair or modification in order for the vessel to have been in compliance with loadline requirements.

ACTION ON RECOMMENDATIONS

Recommendation 1: The Coast Guard should increase efforts to enforce compliance with the loadline laws on uninspected fishing industry vessels.

Action: I concur with this recommendation. Local marine safety offices (MSO's) have already begun implementing an enforcement program which, with the assistance of classification societies, identifies fish processing vessels that do not have the required Loadline Certificate. In each case, the MSO ensures that the vessel meets minimum safety requirements and closely monitors the longer term completion of remaining technical requirements. In addition, we are currently developing programs for enforcing the upcoming final regulations, entitled Requirements for Commercial Fishing Industry Vessels (46 CFR 28), which will implement the Commercial Fishing Industry Vessel Safety Act of 1988. These efforts will also target compliance with existing loadline laws.

Recommendation 2: The Coast Guard should increase efforts to enforce the casualty reporting regulations on uninspected fishing industry vessels.

Action: I concur with this recommendation. Marine safety offices already publish local newsletters and hold periodic seminars to educate and remind marine industry personnel regarding their casualty reporting responsibilities. We will continue to strongly support and encourage such efforts, and will publish similar articles in the Proceedings of the Marine Safety Council. In addition, enforcement programs currently under development will provide a more direct means for emphasizing regulatory requirements to vessel operators and will improve our ability to learn of uninspected fishing industry vessel casualties.

Recommendation 3: The Coast Guard should periodically examine fishing industry vessels for overall seaworthiness, safety and maintenance in accordance with accepted marine practices and the applicable regulations.

Action: I partially concur with this recommendation. We will consider this issue in the formulation of final regulations for commercial fishing industry vessels in 46 CFR 28. We intend to require that fish processing vessels undergo a biennial examination conducted by the American Bureau of Shipping or other equivalent organization.

Recommendation 4: The Coast Guard, ABS or other qualified organization should periodically review fishing industry vessel stability calculations for completeness and conformance with appropriate industry standards, and stability instructions for ease of use by the vessel's master.

Action: I concur with the intent of this recommendation. We will pursue these activities when feasible, such as during certain casualty investigations or as part of our oversight of loadline assigning authorities. In addition we are working with industry to standardize stability information provided to the most complicated fishing industry vessels, fish processors. Finally, we are considering publishing a Navigation and Vessel Inspection Circular (NVIC), with industry input, for similar standards for other types of fishing industry vessels.

We will consider this issue in the formulation of final regulations for commercial fishing industry vessels in 46 CFR 28. We intend to require that vessel owners select a suitably qualified individual to evaluate the stability of each new or substantially modified fishing industry vessel and that the owners maintain the test results and stability calculations. We also intend to require that owners of such vessels provide sufficient stability-related operating instructions in readily usable form.

Recommendation 5: The Coast Guard should require that there be sufficient dewatering capacity on the processor deck to remove the total volume of water being pumped to the processing deck in any condition of trim or list. Cutter pumps or similar carcass removal pumping systems should not be included as part of the dewatering system.

Action: I partially concur with this recommendation. We intend to require a bilge pump capable of draining any watertight compartment under all service conditions for documented fishing industry vessels which operate beyond the boundary line with more than 16 persons on board. In addition, we intend to require that any pump used for supplying water to processing spaces be interlocked with the dewatering pump so that it will operate only if the dewatering system is energized.

Processing water volume and bilge pumping capacity should not be required to complement each other, since processing water volume can be controlled by shutting off machinery or closing valves. Cutter pumps and piping of suitable design and proper maintenance can provide satisfactory bilge pumping capacity on the processor deck and could be counted toward bilge system requirements.

Recommendation 6: The Coast Guard should require automatic or remotely actuated closures, with mechanical backups during power loss, for fish debris overboard chutes on fishing industry vessels.

Action: I concur with the intent of this recommendation. Provisions in existing load line regulations address this issue. We intend to require that on new or substantially altered commercial fishing industry vessels that do not require a load line, openings below the weather deck which are used for discharging water or debris resulting from processing or sorting

operations be fitted with a means to ensure the opening can be closed weathertight. The means of closure would be operable from a location outside the space containing the opening.

Recommendation 7: The Coast Guard should require that the stability evaluation for fishing industry vessels include the weight and free surface correction for processing water and fish whenever a continuous uncontained flow is used inside the vessel during its normal operation at sea.

Action: I partially concur with this recommendation. If a vessel has adequate drainage, it is unnecessary to calculate the weight or free surface of water on deck. However, if adequate drainage is not provided, the free surface effect of each partially filled space should be included in stability calculations. This should include any loose water within the vessel's hull associated with the processing of fish, as well as fish or fish product that can shift as the vessel heels. We intend to require that the uncontained flow of water be considered in determining free surface effects.

Recommendation 8: The Coast Guard should require that fishing industry vessels use the "simplified letter format" described in NVIC 5-86.

Action: I do not concur with this recommendation. The need to provide operators of fishing industry vessels with stability information is best served by establishing a performance standard which provides maximum flexibility for owners and qualified individuals to determine how this information is conveyed. Accordingly, we intend to require that stability information for certain fishing industry vessels be in a form that is readily usable by the master or individual in charge. This information can take many forms and is not limited to a simplified letter format.

Recommendation 9: The Coast Guard should require that fishing industry vessel stability letters or placards define the operating limits of the vessel, including limits of modifications and additions that would invalidate the stability letter.

Action: I concur with this recommendation. We intend to require this type of information.

Recommendation 10: The Coast Guard should require that the stability letter or placard for fishing industry vessels be posted in the pilothouse.

Action: I do not concur with this recommendation. While a letter may lend itself to posting, more detailed instructions or pictorials may not. The stability information should be readily available for use.

Recommendation 11: The Coast Guard should require that loadlined fishing industry vessels employ a licensed master, mate and chief engineer while underway. The sophistication of systems and operations of loadlined fishing industry vessels requires a level of qualifications not recognized under the existing licensing scheme.

Action: I concur with the intent of this recommendation. However, we are concerned about the qualifications of all fishing industry vessel operators, not just those operating loadlined vessels. The Coast Guard currently lacks the statutory authority to require licensing of operators of fishing industry vessels of less than 200 gross tons.

Recommendation 12: The Coast Guard should develop a stability examination specifically for masters and mates of fishing industry vessels that are loadlined or subject to the requirements of the Officers Competency Certificators Convention of 1936. It should cover the fishing industry operational stability issues of loading at sea, loose processing water, and maintaining watertight integrity.

Action: I concur with this recommendation. An appropriate examination must be part of any future program to examine masters.

Recommendation 13: The Coast Guard should require that masters and mates pass a fishing industry vessel stability examination, and have an endorsement on their licenses attesting to this fact prior to service on fishing industry vessels. This requirement should apply to all individuals who desire to serve on fishing industry vessels under the authority of their master's or mate's inspected or uninspected licenses.

Action: I concur with the intent of this recommendation. The licensing requirements described in my comments on recommendation 11, if implemented, would likely include a grandfathering provision for the holders of existing master's and mate's licenses. Nevertheless, we will consider requiring that these individuals be specially trained in fishing industry vessel stability.

Recommendation 14: The Coast Guard should require a minimum ratio of height to width of freeing ports on fishing industry vessels so that loose fish can be rapidly cleared off the deck in an emergency.

Action: I do not concur with this recommendation. The level of fish on deck during this casualty exceeded the height of the bulwark, and larger freeing ports would have had little effect in eliminating loose fish on deck. Vessels that are intended to operate with fish on deck should be designed accordingly.

Recommendation 15: The Coast Guard should require escape route passageways, doors and scuttles on fishing industry vessels to be clearly marked and free of obstruction.

Action: I partially concur with this recommendation. We intend to require that all emergency exits be free of obstruction. However, because most fishing industry vessels are relatively small and the crews are generally familiar with vessel arrangement, I do not consider the marking of exits necessary.

Recommendation 16: The Coast Guard should require quick-acting watertight doors for egress out to the lowest weather deck in an emergency, and in internal watertight bulkheads to hasten evacuation and to prevent progressive flooding.

Action: I concur with this recommendation. We intend to require that new vessels which operate with more than 16 persons on board be fitted with at least two means of escape, one of which must lead to a weatherdeck. The weatherdeck opening should be fitted with a weathertight door, or a watertight door of the quick acting type. Any watertight door intended as a means of escape should be the quick acting type.

Recommendation 17: The Coast Guard should require that every person employed on a fishing industry vessel that operates in cold water receive instruction in donning an immersion suit prior to employment on the vessel.

Recommendation 18: The Coast Guard should require masters of fishing industry vessels to ensure that emergency drills are conducted at least once a month.

Action: I concur with these recommendations. We intend to establish such requirements for documented vessels that operate beyond the boundary line or with more than 16 persons on board.

Recommendation 19: The Coast Guard should redouble its efforts to encourage the use of Human Factors Engineering (HFE) in the fishing vessel industry.

Action: I concur with this recommendation. The Coast Guard is continuing its efforts to promote Human Factors Engineering (HFE). Regulatory projects take HFE into consideration where appropriate. In addition, entry level training in HFE was recently incorporated into the inspection department curriculum at our Marine Safety School at the Reserve Training Center, Yorktown, Virginia.

Recommendation 20: The Coast Guard should not rely on the insurance industry for oversight of safety training, vessel maintenance, or accident reporting.

Action: I concur with this recommendation. Insurance industry input is but one source of performance data for oversight of safety training, vessel maintenance and accident reporting. Casualty reporting continues to be required. In addition, enhanced Coast Guard boarding programs will provide input in these areas. The capture of data from all sources will allow the Coast Guard to better evaluate the safety performance of commercial fishing industry vessels. These issues will be addressed in the upcoming final regulations.

Recommendation 21: The Coast Guard should require a general alarm or loud speaker system on fishing industry vessels that is audible over all ambient noise in normally manned spaces. This system should be tested upon departing port and during monthly drills.

Action: I concur with this recommendation. We intend to require that documented fishing industry vessels which operate beyond the boundary line or with more than 16 persons on board install and periodically test their general alarm.

Recommendation 22: The Coast Guard should require immersion suits on fishing industry vessels to be stowed where the crew can quickly access them in an emergency. Immersion suits must be available at the egress of the engineroom, pilothouse, processing spaces, and accomodations for the maximum number of personnel that work and sleep in those areas. More than one immersion suit per individual on board will be necessary to satisfy accessibility arrangements on most fishing industry vessels.

Recommendation 23: The Coast Guard should require that immersion suits on fishing industry vessels be accessible and not

stowed with other items or materials. Crewmembers must have immediate access to immersion suits so that they do not have to search for immersion suits during a casualty such as a capsizing or sinking.

Action: I concur with these recommendations. We intend to require that wearable personnel flotation devices (PFD's), including Coast Guard approved immersion suits, be accessible in both work and berthing areas. In some cases, this will make it necessary to provide more than one PFD per person.

Recommendation 24: The Coast Guard should require that an emergency inflation actuator be added to inflatable liferafts used in cold water areas.

Action: I concur with the intent of this recommendation. Our current regulations technically allow for the provision of an "emergency inflation actuator" by means of connecting the CO2 cylinder firing head to the painter before the extreme end of the painter. Coast Guard and SOLAS regulations both specify minimum painter length, but neither require the connection to the cylinder to be at the end of it (although that is the universal practice). It is possible that painters could be connected so as to commence inflation after only a short pull. We will consult with the manufacturers of approved liferafts concerning the practicality and advisability of such a modification, and take appropriate action.

Recommendation 25: The Coast Guard should encourage the use of the Dual Tonnage Measurement System on fishing industry vessels when exempt superstructure spaces are desired. When the dual tonnage system is used and a single tonnage is assigned according to 46 CFR 69.175(c), spaces immediately above the freeboard deck may be omitted from tonnage provided a tonnage mark is located at the level of the uppermost part of the loadline grid. Tonnage openings that are susceptible to damage, leaking, and blocking would not be necessary.

Action: I concur with this recommendation. The use of the Dual Tonnage Measurement System is encouraged by the Coast Guard when exempt superstructure spaces are desired. In this case, this system could have eliminated the need for freeing ports in the processing area for tonnage exclusion purposes. However, the Dual Tonnage System was not utilized in this case, and there were no freeing ports on the processing deck. The space was exempted on the basis that it had a Tonnage Opening on the transom. The suggestion that the open chutes which contributed to the downflooding would not have been in place if the vessel

were measured under the Dual System is speculative. Overboard discharge of fish waste from the processing deck is essential in any processing operation. Tonnage openings did not play a role in the ALEUTIAN ENTERPRISE sinking.

Recommendation 26: The Coast Guard should require that fishing industry vessels have on board, in addition to the Certificate of Documentation, a description of tonnage openings on the vessel to assist boarding personnel and vessel operators to identify and/or preserve tonnage openings and other admeasurement requirements.

Action: I do not concur with this recommendation. Our existing tonnage measurement guidelines and enforcement policy already provide adequate sources of information for enforcement personnel.

Recommendation 27: The Coast Guard should develop guidelines for fishing industry vessel inclinings, deadweight surveys and lightweight determinations. They should address the treatment of processing and deck equipment, and seasonal fisheries gear changes that are unique in this industry.

Action: I concur with this recommendation. We will develop and disseminate such guidance.

Recommendation 28: The Coast Guard should extend the drug and alcohol testing requirements concerning pre-employment testing, kit availability, etc. to all fishing industry vessels that require a loadline.

Action: I concur with the intent of this recommendation. Existing chemical testing standards contained in 46 CFR Part 16 are not based on a vessel's tonnage or nature of operation, but instead apply to crewmembers on commercial vessels that are required to engage, employ, or be operated by an individual holding a license, certificate, or merchant mariner's document. As indicated in my comments on recommendation 11, the Coast Guard currently lacks the statutory authority to require licensing of operators of fishing industry vessels of less than 200 gross tons. We will then address this recommendation in an appropriate regulatory project if we receive legislative authority.

Recommendation 29: The Coast Guard should seek the authority to impose significant penalties for failure to comply with the drug and alcohol testing regulations to encourage compliance in the fishing industry.

Action: I concur with the intent of this recommendation. The matter of penalties for failure to comply with drug or alcohol testing requirements will be addressed in conjunction with a general review of the Coast Guard's chemical drug and alcohol testing program.

Recommendation 30: The Coast Guard should amend 46 CFR 4.06, which currently requires urine sample collection to be supervised, to require that sample collection be witnessed.

Action: I do not concur with this recommendation. Urine sample collection requirements are governed by 49 CFR Part 40, entitled "Procedures for Transportation Workplace Drug Testing Programs." The Department of Transportation (DOT) adopted these testing procedures as the standard for all transportation modes. The procedures provide for protection of an individual's privacy, unless there is a reason to believe that the individual may alter or substitute the specimen to be provided. In those instances, sample collection may be observed. The requirements of 49 CFR 40.25 apply.

Recommendation 31: The Coast Guard should amend 46 CFR 4.06 to provide for a legal presumption that a urine sample is invalid if not presented in a sterile sample bottle.

Action: I do not concur with this recommendation. The governing regulations in 49 CFR 40.23 already require the use of a clean, single-use specimen bottle that is securely wrapped until filled with the specimen.

Recommendation 32: The Coast Guard should amend 46 CFR 4.06 to require the cooling of the sample if transportation to the laboratory could exceed 18 hours.

Action: I do not concur with this recommendation. Experience has shown that a urine specimen suffers minimal degradation at ambient temperatures. A requirement for cooling the sample for the several days prior to or during shipment is therefore unwarranted.

Recommendation 33: The Coast Guard should amend 46 CFR 4.06 to indicate that if a post accident urine sample is not taken within 4 hours after a casualty because of the owner's, operator's, master's or donee's misfeasance or malfeasance, negative samples will be presumed invalid.

Action: I do not concur with this recommendation. The existing standards in 46 CFR Part 4 and the governing regulations in 49

CFR Part 40 already contain sufficient requirements for effective chemical drug and alcohol testing following serious marine incidents.

Recommendation 34: The Coast Guard should enter into a memorandum of understanding with the National Marine Fisheries Service (NMFS) regarding the use of observers to assist in fishing industry vessel safety. Observers could be trained to identify safety equipment deficiencies and poor safety practices for input to the Coast Guard's safety enforcement program.

Recommendation 35: The Coast Guard should enter into discussions with NMFS to encourage that agency to upgrade its enforcement of the Title XI Loan Guarantee Program with particular emphasis on the requirement of triannual surveys by a competent, impartial authority. The Coast Guard should discuss the feasibility of strict safety, personnel, and maintenance and repair requirements as conditions precedent to the acquisition of new loan guarantees.

Action: I concur with the intent of these recommendations. We will develop a working group with NMFS in order to discuss fishing vessel safety and enforcement issues.

Recommendation 36: The Coast Guard and the Occupational Safety and Health Administration (OSHA) should enter into a memorandum of understanding that clearly sets forth the extent of each agency's responsibilities regarding fishing industry vessels.

Action: I concur with this recommendation. We have initiated discussions with the Directorate of Compliance Programs, OSHA, on a memorandum of understanding regarding fishing industry vessels.

Recommendation 37: Coast Guard boarding officers should be capable of reading and understanding stability letters and placards, and qualified to examine fishing vessels for unsafe alterations and excess loading.

Action: I do not concur with this recommendation. It is neither practical nor feasible to train all boarding officers in the technical aspects of fishing vessel stability, loading and operation. The burdens of safe loading and operation always remain with the vessel owner and operator.

Recommendation 38: On April 18, 1990, the Board identified what appeared to be an industry wide failure to obtain loadlines. The Board recommended immediate enforcement action by the Coast Guard to bring fishing industry vessels into compliance. The Board

understands that the Coast Guard has increased its enforcement posture in this regard and recommends that the current level of enforcement be maintained until full compliance is achieved.

Action: I concur with this recommendation. As indicated in my comments on recommendation 1, appropriate loadline enforcement actions are already underway, and additional programs are being developed.

Recommendation 39: Inasmuch as this casualty constitutes a major marine casualty, a copy of this report should be forwarded to the National Transportation Safety Board (NTSB).

Action: I concur with this recommendation and will provide the NTSB with a copy of the Marine Board's report.

Recommendation 40: Inasmuch as this casualty constitutes a serious casualty, a copy of this report should be forwarded to the International Maritime Organization (IMO).

Action: I concur with this recommendation and will provide the IMO with a copy of the Marine Board's report.

Recommendation 41: A copy of this report should be provided to members of the Fishing Vessel Advisory Committee, OSHA, and Artic Alaska Fisheries Corporation, manager of the ALEUTIAN ENTERPRISE.

Action: I concur with this recommendation and will provide copies of the Marine Board's report to the listed entities.

Recommendation 42: A copy of ths report should be filed in Docket CGD88-079, Commercial Fishing Industry Vessel Regulations, Notice of Proposed Rulemaking (NPRM) for consideration prior to publication of the final rule.

Action: I concur with this recommendation. The Board's recommendations were considered in developing the final rule for CGD88-079, "Commercial Fishing Industry Vessel Regulations".

Recommendation 43: A copy of this report should be provided to the Chief, Financial Services Division, and the Chief, Fisheries Management Division, National Marine Services, National Oceanic and Atmospheric Administration (NOAA), U.S. Department of Commerce, Washington D.C. for information and further dissemination.

Action: I concur with this recommendation and will provide a copy of the Marine Board's report to NOAA for their information.

Recommendation 44: This report should be given wide dissemination throughout the commercial fishing vessel industry community including major fisheries journals, the National Council on Fishing Vessel Safety and Insurance, the North Pacific Fishing Vessel Owners' Association, Factory Trawler's Association and other major fishing industry vessel associations in the Pacific Northwest.

Action: I concur with this recommendation and will ensure that this report is given wide dissemination to the organizations listed.

[redacted]

J. W. KIME
Admiral, U. S. Coast Guard
COMMANDANT

CONTENTS

LIST OF FIGURES

LIST OF ABBREVIATIONS

AAFC	Arctic Alaska Fisheries Corporation
AAS	Arctic Alaska Seafood
ABS	American Bureau of Shipping
AC	Alternating Current
AFSAC	Alaska Fisheries Safety Advisory Council
ANPRM	Advance Notice of Proposed Rulemaking
CFR	Code of Federal Regulations
DOB	Date of Birth
EEZ	Exclusive Economic Zone
EMD	Electro-motive Division (General Motors Corporation)
EPIRB	Emergency Position Indicating Radio Beacon
E.R.	Engineroom
F.O.	Fuel Oil
FOG	Fisheries Obligation Guarantee
FR	Federal Register
FTA	Factory Trawler Association
FWD	Forward
GM	Metacentric Height
GMC	General Motors Corporation
G-MTH	Marine Technical and Hazardous Material Division (Coast Guard Headquarters)
G-MVI	Merchant Vessel Inspection and Documentation Division (Coast Guard Headquarters)
GPM	Gallons Per Minute
HFE	Human Factors Engineering
H&G	Head and Gut

IMO	Intergovernmental Maritime Organization
KG	Vertical Center of Gravity
lbs.	Pounds
LCG	Longitudinal Center of Gravity
LT	Long Ton (2,240 pounds)
MOU	Memorandum of Understanding
MSC	Marine Safety Center
MSO	Marine Safety Office
NMFS	National Marine Fisheries Service
NOC	Next of Kin
NPFVOA	North Pacific Fishing Vessel Owners' Association
NPRM	Notice of Proposed Rulemaking
NVIC	Navigation and Vessel Inspection Circular
OSHA	Occupational Safety and Health Administration
PFD	Personal Flotation Device
P/S	Port and Starboard
pt.	Port
Pub. L.	Public Law
Pub. Law	Public Law
RPM	Revolutions Per Minute
SSB	Single Side Band (radio)
SSN	Social Security Number
st.	Starboard
STBD	Starboard
T&S	Trim and Stability (Report)
USC	United States Code
UMIB	Urgent Marine Information Broadcast
USCG	United States Coast Guard
USCGC	United States Coast Guard Cutter
VCG	Vertical Center of Gravity
VHF	Very High Frequency

INDEX OF KEY WORDS AND PHRASES

16732/ALEUTIAN ENTERPRISE
November 6, 1990

From: Marine Board of Investigation
To: Commandant (G-MMI)

Subj: Uninspected Fish Processing Vessel ALEUTIAN ENTERPRISE (ex CONCORD) O.N. 664123; Flooding, Capsizing, and Sinking in the Bering Sea on March 22, 1990 with nine persons missing and presumed dead.

FINDINGS OF FACT

1. SUMMARY

On March 2, 1990 the fish processing vessel ALEUTIAN ENTERPRISE, (ex CONCORD) O.N. 664123, with a crew of 30 departed Dutch Harbor, Alaska enroute fishing grounds in the Bering Sea. During the weeks that followed the vessel made several uneventful trawls and received two additional personnel, later debarking one to another processing vessel. At approximately 1:30 P.M., on March 22, 1990 (all times are Alaska Standard Time) with a crew of 31 on board in relatively calm seas and wind the net failed while hauling on board what was described as the biggest catch of the trip, resulting in fish shifting on deck, causing the vessel to list to the port side. With cargo holds nearly filled to capacity, the vessel listed further to port as the captain and chief engineer unsuccessfully attempted to correct the situation. Processing personnel, upon discovering water entering the processing deck through side openings, exited the area to abandoned the ship. With the port stern settling and the vessel rolling to port, the captain sent a May-Day to nearby vessels and activated the general alarm, which did not sound. He proceeded below decks to warn the crew and then abandoned ship. The vessel subsequently capsized and sank at approximately 1:40 P.M. in about 400 feet of water at position Latitude 56°, 13' 22" North, Longitude 169°, 48' 56" West. Nearby fishing industry vessels recovered 22 persons from the water and liferafts. A subsequent search by Coast Guard aircraft and fishing vessels in the immediate area failed to recover additional personnel. Nine persons are missing at sea and presumed dead.

2. VESSEL DATA

Name:	ALEUTIAN ENTERPRISE (ex CONCORD)
Official Number:	664123
Service	Fish processing
Document:	Coastwise, Fishery, Registry
Gross Tons:	195

Net Tons:	133
Registered Length:	142.7'
Registered Breadth:	38'
Registered Depth:	10.5'
Built:	1980, Halter Marine Inc., Moss Pt. MS
Hull Number:	8919
Material:	Steel
Construction:	Welded
Converted:	1984, Bender Shipbuilding, Mobile, AL
Propulsion:	Diesel, Twin E.M.D. Model 8-645-F6 with controllable pitch propellors
Horsepower:	1950
Market Value:	$6,000,000.00
Homeport:	Seattle, WA
Inclining Test Conducted:	July 31, 1987, Seattle, WA
Date of Recent Trim & Stability Book:	August 1987
Last Drydocked:	July 1988, Seattle, WA
Load Line Certificate:	None
Owners:	Aleutian Enterprise, LTD.; A limited partnership
Operators:	Arctic Alaska Fisheries Corporation Fishermen's Center, Fishermen's Terminal, P.O. Box 79021, Seattle, WA

98119

Master:	[redacted]
License:	[redacted] Issue 1–1 Master of Near Coastal Steam or Motor Vessels of Not More Than 100 Gross Tons; Radar Observer (Unlimited); Mate of Near Coastal Uninspected Fishing Industry Vessels of Not More Than 1600 Gross Tons; also Mate of Near Coastal Stea or Motor Vessels of Not More Than 200 Gross Tons.
Issued:	June 9, 1989 – MSO Puget Sound
Mate:	[redacted]
License:	[redacted] Issue 3–7 Master Ocean Steam and Motor Vessels of Not More Than 1600 Gross Tons; also, Master Ocean Uninspected Fishing Industry Motor Vessels of Not More Than 2000 Gross Tons; also Radar Observer (Unlimited).
Issued:	December 4, 1989 – MSO New Orleans
Chief Engineer:	John A. Dieterich
License:	637803 Issue 1–3 Second Assistant Engineer of Motor Vessels of Not More Tha 4000 HP; Third Assistant Engineer of Motor Vessels of Not More Than 8000 HP; Chief Engineer (Limited Near Coastal) Motor Vessels of Not More Than 6000 HP: Assistant Enginee (Limited Oceans) of Motor Vessels of Any HP; Chief Enginee Uninspected Fishing Industry Motor Vessels of Not More Tha 6000 HP.
Issued:	March 16, 1989 – MSO Honolulu.
Asst. Engineer:	[redacted]
License:	None

According to the records of the U.S. Department of Justice, Immigration and Naturalization Service, [redacted] a processor, was not granted status that would allow him to be employed in the United States.

Although the ALEUTIAN ENTERPRISE was less than 200 gross tons and therefore not subject to the licensing and manning requirements of the Officers' Competency Certificates Convention, 1936 (46 USC 8304) Arctic Alaska Fisheries Corperation (AAFC) made an effort to place licensed personnel on board.

3. CREWMEMBER INFORMATION

On June 26, 1990, the Alaska Department of Health and Welfare, Bureau of Vital Statistics, Juneau, Alaska issued certificates of Presumptive Death for all nine missing crewman. The certificates noted the cause of presumed death for all nine as drowning. Missing are:

Name: [redacted]
Position: Chief Engineer
SSN: [redacted] DOB: [redacted]
Address: [redacted]
NOK: Mother – Ms. [redacted]

Name: [redacted]
Position: Mate
SSN: [redacted] DOB: [redacted]
Address: [redacted]
NOK: Wife – [redacted]

Name: [redacted]
Position: Cook
SSN: [redacted] DOB: [redacted]
Address: [redacted]
NOK: In-Law – [redacted]

Name: [redacted]
Position: NMFS Observer
SSN: [redacted] DOB: [redacted]
Address: [redacted]
NOK: Father – Mr. [redacted]

Name: [redacted]
Position: Processor (Foreman)
SSN: [redacted] DOB: [redacted]
Address: [redacted]
NOK: Financee – [redacted]

Name: [redacted]
Position: Processor
SSN: [redacted] DOB: [redacted]
Address: [redacted]
NOK: Friend – [redacted]

Name: [redacted]
Position: Processor
SSN: [redacted] DOB: [redacted]
Address: [redacted]
NOK: Father – Mr. [redacted]

Name: [redacted]
Position: Processor
SSN: [redacted] DOB: [redacted]
Address: [redacted]
NOK: Mother – Mrs. [redacted]

Name: [redacted]
Position: Passenger
SSN: [redacted] DOB: [redacted]
Address: [redacted]
NOK: Mother – Mrs. [redacted]

4. VESSEL DESCRIPTION

a. General The ALEUTIAN ENTERPRISE had originally been constructed as a crabber in 1980 at Halter Marine, Moss Point Mississippi. The vessel was not used because it was tied up in litigation; however, the vessel's machinery was maintained by Halter Marine. In the Fall of 1983, the vessel was purchased and converted to a trawler/processor under the management of Arctic Alaska Seafoods (AAS). The vessel was moved to Bender Shipbuilding in Mobile, Alabama where a shelter deck was constructed over the main deck, from the existing house to the stern. Processing equipment and trawl systems were added and the live tanks were converted into dry coil refrigerated storage holds. The conversion was completed in February 1984. See photo, figure (1).

b. Hold Level

Figures (2) through (4) depict the vessel's profile and arrangement. Below the main deck level forward was a forepeak ballast tank, aft were two chain lockers, then a fuel oil tank to port and starboard of centerline. On centerline aft, a passageway led to a watertight door to the

INBOARD PROFILE

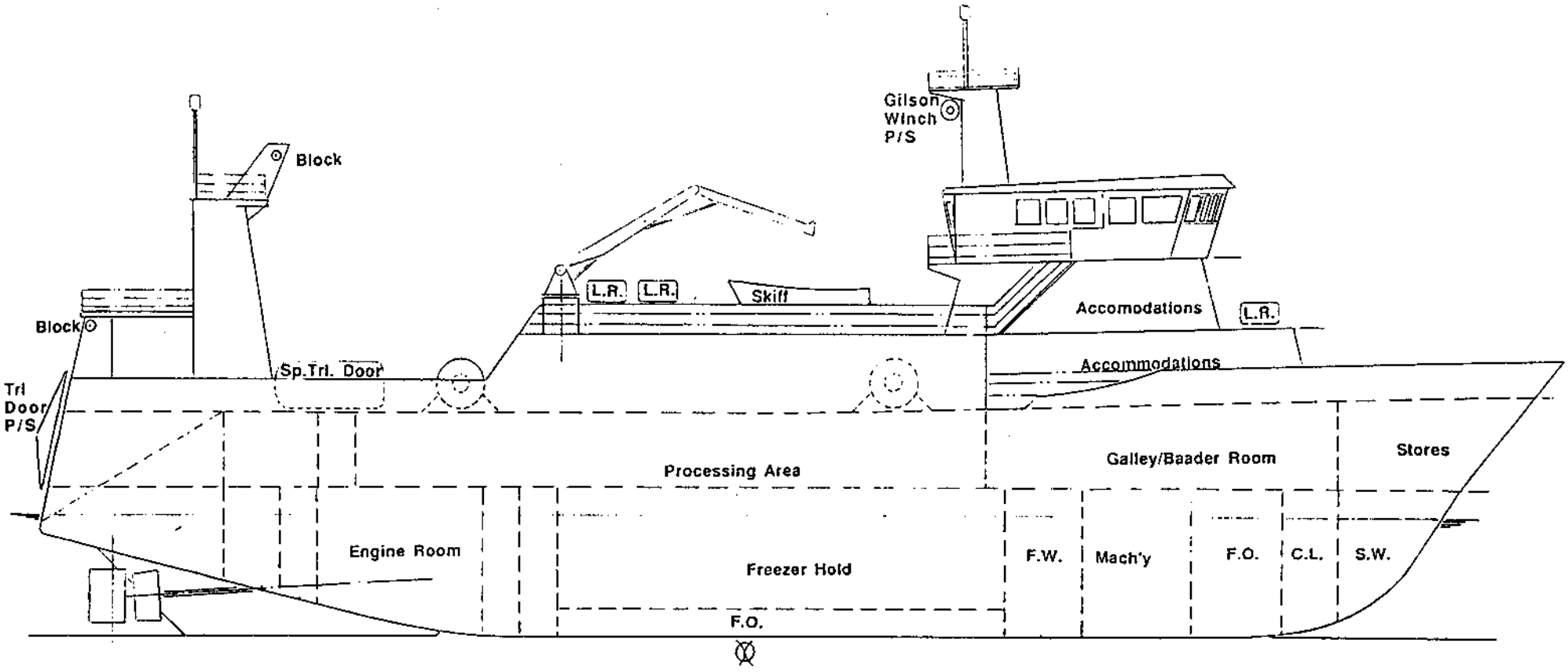
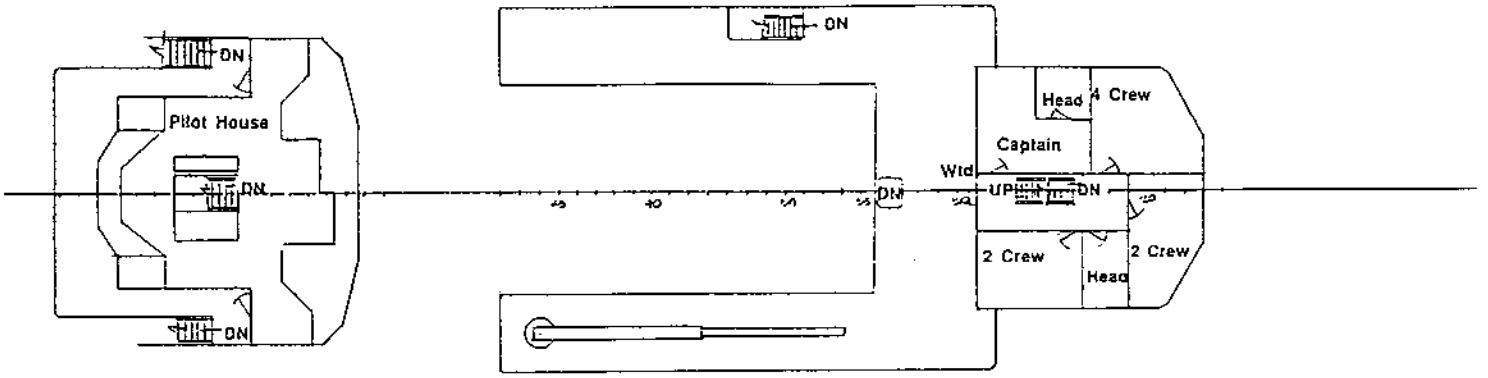
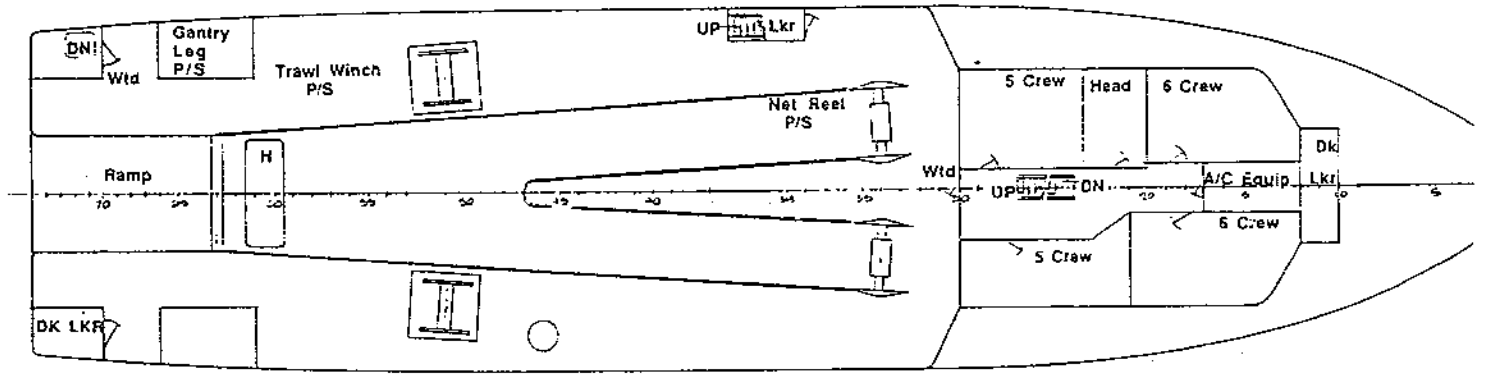


Figure 2

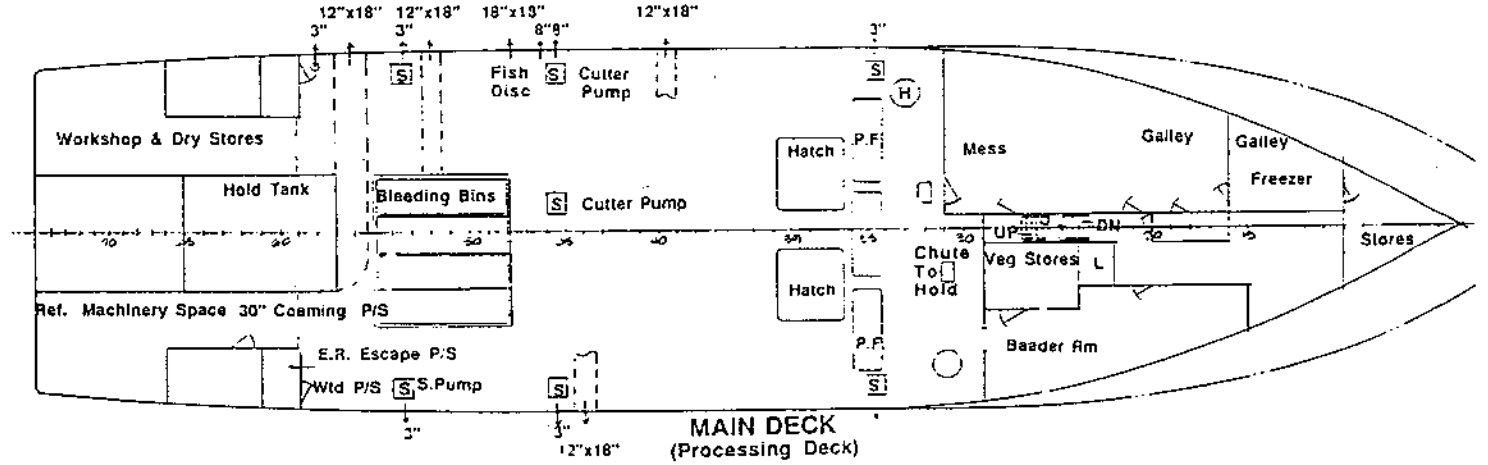
GENERAL ARRANGEMENTS



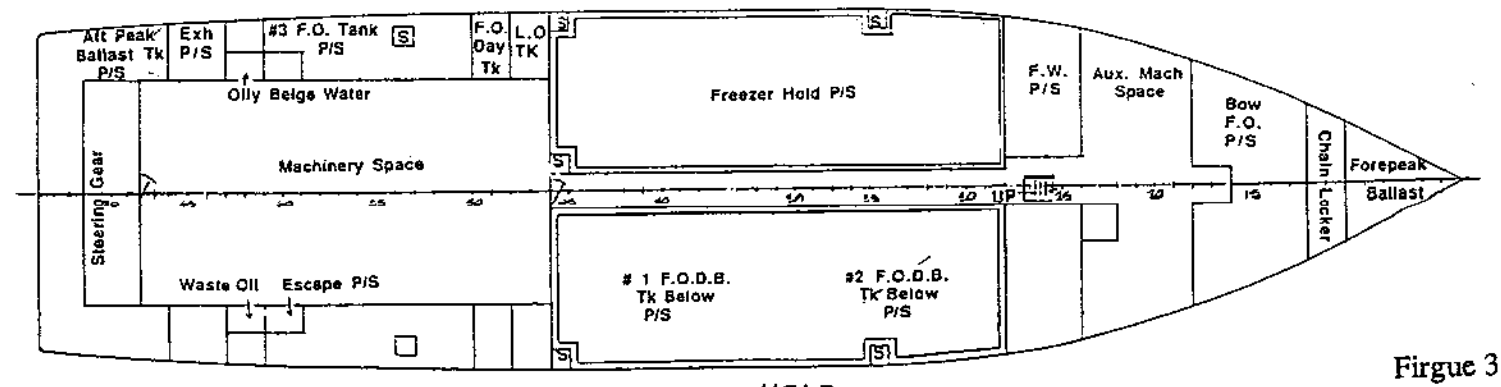
FO'C'SLE LEVEL 2



FO'C'SLE LEVEL1
(Trawl Deck)



MAIN DECK
(Processing Deck)



HOLD

Firgue 3

engineroom. Forward in the passageway was the bow thruster, aft were cofferdams with a product elevator, factory waterpump and a fixed fire system to starboard and the sanitation system and a potable system to port. The rest of the space was used for stowage of product packing material and spare parts. Next were deep potable water tanks, then two refrigerated dry holds of approximately 12,000 cubic feet. Watertight doors accessed the holds from the passageway for loading products. The alleyway was protected by bilge high water alarms. Product packing material was routinely stowed throughout the length of the passageway leaving as little as 18" of clearance. A sound-powered phone was located just forward of the engineroom. Four double bottom fuel oil tanks were located under the holds. A single common vent was installed during the conversion. It vented all four double bottom tanks to the port side of the trawl deck.

The engineroom contained the circulating, bilge and fire pumps forward. The main AC electrical panel and engineering alarms were located on the centerline forward in the engineroom. Port and starboard were twin EMD 8-645-F6 Diesel main engines with hydraulic pumps driven from the forward ends. Aft of the main engines to port and starboard were the GMC 12V-71 auxiliary generators with the GMC 8V-71 harbor generator on centerline. The fuel oil transfer pump and manifold was located just forward of the generators to port of center. Air compressors and air receivers were aft and to starboard were lube oil, hydraulic oil, and fuel oil tanks, engineroom vents and exhaust trunks with ladders and watertight access doors to the main deck. Aft on centerline was a watertight door to the steering room/lazarette. The engineroom was protected by a bilge high water alarm, fixed and portable fire systems, fire sensors, and machinery alarms. The steering room was also protected by a high water alarm. There were no remote shutdowns for the diesel auxiliaries.

c. Main (Processing) Deck Level

The main deck level forward had a forepeak storage area and hot water tanks. Aft to starboard of centerline was the "Baader room" where factory equipment was repaired and spares stowed. The washer and dryers, an open product elevator, and a walk-in cooler were also located on the starboard side. To port, was the galley, mess, and walk-in freezer. Aft was a door to the processing deck and a centerline access ladder to the fo'c'sle level 1. The watertight doors to the processing deck from the galley and the Baader room and the watertight door on the stairway leading to the hold were not in place.

The processing deck or factory, was equipped with 3 Jackstone plate freezers and the "Big Ben" freezer, numerous filleting tables, Baader (processing) machinery, 4 "bleeding bins" or tanks, and the centerline holding or "live" tank aft. Two large cargo hatches, two manhole type scuttles and two non-watertight chutes led through the main deck to the freezer holds below. The refrigeration compressors with spare freon bottles and a work room with a welding machine and spare parts were located aft of the engine exhaust and escape trunks port and starboard. The escape trunks were fitted with standard 8 dog doors. A ladder in the port quarter led to a small watertight space with a door on the weather deck. A 4' by 5' tonnage opening with the cover plate welded on was located on the port side of the transom.

PORTSIDE PROFILE

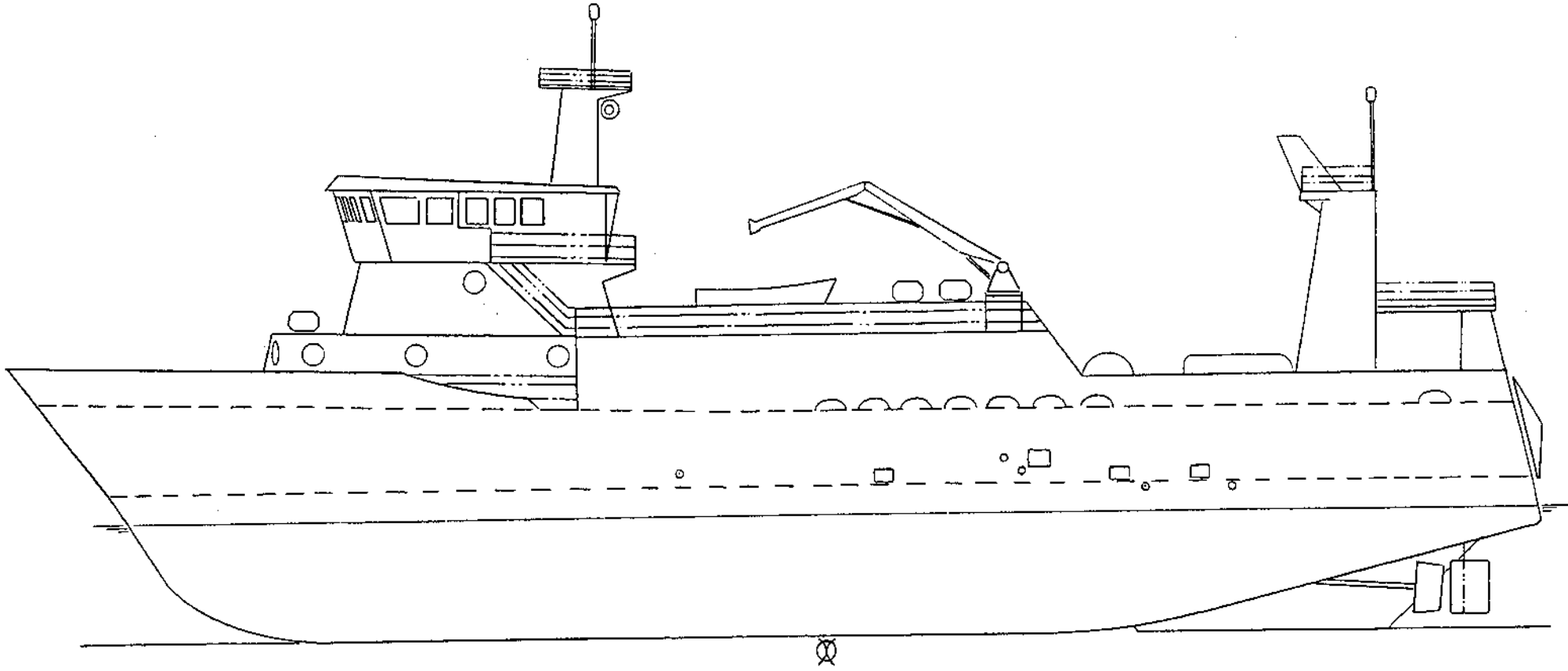


Figure 4

d. Fo'c'sle Level 1 (Trawl Deck)

On the raised fo'c'sle forward was an anchor with chain through a hawse pipe, anchor winch and deck lockers. Bulwarks and life rails were around the deck.

The fo'c'sle level 1 deck house contained a heating and ventilating space on centerline forward. Aft to port and starboard were two six men and two five men staterooms and the crew's head to port. The survival suit locker was located on the starboard side of the passageway. A watertight doorway with an inward opening non-watertight joiner door led to the weatherdeck between the net reels.

Aft of the deck house on the trawl deck were two net reels with a double arena trawl system. To port and starboard were shelter wings protecting numerous deck lockers, bins and tools. A vertical ladder between the net reels and a stairway on the starboard side led up to the shelter deck (fo'c'sle level 2). Flush hatch covers were fitted just aft of the net reels to provide access to the main deck level below. Tank vents were located along each gunwale. Main trawl winches were located aft to port and starboard. Two spare trawl doors were secured on the port side. The hydraulic live tank hatch and stern roller were located at the top of the stern ramp. The ramp was equipped with hydraulic swing doors at the top. Overhead a gantry housed a "Gearmatic 25" gilson winch for moving the codends about the deck. This gantry, which was above the stern ramp, was a 20' by 30' "gantry deck" used for stowage of spare fishing equipment. The working trawl doors hung from the trawl blocks on the transom.

e. Fo'c'sle Level 2 The fo'c'sle level 2 had a 4 man stateroom and Captain's stateroom to port. The captain's stateroom had two berths, lockers, desk, emergency radios and an enclosed head with a shower. To starboard were two staterooms with two berths each and an enclosed head with a shower. The survival suit locker was located on the starboard side of the stairwell. A watertight door led to the fo'c'sle level 2 shelter deck. The hydraulic deck crane was aft to starboard. A 12' skiff with outboard motor, and two inflatable liferafts were aft to port. The rest of the shelter deck was used as a storage area for fishing gear and product packing material.

f. Pilothouse The pilothouse had three helm stations with the trawl steering station on centerline aft. The chart table was on the starboard side of the centerline stairway. Electronics equipment and computers were mounted on the port side counters. The engineroom alarm panel, general alarm, and soundpowered phone were located on the port side of the forward console. Very High Frequency (VHF) and Single Side Band (SSB) radios were mounted over the forward and aft consoles. To port and starboard were the doors and ladders leading to the second deck level. Float-free EPIRBs were mounted on the port and starboard bridgewings. A third EPIRB was located in the pilothouse. Two inflatable liferafts were located on the deck one level down, forward of the pilothouse. Two "Gearmatic 44" gilson winches were mounted to port and starboard of center above the pilot house.

g. Sideshell Openings

Figures (3) and (4) illustrate the arrangement and dimensions of the processing area sideshell openings.

The opening furthest aft on the port side was a 3 inch diameter open hole at deck level. Seawater entering this hole was contained by 30 inch coamings fore and aft and by the hold tank (live tank) inboard.

The next opening forward was a 12 inch by 18 inch cutout with an open grate designed to drain water from the hold tank through a flume (chute) with 30 inch sides. It also had a 30 inch flume coaming.

The next opening was a 3 inch diameter open hole to drain the port side aft sump. It was located a foot below the main deck.

Next there was a 12 inch by 18 inch chute opening at deck level adjacent to the bleeding bins. This opening was equipped with a steel flapper hinged to the top of the chute about 6 inches inboard of the sideshell. The top of the 1 foot high chute was cutout inboard of the flapper.

A 18 inch by 24 inch fish discard chute opening was next. The bottom of the opening was about 2 feet off the deck. Its chute and flapper arrangement were similar to the one adjacent to the bleeding bins, except that the flapper was hinged to the side of the chute.

Next were two 8 inch diameter cutter pump discharge lines which were not equipped with check valves. The lower line came from the center cutter pump and penetrated the side shell just below the fish discard opening.

Further forward was another chute opening with an arrangement identical to the one by the bleeding bins. Furthest forward, by the plate freezers, was another 3 inch sump drain.

h. Watertight Doors and Hatches

Watertight doors were labeled on figure (3). The engineroom escape doors on the main deck in the processing space were watertight and normally secured. No other doors on the main deck were watertight or secured except the galley freezer door. The main hold hatches and manhole hatches were watertight and secured. The covers on the chutes to the holds were not watertight and not secured. These openings were fitted with coamings raised 2 feet above the main deck. Other openings to the hold level were the centerline stairwell and the elevator labeled "L". On foc's'le level 1, the watertight door on the port quarter escape compartment was often kept open. The centerline watertight door to the house was open or missing. The centerline door on the foc's'le level 2 was secured shut or blocked due to the storage of fiber (cardboard packing cartons) and plastic in the area.

i. Gilson Winches

Figure (2) shows the location of the forward port and starboard gilson winches and the aft gilson turning block. The forward gilsons were mounted side-by-side, each about 2 feet off centerline. They did not use turning blocks, but pulled with a bare drum capacity of 44,000 pounds each. The aft gilson was mounted on the gantry and used a turning block on the centerline above the live tank door. It had a capacity of about 10,000 pounds. All three were Gearmatic hydraulic winches.

j. Kort Nozzles The ALEUTIAN ENTERPRISE was equipped with twin 5 foot I.D. kort nozzles and controllable pitch propellers. Five foot by 2½ foot rudders were mounted just aft of the kort nozzle housings. The vessel normally trawled at less than 4 knots and only made about 1/2 knot at 300 % power while hauling back. Each engine provided a maximum of 975 horsepower.

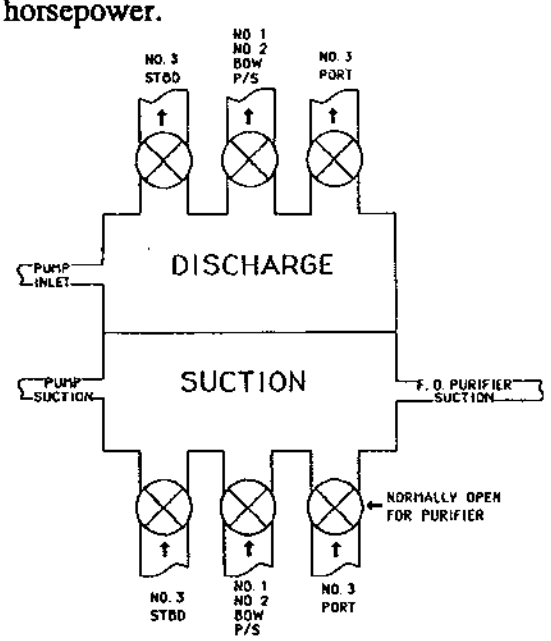


Figure 5

k. Fuel Oil Manifold Figure (5) is a sketch of the fuel oil transfer manifold as described by the assistant engineer. Transferring fuel from No. 3 port to No. 3 starboard fuel oil tanks required opening the No. 3 starboard discharge valve since the No. 3 port suction valve was normally open. The assistant engineer testified that this was a simple task.

5. SAFETY AND LIFESAVING EQUIPMENT

Neither Captain Siemons nor Captain [redacted] who had skippered ALEUTIAN ENTERPRISE since 1984, ever observed anyone from the company visit the vessel to conduct a safety inspection. [redacted] testified that he never discussed safety with other captains. He had never seen a list or record of liferaft maintenance. Fire extinguishers were not checked periodically and no one in particular was responsible for seeing that they were charged. When asked about the general alarm, [redacted] testified, "I generally [tested the general alarm] when there wasn't anyone else aboard or if there was just a couple of people aboard. I didn't want to alarm anybody. And I know I did in '87. . . . This time [1989-1990] up here I didn't get a chance to."

Siemons said he tested the general alarm in the Summer of 1989. He assumed the maintenance and repair items had been taken care of when he relieved the previous captain [redacted]. He did not ask.

One of the processors, [redacted] commented on a conversation he had with the assistant engineer, [redacted] about the general alarm, "I remember him saying that yeah, he was going to fix it when he got on the boat, but they didn't stay in port long enough because he has to take and rewire all the wiring it's all salt water damaged, and the control boxes, something about that. But he said he has to rewire everything and get a new horn. He was going to do that when we came into port. He said he should have before we left [March 2, 1990], but he was going to just go ahead and do it when we got back in."

General alarm contact makers were located on each level of the deckhouse, the processing factory and the engineroom. The system was powered by 12 volt batteries located aft of the deckhouse on foc's'le level 2. A clearly labeled switch to actuate the system was located on the forward console in the pilothouse. A constant voltage battery charger, located below the forward pilothouse console, provided a continuous charge to the batteries.

Two Sea Jay Elliot, MK–5, 10 man inflatable liferafts were cradled port and starboard, on the deck forward of the pilothouse. They were each equipped with a hydrostatic release and tied to the vessel with a 100 foot long painter line. Both rafts were Coast Guard approved. One was equipped with an EPIRB.

A Sea Jay Elliot, SE 83, 12 man and a Givens Buoy, MO–2183, 8 man inflatable liferaft were cradled side–by–side along the port side rail aft of the skiff on foc's'le level 2. They were each equipped with a hydrostatic release and tied to the vessel with a 100 foot long painter line. The 12 man Elliot raft was Coast Guard approved. It was equipped with an EPIRB. The Givens raft was not Coast Guard approved, and was not equipped with an EPIRB.

Coast Guard approved Harvey, Imperial, and Bayley survival (immersion) suits with lights, packaged by the manufacturer were stowed in plywood boxes in the deck house: There were 8 in the foc's'le level 1 passageway, 8 in the foc's'le level 2 passageway and 16 in the pilothouse. The stowage boxes opened from the top and needed to be held open. The boxes were not labeled. Work gloves and other equipment for the deck crew were stowed on top of the survival suits in the foc's'le level 1 box. [redacted] the processing foreman, told Captain Siemons that he waxed the survival suit zippers right after the USCGC MIDGETT boarding on September 20, 1989. According to a processor, [redacted] other survival suits were stowed forward of the freezer holds with fiber and spare parts.

Captain [redacted] stated that he never showed the crew how to don a survival suit, nor did he encourage the crew to try them on. He said, "No, they were made to use one time. I never monkeyed with them, left them just like they were sent there from the factory."

Arc Electric, Inc. Class A float free EPIRBs were located on the port and starboard bridgewings. Another was located in the pilothouse. Nine hand held flares and two Proteus III flares were located in the pilothouse.

Standard AAFC station bills were located in the deck house passageways and in the pilothouse. General alarm signals for fire, man overboard and abandon ship were listed. Fire stations and liferaft assignments were listed by crew position. The mate, chief engineer, assistant engineer,

and factory foreman were specifically assigned. The rest of the crew was instructed to go to the liferafts by stateroom. Bunk cards attached to some of the bunks indicated the liferaft assignment for the crewman occupying the bunk. The information on the station bills and bunk cards indicated liferaft assignments. The actual location of the liferafts was not illustrated on the card.

When asked about safety equipment, survival suits etc., [redacted], the fleet maintenance manager, said, "It should be the captain's responsibility to know when all of these expire."

6. FISHING OPERATIONS

a. Bridge Operations

The ALEUTIAN ENTERPRISE was fitted with a console located on the centerline aft in the pilothouse from where the mate on watch could operate the controls to set and retrieve the net. See Figure (6). There was a 7 inch high by 14 inch deep step in front of the console. The console was flat. Most deck operations were visible from this location except that the net reels could not be seen. Therefore, the net reels were usually operated by one of the deck crew from the controls located on the forward, starboard side of the trawl deck. The winch and gilson controls on the right side of the console could also be controlled from on deck.

The auto trawl hydraulic system kept an even tension on both sides of the net during trawling. The trawl control system was an F. K. Smith trawl system. A gauge, indicating system towing pressure for the winches, was located near the auto trawl box on the console. There were no gauges for the gilson winches.

The winches, net reels, and gilsons were controlled by pushing or pulling handles. To let out cable, the handles were pushed away from the operator (towards the stern). To haul in cable, the handles were pulled towards the operator (towards the bow). Each control was spring loaded, (e.g., it came back to center once released). The starboard gilson and aft gilson were positioned such that they needed to be operated with one hand on each. Mark Siemons, the captain, stated that he could operate both winch controls with one hand, but this could result in applying uneven pressure; therefore, he operated them with two hands. The gilsons had pressure relief valves. Siemons stated that the Gearmatic 44 gilsons on top of the pilothouse were loud when they operated. He could hear a change in the sound when they reached their capacity.

The distance between the winch controls and the joy stick and auto pilot was approximately 4 to 5 feet. According to [redacted] the previous Captain, he could operate the winches and steering at the same time from one location, but it was difficult to do so.

The joy/auto pilot switch controlled how the vessel was steered. When the switch was placed in the auto pilot mode, the vessel was automatically kept on course. In this mode the course of the vessel could be changed by turning a knob to the new course and the rudders would move accordingly until the vessel was on the new course.

AFT PILOTHOUSE CONSOLE

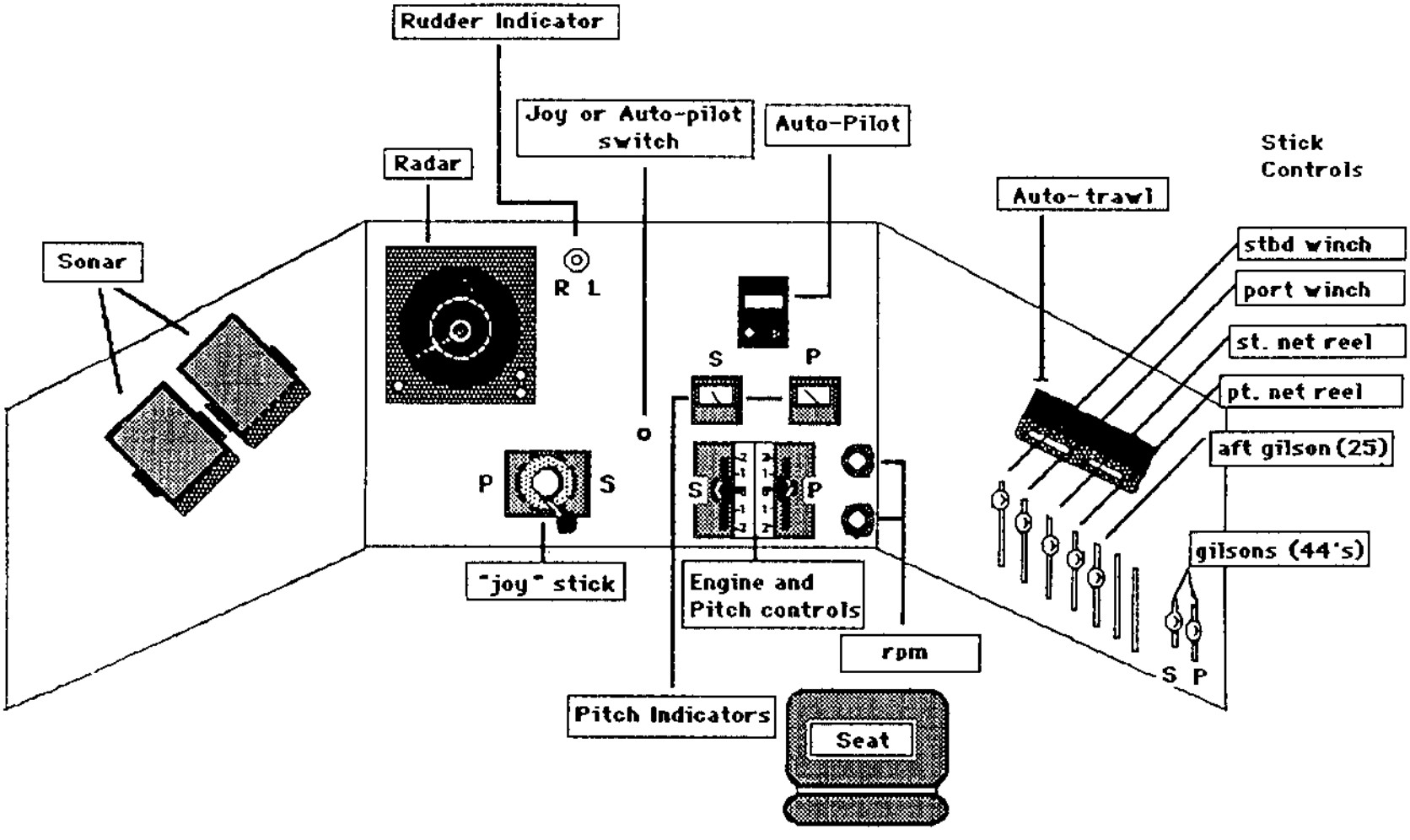


Figure 6

Engine speed (RPM) was controlled using the handles, one port and starboard. The settings were in increments. The range was from one to ten (each representing 10% of maximum RPM) in each direction (forward and aft) with zero in the middle indicating no RPM. The handle control was pulled towards the bow to go forward, and pushed towards the stern to go astern. If the operator's hand was removed from the control the handle would remain in the position last set (not spring loaded). The control handles for each were not color-coded to indicate port and starboard. They were labeled. The pitch control was automatic. As the RPM was adjusted the pitch was set automatically.

One of the vessel's compasses was located forward of the aft console. The mate positioned at the aft console had to look toward the bow to view the compass.

[redacted] the previous captain, stated that at one time (1986–1987) the aft console had two video monitors located above the sounders. Cameras (total of 4) were located in the factory, and engineroom. The two in the engineroom were positioned to show the alarm panel and the forward hydraulic pumps. [redacted] explained that the camera by the hydraulic pumps monitored the pumps because at one time the pumps leaked. The two cameras in the factory monitored the area by the live tank/discharge chute and the area forward, starboard side. These cameras enabled him to observe what type fish they were catching. The monitors in the pilothouse could be switched to show the views presented by any of the cameras. The 1987 condition and valuation survey listed these cameras and monitors as still being aboard, however they were later removed.

The vessel was fitted with net sounding equipment to detect the concentration of fish at the front of the net and in the codend. It was inoperative during the last trip. Siemons sent a report via telex to Seattle requesting a new net sounder.

The pilothouse/engineroom phone system was activated by a hand crank. The pilothouse phone had a bell that sounded when a call came in; the engineroom had a flashing red strobe light. The pilothouse phone was located on the port side of the forward console. The engineroom phone was located in the passageway just forward of the engineroom.

The general alarm actuator was located on the pilothouse forward console. According to Siemons, the general alarm was tested in the Summer of 1989 and didn't work. At that time some of the bells were missing. He was told that repairs were going to be made. Upon returning to the vessel, he saw that the bells were in place and assumed repairs had been made. Siemons never tested the general alarm himself while he was on board ALEUTIAN ENTERPRISE.

An engineroom alarm panel was located on the forward console next to the phone. Siemons used the engineroom alarm system to get the engineer's immediate attention. An alarm panel was located on the centerline in the engineroom. Siemons would activate the last button on the main alarm panel which would set off all the indicator lights, (e.g., bilge, low lube oil, etc.) The engineroom alarm panel also had a siren that activated when the light went on. According to Siemons, the engineer would go over to the alarm panel see that all the indicator lights were flashing and would know he needed to contact the pilothouse. According to [redacted] the

previous chief engineer, the siren could not be heard when the engines were operating at full power. The light could be seen anywhere in the engineroom. When the alarm sounded, the person in the engineroom would not be able to tell whether it was an actual alarm, (e.g., bilge alarm, low lube oil, etc.) or an indication that the mate on watch wanted to talk to him over the phone. The individual would need to go over and look at the alarm panel to determine which situation it was.

If all the indicator lights were on he would contact the pilothouse. If one or a few lights were on it indicated an actual alarm. The system worked in both directions. The engineer could use the alarm system to immediately contact the pilothouse. Siemons didn't discuss the use of the alarm system with the chief engineer, [redacted] He assumed the assistant engineer had discussed it with him. Siemons had used the alarm system as a means of communications with other chief engineers. Engineroom alarm lights would also flash throughout the vessel, including the processing deck area. An alarm indicator was also located in the engineer's stateroom. A large red strobe light was located in the processing area, Baader room, and galley. When the crew saw the light flashing they would notify the engineer so he could contact the pilothouse. The lights did not indicate an emergency condition requiring evacuation.

A pilothouse watch alarm, to ensure the mate on watch was awake, was fitted on the forward console. The alarm could be set for a specified period of time, 5, 10, 15 minutes, etc. When it sounded, it had to be silenced by the person on watch. If it wasn't silenced, another small alarm would go off and if that wasn't silenced the alarm would get louder until it was finally acknowledged and silenced. The alarm did not sound in any other spaces. According to Siemons, watch alarms are common in the industry. Siemons did not use this alarm.

VHF and SSB radios were mounted over the forward and aft consoles. There were two VHF radios fitted above the aft console. At the time of the casualty Siemons had one set on channel 16, the other on a working frequency. The SSB radio located above the aft console was set on a frequency to communicate with vessels in the area.

To communicate with personnel on deck, the captain relied on the use of a fixed loud hailer. The system was designed so that the deck crew could talk to persons in the pilothouse without having to leave their stations. Except for the loud hailer aft on the trawl deck, there was no loud speaker or intercom system throughout the vessel for making general announcements to the crew.

Mark Siemons had been appointed the captain of the ALEUTIAN ENTERPRISE in June of 1989. [redacted] AAFC Vice President of Fishing Operations, who was responsible for the vessel captains, said that he had originally hired Siemons as a processor on the NORTHWEST ENTERPRISE in 1983. [redacted] said, "The man is a very intelligent and very aggressive, interested person, not just in the operation of the system, but also in the operation of the vessels. He took it on his own to go after his master's license." [redacted] said that a license was not a prerequisite for Siemons becoming captain of the ALEUTIAN ENTERPRISE. Siemons had acquired a 1600 gross ton mate's license in June of 1989. Siemons had been a deckhand on the OCEAN ENTERPRISE and a mate on the ARCTIC I before becoming a captain. [redacted] told Siemons, ". . . you can turn this boat and crew around. . ." when he asked him to be captain of the ALEUTIAN ENTERPRISE.

b. Deck Fishing Operations

Figure (7) is an illustration of the fishing net used on the ALEUTIAN ENTERPRISE. It was an Aleutian Combination 99/140 manufactured by Nor'Eastern Trawl Systems, Inc. of Bainbridge, Washington. The 99 was the length of the headrope in feet (the headrope is a steel line running along the top forward edge of a net); the 140 was the length of the footrope also in feet (the footrope is a series of bobbins, tires or disks strung on chain or wire rope attached to the bottom front of a bottom net to protect the net from damage). Towards the aft end of the net was the intermediate which connected to the codend, (the part of the net that collects the fish). The intermediate is connected to the codend through the four riblines (riblines are steel, rope, or synthetic lines that run longitudinally in the net and codend to provide strength and shape to the net). According to Nor'Eastern Trawl Systems, the capacity of the intermediate was 30 to 40 tons.

A zipper (crab pot zipper) or relief valve, as Siemons also referred to it, was in the top center panel of the intermediate. The zipper was the weakest part of the net. It was designed to break before the other parts of the net and was often cut by the crew to remove crab pots and other debris that got caught.

The codend was a knotless, 3½ inch mesh, 40 ton codend also manufactured by Nor'Eastern Trawl Systems, Inc. See figure (8). The codend used during the last trip was fitted with two dumping straps, one located about seven feet down from the top of the codend, the other in the middle. They were used to pick up the codend so fish could be dumped into the live tank. Like the net, the codend also was fitted with four riblines. At the end of the codend was a zipper which was opened to remove fish.

The captain used the gilson winches to haul the net and codend on board. The ALEUTIAN ENTERPRISE used three; two forward (Gearmatic 44) above the pilothouse on the mast port and starboard, and one on centerline (Gearmatic 25) on the aft gantry above the trawl deck. A single hookline runs from each gilson. The gilsons are also used in setting the net or for moving gear on deck.

On a normal haulback the codend would be pulled up the stern ramp to the deck forward of the stern roller. The stern roller is a long metal cylinder at the top of the stern ramp which rotates as the net is hauled across the deck to minimize net abrasion during setting and hauling. The hydraulically operated live tank hatch is located just forward of the stern roller. Figure (9) is a photo of a codend on the trawl deck of the ALEUTIAN ENTERPRISE taken from the pilothouse in the Summer of 1989. The photo shows the forward starboard gilson and the aft gilson attached to the forward end of the codend at a 4–way lifting strap. The live tank hatch is open, and the stern ramp doors are closed. Fish had been released through the zipper in the aft end of the codend and spilled over to the gunwale in the starboard quarter.

During the last haul on March 22 the gilsons were connected to various points along the net to haul the net aboard. The first point was the first lifting strap, the second the second lifting strap

ALEUTIAN COMBINATION NET

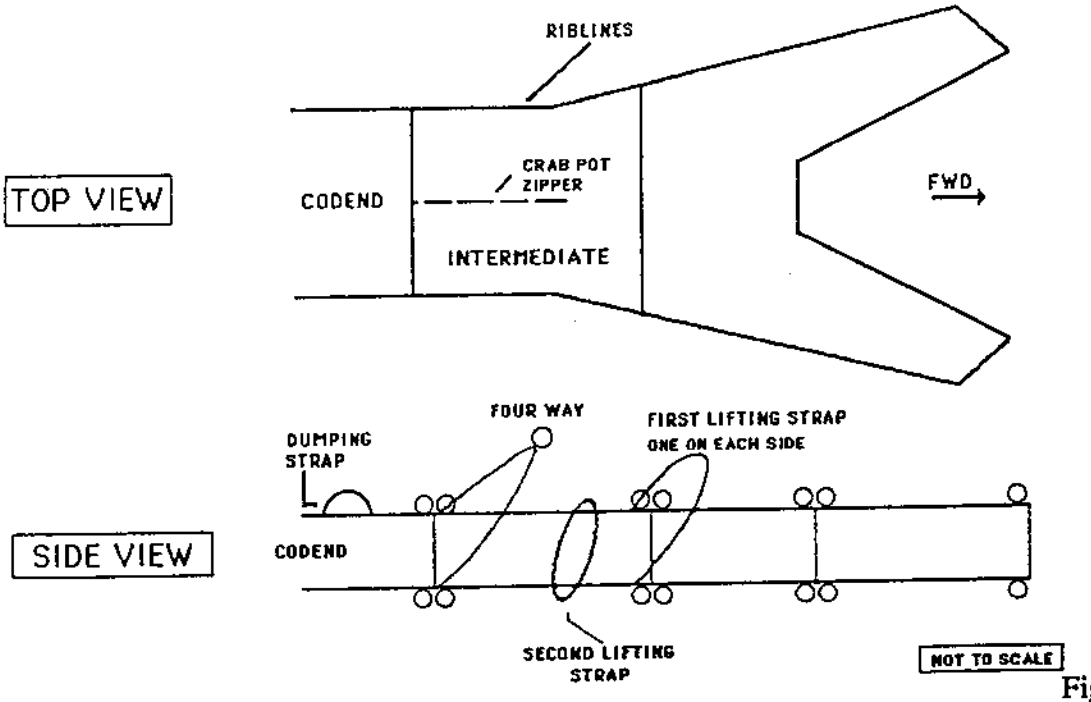


Figure 7

CODEND

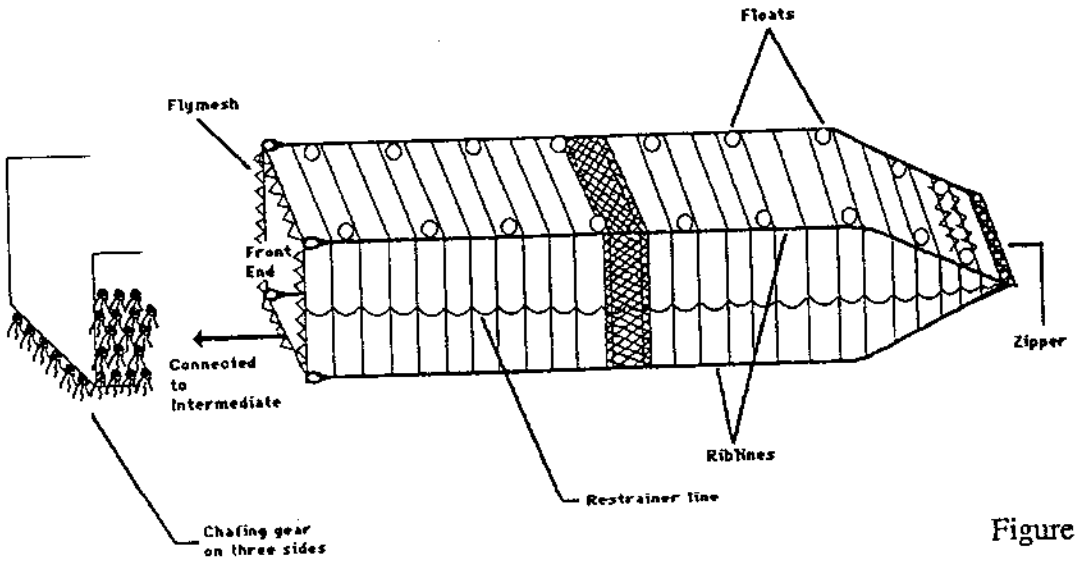
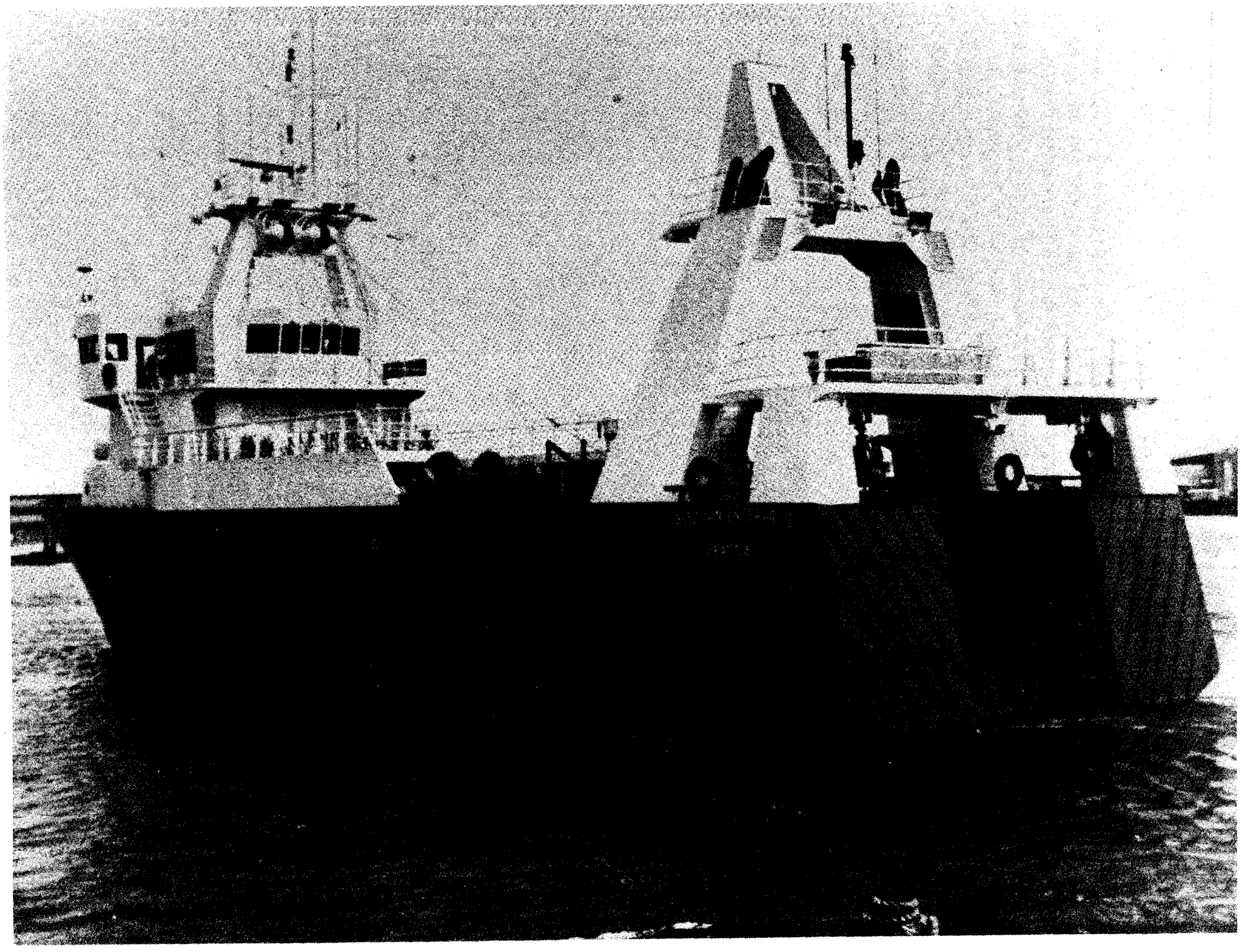


Figure 8



ALEUTIAN ENTERPRISE (1984)

Figure 1

or endless strap (line wrapped around the intermediate several times), and the third was the 4-way lifting strap at the forward end of the codend (lines connected to each ribline and joined together at the top).

The mate on watch could communicate with the deck crew on the fishing deck aft using the loud hailer system located above the aft console. Speakers were located in the pilothouse and aft on deck. Two way conversations with the deck crew aft were possible by turning up the volume control in the pilothouse. According to Siemons he usually turned the pilothouse volume control down because he had too many things to listen to, (e.g., radios). With the loud hailer so adjusted he could not hear the deck crew if they tried to talk to him. The deck crew would then use body motions and facial expressions to communicate with the captain. When the deck crew did not see the captain at the bridge aft trawl control station they either stood by awaiting further instructions or took independent action. During the time of the casualty Siemons had the volume control turned down.

Normally three deckhands worked on the trawl deck. The senior deckhand or "deck boss" was [redacted]. He had been working in the fishing industry for 8 years. He stood the midnight to 4 P.M. watch as deck boss. [redacted] had a 6 A.M. to midnight watch as deckhand and was deck boss when [redacted] was off watch. [redacted] had worked on the ALEUTIAN ENTERPRISE and PACIFIC ENTERPRISE since 1985.

The deckhands described the equipment and ship stores that were stowed on the weather decks. When asked what was stowed on the aft gantry deck, [redacted] said, "Okay, that was one whole net that we used the trip before during rock sole. It was a brand new net and we used it for a whole trip of rock sole and we pretty much trashed it. . . . The crane barely lifts it up." Tons of other fishing gear, spare parts, packing material, trash, etc., were stowed on deck. The Board developed spreadsheets from the testimony to determine the vessel's load condition at the time of the casualty. See the Technical Studies section of this report.

[redacted] also described the freeing ports on the port side of the trawl deck. They were in an area about four feet long and one foot high with steel bars welded eight inches apart.

c. Fish Processing Operations

Figure (10) illustrates the processing equipment layout. Fish were dropped into the live tank through the hydraulically operated hatch just forward of the stern roller on the trawl deck. According to Siemons, the National Marine Fisheries Service (NMFS) Observer, [redacted] measured the live tank and told him it held about forty to forty-five thousand pounds of fish. Siemons told [redacted] that it held forty to forty-two thousand.

The fish were removed from the live tank through one of two large hydraulically driven sluice valves (guillotine type arrangement). Pressurized seawater flushed the fish into a thwartships trough toward a conveyor belt on the port side where they were sorted. The NMFS observer routinely worked in this area.

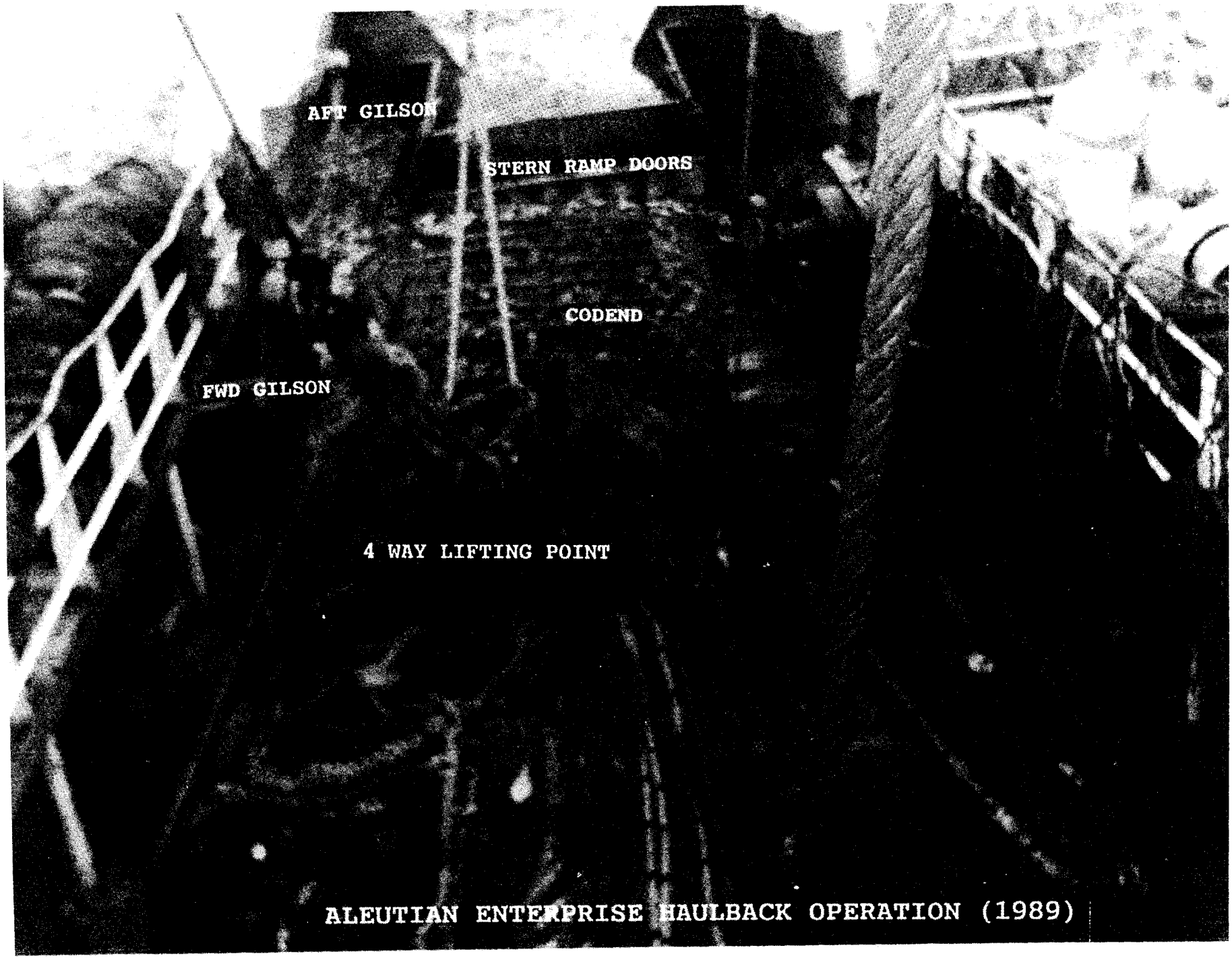

AFT GILSON
STERN RAMP DOORS
CODEND
FWD GILSON
4 WAY LIFTING POINT
ALEUTIAN ENTERPRISE HAULBACK OPERATION (1989)

Figure 9

The NMFS observer on the August to November 1989 trip reported that, "The observer's sampling station was not adequate. The observer had an area of about 48 square feet to work in. A table was constructed to write on and store gear. All fish measured were on the floor. Due to frequent sloshing of water, measuring salmon, halibut, etc. was long and frustrating."

Forward of the observer's station on the port side, fish were removed and cut for bleeding before processing. After they were cut the fish were placed on another conveyor belt which moved them to one of four bleeding bins. Species not desired continued forward and returned to the sea via an overboard discharge chute on the port side. The fish to be processed were automatically dropped into one of the bins (capacity of 10,000 pounds each) located forward of the live tank. Another trough was located on the forward side of the bins where the fish flushed out for processing.

Processor, [redacted], noted that processors sometimes asked the engineer to make the vessel list to port or starboard to get the fish to run out of the bin on the opposite side.

From the bins the fish proceeded along a conveyor to a header machine which cuts the heads off. Then the fish moved through either the 185 or 190 Baader fillet machines. Two pumps located in the hold level constantly ran to supply sea water to the processing equipment and holding tanks to rinse and move the fish through the factory. Together they supplied about 1,000 GPM to the processing space. Normally this water would exit the vessel through the chute openings or via the sump pumps or sump drains. The factory water switch was a push button type with red (off), and green (on) located on the galley bulkhead. The water supply was always on unless the vessel was in port. Processor, [redacted] stated that the factory water switch was, "the same type of switch that goes to the cutter sump and everything else in there." [redacted] a processor, testified that the port sump pump switch was a lever that turned one way for manual operation and the other way for automatic operation. Off was in the middle. He said the pump was always getting "messed up".

Once filleted, the product moved forward where processors cut off excess bones, removed worms and parasites, and placed the fillets in baskets. Fillets were removed from the baskets and placed on the grading table where they were inspected, and graded according to size. The fillets were weighed and packed into fifteen pound sleeves and placed into one of three Jackstone fillet plate freezers located aft of the forward factory bulkhead. Each Jackstone freezer contained a series of hydraulically operated shelves which held a total of thirty–three, forty–five pound cases. Each case held three sleeves at fifteen pounds each. After the freezer was loaded, the shelves were lowered until the shelves met each other. After the fillets were frozen (1½ to 2 hours) they were removed from the freezer trays, "cased up" into boxes and slid down into either the port or starboard freezer holds via a raised chute forward of the plate freezers.

According to processor Armando Valencia, a native of Mexico, working the machines is very hard. "Everyone that does that work – their hands eventually hurt." Processing personnel were given breaks, only after working nonstop for eight hours – when it was time for breakfast, lunch or dinner. Valencia stated that on other vessels he's been on, processing personnel have taken a ten to fifteen minute break approximately once every four hours. Valencia stated that there were no heaters in the processing area to keep the crew warm. He did not have a heater in his room.

PROCESSING EQUIPMENT LAYOUT

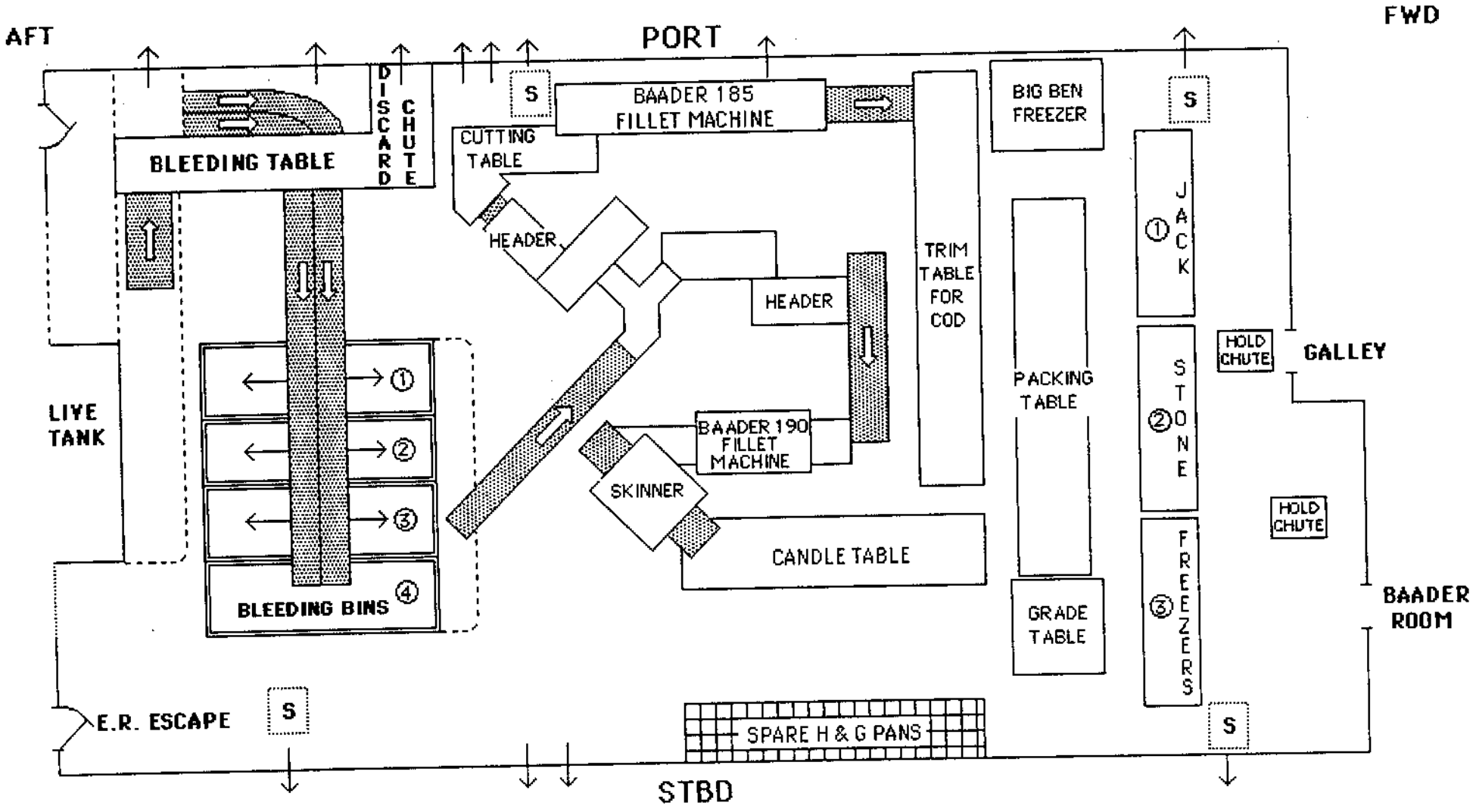


Figure 10

[redacted], a novice processor, or "greenhorn", testified that there was no heat in the processing room. He wore two or three layers of clothing. [redacted] said that he signed four, thirty day contracts. He expected to get more than his contract price and a paid flight home if he stayed four months.

[redacted] was a "greenhorn" having begun working for AAFC as a processor on the ALEUTIAN ENTERPRISE on March 1, 1990. When asked if he was given any safety instructions, [redacted] said, "No. Like I said, I got on the boat, they said find a room and you're going to be starting work in a few hours. . . He [the person who told [redacted] to find a room] said, 'There's survival suits in that deck locker right there.' And I lifted up the top and he goes, 'Yeah, it's underneath all that stuff.' You know, there's rain gear and gloves and stuff that was on top of the survival suits. And I didn't think to much of it because I was thinking, you know, this boat's too big to sink." [redacted] didn't know where the liferafts were. He said, "From then on I was just sleeping and working. After a few days, you just get a pace set. That's all you think about is getting sleep and working, getting something in your stomach."

Processor, [redacted] said that he normally got 5 to 5½ hours sleep. He had a portable heater in his stateroom. Sometimes he would come to work in the processing room and there would be ice on the bulkheads. Another processor, [redacted] stated, "I slept maybe five hours, four--and--a--half or five hours. . . . The living conditions were, I don't know. It depends if the crew kept it clean or not. My room was a pretty big mess. That's normal I guess. You don't really have time to clean. You just want to go to work and go to bed." [redacted] worked from 11:30 P.M. to 4:30 P.M. – 17 hours. In addition he was sometimes assigned overtime work by the foreman, "kind of like" a punishment.

As [redacted] described it, "Well, we kind of all did overtime. Both foremen believed in overtime because overtime means you worked that much more and was that much faster you'd get to port and much more money we'd make. So if you worked more time then obviously you'd get done a little faster. Everybody worked more time. So they [foremen] would go around and sometimes looked for people to give overtime and sometimes it would just come because they deserved it, like, if you leave a line and they don't know where you went you'd get overtime. Everybody just kept working and didn't really say nothing even if you did get overtime because there really wasn't nothing you could do. If you argued with them then they'd probably give you more overtime."

In addition to several layers of clothes, processors wore raincoats, rubber gloves and knee high boots. [redacted] stated that there was always a few inches of water on the deck. Sometimes it would come "pretty close" to going into his boots. Another processor, [redacted] said, "Our factory is basically [sea] water level. I'd say the water level [inside] is basically up to your ankles, but that's it. So the pumps were important, but not as important as some of the other boats [that have factories below water level]." It was typical that water would collect on the processing deck. He said, "Every once in a while that water would get fairly high, like up to your knees, but only in the one certain spot where the boat was listing. . . . And we would just process through it and not worry about it."

Processor, [redacted] said, "If you don't have sumps you'll sink. . . . It takes one sump pump on each side to dewater the processing deck when no processing is going on." [redacted] stated that the port cutter sump pump by the bleeding area always clogged. "I've seen water like three, four feet back there." The header machine and Baader 185 dropped debris near that cutter pump. He said, "It really had nothing to do with the weather because the water would always be coming in the sumps, and all those hoses are always running in the factory. You know, they clog up and there's water going to build up automatically."

[redacted] the assistant engineer stated, "We had quite a bit of water one time when we had one of the deckhands hose down a controller and popped the panel for the processing area and all the sumps shut down. But that was only like a foot of water. We were pretty trim." [redacted] said that processors sometimes removed the chute and flapper that was normally fitted to the through-hull opening under the Baader 185 machine on the port side. "Whenever they'd plug up because of the header – the carcasses, they'd pull it out and then I'd notice it was out and I'd replace it. . . . So I'd just pick it up, set it back in, and put two bolts back in." He had replaced the fish discharge flapper on a previous trip. "The flapper had rotted off the top cover. So what they did was they took a piece of quarter inch plate, welded a piece of pipe to the top of it. That was still in good shape, but the rod going through it had eaten away from swinging. So I just replaced that rod with a piece of stainless steel rod." He testified that there were male plugs for the deck drains. He screwed them in when the vessel was in port to prevent an oil sheen in the harbor. They were always off at sea.

Processors testified that it was not easy to get around in the factory. [redacted] testified that the only way to get away from his work station in the processing room was to jump over a table. Another processor [redacted] described the doorways in the forward bulkhead of the processing space, "They are watertight doorways with no watertight doors on them."

The processors usually listened to loud music while working in the factory deck. During the August to November 1989 trip, the NMFS observer reported that extremely loud heavy metal music blasted out of two 100 watt speakers twenty-four hours a day creating an unsafe atmosphere. "The music after a while grated on ones nerves. The next observer needs a pair of high quality ear phones to cut down noise level to nil." During the March 2, 1990, trip music was not played because the speakers were not working. A telex was sent from the vessel to AAFC requesting replacements.

7. THE CASUALTY

a. Departure from Dutch Harbor

[redacted] took command of ALEUTIAN ENTERPRISE for the second time on January 31, 1990 when he relieved [redacted] Siemons met [redacted] at the airport where he spent approximately fifteen minutes discussing the ALEUTIAN ENTERPRISE. According to Siemons, [redacted] told him that everything was fine except that he may have problems with the

fillet machines. Siemons also spent about the same amount of time at the airport with [redacted] the offgoing factory foreman. Siemons stated that [redacted] disagreed with [redacted] concerning the fillet machines. Siemons made two trips on the ALEUTIAN ENTERPRISE in 1990; one in February and the other in March which involved this casualty.

[redacted] the observer from the National Marine Fisheries Service (NMFS), reported aboard the ALEUTIAN ENTERPRISE for the February 1990 trip out of Dutch Harbor. Siemons recalled that [redacted] presented him with a letter of introduction from NMFS, but couldn't recall what it said. The "Letter of Introduction," provided to NMFS observers to present to the vessel captain upon reporting aboard, contains a request that the captain discuss and explain the vessel's safety and emergency procedures with the observer and identify the procedures which should be followed in the event of a vessel emergency. It asks the captain to, "Please indicate the dangerous areas aboard your vessel and the location of safety and emergency equipment (i.e. lifeboat stations, location of life vests, emergency exits from the factory or living quarters, etc.)." During the March trip Siemons met with [redacted] several times.

Prior to getting underway from Dutch Harbor for the March trip, the vessel was loaded supplies. Extra empty collapsed cardboard boxes or "fiber" and 50 pound rolls of plastic for packaging were loaded into the freezer holds and the "blue room", a makeshift space on the weatherdeck aft of the captain's cabin. Other materials and provisions were also placed aboard. During the mid-afternoon of March 2, 1990 the ALEUTIAN ENTERPRISE with a crew of 30 departed Dutch Harbor, Alaska enroute to fishing grounds in the Bering Sea. After departing, Siemons made a short practice tow picking up three to four thousand pounds of fish for the processing deck to start up and to check the equipment. According to Siemons, this enabled the factory foreman to show his new processors what was expected of them. After the tow the ALEUTIAN ENTERPRISE proceeded towards the fishing grounds in the vicinity of the Pribilof Islands in the Bering Sea, a 22-hour trip.

The fresh water tanks were not topped-off before departing Dutch Harbor and were low on water at the time of the casualty due to a problem with the potable watermaker. The engineers struggled to keep the potable watermaker working.

On deck, crewmen began making a new intermediate for the port net since the one on board was worn out. Siemons stated, "All of the knots were chafed. After a while the web gets pulled so tight after a certain amount of use, normal wear and tear, that you get weak spots everywhere."

During this trip the captain sent and received several telexes dealing with a variety of issues, including production reports, repair parts for Baader processing equipment, crew draws (advance on expected pay), etc. One of the telexes sent from the ALEUTIAN ENTERPRISE to AAFC dealt with the new processing personnel; "Those four green horns you sent us were a pretty sick joke. They're slow but learning to get faster on their sleep shifts." Siemons stated that this was [redacted] sense of humor. Siemons also communicated daily, by radio, with the Dutch Harbor office. The manager of the Dutch Harbor office called each vessel by radio at 10:30 A.M.and 2:30 P.M. to ascertain its status. During one of these calls Siemons reported his estimated time of arrival to Dutch Harbor as March 23rd.

Approximately midway through the trip Siemons picked up [redacted] a Baader technician from the OCEAN ENTERPRISE via a skiff to work on the Baader processing equipment. [redacted] was transferred back to the OCEAN ENTERPRISE about four or five days before the casualty.

During this transfer operation [redacted] a processor, boarded the ALEUTIAN ENTERPRISE. [redacted] had quit the OCEAN ENTERPRISE after two days work. There were now 31 crewmen aboard. [redacted] the factory foreman on the ALEUTIAN ENTERPRISE, gave [redacted] a bunk and explained that he was to eat when the crew eats and not to be in the galley watching movies. He was free to move about the vessel except aft where the deck crew was working. Siemons did not see [redacted] often. He stated that [redacted] spent most of his time in his room, "reading or something." Siemons didn't know what type survival training, if any, [redacted] had. He also stated he didn't know, nor did he ask, if [redacted] received any safety orientation when he came aboard.

During this trip [redacted] a processor, became ill. Siemons became aware of his condition about ten days before the casualty when [redacted] told Siemons of [redacted] illness after Siemons had noticed that a man was missing in the factory. [redacted] told Siemons that Price was anemic. Siemons told [redacted] to stay in his room and not to exert himself, then gave [redacted] vitamins since [redacted] did not have any with him. Siemons could not recall if he notified the Dutch Harbor office concerning Price's condition. He did not call for any medical advice on how to treat Price. According to Siemons, [redacted] told him how he needed to be treated. Siemons felt that was sufficient.

A few days before the casualty, five or six processors filled the blue room (fo'c'sle level 2 weatherdeck just aft of the deckhouse that was covered with a blue tarp) with fiber and plastic from the hold freezers to make room for more fish. [redacted] put the last fiber in front of the fo'c'sle level 2 door and tied the door shut. He testified that the captain was nearby at the time and said nothing.

Siemons had the 8:00 A.M. to 12:00 P.M. watch. He awoke early on March 22 after about 7 hours sleep. After breakfast he toured the vessel visiting the processing deck and engineroom. In the processing deck the crew was busy processing the catch from the previous haulback. He went down to the engineroom via the aft starboard door. He did not walk around the engineroom, but did speak briefly with [redacted] the chief engineer. Siemons could not recall what [redacted] was doing. After he completed his tour, Siemons went up to the pilothouse and had a general discussion with [redacted], the mate on watch. [redacted] mentioned that fishing was good during the night which, according to Siemons, was unusual – night fishing is usually slow. There was a bag of fish on deck at this time.

b. Deck Operations

[redacted] (deck foreman), [redacted] (deck hand and night foreman), and [redacted] (deck hand) were on deck aft when Siemons relieved the watch. Siemons had worked with these men many times before, both as captain and as a deck hand. Of the three, Siemons rated [redacted] first

and [redacted] second in professional ability. [redacted] needed more work on handling people. Both [redacted] and [redacted] had built nets and were very familiar with net terminology and connection points.

Siemons' first, and only haul on the 22nd, started around 11:30 A.M. He did not start a haul earlier because there was enough fish on board, including on deck, to keep the factory busy. He waited until they could shut the live tank door before setting his nets for a bottom trawl. He shortly came across a heavy concentration of codfish. At approximately 1:00 to 1:15 P.M. the trawl cable tension indicators showed that the net was full so Siemons commenced haul back operations. Siemons and the deck crew began the process of trying to get the trawl aboard.

After the main wires were reeled in with the port and starboard aft main towing winches the trawl doors were disconnected and stored in their position on the port and starboard transom. The rigging, with the net and codend attached, was hauled in on the port net reel drum located forward on the trawl deck. As the net was being hauled aboard, Siemons "level wound" the net and rigging on the reel by turning the vessel side–to–side. The engines were ahead at 20–30% with the vessel making approximately 1/2 knot. The wind and seas were off the starboard bow at 15 to 20 knots and 5 to 6 feet, respectively. Siemons could not recall what course the vessel was on. The live tank was 3/4 full and three of the four bleeding bins were full. The number four bin was 1/2 full.

Siemons saw the codend surface at about 200 feet astern. He called down to the crew on deck via the loud hailer and told them to look what was following them. As the net moved closer [redacted] could see a steady flow of fish coming out from both sides of the forward portion of the net, "because it was overloaded."

[redacted] stated that he believed the belly of the net ripped as it was coming up the stern ramp. He noted that fish were, "pouring out the whole time we were pulling it up the stern ramp." He ran to his locker and got his camera to take a picture of the codend because he knew it was, "a huge bag." [redacted] went down the stern ramp onto the codend and [redacted] took his picture. AAFC had a practice of paying $300 for photo's of fishing operations that were selected for publication in their newsletter, "View from the Bridge." [redacted] said that the intermediate part of the net looked 3/4 full. He did not wear a personal flotation device (life jacket) nor life line when he went out onto the codend. None of the deck crew were wearing hard hats.

Siemons continued hauling in the net until the top of the intermediate was up to the stern roller. The deck crew hooked the starboard gilson winch cable from above the pilothouse, to the first lifting strap at the top of the intermediate. Siemons operated the starboard gilson control on the aft console and hauled the intermediate aboard to a point where the crew could attach a second lifting strap. Siemons stated that the vessel took a normal list while picking up the bag. [redacted] said that the vessel listed three or four degrees to port before they started pulling the codend up the stern ramp, "But we weren't worried about that at the time because it was nothing uncommon to list."

Siemons stopped hauling in and the second strap was secured around the net just forward of the fish in the intermediate at a location approximately 1/2 to 3/4 of the way up the intermediate. After the second lifting strap was in place, the deck crew hooked the port gilson cable to it. Then Siemons hauled the net forward and upward with both forward gilson winches. [redacted] stated that the codend was on the port side of the stern ramp leaving a 1½ to 2 foot gap between the codend and the starboard side of the stern ramp. According to [redacted] the net had a tendency to, "stick" to the side the net was being hauled from. [redacted] said they stopped pulling with both gilsons, "Because we were waiting for the list to come back. You don't want to bring a bag like that on board with a list as such."

[redacted] stated that as the net was being hauled in, "It was obvious it needed some help. So at that point . . . on a normal size bag we usually take the starboard gilson or the port gilson and bring it back and hook it up to the 4-way and then pull. But we couldn't undo both of them because if we would have undone one gilson, then something would have broke and then that [codend] would have shot back in the water. So we had to leave them both on. So we took the 25, [a gilson winch located on the aft gantry]. I believe [redacted] was manning the 25. I can't see this thing. And I walked down the stern ramp with the 25 hook on the codend and hooked it into the 4-way right here. We used that to help. It's just additional power to help bring the bag up." No one told [redacted] to hook up the aft 25 gilson, "It was just the right thing to do at the time, instinct, I guess." When asked if the aft gilson picked up the codend he replied, "I just think it helped – yeah, it did a little bit, but I think it just helped relieve a little bit of pressure. Still, all the pulling was being done by these two [forward gilsons]." [redacted] operated the aft gilson controls and took out the slack. Siemons stated the vessel had a ten to fifteen degree port list at this time. According to Siemons, he did not give instructions to the deck crew to hook up the after 25 gilson.

Siemons resumed pulling in on the port and starboard gilsons he noticed that the second lifting strap was slipping forward on the intermediate. The net was suspended from the top of the stern ramp at the stern roller, forward at an angle of about 45 degrees towards the gilsons above the pilothouse. The highest point of the intermediate above the deck was approximately 12 to 14 feet. At least one gilson winch reached its maximum pulling capacity. According to [redacted] "After the gilsons bogged down, it felt like, you know, a lot of times we could break straps and stuff. When they bog down it's like waiting for something, one of the lifting straps to break or something to break."

The second lifting strap caught on the net web, ripping the intermediate, top, bottom, and sides, away from the codend dumping all the fish in the intermediate on deck. The crab pot zipper in the center of the top panel of the intermediate also blew open squirting fish up in the air. [redacted] stated, "And the fish flew all over the deck. And that was still no problem. The fish were all over the deck, everything was still calm and cool for a couple of minutes." Siemons stated that there was between 10-15,000 pounds of fish in the intermediate before it ripped. [redacted] stated that the intermediate was half full.

Siemons continued pulling until the connection point on the sides of the net for the four-way were at the top of the stern roller. Once up to the stern ramp he stopped pulling so he could slack

off the port gilson wire, remove it from the second lifting strap and connect it to the connection point to the four-way. Siemons instructed the deck crew via the loudhailer to open up the live tank deck hatch just forward of the stern ramp so the fish could go down into the live tank. [redacted] and [redacted] looked up at the pilothouse and shook their heads saying they would try to open it up. According to [redacted], the deck crew used signs and signals to communicate with the pilothouse. [redacted] stated, "After you work with people 16 hours a day for 4 months you learn certain signals and signs that indicate . . . it just becomes part of the job." [redacted] attempted to open the live tank, but it only opened about six to eight inches, hit the intermediate and something gave way when he heard a popping sound. The live tank hatch closed shut.

[redacted] closed the stern ramp doors as far as they could go against the net in an attempt to stop the flow of fish from going down the stern ramp. The deck crew also tried to block the freeing ports to prevent fish from going over the side. [redacted] testified, "I remember [redacted] the captain, asking me to stick something in the scupper to plug it off. . . . He was in the wheelhouse over the load hailer. . . . All I had was a half round piece of tire. . . . I just dropped it on top of them, but that didn't do any good." Siemons observed [redacted] standing on the stern ramp, starboard side next to the net attempting to kick fish forward so that when the live tank hatch was opened the fish would fall down inside.

Siemons started letting down on the port gilson cable when the hook got caught in the netting of the intermediate. He came out of the pilothouse, starboard side, went aft to port, down the port ladder past the skiff and reached over to release the hook which was still connected to the second lifting strap. He couldn't reach the hook so he jumped down onto the intermediate which was suspended off the deck. [redacted] operated the gilson controls from the station on the trawl deck, forward starboard side, and slacked the port gilson while Siemons released the hook. Siemons passed it to one of the deck hands and jumped down on the trawl deck. He went aft and looked at the situation and returned to the pilothouse. When Siemons left to go back to the pilothouse, [redacted] and [redacted] discussed between themselves that they would not be able to get the bag on deck because it was to big. They did not discuss this with [redacted] or Siemons. The deck crew connected the port gilson wire to the four-way.

Siemons then lowered the starboard gilson shifting the strain of the net and codend to the wire on the port gilson. One of the deck hands disconnected the starboard gilson from the first lifting strap. The vessel started listing more to port. Siemons became concerned because the list increased to approximately fifteen to twenty degrees. He called the nearby fish processing vessel NORTHWEST ENTERPRISE via the SSB and told them that the ALEUTIAN ENTERPRISE just took an unusual list that he had never experienced before and to standby because there could be problems. The NORTHWEST ENTERPRISE was approximately three miles away.

Siemons did not alert the crew. According to Siemons he didn't alert the crew because, "I felt that there were things that I could do still to possibly prevent the casualty." Siemons then went forward in the pilothouse to the engineroom alarm panel and activated the call system to contact [redacted] in the engineroom. According to Siemons [redacted] returned his call after what seemed to be a longer time than usual. Less then 30 seconds is usual, [redacted] took more than

30 seconds this time. [redacted], the assistant engineer, was asleep in his room one deck below the pilothouse on the starboard side aft, when he awoke at the sound of the engineroom alarm through the repeater in his room. He heard it for 20 to 30 seconds before it was acknowledged. When [redacted] answered, Siemons told him, "we've got a hell of a port list starting." Siemons asked if he knew why. [redacted] reportedly stated that he was transferring fuel to the starboard side. Siemons asked him if he was sure. [redacted] responded "yes." Siemons stated that [redacted] probably had noticed the list at the same time he did and immediately started transferring fuel to correct it.

Siemons hung up the phone and returned to the aft console. He noticed that the aft gilson was connected, but he could not see its connection point. Siemons also noted that the vessel had listed another five to ten degrees to port. [redacted] saw fish starting to shift to port, and the codend took "a little roll and everything started to go to port, over the rail." Fish started going down the open watertight door leading down into the factory deck on the port side aft. [redacted] stated he was going to shut the door, but fish were going down below through it, and water coming over the rail. Equipment stored up in the aft gantry slid to port, hitting the rail hard. He said that the vessel was still in the trough of the waves and not turning.

One of the deck crewmen opened the stern ramp doors. Siemons started letting out the port and starboard gilsons, and the aft gilson using both hands on the controls. Although the starboard gilson was not connected, he lowered it anyway, instinctively, "I didn't know what had happened. When I seen the list I just reacted without really thinking. I started reacting." Siemons could see that the deck crew was aware of the situation – one of them had his hand on the controls to the aft gilson and apparently was also lowering it. Siemons believed this to be the case because the aft gilson was lowering at a rate faster than he was capable of from the aft pilothouse console. According to Siemons, he did not instruct the crew to lower the aft gilson. [redacted] and [redacted] were standing by the aft gilson controls when the port and starboard gilsons were let out. According to [redacted] when the wires to the port and starboard gilsons were let out, the aft gilson took up the strain and Siemons told them to, "go down on the 25." [redacted] also stated that Siemons instructed him via the loud hailer to let down on the aft gilson. [redacted] stepped forward and lowered the aft gilson. The vessel continued to list.

Siemons saw the wire from the aft gilson become "very slack" and coil up on deck. He noticed that the wire from the starboard gilson had plenty of slack in it because it was straight up and down on the rail in front of him. The wire from the port gilson was also slack because he saw it laying on the intermediate. He observed the net start moving aft down the stern ramp. The net was still connected to the port net reel. After he lowered all gilsons he reached over to the auto pilot and turned it 45 degrees to port and gave the starboard propeller 100% pitch. He kept it at 100% for a few seconds and then returned it to neutral (0%). Siemons stopped this maneuver because he did not think the vessel would react fast enough to correct the situation. According to Siemons he wanted to put the vessel in a sharp port turn in the hopes of bringing the port side up to right the vessel. The port engine was still ahead at 20–30% and the auto pilot was over to 45 degrees to port.

Siemons called the NORTHWEST ENTERPRISE by radio and told them that ALEUTIAN ENTERPRISE was going down fast. He went forward in the pilothouse and activated the engineroom alarm panel to contact [redacted] [redacted] acknowledged the call faster than he did the first time. When [redacted] answered, Siemons told him to get out. Siemons stated that, "whatever he was trying to do wasn't working." [redacted], who was still in his stateroom, recalled that approximately one minute transpired between the first and second alarm. The second alarm was acknowledged within 5 to 10 seconds.

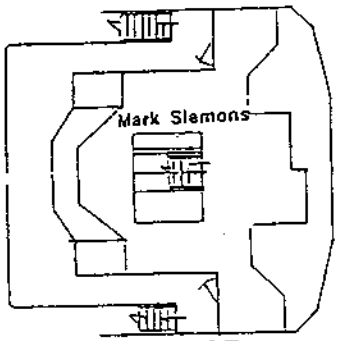
Siemons activated the general alarm. The alarm did not sound. He also activated the engineroom alarm again, then pulled survival suits out of the pilothouse locker near the alarm panel. [redacted], the assistant engineer, came up to the pilothouse. Siemons asked him if there was anything else he could think of that may help. [redacted] had nothing to offer. Siemons then ran down the ladder inside the pilothouse to the deck below.

c. Processing Operations

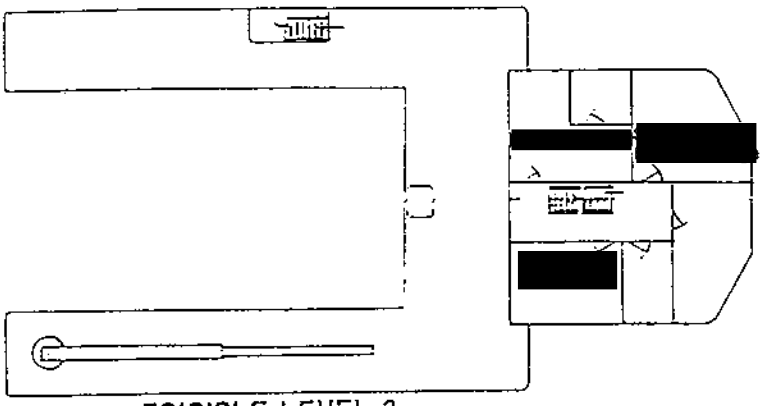
Prior to the casualty personnel in the processing deck were processing fish. A net was being brought aboard. The fish holding tank and bins were nearly full. [redacted], a processor, left and went to his room after becoming frustrated with the processing machinery which was not operating properly. [redacted] testified that the center cutter pump had not been working on the day of the casualty. [redacted], the factory foreman, took [redacted] place. The port freezer hold was being loaded with cases of fish. [redacted] the NMFS observer, was aft on the port side by the bleeding area and fish discharge chute. The vessel suddenly listed to port and stayed there. A red light was observed flashing. Processing personnel did not leave their stations. Most continued to work. They knew the flashing light indicated that the captain wanted to talk to the engineer on the phone. Several processors observed water pouring into the processing deck through the port fish overboard discharge chute. [redacted] went to the aft port area where he attempted to stop the water from entering through the fish discharge chute. Water continued to accumulate on the port side of the processing deck as the list increased. Equipment and shelving shifted to port and the processors finally evacuated the processing deck. [redacted] and [redacted] remained aft by the discharge chute. [redacted] was never seen again. [redacted] was later observed on the trawl deck trying to swim. The locations of the crewmen throughout the vessel at the time of the list and flooding are illustrated in Figure (11).

[redacted] was working forward by the freezers grading and packing fish. [redacted] testified that the center cutter pump was not working on the day of the casualty. [redacted] said he noticed the vessel list to port, but kept on working because, "When we are hauling the net, the boat moves. So we keep working. But the boat don't go to the other position." [redacted] had observed a red light flashing, "I saw the red light, but it's not the sign for alarm, it's like a sign when we are called by engineroom." When he realized the vessel was not going to recover from the list he ran aft to the port side by the bleeding area and fish discharge chute where he saw [redacted] He observed water pouring in through the discharge

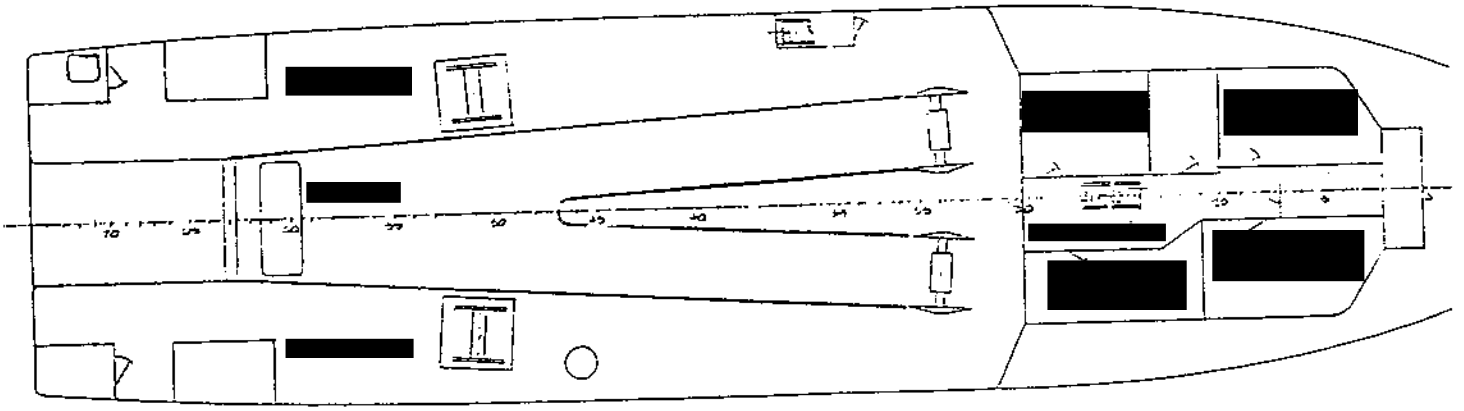
CREW LOCATIONS



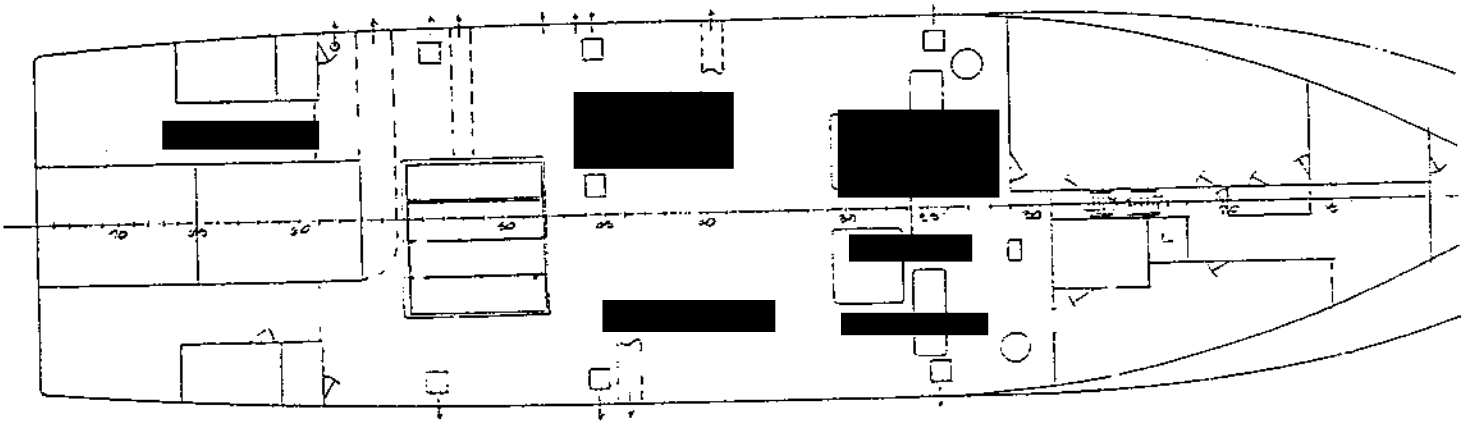
PILOT HOUSE



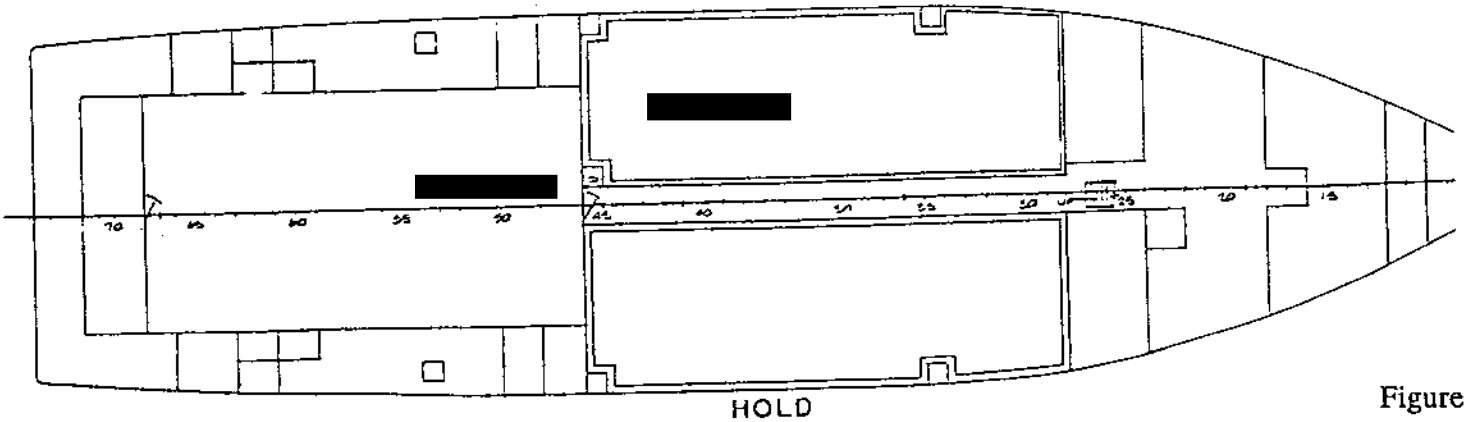
FO'C'SLE LEVEL 2



FO'C'SLE LEVEL1
(Trawl Deck)



MAIN DECK
(Processing Deck)



HOLD

Figure 11

chute. [redacted] was trying to hold back the water by pushing the discharge chute cover outboard with both hands. [redacted] turned around and exited the processing deck. The plate freezer blocked his view of the entrance to the galley so he ran to the first exit he could see – the door on the starboard side leading into the Baader room. He entered the Baader room, went forward, and back around to the port side into the galley where he stopped to take off his rain gear. He heard light bulbs exploding.

[redacted] was packing fish on the port side forward when he heard the net come across the deck. He stated the vessel listed and felt like it was going into a turn, "I was holding my fish. And it just seemed like the list started getting a little bit more and a little bit more. And I was thinking that it was turning really hard. And then it just kept going over. And then water started coming up through the hatch way back of the bleeding area and swirling up there. And I was kind of starting to . . . it was starting to be more than a regular list. Things were starting to come off and slide across the factory." He saw the water coming in through the fish discharge chute.

[redacted] had just finished stacking cases in the port cargo freezer hold when he first noticed a list. He stated, "I really wasn't paying much attention to it because it was normal." He proceeded back up to the processing deck and began working by the plate freezers aft of the galley when he observed water on the port side all the way up to the ceiling.

[redacted] told [redacted] to turn on the forward port sump pump. [redacted] stated that he had to hang on the pipes and move over to the sump hand–over–hand because the water was deep. At the time he put the switch on, he believed it had been in the automatic position. [redacted] recalled that earlier in the day, around 9:00 A.M., the sump clogged up, "With a bunch of fish heads and stuff like that. So I unclogged it and let everything go down. It was working, but everything just goes straight to there it seems like. All of the fish and everything go there instead of to the other side. But again, the boat was listing a little bit. So it caused a lot of fish to go in there and clog it up, plastic or whatever." He knew it clogged up earlier, "because the water just keeps getting deeper and goes into my area where I was casing. It just floods the floors and the water is going back and forth flooding the floors." To unclog it [redacted] stated, "First I tried to turn it on by hand and that usually sucks it down hard and that don't work. So I have to get a gaff hook or reach down there and clean all the bigger stuff out, if there is rubber gloves in there or plastic or whatever and take that out and throw it away." [redacted] turned around and noticed that everybody was starting to run out of the processing deck – "I took off screaming for people to go. Everyone started running upstairs."

[redacted] was working by the main trim line when the vessel listed to port, "and it was a normal list – ten degrees, fifteen degrees, something like that, nothing real bad. And it started to get worse. We had pans against the starboard side that fell over. That's how bad it was getting. It started to get worse and the pans fell over." When asked about the list he said, "We got a slight list, like maybe he [captain] was hauling the gear back and it was off to the side. [redacted] knew the net was coming in because he heard the net reels hauling back and the hydraulics "whining." According to [redacted] "Then all of a sudden it [the list] became abnormal, started to become abnormal. And that's when I saw the water coming in." The vessel listed to port and about fifteen seconds later the list became "abnormal." When it became abnormal it never stopped, it was, according to [redacted] "a slow, but steady increase."

[redacted] looked back in the area of the port discharge chute and observed water coming in. "It [water] was coming out through the discharge chute, yeah, the discharge chute and the chute aft of that, or not the chute, but the sump aft of that . . . probably three feet of water, and the water was bubbling." The water started to go over the wall in front of [redacted]. [redacted] also saw the water and ran back. [redacted] followed him. [redacted] asked [redacted] if he needed any help, but [redacted] didn't answer. [redacted] saw [redacted] back by the live tank. [redacted] looked down at the water and back up to [redacted] No words were exchanged. [redacted] turned around and headed back around the machinery and holding bins and out the processing deck via the galley doorway forward of the plate freezers. On his way out, [redacted] saw the red strobe light flashing. It wasn't on when he ran aft to the discharge chute, but it flashed as he was running out of the processing deck.

[redacted] was working at the trimming table at about the center of the processing deck when he heard someone yell, "We're taking on water through our garbage chute". And then I looked back and saw water rising. I didn't think anything of it until our boat list, until it listed pretty far. It tilted pretty good, and then that's when pans crashed to the floor." When asked if the vessel had a list just prior to this incident he commented, "Yeah, there was a list for about five minutes, but I didn't think anything of it because, you know, the boat's tilted farther than that before, so I just kept working." [redacted] saw [redacted] jump over one of the tables and go back to the port side aft. [redacted] recalled water coming in through the discharge chute before, "Only like when we'd get rough weather, a wave would come and splash water and that's about it, you know, not constant rushing water. The way I figured it, the deck was under water when I was still down in the plant [processing deck] because I got up when it's almost under, or it was under." [redacted] then ran over to the starboard side, around the packing tables and freezers and out through the galley door. He was one of the last few crewmen out.

When asked why he didn't leave sooner he replied, "Well, because, you know, usually when you leave, the foreman is going to start yelling at you. So that's what I thought was going to happen, either I was going to get yelled at or, so I just stayed there, you know." Concerning water on deck just prior to this incident he said, "Probably a few inches . . . usually at all times there's a few inches of water on the floor, and sometimes about a foot, maybe."

[redacted] was working at the starboard "190" trim line when he noticed a port list and the pans falling. He heard someone say, "Get out," so he ran through the Baader room, through the galley and up to fo'c'sle level 1. When asked if the vessel had a list just before this incident he replied, "Probably five, ten degrees either way it goes, you know. You could feel it when they pull the net you know, because it was just actually normal, you know. We were all pretty much used to it. They pull up the net and depending on how big the net was there would always be a little bit of a list, you know. So we were all pretty much used to it."

[redacted] was working at the trimming table trimming fillets when he heard [redacted] yell that they were taking in water in the bleeding area. [redacted] saw water up against the wall, portside aft, "And I can see there was a lot of water back there. It was probably half filled. It's hard to say because it was all against the wall. So it's hard to say how deep it was because the

sumps now and again get backed up and we've got to unplug them and drain out the water. But we don't let it get deep at all. Usually it's just up to the top of your boots and you can fix it by just opening up the sumps. Fish get caught in the sumps now and then. But this wasn't only because of the sumps. I knew that. And that's when [redacted] went around the corner and went back to the bleeding area. And I decided not even to, I decided to get out because [redacted] even yelled that we should get out of the factory but he kept going back there."

When asked about an initial list [redacted] commented, "Yes, there was a list that started happening. But we always have them. So there was no panic at first because this is a small list. And then it just gradually didn't come back. It took kind of, after the first little list it took a dive kind of quick because that's how the pans came crashing down. There had to have been a fast one because by the time I got to the galley you couldn't run on the floor. The floor was at an angle that much."

d. Evacuation

When the processors evacuated the processing deck, they ran up to the next deck level to get survival suits. Crewmen struggled for survival suits. A few were able to get one and attempted to put it on. One crewmen became pinned behind a survival suit locker and was freed by another crewmen. [redacted] helped distribute survival suits, then ran throughout the decks banging on doors and yelling for shipmates asleep in their rooms to get out – some made it out to safety.

Most of the crew exited the deck house via the door on the trawl deck and climbed up the ladder located between the forward net reels to fo'c'sle level 2 (the deck above). They walked on the side of the vessel as it continued to roll to port – some jumped, slipped, fell or were washed into the water while others made it to the bottom of the hull as the vessel capsized. The survivors on the hull eventually jumped into the water as the bow came out of the water and the vessel slipped below the surface.

Jefferies, who was asleep in his room at the time the vessel listed, was seen hitting the rail on the upper deck of the vessel as the vessel rolled to port. [redacted] the mate, was heard by Siemons responding to his call to abandon ship. [redacted] who was also asleep at the time the vessel listed was heard in the water. [redacted] the cook, was seen at several locations throughout the vessel, but never outside. Three missing crewmen were never seen or heard from outside their staterooms.

After Siemons left the pilothouse he pounded on his stateroom door to alert [redacted] According to Siemons he opened the door and saw [redacted] looking at him. Siemons told him they were sinking and to get out. Siemons also noticed that [redacted] was standing in the room across from Siemons. [redacted] had a survival suit in his hand. He asked Siemons if he notified the engineer. Siemons answered he had already done so and the engineer was aware of the situation. According to Siemons, [redacted] acted as if he (Siemons) didn't even say a word to him. [redacted] kept repeating, "What about [redacted] the engineer." Siemons went down two more levels to the galley. He saw water entering the galley through the open door leading out to the processing deck. Water was quickly filling the galley and had reached the overhead on the port side. The

water was a few inches deep on the inboard side where his foot was. He also heard what he believed to be florescent lights popping. He ran back up.

[redacted] who was originally working aft on the trawl deck, ran forward and observed processors, "standing in amazement," in the passageway. The door between the net reels leading into the passageway on fo'c'sle level 1 was open – he had tied it open. He yelled for the processors to get up the ladder. [redacted] climbed the ladder followed by several crewmen. He tried climbing up the side of the vessel, but could not make it so he held on to the rail. [redacted] recalled, "One guy [redacted] came sliding down and he sort of pushed off like he was trying to do a dive off the rail. And he landed into the water and the opposite side of the rail was just submerged, just barely under the water. And he hit it straight across his chest, and that was the last I saw of him." [redacted] fell into the water. He was wearing long johns, sweats, sweatshirt, T–shirt, rain gear, utility belt, boots, and two pair of socks.

[redacted] ran up to fo'c'sle level 1 and noticed that [redacted] was trapped behind the survival suit locker. He freed him and gave him a survival suit. [redacted] observed that the passageway was full of fiber and debris, "everything was on the floor." He knew the door leading out to the "blue room" was blocked with fiber. [redacted] made it out on the trawl deck and saw [redacted] in the water trying to swim. [redacted] did not have a survival suit on.

[redacted] ran to his room and woke up [redacted] [redacted] who was in the same room, was already getting up. [redacted] grabbed a survival suit after removing, "deck stuff out of the locker. The survival suits were with a bunch of deck hand equipment." It took him 30–35 seconds to open the locker and remove a survival suit, "I had the other people fighting and trying to take it or try and push me out of the way. Quite a few people were grabbing once they realized that's where the survival suits were. It was move or else everyone was trying to take, I mean they tried to take mine. And it was like no way. People were just take it and I don't know if anybody got it taken away from them or not. I think there was only one or two people that got a suit."

[redacted] went out on the trawl deck to put on the survival suit. "I was going to sit down, but I was afraid of something happening and I wouldn't be able to get up. But I stayed up and hung onto something around the starboard net reel. And put my feet in, put my arms in. I wasn't even thinking about putting my hat on. I was going to put my hat on, but started to get nervous because the zipper didn't work. So the boat was already going down pretty fast by then. So that's when I just took off. I couldn't take it off. I didn't have time. I didn't think I had time." He was wearing a pair of blue jeans, T–shirt, socks and calf high rubber boots under his survival suit. [redacted] tried to zip the survival suit up several times before entering the water. At one point he had someone try to zip it up for him, but it would not. [redacted] stated that the zipper, "looked kind of rusty or corroded a little bit. It wasn't waxed. I could tell if it had been waxed, it would have went up." [redacted] climbed onto the portside and over the crab pots where he held on to some pallets. He noticed [redacted] below him. The survival suit started filling with water from sea swells slapping against the vessel. A swell hit him and he fell into the water.

Upon leaving the processing deck [redacted] ran up to fo'c'sle level 1 and looked aft out on deck. The port quarter was not covered with water, but it was going down. He and [redacted] started

getting survival suits out of the locker. [redacted] handed [redacted] the survival suits and [redacted] passed them out to crewmen standing in the passageway. Someone opened the door leading into Jefferies room and hollered, "Get up." According to [redacted] "looked kind of dazed, wasn't moving, so I yelled at him to get up, get up and get out. And when he looked like he was starting to move to get up to realize what was happening, I ran back towards the bow of the boat . . . I opened up the door on my room, and I saw [redacted] there. And on my way back I was yelling, 'Everybody up and out'. I swung the door open. He was on his feet, so I turned to open the door on the port side and [redacted] came out of the room behind me. I said, 'Good, you made it,' and I followed him out." [redacted] room was dark and he didn't see [redacted] who shared the room with [redacted] and [redacted] never opened the second door on the port side.

[redacted] ran up to the next level (fo'c'sle level 2) and up one more deck to the pilothouse yelling for people to get out. The vessel had rolled far enough to where he and [redacted] went over the rail onto the bottom of the vessel. [redacted] was wearing Levis, polypropylene long johns, wool socks, three shirts, a sweat shirt, a T-shirt, another type of shirt, and a hat. He was not wearing boots or shoes. While he was on the hull he saw [redacted] and [redacted] He found a survival suit and gave it to [redacted] who put it on and slid off the vessel into the water. [redacted] had a survival suit, but was having difficulty putting it on. [redacted] helped him zip it up, pull his hood on, and secure the face piece. While [redacted] was on the hull he didn't see any dents, cracks, openings, or holes. [redacted] jumped into the water as the vessel started to sink and the bow started to rise up in the air out of the water.

[redacted] ran up from the processing deck to fo'c'sle level 1 and noticed that the trawl deck was under water. He grabbed a survival suit that someone handed to him and proceeded up the outside ladder. He handed his survival suit to someone ahead of him because he could not carry it and climb the ladder at the same time. When he got up to fo'c'sle level 2 someone else had his survival suit. [redacted] felt he didn't have time to put it on anyway. The vessel was on its port side so he walked along the starboard rail up to the pilothouse and jumped into the water.

When [redacted] ran out of the processing deck he recalled seeing [redacted] the cook, standing against the wall by the door on fo'c'sle level 1 next to [redacted] [redacted] told him to get the chief engineer. [redacted] thought he meant the captain so he started to run up the stairs to fo'c'sle level 2, but turned around and came back down when [redacted] told him that he said the chief engineer not the captain. [redacted] headed back down and [redacted] told him to get out on deck and follow him up the ladder between the net reels. [redacted] saw the net floating astern of the vessel. The net was, "dragging probably like – I seen the net probably 30 yards behind the boat." He removed his rain gear and before he could climb the ladder he was struck by something and knocked into the water off the port side. He was wearing jeans, boots, wool socks, T-shirt, sweater, and a sweatshirt with a hood.

After [redacted] left the processing deck he ran through the deck house and stopped at the stairway leading up to the pilothouse. He heard Siemons making a May-Day call. [redacted] made it out and ended up on the side of the vessel and slipped into the water. [redacted] was wearing Levis, a pair of insulated underwear, two sweat-shirts, rain pants, boots, and gloves.

[redacted] was working on the starboard side by the fillet freezer when the vessel started to list. He continued to work as the vessel listed further until he saw someone run forward past him out of the processing deck. Seeing this, he stopped working and got at the end of the line that formed at the bottom of the stairs leading up to the deck above (fo'c'sle level 1). When he reached the deck above, [redacted] told him to go back and look for the chief engineer. [redacted] went back down and while standing in the galley doorway leading into the processing deck, observed that the water was too deep to proceed further. He could not see aft into the processing deck because the freezers were blocking his view. [redacted] proceeded back up to fo'c'sle level 1 and asked [redacted] for a survival suit. He was told there were no more left in the locker. He did not bother to look for another locker because the list was getting worse and he felt he didn't have enough time. He made it out onto the trawl deck and climbed up the ladder, pushing people up ahead of him yelling "Go, Go, Go," as he waited for them to climb the ladder. He eventually made it into the water.

[redacted] left the processing deck, "I happened to get mad at the machine I was running and I said I've got to leave, I have to get out of here a couple of minutes. I ran up to my room and got a piece of gum or I don't remember what, just to get out of the factory for a while, a couple of minutes. And the next thing I know the boat rolled to port side. And I thought nothing of it because whenever we pick up a bag it always lists to one side, either or. And it was a little bit to far . . ." Five minutes before he left the processing deck the vessel had developed a port list when the net was being brought aboard. He heard the net coming up. The list stayed the same until later when he got to his room. The vessel suddenly listed heavily to port, and he was pushed back into [redacted] bunk. He heard the captain run down the stairs yelling, "the boat's going down, we're going to sink." As [redacted] got [redacted] out of bed, the vessel was already on its side. "I had to climb up to get to the door."

[redacted] saw [redacted] and [redacted] getting survival suits out of the locker. When asked if he stopped to get a survival suit for himself, [redacted] replied, "No, [redacted] was having too much trouble getting his out. And I asked him for one, but he said, 'I can barely get one out myself' and I took off."

[redacted] ran down to fo'c'sle level 1 (trawl deck) below. When asked if there was an exit on fo'c'sle level 2 he said, "Yes, they call it the blue room. You can go out the door, but sometimes it's locked, tied up and sometimes there is fiber all in front of the door. So sometimes you can't open the latches to get out of it." [redacted] did not try to exit that door, instead he continued down one deck, and back up from outside using the ladder between the net reels. He finally reached the hull, and fell into the water.

When asked if he ever heard an alarm [redacted] stated, "The only alarm I heard was [redacted] Siemons yelling. And I guess he turned on the lights, but the lights are for the engineer and none of the processors really paid attention to that because that doesn't pertain to us."

[redacted], who was asleep in his room, was awakened by [redacted] and told to get out because something was wrong. [redacted] stated that the door in his room was up in the air. He

had to climb "up" his room to get out. Once out he made it to the side of the vessel. [redacted] had thrown him a survivor suit. [redacted] was able to get his survival suit on up to his shoulders, but couldn't get the zipper up. He fell into the water and floated away from the vessel.

[redacted] was in his room when he was awaken by [redacted] screaming for people to get off the boat. [redacted] was wearing underwear, T-shirt, and "long johns." [redacted] stated, "I was still kind of groggy when I first woke up and stood up." [redacted] saw [redacted] in the passageway. It looked as if [redacted] was trying to put boots or a survival suit on. He could only see the top half of [redacted] because, "all of the fibers was there and I only saw his chest up." [redacted] went out into the passageway outside his room and asked someone where the survival suits were. Someone replied, "in the locker." He looked inside and noticed that, "They were buried under a bunch of stuff in there and there were gloves and all kinds of crap. And it was just like somebody had jumped on them at the bottom." He grabbed one and, "everybody grabbed that from me." He got another one and then became pinned against the bulkhead when the survival suit locker slid against him. At that time water was entering the passageway. [redacted] helped him get out from behind the locker. [redacted] dropped his survival suit because, ". . . there was no time. I didn't even know how to put the thing on." He ran out onto the trawl deck between the net reels and swam out away from the vessel.

[redacted] was asleep in his room on fo'c'sle level 1 when he was awaken by [redacted] who opened the door to his room and yelled to get out. [redacted] and [redacted] were in the same room. [redacted] got a survival suit out of the locker and managed to get his second leg in before he noticed water entering the passageway. He went out on the trawl deck between the net reels and over to the starboard side and entered the water because the vessel rolled over. He had the survival suit on up to his hips. He was wearing two sweat suits, socks, but no boots or shoes.

e. Survival

Of the 31 persons aboard the ALEUTIAN ENTERPRISE, 22 were recovered. A pictorial summary of the locations of persons in the rafts and skiff is shown in figure (12).

Siemons fell backwards from the ALEUTIAN ENTERPRISE into the water. He noticed diesel fuel in the water – he and other crewmen ingested some. Once in the water he came across a liferaft still in the canister. Siemons pulled on the painter for fifteen to twenty seconds until he got to the end. He put both feet on the canister and wrapped the painter around his arm and pulled. The canister popped open and the raft inflated. He boarded the raft and pulled several crewmen aboard.

Siemons saw a raft that had been stored on the starboard side of the vessel floating nearby. The painter was wedged into the side of the canister. He observed [redacted] trying to get it open. He could not. [redacted] was exhausted and went under water several times while trying to hold onto the liferaft canister which kept spinning around like a barrel. Siemons told him not to give up. Siemons paddled over to where [redacted] was and pulled him aboard. Siemons then pulled on the painter that was wedged between the raft canisters, but it would not open. He couldn't work at it any longer because his hands were too numb.

CREW RESCUE

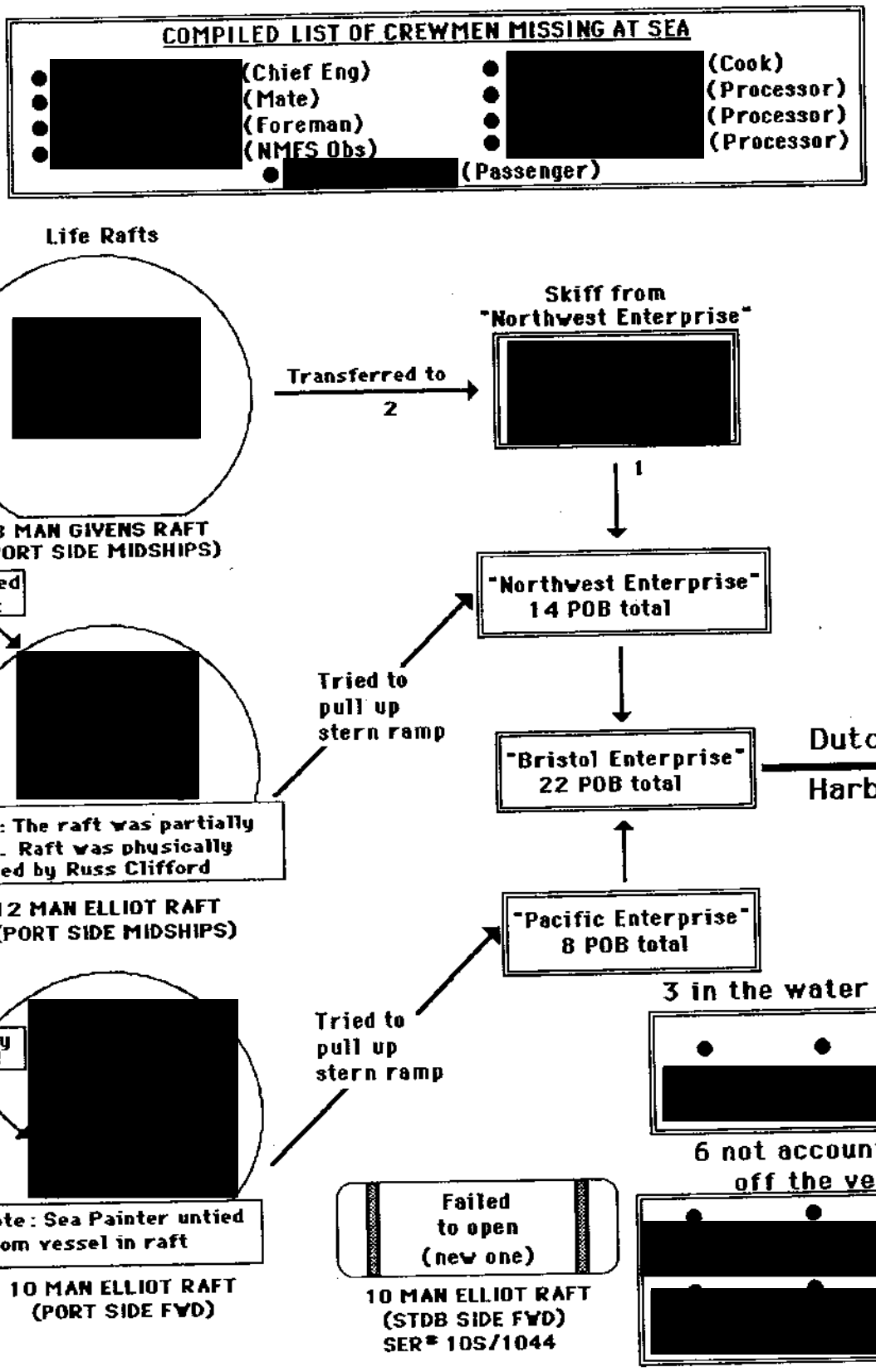


Figure 12

One of the crewmembers untied the painter that connected Siemons' raft to the vessel. The crewmen in his raft were getting headaches from the diesel fumes. Siemons noted that the bow of the ALEUTIAN ENTERPRISE was still out of the water nearly standing on end; the pilothouse was half to three quarters submerged. He saw what he believed to be one of the EPIRBS float by with a light blinking.

Once in the water [redacted] looked around for something to hold on to to keep afloat. He came across an inflatable liferaft still in the canister. "I was hanging onto the end of it. You know, if I grab it on the side, like grabbing a hold of a can or something, it'll just spin in the water. That's what it did when I first attempted to grab a hold. I spun around and got a hold of the end. I looked back and then people were starting to go in the water. And I saw another liferaft forward. And I kept watching that and I heard someone yell, 'Pull on the painter line.' So I started pulling. I went under water and started pulling and pulling and pulling, and it wouldn't open. And I had to fight my way back up to the surface. I got a hold of the end again, the end of the raft, holding on, looking up, and here was coming down the bow [ALEUTIAN ENTERPRISE] on top of me like this. I was right underneath the bow. It bobbed back up. I looked back again, then I went down under again and I started pulling on it, pulling on that painter, pulling on the painter. I ran out of air and time and was getting tired, fought my way back to the top, held on to the liferaft again. I thought it was going to be the last time I was going to take a chance on doing it. Here come the bow down on me again.

I looked forward. I saw one of them open, the raft up forward opened. . . . Somebody must have opened it. . . . I went back under for the last time. I said this is the last time I'm pulling on it. I looked back and [redacted] the Captain, I think was yelling at me, 'Can you get it open, [redacted]' 'Can I get it open?' I said 'No, I can't.' And I held on to it. And I looked back again and that liferaft was closer to me. And I looked again at the bow. It started coming down on me again. I said, I'm not, I thought this to myself, I'm not sitting here waiting for this thing [ALEUTIAN ENTERPRISE] to come down on top of me. I pushed off that [liferaft canister] and swam for all I was worth toward that liferaft . . . and I couldn't swim no further. I went under again. All I can see is green. I went under again, flashed back, looking at my little boy, came back up, fought my way all the way to the liferaft, grabbed a hold of it. My hands were so numb I couldn't hold on. I went under again. I just stuck my arm out of the water and two guys pulled me aboard. There I laid stiff till the PACIFIC ENTERPRISE picked us up. I don't even remember, I was in such shock."

[redacted] who was wearing sweat pants, three sweat shirts, and one pair of socks stated that he was in the water for about five minutes before boarding a liferaft. [redacted] estified that, "I couldn't feel myself swim and I was having a hard time breathing when I was swimming. My fingers and my feet were both numb by the time I got to the boat, by the time we got to the liferaft." [redacted] was taken aboard the PACIFIC ENTERPRISE.

[redacted] was in the water for ten to fifteen minutes clinging to a piece of net before being rescued. He heard [redacted] in the water, but didn't see him. Just prior to being rescued he couldn't move his arms and legs and started to pass out. He never made it to a liferaft and had no

survival suit. [redacted] couldn't recall how he got aboard the NORTHWEST ENTERPRISE, but remembered that when he awoke he had cramps in his legs.

When [redacted] entered the water he heard people screaming for help. [redacted] pushed a floating ball over to him, but [redacted] could not grab hold of it because it was too large. [redacted] then grabbed onto a roll of web for a short time, but it kept spinning. He let go of the web and hung onto a smaller one. He saw [redacted] inflate the raft nearby so [redacted] swam towards it and got aboard. [redacted] stated that it was hard to swim to get into the raft, "my suit was full of water again. I finally got in there and everybody just stayed in there kind of scared. Nobody could get the oars, because their hands were all frozen. And they couldn't move them. But I could, I had that suit on and it helped me a little bit. I tried to get it undone and I couldn't open that though. But I could move a little bit. Nobody else could now. So when I would go to the side to try and get towards [redacted] The raft would just turn because nobody could row on the other side." Several survivors were eventually brought aboard the raft and taken to the NORTHWEST ENTERPRISE. [redacted] couldn't make it up the ladder – his survival suit was full of water and the rungs on the ladder were slanted and slippery. He entered the water and was recovered by the skiff and taken aboard.

When [redacted] entered the water he swam over to a liferaft container floating nearby. [redacted] noticed that the canister was partially open. He said it looked like it had started to open, but never made it all the way. The canister halves were separated six to eight inches and there was a one inch wide silver or aluminum metal band extending lengthwise in the separation between the halves. [redacted] did not see any lines coming from the raft. He grabbed the band and shook it and then pushed the shell on one side and then the other. He didn't have to use a lot of force to free the canister halves. The raft opened and immediately inflated – upsidedown. He read the instruction on the side of the raft on how to right the raft and then he and [redacted] righted it. [redacted] then helped several crewmen board the raft before he got in. They were subsequently brought aboard the NORTHWEST ENTERPRISE.

At the time [redacted] entered the water he was wearing boots, sweat pants, a couple of sweat shirts, and rain gear. Once in the water he removed one of his boots, but couldn't remove the other. He tried to grab hold of codfish and nets floating nearby, but couldn't. He held onto a net, but it started to sink because someone else was also holding on to it. He let go and held onto an orange buoy until he saw [redacted] right one of the rafts. He swam over and [redacted] helped him in. [redacted] could not move his legs. He tried to climb up the ladder to the NORTHWEST ENTERPRISE, but couldn't make it. He was placed in a skiff from the vessel and hoisted aboard with the skiff.

Once in the water, [redacted] held on to a buoy and saw a liferaft inflate in front of him. He tried to swim over to it, but couldn't climb over a net ahead of him so he held on to the buoy again. He saw an inflated raft behind him so he swam about 20 yards to it and got aboard. [redacted] was in the water for ten to fifteen minutes before boarding the raft. A review of a videotape taken during the rescue operation showed four crewmembers on this liferaft. A canopy popped up once they got off. These four persons were recovered by a skiff from the NORTHWEST ENTERPRISE. They were ferried over to the vessel where they were brought aboard. The skiff returned to the scene and recovered four more survivors from another inflatable liferaft.

While [redacted] was in the water he looked back at the vessel and saw [redacted] hit the rail as he fell off the vessel and into the water. He noticed that there were only two people left on the hull, [redacted] and [redacted] He remained afloat by holding onto a buoy. [redacted] came across a raft that was inflated upsidedown. He and [redacted] read the instructions on the side and righted the raft. [redacted] got in and was subsequently transferred to the NORTHWEST ENTERPRISE.

After [redacted] entered the water he came across one of the inflatable liferafts that was still in its container. He tried to hold on to it, but it kept spinning around like a barrel. He swam over to [redacted] who gave him his orange float to hold onto. [redacted] swam over to one of the inflated rafts and got aboard. [redacted] saw a liferaft in the distance and yelled to people inside to throw him something because he was getting numb. [redacted] tried to head towards the raft, "I kept trying to kick to it for about five minutes. I kept trying to kick, kick, kick, and I wasn't going nowhere. And they [liferaft] were on top of the water. So they were drifting further away from me. So then I just quit trying to get to it. I knew it was hopeless." [redacted] was eventually recovered by the skiff from the NORTHWEST ENTERPRISE. When he got aboard, he couldn't move, "I was really paralyzed."

[redacted] swam away from the vessel over to [redacted] who had a survival suit on. Gallagher did not have his survival suit on all the way because he had water in it. [redacted] said to [redacted] " . . . don't let me die. Let me hold on to you for a little while so I can kick my boots off. We were both in a panic, but [redacted] and I made it through it. I'd let go and hold on and let go so none of us would drown. None of the liferafts opened up when they hit the water. They were all in the canisters still. And I was just waiting for one of them to open." The captain inflated one of the rafts, so he and [redacted] swam over and got inside. Once in the raft, ". . . We tried to close the doors or the little panels so no more water would get in because there was a lot of water in there and a lot of diesel fumes. And diesel was everywhere. . . . You could barely see. It was in my eyes, and my stomach, my mouth, my hands." [redacted] removed his survival suit.

[redacted] stated that if the casualty had occurred two hours earlier he wouldn't be alive. When asked why, he replied, "Because we would have had no boats around us two hours earlier. We were fishing out by ourselves. Everybody thinks they have a secret fishing spot, but everybody basically knows where everybody is at. And we ran for two hours to this other spot where the PACIFIC ENTERPRISE and NORTHWEST ENTERPRISE were. And they were picking up nice bags of cods. So we just wanted to plug [fill] the boat. And this net would have plugged the boat. We already had a full live tank. I believe three holding bins of fish. We had more than enough fish to keep us busy for a good sixteen hours. And then we pulled up this bag, or tried to anyway."

[redacted] was in the water for about ten minutes before he floated on his back and boarded a nearby raft. His survival suit had filled with water. Five to ten minutes later he was transferred to the NORTHWEST ENTERPRISE from the skiff. According to [redacted] when he got aboard, "I couldn't walk, I couldn't move my arms or my legs very little."

Once [redacted] was in the water clear of the vessel he swam around until he found a liferaft. [redacted] had earlier seen [redacted] conscious in the water. He did not speak to him and [redacted] did not say anything to [redacted] [redacted] righted the raft and pushed [redacted] in. [redacted] tried to help [redacted] right the raft but couldn't, "I was so cold I could not even feel the raft. [redacted] was the one that was taking charge."

When [redacted] entered the water he held onto a plastic trash bag floating nearby. He lost hold of the bag and tried to climb onto a bundle of netting, but the bundle sank. He swam over to the raft that [redacted] had righted. [redacted] who was the last person to board the raft, helped [redacted] get in. [redacted] put his survival suit on the rest of the way once he got aboard. He was subsequently transferred to the NORTHWEST ENTERPRISE.

Once crewmen were brought aboard the NORTHWEST ENTERPRISE and PACIFIC ENTERPRISE they were treated for hypothermia. Several were wrapped in blankets and sleeping bags and put into a warm shower and placed in a bunk. Some of the crewmen from the NORTHWEST and PACIFIC ENTERPRISE laid beside the survivors to help warm them.

The vessel sank in approximately 400 feet of water at Latitude 56°, 13' 22" North, Longitude 169°, 48', 56" West.

f. Search Efforts

The NORTHWEST ENTERPRISE 1:35 P.M. logbook entry indicated that the ALEUTIAN ENTERPRISE called and reported they were listing to port. The (NORTHWEST ENTERPRISE) 1:45 P.M. entry indicated that ALEUTIAN ENTERPRISE was sinking. The PACIFIC ENTERPRISE noted in its logbook at 1:35 PM that they observed the ALEUTIAN ENTERPRISE take a severe list to port, "it did not look good. Started turning after 3 minutes. She was lying about 90° port side in water. Observed liferafts come off and then about 1340–45 [1:40–1:45 P.M.] she went under . . . Will continue to search until dark falls." The NORTHWEST ENTERPRISE, PACIFIC ENTERPRISE, and several other fishing industry vessels in the area commenced an immediate search for survivors.

The PACIFIC ENTERPRISE radioed the Dutch Harbor office and reported that the ALEUTIAN ENTERPRISE was in distress and had "rolled over." The NORTHWEST ENTERPRISE and PACIFIC ENTERPRISE immediately responded to Siemons' May–Day and proceeded to assist, arriving within ten minutes. Personnel at Dutch Harbor immediately called the Coast Guard. At first AAFC reported that there were thirty–two persons aboard the ALEUTIAN ENTERPRISE. Several hours later they revised the number to thirty–one. Coast Guard search and rescue efforts consisted of two C–130 sorties from Coast Guard Air Station Kodiak and communications support by Coast Guard Communications Station Kodiak. The USCGC JARVIS was diverted to assist, but due to the distances involved was released from the case prior to arrival on scene.

At 2:00 P.M. the NORTHWEST ENTERPRISE recovered fourteen survivors from the water. At about 2:10 P.M. a Coast Guard aircraft arrived on–scene and sighted various debris in the water including corks, fish and fish nets, and a bubbling oil slick 3/4 by 1/2 mile wide. PACIFIC ENTERPRISE recovered eight survivors from the water at 2:15 P.M.

At 2:19 P.M. on March 22, 1990 the North Pacific Search and Rescue Coordinator in Juneau, Alaska issued an Urgent Marine Information Broadcast (UMIB) that was broadcast every hour until it was cancelled the following day at 10:28 A.M. The broadcast, which was transmitted on 4125 KHz, 2182 KHz, and 500 KHz read, "The fishing vessel ALEUTIAN ENTERPRISE with 30 POB [persons on board], has capsized and is sinking in position 56-12.2N 169-47.8W. Vessels in the vicinity are requested to keep a sharp lookout. Assist if possible, and advise the nearest Coast Guard station." The UMIB was cancelled at 10:28 A.M. on March 23rd.

At 3:51 P.M., on March 22, the fish processing vessel OCEAN PHOENIX called the PACIFIC ENTERPRISE and offered search assistance and informed them that they have a "medic" aboard and that any survivors requiring medical attention could be treated. PACIFIC ENTERPRISE declined the offer because they were still searching and, "the two crewmen in question had made improvements."

At about 5:27 P.M. another Coast Guard C-130 aircraft arrived on-scene and relieved the first. Nothing but debris was found; the oil slick had increased to one mile wide by three miles long.

The two Coast Guard C-130 aircraft searched a total of 6.9 hours. The searches were sector single unit and parallel single searches. All searches were in the immediate vicinity of the sinking, using debris from the sunken vessel as datum. Datum marker buoys were deployed to monitor drift. The probability of detection for persons in the water was reported by the C-130 pilots to be nearly 100% in the immediate vicinity of datum. This was backed up by the amount and type of debris located including corks, oil, fish, and nets. No EPIRB information was received from the satellite or from on-scene units.

The Coast Guard determined the probability of survival to be less than 45 minutes based on the water temperature (0-1 degree Celsius), recovered survivors not being in survival suits, and reports from other fishing vessels on scene that missing crewmembers were most likely unable to escape the vessel prior to its capsizing. Survival time in 0-1 degree Celsius water is less than 45 minutes when wearing a PFD and approximately 18 hours when wearing a survival suit. As search time progressed survival probability decreased due to all rafts being located, the high probability of detection reported by the searching aircraft, and reports by fishing industry vessels assisting in the search that the vessel capsized and sank very quickly.

At 6:18 P.M. the Coast Guard's visual search was completed after failing to locate any survivors. Vessels in the area continued until early March the 23rd. No additional crewmen were recovered. No instructions were given by AAFC to its vessels on the conduct of the search - each vessel captain took it upon himself to participate in the search effort. When asked how the decision was reached within AAFC to terminate the search Baker replied, "As far as termination of it I guess we followed the lead of the Coast Guard. And that's as best I can describe it. We didn't have a policy to go any further. I think we did a little more beyond when the Coast Guard terminated their efforts, but how much beyond that I can't pinpoint at this time." During the search Coast Guard pilots established and maintained radio communications with fishing industry vessels participating in the search.

Plans were made to return survivors to Seattle, Washington. AAFC's initial plan was to take survivors to St. Paul Island (sixty miles away) to be treated and flown back to Anchorage, Alaska; however, because of ice jams blocking the entrance to the harbor at St. Paul, AAFC decided to take survivors to Dutch Harbor (200 miles away).

g. Underway to Dutch Harbor

On March 23, at about 12:45 A.M., survivors were transferred at sea from the NORTHWEST ENTERPRISE and PACIFIC ENTERPRISE to the BRISTOL ENTERPRISE. The vessels tied-up to each other so that the BRISTOL ENTERPRISE was at one end. Survivors jumped onto the BRISTOL ENTERPRISE. They were not wearing personal flotation devices (life jackets) nor did they have a safety line attached. No safety nets or other device were placed between the vessels. One person cut his head during the transfer. The transfer was completed at about 1:30 A.M. and the BRISTOL ENTERPRISE got underway for Dutch Harbor.

Siemons told the captain of the BRISTOL ENTERPRISE that he wanted to get his crew to port and home as soon as possible. Siemons felt the vessel should have arrived sooner (twenty hours versus twenty-eight) than the estimated time of arrival he was given. He was informed by someone on the BRISTOL ENTERPRISE that the reason for the delay was because there were reporters, "and people that were going to bug us when we got in."

During the trip to Dutch Harbor, the captain of the BRISTOL ENTERPRISE and Siemons requested written statements from the survivors. Sixteen of the twenty-two survivors provided a written statement of the casualty. Siemons had previously given his account of the casualty to the captain of the PACIFIC ENTERPRISE which was sent by telex to AAFC in Seattle. The remaining survivors, for one reason or another, did not provide a written statement. Survivors felt that Siemons was trying to influence them in what they wrote; he made comments to them after reading their statements. Siemons had one survivor cross off a few words on his statement and substitute another. Another survivor was told to add more information. Siemons stated that he didn't try to alter all the statements. He read several of them and he felt that some of the crewmen made allegations they had no direct knowledge of.

[redacted] a processor, stated that Siemons told him to make sure he told everything that happened. According to [redacted] Siemons did not tell him what to write, but made general comments, ". . . he [Siemons] was just sitting there just talking to somebody, but he was saying enough so everybody could hear it, you know, like there was eight life suits on every deck; he said that we had plenty of time to watch the tapes, the survival tapes, tapes on inflatable liferafts, or something. But, you know, I don't feel we had the time to watch them, you know you'd work 18 hours and you'd be worrying about getting some sleep, you know. Because, like I said, I was only getting four or five hours of sleep, you know. I'm not going to spend three of those hours watching some survival tapes, you know, get an hour of sleep and then go do another 18 hour shift. You know, I would gladly have watched them if we'd went into port or something, you know, which I think is, when they first got on the boat, they should have had a little survival training or something and had us watch the tapes or whatever. But like I said, they didn't. They just told me to find a room and I'd be starting work in a couple hours."

h. Arrival in Dutch Harbor

The BRISTOL ENTERPRISE docked in Dutch Harbor at 2:00 A.M., March 24 where it was met by company officials and Coast Guard investigating officers from the Marine Safety Office, Anchorage. Survivors were given new clothing and permitted to call home. Siemons provided [redacted], AAFC's employment manager, a urine specimen (see section on Alcohol and Drug Policy for details).

According to personnel at the Iliuliuk Family and Health Services Inc. (clinic in Dutch Harbor) a practitioner received a call at 3:30 A.M. on Saturday, March 24, 1990 from [redacted] of AAFC's Dutch Harbor office that one, possibly two crewmembers off the ALEUTIAN ENTERPRISE would be coming into the clinic for emergency treatment. [redacted] manager of AAFC's Dutch Harbor office, recalled that the clinic was actually notified in the afternoon of March 23rd. Instead of one or two, five crewmembers were subsequently brought in. [redacted] stated that once the crewmen arrived in Dutch Harbor additional survivors decided they wanted to go to the clinic. Two were considered emergency; three non-emergency. All five were treated.

According to a representative of the clinic, [redacted] notified the clinic at 6:30 A.M. that an additional seventeen crew members would need to be seen. [redacted] later testified that it was seven not seventeen that asked to be seen. The medical practitioner on duty told [redacted] that at 10:00 A.M. another medical practitioner and additional staff were coming on duty. Arrangements for the seventeen (seven as [redacted] recalled) were made for later in the morning. It was then agreed that [redacted] would bring in two survivors immediately and arrangements would be made for the others later in the day. Instead of two, six survivors were brought in - two, which were non-emergency, were treated. The remaining four were asked to wait until the relieving medical practitioners and additional staff came on duty. [redacted] stated that the survivors told him that they were asked to leave. The crewmembers decided to return to the bunkhouse and did not return to the clinic.

Survivors were flown to Anchorage the same day on charter flights arranged by AAFC and then flown to Seattle, Washington.

8. OWNERS AND OPERATING MANAGERS

The ALEUTIAN ENTERPRISE was owned by Aleutian Enterprise, LTD, a California limited partnership, formed in August 1983. The general partners of Aleutian Enterprise, LTD, were Kindschi & Associates, Inc. (33% general partnership interest), and Northern Trawlers, Inc. (66% general partnership interest). Kindschi & Associates, Inc. was a California corporation whose shareholders were [redacted] Northern Trawlers, Inc was a Washington corporation whose shareholders were [redacted] and [redacted] The remaining 1% was owned by silent partners.

On December 1, 1983 a management agreement was entered into between Arctic Alaska Seafoods (AAS), Inc. and Aleutian Enterprise, LTD. [redacted] President, signed on behalf of AAS and [redacted] President and one of the general partners signed on behalf of Aleutian Enterprise, LTD. Under this agreement AAS agreed to supervise and manage the fishing operations, repair and maintenance. Among other things, the agreement stated that AAS as operators of the ALEUTIAN ENTERPRISE shall hire competent crew and skippers and arrange transportation and accommodations for same; obtain insurance on the trawler and its catch including product liability insurance in accordance with instructions from the partnership and handle all insurance claims thereunder; handle all crew and skipper salaries, benefits and settlements; maintain the trawler in good operating condition at all times; and schedule all repairs and maintenance and order all required parts. The agreement also stated that AAS may hire such independent contractors as it deems necessary to perform its responsibility to maintain the trawler in good operating condition and schedule all repairs and maintenance and order all required parts.

The ALEUTIAN ENTERPRISE, a catcher processor, harvested and processed a variety of bottomfish year-round, on a 24-hour basis off the coast of Alaska. The vessel operated at varying levels of productive capacity during the year depending on resource availability. The bottomfish harvested by the vessel were processed into fillets or headed and gutted (H&G), packaged, stored and then transshipped for delivery to U.S. and Japanese markets.

In 1988 Arctic Alaska Fisheries Corporation (AAFC) was formed. Partners in the vessels being managed by AAS were given the opportunity to convert their partnership status for a shareholder status in AAFC. Only the ALEUTIAN ENTERPRISE partnership elected not to accept the offer. The owners of the ALEUTIAN ENTERPRISE elected not to roll into the newly formed public corporation because they were satisfied with the compensation being received. AAS became a subsidiary of AAFC and produced specialty seafoods. A new formal management agreement between the owners of the ALEUTIAN ENTERPRISE and AAFC was not entered into because AAS was a wholly owned subsidiary of AAFC. The formally independent vessel operating companies, as well as Arctic Alaska Seafoods, Inc. became subsidiaries. An article in AAFC Newsletter, "View from the Bridge" noted that, "The paper change means absolutely nothing in terms of day-to-day operations - the officers and management of the new company are identical with those of Arctic Alaska Seafoods."

On March 30, 1988, AAFC filed its registration statement with the Securities and Exchange Commission in Washington, DC and began the final stages of the process of selling the shares through Merrill Lynch, the Company's underwriters. On April 28, with the selling process completed, AAFC's stock began trading on the American Stock Exchange.

According to its annual report, AAFC is a vertically integrated seafood products company; the largest fishing and at-sea processing company in the United States. The 20 plus vessels managed by AAFC operate year-round in the U.S. 200-mile zone off Alaska. AAFC employs approximately 1,600 employees, including shore side and vessel personnel, and generates a payroll of approximately 40 million dollars annually. At the time of the casualty, AAFC's corporate structure was organized as shown in figure (13).

ARCTIC ALASKA FISHERIES CORPORATION

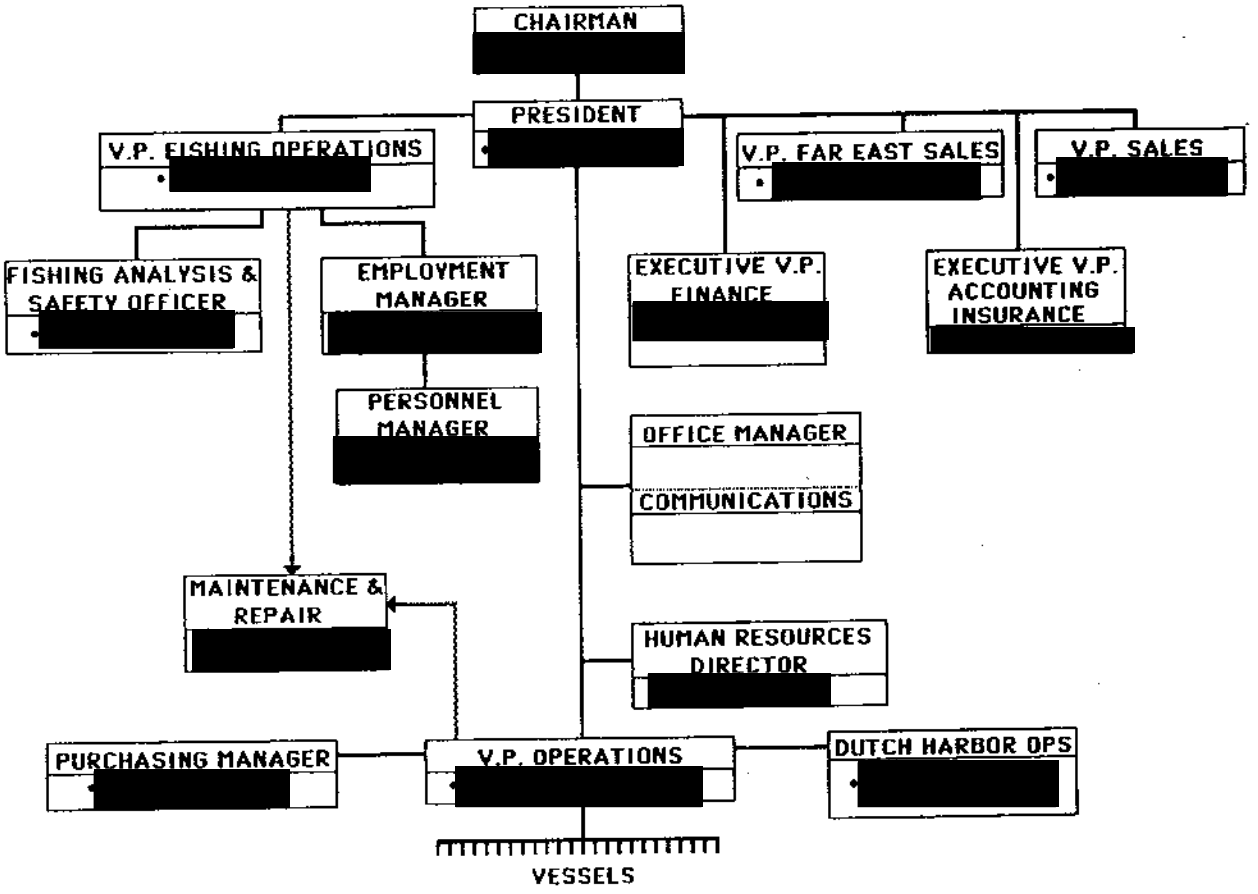


FIGURE (13)

AAFC is a member of three "trade organizations": the National Fisheries Institute in Washington DC, the Alaska Factory Trawlers Association in Seattle, Washington, and the North Pacific Fishing Vessel Owners' Association in Seattle, Washington. One of AAFC's employees, the Government Operations Representative, is a member of the National Fishing Vessel Safety Advisory Committee established by the Commercial Fishing Industry Vessel Safety Act of 1988.

The primary departments that dealt with AAFC's vessels were Fishing Operations, and Operations. The duties, responsibilities, and authorities of each person filling these positions as well as the positions under them were not spelled out in writing.

Vice President, Fishing Operations was formed in January 1989 when [redacted] was appointed to this position. Two groups reported to the Vice President of Fishing Operations – the Fishing Analysis/Safety Officer and the Employment Manager. The Maintenance and Repair Department was once under the Vice President of Fishing Operations, but was later shifted under the Vice President of Operations. [redacted] believed that at the time of the loss of the ALEUTIAN ENTERPRISE maintenance and repair was under the Vice President of Operations.

[redacted] described his duties as ". . . a trouble shooting position. It's a balance of communications to the vessel on fishing operations, production versus sales . . ." [redacted] stated that the captains report to him on a number of issues. When asked if they report to him concerning personnel he stated, "In some instances. Basically as with any vessel, the master is in command of the and responsible for that vessel. And we're a support group such that if they have a problem, we'll attempt to solve it and at times do something to solve it."

[redacted] was given the position of Fishing Analysis/Safety Officer under [redacted] [redacted] was brought in to support operations, and was an interim safety officer to help get the safety program going. He got involved in duties such as reporting fish catches, quotas, and incidental interaction with NMFS personnel.

In his position as Employment Manager, [redacted] was involved in hiring captains and chief engineers. He made recommendations to [redacted] who made the final decision whether to hire a particular individual. The Employment Manager is in charge of recruiting, hiring, and retaining key personnel. When asked who the vessel captains work for, [redacted] stated, "There is not necessarily anything written down that I'm aware of. But historically they work for [redacted] who is Vice President of Fishing Operations. That's not to say they wouldn't with the Vice President of Operations as well. But they primarily take their direction from Jim Hubbard."

[redacted] has been Vice President of Operations since January 1985. [redacted] had three departments under him: Purchasing, Dutch Harbor Operations, and Maintenance and Repair. [redacted] described his role as, "dealing with any problem related to operations. The captains report to me with all their catch records and problems . . . and my job is to do whatever it takes to keep the fleet at work."

In describing the difference between his position and [redacted] stated, "Mr. [redacted] is mostly involved in direct fishing because of his background is in fishing. Mine is operations as such. Before Mr. [redacted] came aboard I did that also. So we divided it up a little bit because taking care of 25 vessels for one man was a little bit too much. So it's hard to define exactly. I mean, we do everything that comes up."

As noted above, the Maintenance and Repair Department had shifted from the Vice President of Fishing Operations. It was now considered a shared responsibility between the Vice Presidents of Fishing Operations and Operations. Commenting on this shared responsibility [redacted] stated, ". . . he's [redacted] Vice President, Fishing Operations] an experienced captain. And he knows sometimes what is needed on vessels. So we sit down and talk things over and agree on a decision or whatever."

In describing the relationships between Fishing Operations, Operations, and Dutch Harbor regarding maintenance and repair responsibilities, [redacted] stated, "Okay. We did some reorganization, as you can see, when Mr [redacted] came on board because I had Purchasing, Personnel, Maintenance, all of the operations and it was 25 vessels. So we split it up. Mr. [redacted] came into the office and he took over the operations of the vessels as such. And I did get sometimes involved because we worked very closely together."

In his position as Vice President of Operations, [redacted] was not responsible for keeping track of weight growth on AAFC vessels nor was he aware of anyone in AAFC who was. He requires the captains to notify him of modifications to vessel hulls if major structural changes are made. [redacted] was not aware of the cutout in the starboard engineroom fidley in the processing deck. He stated he would have wanted to know about it and if he knew about it he would have asked, ". . . quite a few questions – why, what's the reason, where does it really go, what effect could it have."

Ray Ivie started with AAFC in January 1988 as Manager of the Maintenance and Repair Department until October 1988 when, according to Ivie, he was "reduced to port engineer." He continued as port engineer until December 1989 when he left AAFC. When he became the port engineer he worked under [redacted] who took over [redacted] position as Manager of the Maintenance and Repair Department.

9. ALCOHOL AND DRUG POLICY

a. Drug Testing Requirement On December 21, 1988 the Coast Guard's final rule took effect which required the establishment of anti-drug programs to reduce the incidence of drug abuse by commercial vessel personnel. This program includes pre-employment, periodic, random, post accident, and reasonable cause testing. The post accident portion of the program also involves testing for alcohol use. The drug testing program has limited penalty provisions for employers who fail to comply.

b. AAFC Drug Testing Policy

Administration of AAFC drug policy was through its Human Resources Department in Seattle. According to AAFC's written substance abuse policy, it was developed to promote safety and efficiency on its vessels and to follow the U.S. Coast Guard's drug testing regulations. The policy stated that testing procedures will follow DOT, "Procedures for Transportation Workplace Drug Testing Programs." The policy requires that the chemical drug testing program include the master, mate, engineer, deck personnel, and factory foremen; however, all employees, regardless of job classification are subject to post-accident and, "for cause", drug testing. All officers and crewmembers whose jobs may effect the safety of navigation and operation shall be subject to all aspects of this drug testing plan. AAFC's plan requires AAFC to test all employees who are directly or indirectly involved in any serious accident or incident for drugs and alcohol.

[redacted] Director of Human Resources at AAFC since June 1989 stated that he developed AAFC's substance abuse policy. The policy was ". . . intended to apply to all vessels. However at the time that it was put together we only envisioned testing licensed officers aboard all vessels, regardless of tonnage. I tried to write it so they would not differentiate between vessels. I realize that under 200 gross tons they are not required with the exception of post accident testing. However, we have people who move from vessel to vessel. And I felt that it was much easier to put it together this way than to try and restrict it to just a particular vessel." AAFC's drug policy was started in June or July of 1988 and put into full force in January 1990.

The regulations require the marine employer to determine which individuals should be tested in a serious marine incident. In the case of the ALEUTIAN ENTERPRISE casualty, [redacted] the employment manager, determined that only the captain needed to be tested. The regulations permit a law enforcement officer to determine that additional individuals should be tested. In such cases the marine employer is required to take all practical steps to have these additional persons tested. In the case of the ALEUTIAN ENTERPRISE, law enforcement officers did not request that additional persons be tested.

c. Captain's Drug Test

The BRISTOL ENTERPRISE, with survivors of the ALEUTIAN ENTERPRISE on board, arrived at Dutch Harbor at 2:00 A.M on March 24, 1990 after being delayed by company officials for approximately 8 hours because of concerns that a lot of news reporters would be waiting if the vessel arrived earlier. Between 6:00 A.M. and 7:00 A.M. [redacted] obtained a urine sample from Siemons. [redacted] had provided Siemons a lube oil sample bottle for the urine sample. [redacted] believed the bottle was sterile. [redacted] did not witness the sample being provided by Siemons. Company policy did not provide instructions regarding the witnessing of urine samples. [redacted] put the sample in his briefcase. After reporting to work in Seattle on March 26, he delivered the sample to the testing laboratory at approximately 12:00 noon. At no time did he refrigerate the sample. Urine specimens are required by 46 CFR 4.06-40 to be shipped to the testing laboratory by an expeditious means. Samples need not be shipped in a cooled condition for overnight delivery.

Captain Siemons' urinalysis was completed by the Eastside Medical Laboratory, Inc. The results showed [redacted] for amphetamines, opiates, cocaine metabolite, phencyclidine, and cannabinoids. He was not tested for alcohol.

Under 46 CFR 4.06-1, a marine employer is required to ensure that urine specimen collection and shipping kits are readily available for use following a marine accident. Specimen collection and shipping kits need not be maintained aboard each vessel if they can otherwise be readily obtained within 24-hours from the time of the occurrence of the serious marine incident. Company policy requires that each vessel have on board a urine specimen collection and shipping kit which should be readily available in the event of a serious marine incident. The kits are to include, among other things, plastic specimen bottles, step-by-step instructions, and shipping materials. There was no kit aboard the ALEUTIAN ENTERPRISE or any of the other AAFC vessels involved in the rescue. [redacted] said that the kits had been sent to Dutch Harbor in a single large shipment. [redacted] did not know whether they had been distributed to any of the vessels.

The AAFC company policy states that after the specimen is taken it will be stored in a safe place with limited access. There is no mention as to whether the samples are to be refrigerated. [redacted] stated that he attended a seminar given by the Department of Transportation in Seattle concerning substance abuse that included procedures in witnessing and handling specimens. During his testimony, [redacted] responded to several questions concerning what recommendations were made during this seminar. Regarding witnessing of the sampling, "Yes. They made a recommendation that it was basically an on-site decision that the person that was going to obtain the sample from the donor would be a judgement call as to whether he thought it was necessary to witness the person making the donation." Concerning the time to take the sample, "Yes, they did, as soon as possible or practical." Concerning the need to get the sample to the lab as soon as possible, "I don't recall how quickly. I know that it was mentioned that it was necessary or the best practice to get it there as soon as possible." Concerning the validity of the samples if it took too long to get the sample to the lab, "Yes. There was some verbal description given on that. I don't recall it specifically at this time but I do recall something, the chemical makeup of it separating out or causing possibly a distorted test result as a result of not getting it there as soon as you can." Concerning preserving the sample, "Yes, there was. . . . putting it in a refrigerator to preserve it."

AAFC policy lists a Seattle laboratory to send the sample to. No Alaska laboratory is identified, nor did [redacted] know of any in Anchorage that met the standards identified in the "Mandatory Guidelines for Federal Workplace Drug Testing program," by the Department of Health and Human Services.

d. Pre-Employment Drug Testing

Pre-employment chemical testing is not required of crewmen who are not acting under the authority of a Coast Guard license or document, or who are not required by law to hold a Coast Guard license or certificate, or who are primarily employed in the preparation of fish or fish

products or in support positions not related to navigation on a fish processing vessel. AAFC's written drug testing program was stricter than the Coast Guard's. Applicants for employment on board any AAFC vessel regardless of their job classifications are subject to pre-employment testing. However, many of the ALEUTIAN ENTERPRISE crewmembers had not been pre-employment tested, including Siemons.

Coast Guard regulation requires the marine employer to ensure that all individuals engaged or employed on board a commercial vessel are fully indoctrinated in the requirements of the chemical drug and alcohol testing regulations and that appropriate vessel personnel are trained in the practical applications of the requirements of mandatory chemical testing following serious marine incidents. AAFC did not have such a training program in place. Captain Siemons had not been trained in the requirements of these regulations.

In addition to AAFC's written policy on drug and alcohol usage, AAFC had placards posted throughout its vessels prohibiting the possession, use, distribution or sale of drugs, noting that this policy would be strictly adhered to. Persons violating this policy would be immediately dismissed. Several crewmen recalled seeing these placards posted on ALEUTIAN ENTERPRISE.

An information booklet provided each employee also contained a statement regarding AAFC's drug and alcohol policy. It noted that employee's jobs could be terminated for violation of the policy. Employees also signed a statement acknowledging that they have been informed about AAFC's policy and that they authorized the search of their personal belongings upon arrival onto AAFC's vessels and during unannounced inspections. According to Siemons, he never searched crewmen's personal belongings nor did he conduct any unannounced inspections.

On May 6, 1987, [redacted] Chairman of the Board at AAFC, distributed a memo to all captains and factory foremen restating AAFC's policy on drugs and alcohol. On March 9, 1990, AAFC sent a telex to its vessels regarding alcohol control. The telex noted that AAFC has been plagued with a rash of alcohol related problems including a fatality. The telex sought the captain's support in resolving this problem. The captain and crew on ALEUTIAN ENTERPRISE interpreted this telex as a strong reminder that alcohol use on board would not be tolerated.

e. Drug and Alcohol Use

Some of the crewmen on board ALEUTIAN ENTERPRISE testified that alcohol and drugs had been used on board. [redacted], a processor on board ALEUTIAN ENTERPRISE, stated that on the trip leading up to the casualty he had one gallon of vodka on board. It lasted a week and a half and he shared it with ten to fifteen crewmen. He saw crewmen drinking two to three days before the casualty. [redacted] commented that he and two other crewmen smoked "pot" on board ALEUTIAN ENTERPRISE during a previous trip. Neither of the two crewmen were on board during the trip leading up to the casualty. He stated that towards the end of the prior trip, "Most of the alcohol and everything was gone." When asked if he saw anyone smoking "pot" he replied, "No, I would smell it every once in awhile. But, you know, I smoked pot maybe once on

board myself and once in port. But other than that, it wasn't, you know, I didn't notice it that much. You know, I knew it cost a lot in port, and it was like prices that were quoted to me were $110 a quarter, which is quite a bit of money. And I wasn't looking to spend anything like that. And, you know, a lot of the people that were in my room weren't looking to spend anything like that. It was just people that couldn't get away from it. And it was first, I'd say two or three people had it on the boat, maybe a couple more. You know, it wasn't a real big problem. Alcohol was, everybody had alcohol on board."

[redacted] a processor, testified that he and other crewmen drank after work during this trip. On or about March 7 or 8, at 4:30 P.M., he smelled marijuana as he was going up into the pilothouse. He saw one crewman in the pilothouse. Captain Siemons was outside the pilothouse at the time. [redacted] could not recall who the crewman was.

[redacted] a new processor on board ALEUTIAN ENTERPRISE, saw drinking on board, but commented that it never got to a point where people got drunk or there was fighting. [redacted] also commented that crewmen would invite others in their rooms after work shifts and have mixed drinks. He saw beer at dinner. [redacted] smelled pot every once in a while, but never saw anyone actually smoking pot. When asked if he remembered any specific times and places when he smelled pot he replied, "Well, I'd be working and trimming on the line and I'd smell it because when you're in the factory there is really no air circulation. Air is circulating, but only by doors opening and the chutes on the side of the boat. But it stays in there for awhile. So usually everybody knows when somebody is smoking." [redacted] never saw the captain or factory foreman enforce AAFC's drug and alcohol policy.

[redacted] stated that the deckhands anticipated being tested for drugs at the end of the trip. "All the deck were always worried about a drug test. And if they tested positive, something about the contract. They could get, you know, the least money as possible or something to do with their money."

10. CREW HIRING PROCEDURES

Prospective crewmen complete an employment application indicating a preference for the type of work to be performed, e.g. cook, deckhand, processor. They are provided a copy of the AAFC Information Booklet which contains information on a wide spectrum of issues including alcohol and drug policy, general work rules, and safety program. Under the section titled, "Schedule and Jobs", work shifts are described as being 6 hours on and 6 hours off.

Concerning overtime the booklet indicates, "If you are offered overtime hours, you may work overtime during your sleep shift, but you MUST still be available to work your regular shift." Under safety program the booklet notes, "You can ensure your own safety and that of your fellow crewmembers by strictly following the ship's safety rules and procedures. These rules and procedures will be published and amended as required and are displayed throughout the ship."

There were no written safety rules as indicated in the booklet; the safety rules were up to the captain of each vessel.

Each person acknowledges receipt of the booklet by signing the acknowledgment page. While this booklet was provided to all prospective employees, the booklet is tailored for the ARCTIC ENTERPRISE, a large factory trawler that employs approximately 160 persons. According to AAFC officials, recruiters were verbally instructed to advise prospective employees of the actual work schedule, 16 hours on and 8 hours off, for those individuals going to vessels other than ARCTIC ENTERPRISE. Prospective employees were shown an, "Employee Orientation Tape", that was designed to acquaint new hires with what the working conditions are like in Alaska.

According to [redacted] a safety consultant in Seattle, one of the significant recruiting problems faced by the industry was the fact that conditions are extremely harsh. Often new employees go to Alaska with a rather naive view of the living and working conditions aboard a factory trawler. [redacted] noted that AAFC wanted a recruitment vehicle that would help screen people before they went to Alaska and discovered they didn't really care for working on a factory processing line. He developed a videotape that illustrated a very graphic representation of the living and working conditions aboard a factory trawler. After the ALEUTIAN ENTERPRISE casualty, a section on safety was added.

AAFC uses a number of recruiters to hire employees. Each recruiter is responsible for approximately 6 vessels. As the company expanded so did the number of recruiters. [redacted] estimated that the turnover rate for processors was about 50 percent. [redacted] AAFC President stated that the AAFC turnover rate is less than his competitors in the bottom fishing industry.

[redacted] explained that 30 percent of the gross product profit is set aside for the crew. The rest is for the vessel and the owners. He said that the captain is responsible for distributing the 30 percent between himself and the crew according to the company guidelines. Each crewman gets at least his, "contract minimum", then the captain distributes pay above that according to each crewman's productivity. Siemons stated that he tries to have two experienced deckhands and two that are trying to be deckhands so that he doesn't have all the money (shares) tied up on deck. In the factory, he tries to bring the minimal amount of people needed to process the amount of fish that can be caught during the particular time of year they are fishing.

[redacted] said that the average annual wage for trawler captains is $180,000. The lead captain earns about three-quarters of that. A series of four captains and four chief engineers had served on the ALEUTIAN ENTERPRISE in the 12 months preceeding the casualty. There had been no lead captain or chief engineer during that time.

11. DUTCH HARBOR CONNECTION

Unalaska–Dutch Harbor is located about 2,235 miles from Seattle, Washington and 800 air miles southwest of Anchorage, Alaska in the Aleutian Chain. Unalaska–Dutch Harbor encompasses about 27 miles of ports and harbors. Over the past two years Dutch Harbor has been undergoing rapid expansion. More than $200 million in new construction is underway, including two new state–of–the–art surimi plants, new dock space and $28 million in road, utility, and school projects. The number of vessels bringing bottom fish, crab, and other species into Dutch Harbor has quadrupled in two years. The community has no full–time psychologist or physician. The medical clinic had more than 14,000 cases in 1989, including 1,700 emergencies. There were 200 medical evacuations from Unalaska; the clinic was involved with most of them. These figures represent a doubling in caseload and a tripling of emergencies in two years. Most of the new cases were fishermen from factory processors.

The Iliuliuk Clinic has a limited medical staff of only two practitioners, two registered nurses, and one lab/x–ray technician. They operate a twenty–four hour seven day–a–week medical facility with office hours Monday through Friday, 9:00 A.M. to 5:00 P.M. and emergency hours the remaining time. During the busy season of January, February, and March, the clinic sees an average of sixty–five patients during office hours and two after–hour emergencies. During the busy three month season, office hours are often extended to Saturday to accommodate the fleet. Non–emergency night calls are asked to be rescheduled during the day to allow the maximum amount of patients to be seen by a limited staff.

AAFC established a facility at Dutch Harbor, Alaska approximately two and a half years ago, to support AAFC vessels in taking on supplies, discharging cargo, arranging for repairs, refueling, and transferring personnel to and from vessels. The facility is headed by a manager who reports to the Vice President of Operations in Seattle, Washington. This remote center maintains daily communications with AAFC vessels fishing in Alaskan waters. If repairs are needed, the vessel captain contacts the Dutch Harbor office for scheduling. Routine repairs are the responsibility of the captain. Major repairs and maintenance would be coordinated through the AAFC maintenance and repair department in Seattle. It is the vessel's captain who decides who to contact, Dutch Harbor or Seattle. The Dutch Harbor office does not routinely contact the Seattle office regarding repairs made to vessels in Dutch Harbor.

12. HISTORY OF VESSEL REPAIRS, MODIFICATIONS AND SURVEYS

The Bender Shipbuilding Company in Mobile, Alabama designed the fishing deck, stern ramp and other major additions and modifications necessary to convert the ALEUTIAN ENTERPRISE from a crabber to a trawler/processor in 1984. Guarino and Cox, Naval Architects of New Orleans, Louisiana were subcontracted to draw the shelter deck plans and produce a T&S Report. Flohr Metal Fabricators, Inc. of Seattle, drew plans for the processing factory layout. [redacted] and [redacted] represented the owners during the construction and commissioning of the vessel.

Coast Guard admeasurer, [redacted] measured the vessel for its documented tonnage in late 1983. [redacted] and [redacted] had designed the processing space to be exempt from tonnage through the use of appropriate tonnage openings in the trawl deck and live tank using the rules for open shelter decks. The Certificate of Admeasurement issued on February 6, 1984 showed that most of the volume was exempted as an "open house". [redacted] photos showed that a tonnage opening that did not appear in the plans had been cut into the port side of the transom before delivery in order to bring the vessel below 200 gross tons.

Processing equipment was located directly below the trawl deck tonnage opening. The admeasurement requirement of 46 CFR 69.117(e)(2)(vi) for open shelter deck exemptions would have precluded the installation of the processing equipment below the trawl deck tonnage opening. An opening in the transom would have exempted the space as an "open house" under 46 CFR 69.117(d)(2)(ii) rather than an open shelter deck as the naval architects had planned.

On February 8, 1984 [redacted] and [redacted] inclined the vessel at the Bender yard before it left for Seattle and provided a Trim and Stability Report based on a lightship displacement of 819.96 long tons.

The ALEUTIAN ENTERPRISE went into service that same year as one of the first, "state of the art", U.S. flag, bottom fishing trawler/processors in the Bering Sea. Her primary captain was [redacted] who continued to skipper the vessel regularly until 1988.

Several surveys were conducted during the lifetime of the vessel by [redacted] who was experienced in the marine industry dating back to 1941. In about 1982, [redacted] was a member of the National Association of Marine Surveyors (NAMS), but did not continue his membership after the first year. During surveys he did not use checklists, guides, or standards – he relied on his many years of experience to determine what to examine. [redacted] has been involved in survey work since 1972. He estimated that he had conducted approximately 6,000 surveys. His main source of business over the last several years was AAFC managed vessels.

In October 1980, at the request of Greyhound Leasing, [redacted] conducted a condition and valuation survey of the CONCORD (ALEUTIAN ENTERPRISE) at Halter Marine, Inc. The survey report indicated that, "The vessel was constructed and inspected to ABS standards for hull and machinery." The survey also noted that it was constructed to Alaska Fisheries Safety Advisory Council (AFSAC) standards and met them. There were no recommendations made by the surveyor. The report did not indicate that a copy was provided to the insurance company.

In December 1984, and June/July 1986, at the request of Aleutian Enterprise, LTD, [redacted] conducted condition and valuation surveys while the vessel was in drydock, and afloat in Seattle, Washington. The survey reports contained a statement that the vessel was constructed and inspected to American Bureau of Shipping (ABS) standards. There were no recommendations. The reports did not indicate that a copy was provided to the insurance company.

[redacted] notation on the ALEUTIAN ENTERPRISE surveys regarding ABS standards was based on what he observed and was told during his original survey in 1980. According to

[redacted] "It was normal for the builder, Halter Marine, to have an ABS man in the yard watching the construction of the hull." When asked who told him the vessel was built and inspected to ABS standards he responded, "I can't tell you that now. It's been too long ago. But that was their standard in the yard. Most of the work they were doing was ABS, for ABS class and it was pretty well known and the ABS people were in the yard when I was down there."

According to ABS, the ALEUTIAN ENTERPRISE, "was never classed, or reviewed for class by ABS, nor has the vessel been assigned a loadline."

[redacted] described how he conducted a condition and valuation survey. Upon arrival he would meet with the captain, chief engineer, or port engineer, and discuss what has been done to the vessel. He would then proceed with his survey and work from the pilothouse down to the engineroom.

When conducting the survey he would refer to the equipment indicated on the previous survey and note any changes since then. He would conduct a, "full visual inspection." [redacted] did not operate or have anyone else operate equipment on board; he would ascertain whether the equipment was operable by querying the person who accompanied him during the survey. He would not check navigation lights, pilothouse alarm panel, general alarms, EPIRB, steering controls, or ships whistle. He would not test the lights on the ring buoys, personal flotation devices, or immersion suits. He would not check to make sure placards or instructions were posted in the staterooms. He would take approximately two survival suits out of the lockers and visually examine them and possibly test the zippers to ensure they were not sticking. He would check the service dates on the inflatable liferafts and hydrostatic release devices. He would not test the cutter sumps or sumps, high level bilge alarms, engineroom alarm panel, main engines, fire and bilge pumps, or charge the fire hoses to test for leaks.

If the vessel was in drydock he would enter tanks that were open and accessible. He did not maintain a list of spaces not entered from year–to–year to ensure spaces not previously entered would be examined after a certain number of years. He would examine the hull bottom and side shell as far as he could see. He would not use a crane or other devise to view up the side of the hull. [redacted] did not inspect or test the sea valves, through–hull fittings, or closure devices. Upon completion of his survey he would note any recommendations and would update the list of equipment. A copy of the survey would be provided to the vessel's owners. Unless otherwise indicated on the survey, the insurance company or insurance broker would not be provided a copy.

[redacted] stated that this is the type of condition and valuation survey he performed on ALEUTIAN ENTERPRISE. He could not recall if he went beyond this.

In July/August 1987, at the request of Aleutian Enterprise, LTD , Goldade conducted a condition and valuation survey while the vessel was in drydock, and afloat at Marco Shipyard in Seattle, Washington. The survey concluded with the remark that, "this vessel will be a good insurable risk after the recommendations have been complied with." Two recommendations were made:

service test three 20 lb. portable dry chemical fire extinguishers, and install remote shut downs on the auxiliary engine in the engineroom in case of fire. The report contained the same ABS statement as before. The report showed that a copy was sent to Northern National Insurance Brokers, Inc. The report noted that the vessel had a market and replacement value of 6 million and 7.2 million dollars respectively.

[redacted], Vice President of Fishing Operations did not know if survey reports were distributed to the vessels. Captain Siemons had not seen a survey report concerning the ALEUTIAN ENTERPRISE.

By 1987, because several changes had been made to the vessel, AAFC decided to have it re-inclined following a drydocking at Marco Shipyard in Seattle. The primary reason for the new analysis was to correct the Trim and Stability Report loading conditions for changes made to the below deck arrangements. The freezer holds were extended forward from frame 34 to frame 28 and the No.1 ballast tank was converted to a fuel oil tank.

[redacted] a naval architect from Seattle, conducted a deadweight survey and performed the inclining. He said that if he had noticed a deficiency that affected stability he would have advised the operators not to sail until it was fixed. He could not recall any deficiencies. He generated a new Trim and Stability Report based on the inclining that resulted in a calculated lightship displacement of 955.47 long tons. Some equipment had been added or replaced and a small section of deck had been added on foc's'le level 2. Most of the increase in lightship displacement was attributed to general weight growth and perhaps a difference in the definition of lightship between [redacted] and [redacted].

After the inclining, but before the vessel left Marco Shipyard, two 1,000 gallons per minute (GPM) cutter pumps were installed on the processing deck; one in a centerline sump and the other in a port side aft sump. These pumps provided a means for removing fish carcasses, debris and water from around the heading and gutting machines and fillet tables. The pumps were not equipped with check valves to prevent seawater from flowing into the vessel when the pumps were not operating. Previously, fish debris had been removed by sliding it down chutes through three square, through-hull openings fitted with steel flappers at the processing deck level, port side, and one chute starboard. The square openings were never welded closed. They continued to be used for removal of fish debris whenever the cutter pumps became clogged.

[redacted] assistant engineer, said (regarding the port forward flapper), "Whenever they'd plug up because of the header – the carcasses [from the header machine], they'd [the processors] pull it [the port forward flapper] out and then I'd notice it was out and I'd replace it . . . I'd only usually put two bolts in there because they were stainless and they'd [the processors] lose them." He also testified, "I had repaired the port after – what we called the shit chute flapper next to the cutter pump . . . We were out fishing and it broke and it was rough and you need it real bad when it's rough . . . The flapper had rotted off the top cover."

[redacted] AAFC Vice President of Vessel Operations, explained that company policy is to check closing devices when the vessels come into drydock. When asked if he thought the openings without flappers affect the stability of the vessel, he said, "No, I don't think so."

When asked what he knew about the openings on the processing deck, [redacted] fleet maintenance manager from January 1988 to December 1989 said, "I don't recall anything about the overboard discharge on the boat at all. It's just something I never looked at . . . We never got involved with the factory situation. This was mostly handled by [redacted] and the factory foreman on board that boat."

The Board observed overboard discard openings on another AAFC processing vessel, the NORTHWEST ENTERPRISE during a visit to Dutch Harbor. Missing flappers and a plywood insert in the hull were noted by the Board and company officials. When subsequently asked about openings on the NORTHWEST ENTERPRISE, [redacted] said that the plywood insert had been replaced with steel, "And hopefully some action was taken on the other ones also."

The ALEUTIAN ENTERPRISE was drydocked again in the Summer of 1988 at the UNIMAR facility in Seattle. There it was discovered that it had bottom damage due to a grounding that had not been reported to AAFC. At the request of Arctic Alaska Seafood, [redacted] conducted a survey to ascertain the extent of damage from the grounding. Approximately 115 square feet of bottom plating was set in and required renewal. The bow thruster, keel cooler, and rudders were damaged and needed replacement or repairs. His report did not indicate that a copy was sent to the insurance company. Repairs were made to the satisfaction of AAFC. [redacted] President of AAFC, testified that AAFC did not conduct an investigation to determine what caused the grounding.

During this period a 12 foot by 25 foot, 3/4" doubler plate was installed with plug welds on the stern ramp because of holes caused by the constant abrasion of the trawling gear. This doubler weighed approximately 5.35 tons. When asked if there was someone in AAFC who would have been concerned with the weight growth of the vessels, Schmiedtke said that there was no one with that responsibility.

A condition and valuation survey was not conducted before the vessel returned to Alaska. It was AAFC's unwritten policy to conduct condition surveys every 18 months to 2 years, generally when the vessels returned from Alaska. At the time of capsizing it had been 2 years 8 months since the ALEUTIAN ENTERPRISE's last condition survey.

The ALEUTIAN ENTERPRISE never returned to Seattle after the Summer of 1988. It operated out of Dutch Harbor, Alaska, where AAFC maintains a warehouse and management office and staff. There is no drydock of sufficient size for the ALEUTIAN ENTERPRISE in Dutch Harbor. Minor repairs were often contracted to local welders, mechanics, electricians, etc.

On November 2, 1989, the 4 foot by 5 foot tonnage opening plate on the port side of the transom was completely welded closed because it had been leaking. Captain Siemons said that when he first saw the tonnage opening in the transom, "It had a small trickle . . . I told them to weld it up." He told [redacted] the AAFC Dutch Harbor Manager, but never reported it to anyone in Seattle.

When asked about welding on the transom Ivie testified, "It's a concern to us, but it wasn't our area of responsibility . . . [redacted] was assigned by [redacted] to take over some of the

duties, the maintenance area, during our absence in Dutch Harbor, which I assume he did." When asked if he knew that the tonnage opening was welded, [redacted] testified, "It was partially welded, yes . . . I would have dealt with it the next time the vessel would come into drydock."

Other modifications included the removal of two watertight doors in the bulkhead forward of the processing area and one on the main deck at the top of the stairwell to the hold level. When asked about the watertight door at the top of the stairwell to the hold, Siemons said, "That door was removed while I was in Seattle." He did not make any inquiries or notifications about the door to anyone in Dutch Harbor or Seattle. [redacted] Vice President of Fishing Operations, said that he was not aware of a watertight door removal, "It would be [redacted] possibly, if anybody would be aware of it. Pretty much the Dutch Harbor operation was under [redacted]." When asked about the maintenance and repair of vessels in Dutch Harbor, Mr. [redacted] said, "My involvement is very little. But we have the maintenance manager [redacted] up there or superintendent [redacted] from time-to-time when something urgent comes up. Otherwise the [Dutch Harbor] assistant manager has been taking care of lining up vendors for the vessels." [redacted] AAFC President described the Dutch Harbor manager, "He basically works for the captains of vessels. He's just a support person as the Seattle staff is, accounting people or purchasing."

When asked about watertight door removals Ivie, the fleet maintenance manager testified, "I probably wouldn't know about it. . . . We didn't have a port engineer for every boat or, you know, it was a hit-and-miss proposition. You had to go where the problems were . . . Sometimes they would tell me and sometimes they wouldn't, even though I was in Dutch Harbor . . . They had nothing that you could pick up and read . . . For the most part, I talked to the chief engineer; very few times to the captain." [redacted] the Dutch Harbor manager testified, "My basic responsibilities were vessel support, communications with the fleet, coordinating communications with the fleet to my superior, [redacted]"

A notation in the ALEUTIAN ENTERPRISE engineroom log indicated that on December 6, 1989 a door, (non-watertight) was cut into the starboard engineroom exhaust fidley at the processing deck level to provide storage space and access to the sounding tube. Siemons first noticed the cutout about five days before the casualty. He was concerned about it and planned to telephone AAFC upon return to Dutch Harbor four or five days later. He did not send a telex or phone AAFC or Dutch Harbor about it because the vessel would soon be returning to Dutch Harbor. The December 6 engineroom log sheet had been routinely sent back to Seattle. When asked about the door cut into the engine exhaust fidley, [redacted] said, "I wouldn't want to know about it . . . I don't review these [engineroom] logs. That was the maintenance department." When asked if he knew about cutouts made in internal bulkheads, Ivie said, "I don't know of any . . . We had no general policy about any of these things."

On February 15, 1990 weld repairs were made on the stern ramp by a welder in Dutch Harbor. When asked about the stern ramp repairs, Siemons said, "The pin holes that were shown to me were nothing major. There were just trickles . . . And I had suggested getting it welded . . . There was somebody from the warehouse with me." Cracks in the stern ramp had been welded five months before by a welder in Dutch Harbor.

On February 23, 1990, about a month before the capsizing, the ALEUTIAN ENTERPRISE was caught in a gale and lost all power when a constant voltage regulator failed. The crew was not processing fish at the time. The logbook entry for that date indicated that at 9:00 A.M. the vessel lost all generators. At 10:30 A.M. the auxiliary generator was placed on line and ALEUTIAN ENTERPRISE headed back to Dutch Harbor escorted by the UNIMAK ENTERPRISE. At 8:30 P.M. all generators and engines were on line and ALEUTIAN ENTERPRISE and UNIMAK ENTERPRISE headed back to the fishing grounds. Siemons did not notify the crew because he was concerned with staying in radio contact with other vessels, power permitting.

During the incident, the foreman became very concerned when the level of loose water on the processing deck increased and spilled over the raised coaming of the chutes to the freezer holds and damaged the frozen fish products. The pumps supplying water to the factory equipment were inoperable. [redacted] was on board during this incident. When asked what he observed on the processing deck he stated, "I headed out past the plate freezers to see if there was some way to turn on the cutter pumps, and we took a pretty good roll right then." Regarding the water in the processing deck, he stated, "When the boat was listing one way or another, it was up the wall maybe four feet, five feet, something like that." The vessel was, "rolling pretty good. It was – oh, I don't know, 25 degrees, something like that." When asked if he knew where the water was coming from he said, "It was coming in the chutes. There was no water on. The pumps weren't working; none of the pumps were working, so whatever was in the chutes, was rolling around. Whatever was coming in on the floor couldn't get out. We were rolling pretty heavy. It wouldn't drain out as fast, I mean they were still draining, but it wouldn't drain out as fast as it was coming in." When asked why the water wouldn't drain as fast as it came in he stated, "There were no pumps running. The drains aren't sufficient. The three–inch drains we have aren't sufficient. Whenever you tilt the drains, it lets water in. Whenever you list one way, they let water in and then it rolls the other way and comes in on the other side and doesn't have a chance to drain. We were rolling pretty quick. It was a pretty good storm."

[redacted] processor on board ALEUTIAN ENTERPRISE, stated that the water in the factory was coming over his boots when it was "sloshing back and forth." [redacted] indicated that his boots were a foot and a half high. Once power was back and the sump pumps were turned on, the water drained out "quickly".

The only source of the water to the processing deck was the through–hull openings along the main deck in the processing space. The crew later increased the height of the freezer chute coamings following the incident to prevent product damage if flooding occurred again. No activities were directed toward correcting the lack of watertight integrity of the sideshell of the processing area. Siemons reported the power failure and flooding to Dutch Harbor via radio. He explained, "When I reported to him, its just like reporting to Seattle, as far as I'm concerned." He was not aware that of any requirement to report this incident to the U. S. Coast Guard. AAFC President, [redacted] was not aware of flooding incident. When asked if there is a company policy for reporting the power outage and flooding incident, [redacted] stated, "There is no policy on reporting those types of things."

The ALEUTIAN ENTERPRISE weekly production telex to AAFC Seattle indicated, "Frozen: . . . The other day we lost all pior [power] in a storm and got pretty thrashed on, we had water in process room, an went down freezers we had no sumps, but we got freezer shoots foamed in minimal time, We pumped water out of freezers temps never went past -5 for our port freezer. Stbd was fine. We had alot of rebaging and refreezing. 100 or so cases lost. 120 rebages alot marked ⌂ 2 because of the salt water it makes you wonder if its worth the time, to pack so neat and watch like a hawk to get fucked in minutes. Was marking these ⌂ 2 the appropriate thing to do? Pls respond would hate to lose money for this kind of shit."

AAFC vice presidents, [redacted] and [redacted] were not informed of the power outage and flooding incident. [redacted] said he had not been concerned about flooding because five sump pumps had been installed on the processing deck. He said that the ALEUTIAN ENTERPRISE was not supposed to have discard openings since the pumps were installed. He thought they had been welded up. He had been aboard the vessel in the Summer of 1989. He walked through the vessel and did not recall missing watertight doors or deteriorated flappers. He didn't know that the crew had raised the coamings on the freezer chutes following the flooding incident. He stated that AAFC maintained no machinery or repair records for the ALEUTIAN ENTERPRISE.

13. SAFETY EDUCATION AND TRAINING

The Pacific Northwest, long a recognized leader in fishing vessel safety training, has several publications, training programs, and videotapes devoted to fishing vessel safety. The "Vessel Safety Manual", published in 1986, with over 5,000 copies in print, was a joint effort between the Coast Guard and the North Pacific Fishing Vessel Owner's Association. The manual includes topics on vessel familiarity, stability, and vessel safety equipment and survival procedures.

"The Cold Water Survival Handbook", published in 1989 with over 6,000 copies in print, is a portable primer on coping with cold water hazards. It discusses such equipment as emergency suits, life rafts, personal flotation devices, and EPIRBS. It was the first installment of a six-part program called the "Marine Survival Equipment and Training Program." The other five parts, in their current form, are videotapes of different types of water survival equipment. "The Long Line and Purse Seine Safety Handbook", published in 1989 with 2,000 copies in print, digresses from the general "Vessel Safety Manual" with more specific gear handling safety recommendations for the long line and purse seine fleets.

Subsequent to the publication of the "Vessel Safety Manual", a five-part, 40 hour classroom training curriculum called the "Safety Vessel Program", was created in Seattle. A series of videotapes was created that put the classroom curriculum on tape as a refresher for persons who had attended the training. It was designed to facilitate on board refresher and training. The video series, referred to as, "The Safety and Survival at Sea Videotape Series", features four titles, "Safety Equipment and Survival Procedures", "Fire Prevention and Control", "Medical

Emergencies at Sea", and "Navigation and Stability." Additionally, there is another five part video series on marine safety that includes, "Inflatable Life Rafts", "Emersion Suits", "EPIRBS", "Visual Distress Signals", and "Personal Flotation Devices." A number of enterprises affiliated with various academic institutions conduct training, e.g. the Alaska Vocational Technical Institute in Seaward, Alaska, Clatsup Community College, and Trident Campus of the Seattle Central Community College.

According to [redacted] a safety consultant in Seattle, who edited, authored, or produced many of the publications and videos noted above, fishermen are very reluctant to attend safety classes while on shore leave. To try to overcome this obstacle [redacted] worked with vessel owners and obtained a commitment to support the program. Programs were also structured and scheduled to respond to the nature of the fishing industry. Most of the academic facilities operate according to set institutional schedules. Programs were coordinated with vessel owners so that crewmembers rotating from Alaska could attend at a time determined by the vessel owner.

Insurance companies support of safety training tends to stimulate the interest of vessel owners. Sabella believed that vessel owners would obtain the best available premiums that their loss record and operating style entitled them to, by virtue of having trained personnel on board; e.g. demonstrating that crewmen have participated in a safety training program would be a plus when negotiating insurance premium. He lobbied the insurance industry for reducing premiums if vessel personnel participated in safety training; however, this did not come about.

AAFC periodically publishes a newsletter entitled, "View from the Bridge." The newsletter usually contained articles on vessel safety. The March 1988 issue contained an article from [redacted], AAFC Personnel Manager, (referred to as "Letter from [redacted]") stating that safety was everybody's business and that the "management team at Arctic Alaska is vitally concerned with protecting your safety and health. We make every effort to provide a safe working environment, but safety and health begin with you. Fishing is dangerous, so we all have to pay close attention. You can help ensure your safety and that of your shipmates by strictly following our safety rules and procedures." The issue also contained an article on the tragic loss of an employee who was struck by a crab pot. "Tragic incidents like this one underscore the dangers of commercial fishing and explain Arctic Alaska's policy of constant attention to safety training and preparation."

In the "Letter from [redacted]" section of the May 1988 "View from the Bridge" [redacted] noted that, "At Arctic Alaska, we do the best job we can at giving you the training necessary to enable you to do your job safely and well. Fishing is a dangerous business. At sea, mistakes can be deadly. We've provided your vessel with safety manuals and safety videotapes for reading and viewing onboard, and we're sending key personnel from each boat through training courses designed to boost the level of preparedness in our fleet. We don't want our vessels and our crews to suffer from the same mistakes that have cost others dearly in the hazardous business of fishing." When asked what he had in mind regarding the safety program, [redacted] President and Chief Executive Officer at AAFC stated, "I would guess what he [redacted] had in mind was that

we would make available that program [NPFVOA], the programs that he was referring to, to those supervisory personnel aboard those vessels."

The July 1988 "View from the Bridge" contained an excerpt from a safety manual being developed for AAFC personnel by one of their deckhands. The excerpt that appeared in this issue was the first installment in a series. In the "Letter from [redacted]' section [redacted] noted, "Our vessels aren't just fish boats, they're floating profit centers that require highly trained crews, men and women who approach fishing as a career. If we don't develop higher standards of professionalism than have ever existed before in the U.S. fishing industry, our style of year-round production on multiple factory platforms can't endure. To create that level of professionalism, Arctic Alaska is committed to education and training for all its personnel. The question isn't whether you're going to participate in training, it's how soon you can sign up. One example of our emphasis on education and training is [redacted] deck safety column that begins in this issue of 'View from the Bridge.' Another is our policy of having **every** skipper, officer and foreman in our fleet attend the highly regarded Crew Training Program courses offered by the North Pacific Fishing Vessel Owner's Association. These courses teach you what to do in a medical emergency, how to prepare for man-overboard or abandon ship incidents, how to minimize the hazards of fire at sea, and more. Call the Personnel Office to schedule your attendance during an upcoming rotation off the vessel. The courses aren't cheap, but the company will pay your tuition throughout the remainder of 1988."

AAFC's corporate report (believed to be for the year ending 1988) noted, "We train members extensively in fishing, processing and safety, and we promote from within." When asked to describe the extensive training that was provided, [redacted], AAFC Vice President of operations, replied, "When it comes to fishing it's practically onboard training, people in the processing area when they can go on deck and observe things, how things work up there, to become eventually a deck hand. It's the same with the processing. Mostly they are green people [no experience]. They come on aboard. They get short instructions on what's going on." There was no AAFC policy for training inexperienced people. They received no formal training and very little informal training. Regarding the extensive safety training mentioned in the corporate report, he commented, "The program is the same as the courses run by the association, [NPFVOA] and we encourage and told people this is available and to take those courses."

AAFC's 1989 annual report noted that, "Employee safety in vessel and processing operations is emphasized during training and day-to-day work." When asked how AAFC emphasized training Baker stated, ". . . Emphasized it through our key personnel aboard the vessels. . . . On board the vessel, really all we've had available to us is what we purchased through the [North Pacific Fishing] Vessel Owners' Association in the way of safety manuals and the videotapes through the Vessel Owners' Association."

The February 1989 "View from the Bridge" contained an article on the December 11, 1988 loss of the ARCTIC II during an intense storm. ". . . Nonetheless, the experience has provoked Arctic Alaska to redouble its efforts to provide safety and emergency training to its crewmen. (see 'Letter from [redacted] in this issue)" [redacted] took over as Personnel Manager from [redacted]

In his "Letter from [redacted] column, [redacted] commented on the loss of the ARCTIC II and noted, "Suddenly, however, a tragedy awakens us to the proximity of the dangers that always lurk beneath our feet. There's an old saying that the best built boat is only as good as its skipper and crew. Stated differently the only way to minimize the hazards of the sea is through knowledge, preparation and training. To ensure that its crews operate with utmost professionalism and minimizes the dangers of fishing to the maximum extent possible, Arctic Alaska is reaffirming its commitment to sending **every** shipboard officer to safety training courses like those offered by the North Pacific Fishing Vessels Owners' Association. Beginning immediately **all** licensed and supervisory personnel will be scheduled into training sessions during their shoreside rotations. Just as everyone is susceptible to danger, everyone profits from training. From now on, safety training is a routine part of your job."

Regarding AAFC's policy of sending officers to training courses mentioned his article in the February 1989 issue of "View from the Bridge", [redacted] stated, "I don't think it was as much of a policy as it was an Arctic Alaska statement there, a commitment there to doing exactly what I said there. Certainly, looking back over it a year later it was a lot easier said than done. It was our intent to get as many people into safety courses as possible." When asked if there was any other encouragement other than through the newsletters he replied, "Just verbal conversations, just in conversations." When asked if there was a different commitment for processors he said, "I don't think there was a different commitment. I think, in looking back, I guess the feeling was that it was far more important at that point in time to get all of the licensed officers and supervisory personnel trained in these activities because they would have been responsible for guiding other people's actions should a catastrophe occur. Certainly, there was no objection to other non-supervisory personnel attending. But I believe there was a concerted effort to see they attend. Although, in looking back over the list, certainly there are some that did attend."

The December 1989 "View from the Bridge", "Letter from [redacted] column noted that AAFC recently sent letters to all vessel officers announcing that AAFC management is "working towards the creation of a safety program that will affect daily operations in numerous ways. . . . This is absolutely critical to our success as a company. However, establishing a program in Seattle is not the answer to our safety challenge. Only if the program is accepted and practiced on each of our vessels is it going to have an impact. This program must become a constant fact of life aboard your vessel. Only helping shape it can you ensure that it is realistic and effective for your operation. Because of the number of people aboard and the constant rotations, training, drills and information transfer are essential. From the factory to the wheelhouse, we need a better system of preparing our personnel. Each vessel must prepare for two types of problems: catastrophic emergencies that threaten the entire vessel, and work-related accidents. While catastrophic emergencies are obviously of enormous concern and have to be prevented, the secondary category is actually more costly in terms of lost personnel down time, medical bills, insurance premiums and court settlements. We are in the process of creating a Safety Manual for each of our vessels. Only by making your views known and contributing to its development can you be sure that it will be realistic and effective. Once the Safety Manual has been completed we will consider a variety of informational and educational materials that include

crew handbooks, training courses, placards and signs, and videotapes. We need your input into which ones will be effective."

Siemons stated that the ALEUTIAN ENTERPRISE did not have a set of "View from the Bridge" on board nor was he given instructions to maintain a set.

Records provided by the NPFVOA showed that between February 1986 and November 1989 approximately seventy-seven AAFC employees attended one or more classes offered by the NPFVOA – nearly all were supervisory personnel (captains, mates, engineers, deck and factory foremen). Of the seventy-seven, fourteen personnel previously employed on the ALEUTIAN ENTERPRISE attended these classes – nearly ninety percent of the classes attended were in 1987. None of the seventy-seven personnel were on the ALEUTIAN ENTERPRISE at the time of the casualty. AAFC could not provide any further documentation or records of training of AAFC or ALEUTIAN ENTERPRISE personnel other than what was produced by the NPFVOA.

In the Fall of 1989, [redacted] Vice President of Operations for AAFC approached [redacted] and asked him to conceive a safety and health program that could be applied to the AAFC fleet. In developing his proposal [redacted] interviewed a number of personnel within AAFC both in Seattle and within fleet operations. He found that there needed to be considerable work done with respect to crew preparation.

On October 5, 1989 [redacted] distributed a memorandum to all captains regarding AAFC's safety program. In his memorandum [redacted] noted, "The responsibilities of the skipper and officers have grown enormously. It is not sufficient that they are prepared, they are now responsible for large number of untrained personnel whose lives literally rest in their hands. The new realities require a much more formal approach to safety and crew preparation than fishermen are accustomed to. The only way to minimize accidents and injuries is to practice good habits all the time. This requires an attitude that must start with the skipper and officers. In the future, each of our vessels will be evaluated not only in terms of catch rates and quality control, but in terms of its safety record. We intend to establish a system that identifies which vessels have satisfactory safety records and which suffer high casualty rates. . . . Only by making your views known and contributing to its development can you be sure that it [Safety Manual] will be realistic for your vessel. You will be receiving questionnaires designed to solicit your views, and you should treat them seriously." Siemons did not recall seeing this memo. At the date of the ALEUTIAN ENTERPRISE casualty, AAFC had not established a system to identify the safety records of its vessels.

After developing his proposal, [redacted] presented it to [redacted] and [redacted] in late December 1989. [redacted] asked them to give him further direction on which, if any, segments they wanted to pursue. According to [redacted] directed him to begin preparation of a "Fleet Operations Manual" as the initial phase. The proposal called for an April 1, 1990 completion date. The first draft was submitted to AAFC on or about that date.

Concerning his proposal [redacted] stated that the first step had to be a very visible demonstration by top management in Seattle of its commitment to an everyday vessel safety and health

program. This demonstration would include developing and issuing a corporate statement of safety and health, appointment of a corporate safety director, establishment of safety rules and procedures, delegation of both the responsibility and authority to vessel personnel for safety enhancement, safety training, and accident control. Safety should become part of the formal job description of the captains and officers and supervisors on each vessel and they should be given specific safety responsibilities and held accountable for meetings. Each vessel should have a designated safety officer whose job description includes the conduct of safety orientation and training. His assessment of AAFC was that there wasn't a corporate-wide structure that made safety a day-to-day priority that was treated with the same importance as production.

Although [redacted] found AAFC supervisors willing to participate in a safety program that was supported corporate-wide, they were unprepared to implement the program. He felt they needed some insight into the human and dollar cost of accidents and why it was important that vessels take the time today to implement a safety policy that might stand in the way of an extra net load of fish today, but would represent a very substantial and worthwhile savings tomorrow, in the form of accidents and injuries avoided.

He felt that because of an industry wide problem, of transient factory workers, the logical focus of the safety program should be on supervisory personnel who could train the transient factory hands on a day-to-day basis. A designated officer should greet new hires and provide them with a safety orientation and tour of the vessel and perhaps incorporate a drill at that time or at some subsequent time in the relatively near future. [redacted] recommended that supervisory personnel who instruct factory personnel, have additional training to include first aid, cold water survival, and fire fighting training. While books and videotapes can take you so far, what's ultimately required is hands-on training.

Concerning stability [redacted] stated that fishing industry vessel captains should have a detailed understanding of the stability report prepared for their vessels and observe the terms of the operating restraints recommended by the naval architect. [redacted] testified that AAFC did not have a formal training program on vessel stability for captains.

On March 20, 1990, [redacted] sent a memorandum to all vessel managers (captains) regarding NPFVOA's vessel safety program. The memorandum stated, "In an effort to continue crew training for you and your key vessel personnel, I'm encouraging you to review the attached schedule, the program will arrange special sessions for groups of twelve or more along with a group discount. This could prove very convenient for those of you who are scheduled for drydock and repair this year. Please review this with your key personnel and call me or send a telex of participants you want to send through this program. Your continued support to this program is as always expected and appreciated."

Testimony from company officers at AAFC indicated tha[redacted] was their Safety Officer. According to [redacted] he was given the title of Safety Director on March 27, 1990, five days after the sinking of the ALEUTIAN ENTERPRISE. Prior to this designation he was AAFC's vessel operations analysis. He received direction from [redacted] Vice President, Fishing

Operations. [redacted] also became involved in safety issues for AAFC. Prior to the sinking of the ALEUTIAN ENTERPRISE, AAFC did not have a designated safety officer.

[redacted] has been with AAFC since 1982. He started out as a processor and worked his way up to mate and then captain on the BERING ENTERPRISE. [redacted] stated that as captain of the BERING ENTERPRISE he held safety meetings, "Every time I left port and we got out to open sea I rang the general alarm. And then I alerted everybody to their station which, at that time, was on the main trawl deck, and ran drills from there as far as what the different signals meant. . . . So my crew was trained basically that whenever they heard the alarm come on they're to muster out on deck with life jackets, and from there we had someone try on a survival suit, and people that wanted to try one on, that never tried one on before, they would try one on to be familiar with it; explained to them what's expected of them if there is a man overboard, how I expect them to respond and cooperate; went through procedures for fighting a fire and abandoning ship, which liferafts they were assigned to, that type of thing." The meetings lasted approximately twenty to thirty minutes.

When asked if he talked about the safety meetings with any of the other AAFC captains he stated, "The skippers that relieved me yes. They'd come aboard and I'd tell them the drills that I ran." [redacted] did not know if his reliefs also held similar meetings. After the ALEUTIAN ENTERPRISE incident, the discussion would come up and I found that a couple of the skippers had run drills like I had. But we were unaware of it with each other. Fishermen are pretty proud and like to keep their own things to themselves. So if someone is doing a good thing he likes to keep it to himself I guess." When asked if, as safety officer, he required vessel captains to hold emergency drills [redacted] replied, "Not before [the ALEUTIAN ENTERPRISE casualty]. Before I wasn't formally considered the Safety Officer. That's why I personally did not require anything. If the company had formally addressed the issue I was unaware of it." [redacted] stated that prior to the loss of the ALEUTIAN ENTERPRISE, AAFC did not have a policy requiring vessel captains to have a "drill" and test the general alarm.

In the Winter of 1990 [redacted] spent about five weeks in Dutch Harbor visiting AAFC vessels, ". . . In February I got aboard each and every vessel that had come into Dutch Harbor and personally carried aboard a list of supplies, safety apparatuses they should have on the vessel, and when these apparatuses should be serviced and the cost of servicing them, and the cost of getting a brand new apparatus, so they understood the cost so if they thought something perhaps was too expensive they would know how affordable it really was at the sake of safety, and that it was their option to buy these things. And I had a plastic list laminated [safety equipment list] and posted in each wheelhouse of each vessel." The list included, "Yes, stuff like hard-hats, survival suits, life-jackets, liferafts, EPIRBS, flare kits, everything I could think of what would pertain to vessel safety." When asked if he checked each vessel to see what was aboard he replied, "On a couple of the boats - not all of the boats came into town while I was there. I went aboard and checked a few of the boats and reminded the skippers to have their mates check their boats to make sure they had enough fire extinguishers, if they were using their hard-hats and work vests and make sure their liferafts were hooked up and right on down the line. If what you're asking I

didn't actually go aboard and take a list of what every single boat had. I didn't do that. The company already had a list of what each vessel had aboard."

Regarding the cost aspects of safety equipment [redacted] stated, ". . . The captain is responsible for everything, for the bottom dollar, for the cost of his expenses and whatnot. And I wanted to make sure that they understood was how affordable a lot of the safety equipment was. Some people may say I don't want to buy a hard-hat for 50 bucks, that's a lot of money. Where, in fact, they could get two or three for 50 bucks; to let them realize how affordable this stuff really was and that it wasn't going to break the bank to get this stuff out and get it serviced on time, and to order extra supplies if they need them."

During his visit [redacted] rode the ALEUTIAN ENTERPRISE back to Dutch Harbor after being aboard another AAFC vessel for seven-and-a-half days. When asked if he checked the safety equipment on the ALEUTIAN ENTERPRISE he stated, "When I went up there [Dutch Harbor] I inspected all the vessels as far as how clean they were, how organized they were, my own opinion of how competent I thought the boat was being operated. But, no, on that vessel [ALEUTIAN ENTERPRISE] I did not go through and look at all of the safety equipment . . . we didn't elaborate on what he had and didn't have. I elaborated more on what I was recommending and what the list pertained to." Siemons was the captain on the ALEUTIAN ENTERPRISE at the time Brooks visited the vessel.

When asked about AAFC's policy for safety and maintainence of the ALEUTIAN ENTERPRISE, Siemons testified, "What it boils down to is at the end of the year, if this vessel spent this much money in the prior year and had this kind of a safety record . . . Then they talk in bonuses. . . . If we can do it ourselves, why pay to have some guy come in and do it."

Each survivor of the ALEUTIAN ENTERPRISE casualty testified concerning their safety training and instructions received since being employed by AAFC. [redacted] a processor with less than one year experience in the commercial fishing industry, half of which was on the ALASKA COMMAND, a vessel operated by a different company, said he had received some training there – abandon ship drill, putting on of survival suits. He did not receive similar training on the ALEUTIAN ENTERPRISE. When he reported aboard the ALEUTIAN ENTERPRISE he was not given a safety briefing. When asked if the ALEUTIAN ENTERPRISE was going to have a safety drill he stated that he discussed this with his supervisor [redacted] (factory foreman) before getting underway on the March 1990 trip – "I just asked or told him that we should have a drill for all the guys that don't know where the survival suits are or the rafts. And he said we were going to have one when we were in town but the skipper [Siemons] was in too much of a hurry."

[redacted] a processor, had three years experience aboard commercial fishing industry vessels – almost two years on vessels operated by AAFC. During the time he was aboard AAFC vessels he recalled participating in one safety drill, nearly two years ago and viewing some video safety tapes. It was not mandatory to watch the tapes. In about May, 1989 when he was on the ALEUTIAN ENTERPRISE he recalled going up to the pilothouse and putting on a survival suit

with the rest of the crew. He knew the ALEUTIAN ENTERPRISE had a video player and safety tapes but, ". . . we never had time to watch the TV. The videos, they are there. But I didn't see it this time."

Processor, [redacted] had about two months experience in the commercial fishing industry – most on the ALEUTIAN ENTERPRISE. He had no safety training. He did not receive safety training or safety orientation when he reported aboard. He stated, "I really didn't get no orientation. I got called, me and this other new guy, we both got called into the foreman's room. And he mouthed three or four sentences and had us sign something and we were out. He would just say it's going to be hard work and you're not going to like it and just get when we tell you to get up and everything will be all right and haul ass. And that was it."

14. FEDERAL REGULATIONS AND OVERSIGHT

a. United States Coast Guard (USCG)

The Coast Guard Safety regulations applicable to the ALEUTIAN ENTERPRISE are contained in 46 CFR, Subchapter C. The regulations include basic safety and firefighting equipment, e.g. life preservers, ring life buoy, and portable firefighting equipment. Regarding lifesaving equipment, 46 CFR 25.25–9 requires that it be "readily accessible".

In Alaska U.S. Coast Guard cutters patrol the Exclusive Economic Zone (EEZ) to enforce fishery regulations. The Coast Guard conducts fishery boardings of commercial fishing industry vessels, during which safety examinations may also be included. According to Lieutenant Commander Glenn Sicks, Chief, Merchant Vessel Safety Branch and the fishing vessel safety project coordinator for the Seventeenth Coast Guard District, there is no Coast Guard Headquarters sanctioned program to board fishing industry vessels for the sole purpose of examining safety equipment. There is no prohibition against this; however, limited Coast Guard resources are not focused specifically on this kind of boarding. While the Coast Guard docs not target fishing industry vessels for safety examinations, some are boarded for safety equipment examinations and for occasional planned safety boarding programs when large numbers of vessels are together for a particular event such as major fishery openings.

In conducting safety boardings, Coast Guard personnel within the Seventeenth District use a standard boarding form (commonly referred to as a 4100 boarding form) in conjunction with a separate checkoff list developed by the Seventeenth District. The checkoff list, which goes beyond the basic requirements of the 4100 form, is used to ensure that most federal requirements applicable to fishing industry vessels are covered during the examination, time permitting. The 4100 form lists approximately 20 items with very general notations, e.g. numbering, personal flotation devices, sound producing devices etc. The checkoff list has been distributed to Coast Guard units in Alaska and to many commercial fishermen and their associations in Alaska. According to Lieutenant Commander Sicks, the Seventeenth District distributed the lists to the fishing industry to encourage them to examine their own equipment for compliance with basic Coast Guard safety regulations.

The checkoff list does not address loadlines. Coast Guard cutters within the Seventeenth District have been made aware that there are loadline requirements for fishing industry vessels, but have not received any specialized training on enforcement of these regulations. Lieutenant Commander Sicks commented that it would take more training than resources presently permit to qualify boarding officers to conduct an effective loadline examination in order to determine whether or not a fishing industry vessel was in compliance.

Members of the boarding teams who conduct at-sea fisheries law enforcement and safety boardings are crewmembers from the Coast Guard cutters. Occasionally, Coast Guard personnel assigned to a Marine Safety Office will also board fishing industry vessels for safety examinations. This is the exception rather then the rule. Boarding officers from the cutters receive training in fishery law enforcement and to some extent, training in how to complete the 4100 boarding form. The checkoff lists are routinely distributed within the Seventeenth District to commanding officers of Coast Guard cutters. Lieutenant Commander Sicks boards individual cutters and conducts training on the use of the fishing industry vessel checkoff lists.

After Coast Guard personnel complete a boarding, the 4100 form is submitted to the Seventeenth District for review. There is no requirement to submit the 4100 boarding form if no violations are found. If violations are noted, a review is made to see if elements to support a violation exist; if so, it is submitted by the district to the Coast Guard hearing officer in Alameda, California for further processing. If the hearing officer determines that a violation has been committed, he issues a preliminary assessment. The responsible party is given an opportunity to respond, then the hearing officer assesses a civil penalty or takes other appropriate action, such as dismissing the case or issuing a warning.

On September 20, 1989, the ALEUTIAN ENTERPRISE was boarded by personnel from the Coast Guard Cutter MIDGETT. The 4100 boarding form for that boarding indicated that there were 29 persons on board and the vessel had either 29 adult size personal flotation devices or survival suits. The form was not specific as to which they were. Block 79 indicated "no violations". When asked if the captain of a vessel that receives a "no violation" safety examination by the Coast Guard could assume the Coast Guard did not observe any violations Lieutenant Commander Sicks replied, "He could assume that. I think it would be an incorrect assumption . . . it's based on many factors, what the priorities are during that particular boarding, whether safety equipment checks or pollution control equipment checks were a priority, or whether a fisheries enforcement issue was the focus of that boarding. It's also based on the training and expertise of the boarding officer, whether they would detect all the violations . . . there's a lot of detailed requirements. . . . [I]f the boarding officer isn't familiar with those regulations, they would probably not be aware that they were even looking at a violation."

Prior to the passage of the Commercial Fishing Industry Vessel Safety Act of 1988 the Coast Guard had no specific authority to terminate the voyage of a commercial industry vessel due to especially hazardous conditions on board. This authority had previously been granted only for recreational and uninspected passenger vessels under 46 USC 4308 and 33 CFR 177.07. The Coast Guard can now, "direct the individual in charge of a fishing industry vessel to immediately

take all steps necessary for the safety of individuals on board the vessel if the official observes the vessel being operated in an unsafe condition that the official believes creates an especially hazardous condition, including ordering the individual in charge to return the vessel to a mooring and to remain there until the situation creating the hazard is corrected or ended . . ."

Regarding tonnage admeasurement regulations, Sicks stated that Seventeenth District units have a very aggressive enforcement program. Several vessels have been cited for altering spaces, e.g. changing a ballast tank to a fuel oil tank or a storage area since last admeasured. In several cases tonnage openings that allowed a space to be exempt from admeasurement were found to be gasketed or welded close. This is not permitted. The Seventeenth District does not have a program to board vessels solely to check for tonnage admeasurement violations. Vessels are examined for violations of this type, time permitting, and if knowledgeable personnel are on board, during routine fisheries or safety boardings.

Coast Guard regulation, 46 CFR 4.05-1, requires, the owner, agent, master or person in charge to report vessel casualties involving groundings, loss of main propulsion or steering, flooding, fire, failure of lifesaving and safety equipment, loss of life, serious injuries, and damage costing more that $25,000 to repair. Captain Siemons was not familiar with the casualty reporting requirements. He was not aware of any company policy concerning reporting casualties or accidents to the Coast Guard.

b. Occupational Safety and Health Administration (OSHA)

The Occupational Safety and Health Administration (OSHA) conducts certain inspections on various classes of vessels. Section 4(b)(1) of the Occupational Safety and Health Act of 1970 (Pub. Law 91-596) excludes OSHA from exercising authority over all working conditions where another federal agency exercises, "statutory authority to prescribe or enforce standards or regulations affecting occupational safety or health." The Occupational Safety and Health Commission and the Federal courts have established the following tests as prerequisites to establishing preemption of OSHA authority by another federal agency: the agency must have authority under its enabling statute to regulate the specific working conditions in question; it must exercise its authority; and the legislation granting the agency authority must be intended to address employee health and safety.

Jurisdictional authority over inspected vessels is detailed in a Memorandum of Understanding (MOU) between OSHA and the Coast Guard dated March 1983. The MOU does not address uninspected vessels. OSHA believes it has jurisdiction over uninspected vessels within the outer continental shelf. If OSHA conducts an inspection on an uninspected vessel and uncovers a problem regulated by the Coast Guard, OSHA advises the local Coast Guard Marine Safety Office. If the Coast Guard suspects or detects violations that are within OSHA's jurisdiction, and not the Coast Guard's, the Coast Guard notifies OSHA. OSHA and the Coast Guard do not have a program of cross-training inspectors.

A second MOU between OSHA and the Coast Guard explains the Coast Guard's authority for safety and health concerning artificial islands, installations, and other devices on the outer continental shelf lands. The MOU delineates the relationship between OSHA and the Coast Guard, noting that for those areas the Coast Guard has developed regulations OSHA will not get involved. If OSHA receives any complaints, OSHA will notify the Coast Guard. If the Coast Guard does not have regulations, OSHA then assumes responsibility and works closely with the Coast Guard.

[redacted], OSHA's area director for Alaska operations, is responsible for carrying out the tasks set forth by the Act. She also is responsible for monitoring state OSHA programs. In carrying out her responsibilities, she has three compliance officers who conduct inspections; a program analyst who helps her keep track of statistics, and two secretaries. Two of the three inspectors are safety specialists, the other an industrial hygienist. None of the inspectors has been employed in the marine industry. They have gained processor vessel experience through the inspections they conducted and through shoreside processing plant training and education. According to [redacted] the hazards they identify on a fish processing vessel are the same as found in shoreside processing plants.

OSHA has a program that targets floating processors. [redacted] staff visits about 50 floating processors a year out of a total of 130–140. The bulk of OSHA's processor inspections are conducted during the crab season on vessels in Dutch Harbor and the Pribilofs. In 1989 they conducted 56 inspections; 52 were planned, two were referrals, and two based on complaints.

According to [redacted] in order for OSHA to conduct an investigation based on a complaint, it would have to be a formal complaint which would mean it was filed by an employee or a member of the immediate family. If there is a fatality or catastrophe (an incident involving the hospitalization of five people or more), OSHA will also conduct an investigation. OSHA will investigate if an accident is severe, (e.g. limb amputated, severe disablement as a result of a fall), if an accident results in considerable media attention, or if OSHA receives considerable inquiries. OSHA regulations require that the employer notify them within 48–hours following a fatality or catastrophe. There is a $400 penalty for non–notification.

OSHA conducts two types of inspections; a health inspection and a safety inspection. During health inspections, the industrial hygienist looks at items such as exposure to noise, exposure to chemicals, use of respiratory protection, and incidents of cumulative trauma disorders, e.g. carpel tunnel syndrome, crab asthma, etc. The safety inspectors look at items such as machinery guards, electrical hazards, fall protection, guard rails, safe access passageways, etc. They also look at shipboard cranes and require them to be certified by an OSHA accredited inspector. OSHA inspectors interview crane operators to make sure they are knowledgeable, and watch the longshoring operations to make sure that they are being conducted safely. The inspector looks at the shackles, shoes, and the wires to make sure they are in good condition. OSHA also ensures that employers conduct required periodic inspections.

OSHA inspectors board vessels, meet with the person in charge, and present their credentials to

identify themselves as OSHA compliance officers. The inspector explains the purpose of the inspection and its scope and reviews the records required by OSHA, e.g. OSHA-200 log of injuries and illnesses. The inspector looks at the vessel's hazard communication program and checks the lockout/tagout program which deals with safely de-energizing machinery prior to maintenance. The vessel's standard operating procedures for emergency respirators are reviewed. According to [redacted] these procedures are required because vessels using ammonia or freon as refrigerant develop leaks from time-to-time which require shipboard personnel to go in and repair the leak. Because employers usually have respiratory protection aboard, OSHA ensures that personnel know how to properly use the equipment and how to respond in case of a leak.

After the inspector has reviewed the various programs and gets a sense of how the vessel is operating, he conducts a walk-through with the employer's representative of places where fish processing personnel are likely to work. During the walk-through the inspector notes any hazardous conditions and gives the employer some ideas on what can be done to correct them. The inspector also discusses working conditions with the employees. The safety inspection takes 4 to 6 hours, depending on the number of problems noted. The health inspection takes longer if sampling, e.g. noise sampling, has to be conducted. After completion of the inspection, the inspector will hold a closing conference and advise the employer of his findings. He explains what can be expected regarding a citation, the different types of violations, OSHA's policies, and gives the employer his phone number to call if there are problems or help is needed. Upon returning to the office the inspector usually sends the employer a packet of information including OSHA's standards and informational pamphlets to help the employer comply with the regulations.

OSHA does not have any specific requirements for general alarms. If OSHA does not have a specific requirement, but can show that not having one is a condition that is likely to cause serious harm or death, and it is recognized by the industry and is correctable; then, according to [redacted] OSHA can invoke Section 5(a)1 of the Act which requires that, "Each employer shall furnish to each of his employees, employment and a place of employment which are free from recognized hazards that are causing or likely to cause death or serious harm to his employees." OSHA does not have regulations that address competency of personnel that operate or manage fish processors, or that manage factories on fish processors.

OSHA does have regulations that require evacuation of vessels, but only as it relates to release of chemicals, e.g. ammonia, freon, or chlorine. OSHA examines the types of hazardous material on board to determine if there is a potential for having a release large enough to require evacuation of the vessel or emergency response. If so, then OSHA requires the employer to have a plan and to provide employee training on how to respond to those types of incidents.

Under 29 CFR 10.1200 (Hazard Communication), an employer is required to set out a written program and to train employees on the proper handling and use of chemicals, including how to respond to emergencies. OSHA verifies compliance through employee interviews on board. Under 29 CFR 10.134 (Respiratory Protection), the employer is required to develop a written

standard operating procedure for the use of emergency respirators in the event employees have to make entry into the situation described above. It also requires a written program to describe how the employer is going to comply with other OSHA requirements.

OSHA regulations also require that hard hats be worn by personnel on deck working underneath an area where a load is being moved if the employee is likely to be struck from something passing overhead.

OSHA inspectors do not give employers advance notice of arrival. Section 17(f) of the Act prohibits this ($1,000 fine or imprisonment for more than 6 months). Advance notice can only be given if it is necessary to expedite the inspection, e.g. locating the vessel, arranging transportation, etc. If advance notice is given then the OSHA inspector is required to document in the case file why notice was given, the circumstances surrounding the notice, who the notice was given to, and what impact, if any, advance notice had on the results of the inspection.

Employers can deny the OSHA inspector access to the vessel. If this occurs OSHA must obtain a search warrant. According to [redacted], the Factory Trawler Association (FTA) apparently has advised its members to deny entry to OSHA inspectors. Vessels belonging to FTA have denied entry and asked OSHA to get a search warrant. Obtaining a search warrant in Alaska is time consuming. She must prepare an affidavit stating why OSHA wants to conduct the inspection, have it reviewed by an OSHA attorney in Seattle, have it returned to Anchorage where the U.S. Attorney reviews it and presents it to the U.S. Magistrate for issuance of a court order. The process can take two weeks. According to [redacted], two weeks is too long from a practical standpoint; the vessel can be gone by the time a warrant is finally issued.

The, "Byron Amendment," (appropriation to the Occupational Safety and Health Act) prohibits OSHA from targeting fishing vessels for safety inspections. OSHA can target them for health inspections, but does not do so because problems are more safety than health related. OSHA can conduct safety or health inspections, but cannot assess penalties. On these vessels, OSHA often has problems establishing an employer/employee relationship. Fishing vessel work may be on a family or a self-contract basis. For OSHA to evoke any standard or requirement there has to be an employer/employee relationship.

The Seattle office of OSHA will conduct a "consultation" inspection at the request of the employer. Prior to this inspection an agreement is entered into between OSHA and the employer whereby the employer will agree to correct discrepancies found by OSHA. Upon completion of this inspection OSHA issues the employer a letter outlining what was found, suggested corrections, and noting that the discrepancies must be corrected. No penalties are issued, but the letter makes it clear that this "consultation" does not alleviate the employer from any future inspections that may be conducted from an enforcement standpoint.

OSHA is required under the Act to issue a civil penalty not to exceed $1,000 for all serious violations, a civil penalty not to exceed $10,000 for willful violations, and a penalty not to exceed $10,000 for repeated violations. Other than serious violations, OSHA is limited under

the Byron Amendment. It can only issue penalties if there are more than 10 violations total. In assessing civil penalties OSHA takes several factors into consideration: severity (on a scale from one to ten, with ten being death); company size (if a company employs or controls less than 100 people it is allowed an adjustment of up to 40%); history, and good faith on the part of the company.

On July 31, 1990, [redacted], the Seattle area director for OSHA, notified the Board that OSHA had terminated its investigation of AAFC regarding the sinking of the ALEUTIAN ENTERPRISE. OSHA considered the proposed Coast Guard Regulations on Uninspected Fishing Industry Vessels published in the Federal Register on April 19, 1990 to have preempted its jurisdiction regarding the hazards of cold water survival and escape from a burning or sinking vessel.

c. National Marine Fisheries Service (NMFS)

Because the ALEUTIAN ENTERPRISE was over 125 feet overall it was required to have a National Marine Fisheries Service (NMFS) observer on board at all times. On November 1, 1989, the Secretary of Commerce approved Amendments 13 and 18 to the Groundfish Fishery Management Plans for the Bering Sea/Aleutian Islands and the Gulf of Alaska areas. The regulations implementing these amendments, effective February 7, 1990, required that the owners and operators of vessels and shoreside processing facilities participating in the groundfish fishery make arrangements and pay for the cost of placing observers onboard their vessels and shoreside processing facilities.

The fishing industry is responsible for arranging and paying for the direct costs of placing NMFS certified observers aboard their vessels through independent observer contractors certified by NMFS. Certified observer contractors are responsible for recruiting observers, deployment, logistics, insuring that observers have been NMFS certified, insurance and employee benefits and delivery of observer data to NMFS. Because of the shared responsibilities, the observer program is a cooperative effort among NMFS, industry, and observer contractors.

NMFS is responsible for overall program administration, training and certification of observers, contractor certification, coordination of levels of observer coverage, final trip debriefing of observers, logistics, and management of the data collected. Observers who meet the basic experience and educational qualifications established by NMFS, and are hired by contractors to be placed aboard domestic vessels in Alaska, are required to successfully complete a two and a half week training certification program conducted by NMFS at the Alaska Fisheries Science Center, Seattle, Washington prior to being placed aboard a domestic vessel.

The vessel owner's responsibility includes maintaining safe conditions on the vessel for the protection of the observer during the time the observer is on board, by adhering to all U.S. Coast Guard and other applicable rules, regulations, or statutes pertaining to safe operation of the vessel, and by keeping on board the vessel: adequate firefighting equipment; one or more liferafts capable of holding all persons on board; and any other equipment required by

regulations pertaining to safe operation of the vessel.

To be certified by NMFS to provide observer services a contractor must either hold a contract with NMFS to provide observer services through federal funding, or must submit a work plan judged as adequate by NMFS. The purpose of the certification process is to provide observers who will obtain and provide NMFS with data on the catch of groundfish, the catch and mortality of prohibited species and marine mammals, and other fisheries data required for stock assessment, research and management.

Contractors are advised by NMFS that the obvservers' work is conducted in a difficult and hazardous environment, and that commercial fishing was rated as one of the most hazardous occupations in the U.S. They are also told that the work requires strenuous physical activity which includes frequent lifting of heavy baskets of fish (60–85 lbs.) and long working hours. The nature of the job is also mentally stressful due to the confined living and working spaces and the different objectives of the observer and crew aboard the vessel.

Contractors must provide individuals who are physically capable of performing the work, and are mature and capable of working independently without direct supervision under stressful conditions. Additionally, they are informed that vessels operate in remote areas of Alaska where trained medical help and facilities are not easily nor immediately available. Due to physical and mental demands of the job, all observers should have passed a physical examination within the past 12 months to certify that there are no health problems or conditions which would jeopardize the observer's safety while at sea or prevent the observer from satisfactorily performing his/her duties. To accomplish this, the certifying physician must be made aware of the dangerous, remote and rigorous nature of the work at sea prior to the observers examination.

On December 22, 1989, [redacted] applied through the Oregon State University's domestic and foreign fishing vessel observer program. Oregon State University is one of seven NMFS certified contractors for the 1990 domestic Alaskan groundfish observer program. On January 1, 1990 he accepted an offer for employment with training scheduled for the two an a half week course commencing January 22, 1990. The training [redacted] received included safety and survival aspects. [redacted] of the Alaska Fisheries Science Center, was the instructor for the course [redacted] attended in January. The course included a slide show on Alaskan ports, safety in boarding and disembarking vessels, life at sea, and hazards. Day 10 of the training program was entirely devoted to safety, including – North Pacific Fishing Vessel Owner's Association safety videos and lectures on hypothermia, medical emergencies at sea, fire control and sea and shore survival, medevacs, radiotelephone procedures and preparation of a medical diagnostic chart, checkout of survival suits, and survival suit and liferaft water practice. Students were required to don survival suits in the dark. They were timed. Students jumped off a dock with the suits on, entered the water, swam 100 feet and boarded a liferaft, disembarked and climbed back on the dock using a ladder. About 45 observers attend this training each month.

After the first few days of training in which [redacted] discusses some of the problems and dangers associated with working on board commercial fishing vessels, she gives the students an

opportunity to leave the program. In a class of 40 students one or two usually leave. [redacted] runs through a scenario where the observer is working in the factory, he or she hears some strange noises, the vessel seems to be listing, and the lights go out. Tieg asks her students what they would do. Through this scenario she hopes to encourage them to always have in their pocket a flashlight to aid in evacuating the area and get out on deck. She also encourages them to run through this scenario in their mind and to do, "visualization techniques, what would I do if – so that escape routes become instinctive rather than something you're trying to figure out in a panic."

Upon reporting onboard, the observer presents a, "letter of introduction," prepared by NMFS, to the captain of the vessel. The letter explains the purpose of the observer program and the duties of the observers. The letter states, in part, "I specifically request that you discuss and explain your vessel's safety and emergency procedures with them and identify the procedures which should be followed in the event of a vessel emergency. Please indicate the dangerous areas aboard your vessel and the location of safety and emergency equipment, e.g. lifeboat stations, location of life vests, emergency exits from the factory or living quarters, etc."

Captain Siemons did not recall seeing the letter of introduction nor did he recall discussing and explaining the vessel's safety and emergency procedures with [redacted]

NMFS provides each observer with equipment to perfrom his job. Included in this package is a lifevest and survival suit. Captain Siemons could not recall if [redacted] brought a survival suit on board the ALEUTIAN ENTERPRISE.

Observers can refuse a trip if they feel the vessel is unsafe. Since there have been some recent disasters and near disasters, observers have been scrutinizing prior observer reports with emphasis on any safety comments noted. If they feel nervous about what the previous observer has reported they may refuse to go aboard.

In addition to providing training to observers, NMFS administers the 800 million dollar Fisheries Obligation Guarantee (FOG) Program, Title XI program. The rules governing this program (50 CFR Part 255) guarantee financing for fishing industry vessels and fisheries shoreside facilities under the provisions of Title XI of the Merchant Marine Act, 1936 (46 USC 1271–1279), as amended by the American Fisheries Promotion Act (Pub. L. 96–581). The purpose of the FOG Program is to make long–term financing available to the U.S. fishing industry by providing a U.S. government guarantee of repayment of the debt portion of fishing vessel and shoreside facility construction.

Among other things, the rules require that all vessels are continuously insured during the term of the program, and inspected and approved before financing is provided. If the guarantee is for more than $500,000, the program may require an inspection and approval by certified architects or engineers. The required property inspection and approval involves assessment of at least: adequacy of workmanship; fitness and sufficiency for the intended purpose; reasonableness of cost; compliance with basic contract specifications regarding property; and the identification and recommended resolution of any significant deficiencies. The program may require American

Bureau of Shipping (ABS) classification requirements for program guarantees involving more than $5,000,000. Applicants are urged to consider voluntary use of the ABS classification program for the construction of fishing industry vessels costing over $5,000,000. Under the program vessels are financed for a period of about 15 to 25 years at interest rates one to two percent below market rates.

Vessels and facilities must be inspected at least once every three years by a competent and impartial authority acceptable to the program. NMFS typically finds this a requirement of insurance. A full inspection report, identifying deficiencies and recommending the action necessary for their correction must be provided to the obligator and to the program. Failure to provide this triannual inspection or correct deficiencies identified by it, will constitute a default of the terms and conditions of the mortgage securing the program's guarantee and cause, at the program's discretion, for acceleration and liquidation of the debt obligation.

The program requires vessels to comply with federal regulations. There is no policy on the competency of shipboard personnel other than the general requirement that the vessel meet all federal requirements.

Nineteen of the vessels managed by AAFC have Title XI financing through the program. In the Seattle Region the guarantee loans portfolio consists of approximately 200 loans of which 85-90% comprise small (30' to 100') vessels. Their loan portfolio consists of less than 20 fish processors; (vessels greater than 100') most of these are managed by AAFC. AAFC has approximately $90,000,000 in guaranteed financing under the FOG Program. The ALEUTIAN ENTERPRISE was not one of these vessels. According to [redacted] President and Chief Executive Officer of AAFC, this was because the vessel went into service before AAFC participated in the program.

15. VOLUNTARY STANDARDS

a. Voluntary Standards for Fishing Industry Vessels

In 1984 in response to the poor safety record of uninspected commercial fishing vessels the Commandant of the Coast Guard proposed a fishing vessel safety initiative to the Secretary of Transportation to reduce the number of casualties. The program was approved by the Secretary and became one of the Secretary of Transportation's safety initiatives. To develop the initiative, the Commandant formed a Fishing Vessel Safety Task Force. After visiting a number of port areas and soliciting advice and recommendations from industry representatives, government agencies and other Coast Guard personnel, it was determined that a voluntary program dealing with vessel standards and crew safety awareness was needed and could be effective in improving safety.

The vessel standards program took the form of U.S. Coast Guard Navigation and Vessel Inspection Circular (NVIC) No. 5-86 dated August 18, 1986 entitled, "Voluntary Standards for U.S. Uninspected Commercial Fishing Vessels." NVIC 5-86 was originally presented as five

separate proposed NVICs (NVIC 5–85 thru 9–85) in order to give industry a chance to comment on them before they were combined and finalized in NVIC 5–86. The five separate proposed NVICs were distributed to over 230 individuals, groups and organizations throughout the U.S. who had an interest in fishing vessel safety. These groups included safety consultants, marine surveyors, naval architects, insurance underwriters, fishing vessel owners' associations, boat builders, fisheries unions, personnel associated with the National Oceanic and Atmospheric Administration Sea Grant program, and the National Marine Fisheries Service. Other methods used to disseminate this information included Fish Expo 85', industry sponsored fishing vessel safety seminars and conferences throughout the country, Federal Register Notice, and articles in industry periodicals.

NVIC 5–86, which was intended to be used as guidelines on board fishing industry vessels, was compiled using various recognized sources, e.g. classification society rules, American Boat and Yacht Council's Safety Standards for Small Craft, as well as from feedback received from persons having an interest in fishing vessel safety. It focused on the technical aspects of fishing vessel design, construction, and equipment, e.g. stability, radio and shipboard navigation equipment, fire safety measures, lifesaving equipment and protection of the crew, hull design and construction, arrangement, maintenance and repair, machinery installations, electrical installations, and pollution requirements.

The safety awareness and education program was pursued by the Coast Guard with the North Pacific Fishing Vessel Owners' Association (NPFVOA). A looseleaf "Vessel Safety Manual" was published with chapters paralleling the vessel standards. It is illustrated with pictures and diagrams in a format tailored for fishermen. The "Vessel Safety Manual" was designed to be a ready reference guide for captains and their crews operating a variety of vessels in different fisheries nationwide. The manual was also designed so that fishing vessel owners, operators, and captains could adopt the principles to establish safety practices on board their vessels.

The "Vessel Safety Manual" in combination with NVIC 5–86 gave the fishing industry the framework necessary to develop and implement safety programs on their own. NVIC 5–86 coupled with the "Vessel Safety Manual" and private industry training courses, provided the commercial fishing industry with an overall fishing vessel safety enhancement program that could significantly improve its safety record by reduction in the number of injuries and loss of lives and vessels.

AAFC purchased "Vessel Safety Manuals" and distributed a copy to each of its vessels. The ALEUTIAN ENTERPRISE had a manual on board. AAFC officials either could not recall seeing NVIC 5–86 or did not have a working knowledge of its contents. Captains [redacted] and Siemons of the ALEUTIAN ENTERPRISE were not aware of the NVIC.

b. Human Factors Engineering

NVIC 4-89, "Introduction to Human Factors and Engineering (HFE)" defines HFE as the specialized engineering discipline concerned with ensuring that systems (equipment and software) are designed to match the capabilities and limitations of the personnel that will operate and maintain them. HFE combines knowledge of human mental and physical capabilities and responses with traditional engineering principles and procedures to design machines and systems, such as ships, from the user's point of view. A very important part of HFE is providing more effective and safer man-machine interaction. The application of HFE to the marine industry can create work environments which ensure effective work patterns, contribute to improved personnel health and safety, and minimize factors which degrade performance or increase human error.

The HFE approach is a philosophy which attempts to design things from the user's point of view by taking into account the ordinary attributes of actual users. Consideration is given to: level of education; training which will be necessary to effectively use the system; access requirements and human physical size; physical environment; human tendencies to become bored and ineffective when performing routine tasks; and the human ability to reason inductively and make decisions in unusual circumstances.

The principal benefit of HFE is the reduction of human errors. According to NVIC 4-89, the reduction of some human errors through the application of HFE principles has the potential of creating cost savings well worth the investment. Direct results will be increased productivity, reliability and operator usability (i.e., minimization of training and manpower costs). In addition to reduction of human error, the Naval Research Advisory Committee has estimated that including human elements in the initial design phases of ships and equipment could improve their effectiveness and availability by 30%, survivability by 15% and reduce the number of casualties by 10%, while reducing personnel by 20%. In addition to increasing efficiency and safety, use of HFE principles will improve living and working conditions aboard ship.

The discipline of HFE is composed of several individual concentrations or elements, which cover a broad spectrum of physiological and psychological concerns: human engineering – the application of human physiology and psychology to the design of equipment, work stations, consoles, controls, displays, software, and the complete system or facility; biomedical engineering – the application of biological and medical knowledge on design to promote the health, safety, protection, sustenance, escape, survival, and recovery of personnel under normal and emergency conditions; manpower/personnel concern – the identification of predicted and/or acceptable range of human characteristics and the required number and skills of personnel needed to install, operate, and maintain equipment, systems, or facilities; training requirements – the development of curriculum and related instructional materials, specific essential training aids, and designs threshold tests to provide competent personnel to operate and maintain the equipment, systems, or facilities; publications /documents – the operating and maintenance documentation that is appropriate for the expected users; and test and evaluation – the verification that users are equipped with the appropriate instructions, tools, and documentation, and can effectively and safely operate and maintain the equipment, systems, or facilities within the full range of expected operating environments.

c. Stability Tests

NVIC 15-81 provides the marine industry and Coast Guard personnel with a basic understanding of the various aspects of a stability test in order to insure that valid stability test results are obtained at minimal cost to both industry and the government.

This Circular expanded upon an earlier NVIC by including some basic naval architectural theory regarding stability tests. It was felt that with this background, both Coast Guard and industry personnel will have a better understanding of what factors influence the results of a stability test and will be better able to recognize unacceptable conditions or procedures when they occur. This opportunity was also taken to update some of the details contained in the previous NVIC to better reflect current practices and techniques. Included in NVIC 15-81 are recommendations on surveying the vessel prior to inclining to identify all items that need to be added to, removed from, or shifted on board the vessel to take it from the condition at the time of the test to the lightship condition. It also contains recommendations concerning determining the condition of the vessel, e.g., tankage, mooring arrangement, list and trim, test weight, and pendulums. Regarding pendulums, NVIC 15-81 recommends that three be used to allow for possible bad readings at any one pendulum station.

NVIC 15-81 was written as a guideline for inclining vessels that are required to have stability letters issued by the Coast Guard. Although it was not written specifically for uninspected fishing industry vessels, it is referenced in NVIC 5-86 as the recommended standard to follow for fishing vessel inclinings.

16. MARINE INSURANCE AND CASUALTY REPORTING

The ALEUTIAN ENTERPRISE had three types of insurance coverage; hull and machinery, protection and indemnity (P&I), and cargo. [redacted] Executive Vice President and Secretary at AAFC arranges the placement of insurance for all AAFC vessels. He also works with lending institutions to obtain long and short-term credit. [redacted] is on the Board of Directors at AAFC, is a Vice President at AAS and holds positions in other subsidiary corporations of AAFC.

[redacted] commented that the insurance crisis experienced several years ago no longer exists. He contrasted the current climate with respect to insurance premiums with what it was several years ago. "With respect to the hull and machinery I think that's the focus of several years ago when the premiums shot up. That was a result of insurance companies writing numerous vessels at a very low premium base and suffering large losses. They wanted to recoup some of their losses; therefore, they raised the premiums or the rate on the vessels and then held those until such time as they had recouped some of their losses."

He described AAFC's business relationship with the hull and machinery insurance carriers, "Normally on a hull and machinery renewal you try and develop a continuity with your

insurance carrier, i.e. you stay with them through thick and thin. Insurance companies may establish a percentage base [a percentage of the premium base]. . . . If you remain below this in terms of losses, then eventually they are going to lower the rate because they are making a profit on you. If they do not then other insurance companies will offer you a better deal because of your loss record. From that standpoint you know exactly where you stand when it comes time to renew the hull and machinery policy. If your losses exceed your premiums over this period of time that you dealt with these people then you can expect rates to go up. They might charge you a twenty-five percent raise following a loss for a year. Once they have recouped some or all of their loss then the rate will go back down with respect to the hull and machinery premiums."

According to [redacted] President of Northern National Insurance Brokers, Inc. there is limited tonnage in the market right now, and has been for about three years, which has increased competition among insurance companies for customers. This has resulted in reduced rates (30 to 40%) for both hull and machinery and P&I.

Regarding P&I insurance, [redacted] used an example where the P&I underwriter allocates 55% of each premium dollar to cover payment of claims, the remaining 45% covers administrative expenses and repurchasing of insurance. If losses are at or below 55% then he would expect the insurance rate to remain unchanged. If losses fall well below the 55% level then he would expect the insurance rate to go down. The latter situation is also dependent upon the overall performance of other members of the association. On behalf of AAFC, he meets with insurance representatives each year and works out their renewal premiums for the coming year based upon the previous years claims.

AAFC vessels are guided by a set of insurance rules established by the underwriters. In the case of P&I insurance, a separate certificate, referred to as the "Certificate of Entry", is issued to each vessel. It lists the vessel owners, the period of time the vessel is covered and any waivers or substitutions of the class rules. For the ALEUTIAN ENTERPRISE Rule 23 requires that, "Unless the directors otherwise agree, every entered ship must be maintained in the highest class with a classification society approved by the managers or if the ship has never been classed, it must have a valid certificate of inspection given by the Coast Guard." The insurance company deemed that the Certificate of Documentation satisfied this rule. According to [redacted] Vice President and Marine Manager of Alexander and Alexander of Washington, Inc. (P&I insurance brokers for AAFC), Rule 23 requires vessels that were classed by a classification society to be maintained in class; it does not require vessels to be classed as a condition of insurance. French stated that Liverpool and London P&I Association was well aware of the status of AAFC vessels.

When asked if an unclassed or uncertificated vessel (a vessel which does not have a certificate of inspection issued by the U. S. Coast Guard) would present more of a risk French stated, "There would be two schools of thought on this, particularly for the hull people. We've just been through this on another vessel. When you have a classed vessel and you have a hull casualty, not a major one for example, it costs underwriters typically more to have it repaired. That's the thinking of some of the underwriters because some of the cosmetics and things have to be a little better as I understand it. It doesn't mean that the repairs aren't as good, but to keep it classed it's

going to cost the underwriters a little more money. And I'm not an underwriter. That's what I hear from some of them occasionally. But yes, it's typically a plus to be classed."

French said that P&I Insurance is similar to the liability portion of an auto insurance policy. It essentially covers loss of life, injury and illness of the crew and to third parties, collision damage, pollution liability, and legal fees, etc. P&I rules do not require vessels to be surveyed, nor do they require that captains and engineers have certain qualifications. The insured is not required to notify him regarding machinery failures, loss of power, or vessel groundings since that would be covered under the hull and machinery policy. The P&I club does not require the insured to have a safety program.

Typically cargo insurance underwriters do not place any requirements on the vessel. Seaworthiness is admitted. They do ascertain the history of past losses, the modes of transportation involved, e.g. land, sea and air, in shipping the cargo, and if transshipment using other steamship lines is used they want to know which ones.

[redacted] provided hull and machinery insurance for AAFC and its predecessor since 1985. During that period the requirements for the policy have not changed. [redacted] stated that the policy does not require stability reports, hull surveys, or crew qualifications and training. He did not suggest to AAFC that it assemble any safety program to reduce the number of claims. Insurance companies have not encouraged vessel owners to use the "Vessel Safety Manual" produced by the North Pacific Fishing Vessel Owners' Association. [redacted] had not seen the Coast Guard's voluntary standards for fishing vessels (NVIC 5–86).

[redacted] receives a copy of survey reports and had two on file for the ALEUTIAN ENTERPRISE. He receives a copy so that he can give the underwriters a copy if requested. He did not remember whether the underwriters for ALEUTIAN ENTERPRISE had asked for a copy. Upon receipt of a survey report he checks to see that the recommendations (if there were any) have been complied with. He would accomplish this by asking [redacted] or [redacted] the surveyor.

The August 1987 survey report closed with, ". . . this vessel will be a good insurable risk after recommendations have been complied with." When asked whether the two recommendations made on the survey report were completed he stated, "I would assume they had been complied with, yes." [redacted] did not make any notations on his file copy or anywhere else as to whether they were completed, when, or by whom. When asked whether he would renew the insurance policy if these two recommendations were not corrected he stated, "Yes . . . they're minor recommendations in this particular instance." When informed that one of the recommendations required the installation of remote shut downs in case of fire, [redacted] stated that he would have renewed the policy even if the remote shut downs were not installed. He would not have consulted with anyone in determining whether completion of these recommendations was necessary as a condition of renewal. [redacted] noted that it was normal for the insured to take care of the recommendations as soon as they were issued. He assumed these recommendations were corrected, but he didn't know for sure.

Upon receipt of a report of damage to machinery or equipment, [redacted] would probably give it to [redacted], Vice President of Operations. He ([redacted] would not be the first person to be notified of any machinery or equipment damage on board AAFC vessels. If [redacted] received notification of an accident he would notify [redacted] verbally. "If we deemed it necessary, we would so notify the insurance broker who in turn would notify the insurance underwriter to put them on notice that we may have a hull or machinery claim." Anytime an individual is injured an injury form must be completed by the injured party, the captain, and a witness, and then sent to AAFC in Seattle. The insurance broker is notified of all injuries; either [redacted] or his representative would notify the P&I association directly.

In July/August of 1988 the ALEUTIAN ENTERPRISE was drydocked to repair bottom damage due to a grounding in Kodiak, Alaska, and starboard bow damage from hitting the dock in Dutch Harbor. [redacted] first found out the vessel had grounded when it was in drydock. The captain on board the ALEUTIAN ENTERPRISE at the time of the grounding was demoted for not reporting the grounding to AAFC. The captain who was onboard when the vessel hit the dock in Dutch Harbor was also demoted.

The damage that resulted when the vessel hit the dock was less than $25,000. [redacted] was aware of the 1988 grounding. He believed that AAFC verbally reported it to the insurance company. He did not investigate the cause of the grounding. [redacted] kept the insurance broker informed as to the dollar expenditures on the repair to the vessel. When it was determined that the cost of repairs would probably not exceed the $100,000 deductible, AAFC notified the broker that a claim would not be submitted. The insurance broker did not conduct an investigation into the cause of the casualty nor was a report made to the U. S. Coast Guard on Form CG-2692.

[redacted], the fleet maintenance manager at that time, observed that the BERING ENTERPRISE, another AAFC operated fish processing vessel, was drydocked in Seattle for bottom damage due to a grounding. A search of files in the Coast Guard Marine Safety Information System failed to produce any record of the groundings of the ALEUTIAN ENTERPRISE and BERING ENTERPRISE.

[redacted] was notified verbally by [redacted] of the 1988 grounding of ALEUTIAN ENTERPRISE. [redacted] asked [redacted] how serious it was and recalled that [redacted] did not expect the claim to exceed the $100,000 deductible. He was later advised by [redacted] that it would not exceed the deductible. [redacted] believes he did not report this accident to anyone else, e.g. the underwriters, since it did not exceed the deductible. He said this is standard practice in the insurance industry. Even if the grounding was caused as a result of negligence, machinery or equipment failure he would not notify the underwriters if the claim did not exceed the deductible.

The damage survey report completed by [redacted] following the 1988 grounding did not contain a statement as to whether the ALEUTIAN ENTERPRISE was a "good insurable risk." When asked if he considered the vessel still a good and insurable risk following the shipyard repairs [redacted] stated that he assumed the surveyor approved the repairs and if he did not he would rely on the insured (AAFC) to advise him of this.

[redacted] was not aware of the February 25, 1990 loss of power and flooding incident on the ALEUTIAN ENTERPRISE. When asked if he would want to be notified of this type of incident he stated, "Again, it depends on how serious it was." When asked if even if it did not exceed the deductible, but was indicative of a potential future problem or could have affected the seaworthiness of the vessel would he be interested. He stated, "I certainly would be interested, but it would be up to the assured to advise me if he felt it necessary." The Coast Guard had no record of the flooding incident on file.

[redacted] was familiar with the Coast Guard's attempt to convince the insurance industry to support fishing vessel safety. He stated that the Coast Guard's efforts did not result in changing the way the insurance industry conducted business. When asked if the insurance industry would reduce premiums if a company had an established safety program, or had licensing requirements, or had its vessels classed by ABS, he commented that they would only receive a reduction if loss ratios improved. He expected that safety regulations would or should decrease the number of injuries which in turn would reduce premiums; therefore, training programs, increased standards, etc. alone would not result in reduced premiums unless accompanied by reduced casualty rates.

French recalled seeing the Coast Guard's voluntary standards for fishing vessels (NVIC 5-86) and the "Vessel Safety Manual" published by NPFVOA. He did not get involved at all in the use of these standards from an insurance standpoint. French was familiar with the Coast Guard's efforts to get insurance companies to accept and adopt the voluntary standards. When asked to discuss his knowledge of these efforts he stated, "Yes, I am a bit familiar with that, that they made an attempt. But you have to realize that the insurance companies, marine and otherwise, cannot act in concert on anything and they're afraid to do so because there are antitrust people looking for them to collude, and it's considered collusion by some of the attorney-generals of the United States, and they're afraid to even meet for a cocktail, believe me. They have a hard time with that." French stated that companies may be treated more favorably by P&I underwriters if they have a training program; he knew that AAFC had a training program. French could not recall whether the fact that AAFC had a training program entered into the discussions with the underwriters during renewal.

17. REGULATORY INITIATIVES

a. Commercial Fishing Vessel Industry Safety Act of 1988 On September 9, 1988, Title 46 USC, was amended in Chapter 45 (Uninspected Commercial Fishing Vessels, Sections 4501 through 4508) by the Commercial Fishing Industry Vessel Safety Act of 1988, Pub. L. 100-24. This chapter, as amended, is applicable to all U.S. uninspected commercial fishing vessels, fish processing vessels, and fish tender vessels, except fish processing vessels of more than 5,000 gross tons and fish tender vessels of more than 500 gross tons since they are subject to inspection under 46 USC 3301(11) and (12). It does not apply to vessels engaged solely in sport fishing that are subject to inspection under 46 USC 3301(8) as small passenger vessels and are regulated under 46 CFR Subchapter T, or to vessels carrying 6 or less passengers which operate as

uninspected passenger vessels regulated under 46 CFR Subchapter C, Part 25. Vessels that alternate between commercial and sport fishing must comply with the requirements for the service in which they are engaged.

b. Advisory Committee The Act required formation of a 17 member Commercial Fishing Industry Vessel Advisory Committee. The Executive Secretary of the Committee was appointed by the Secretary of Transportation, and the Federal Advisory Committee Act applies to the Committee. The Committee terminates on September 30, 1992. A solicitation for membership on the Committee was published in the Federal Register on September 23, 1988 (53 FR 37075). That solicitation also explained the constituency of the Committee. [redacted] Government Relations Representative for AAFC, is a member of the Commercial Fishing Industry Vessel Advisory Committee.

c. Safety Regulations

The Act required the Secretary of Transportation to prescribe regulations for certain safety equipment and vessel operating procedures. The Act also required the reporting of casualties to commercial fishing industry vessels by insurers, reporting of injuries by seamen on board commercial fishing industry vessels, and collection of casualty information by the Secretary.

For all vessels the Act required regulations be developed concerning: fire extinguishing equipment; life preservers; backfire flame arrestors for gasoline engines; ventilation of enclosed spaces; visual distress signals; buoyant apparatus; alerting and locating equipment, including EPIRBs; and placards informing seamen of the duty to report injuries.

For vessels that are documented and operate beyond the boundary line prescribed in 46 CFR, Part 7, or are documented and operate with more than 16 individuals on board, the regulations developed should also include: alerting and locating equipment including EPIRBs; lifeboats or liferafts; an immersion (survival) suit for each individual on board; radio communication equipment; navigation equipment including compasses, radar reflectors, nautical charts, and anchors; first aid equipment; and any other equipment required to minimize the risk of injury.

For vessels that are built after, or which undergo a major conversion completed after the effective date of the regulations and operate with more than 16 individuals on board, the regulations developed should also concern: navigation equipment, including radars and fathometers; life saving equipment, immersion suits, signaling devices, bilge alarms, bilge pumps, life rails and grab rails; fire protection and firefighting equipment; use and installation of insulating material; storage of flammable and combustible material; and fuel, ventilation, and electrical equipment.

The Act also addresses a major operational problem encountered by commercial fishing industry vessels by requiring regulations for operational stability. The Act stated that those regulations

are to apply to all vessels that are built, or are substantially altered in a manner that affects operational stability, after December 31, 1990.

The Act also required that in developing regulations, the Coast Guard shall consider the specialized nature and economics of the operations and the character, design, and construction of commercial fishing industry vessels; and may not require the alteration of a vessel or associated equipment that was constructed or manufactured before the effective date of the regulation.

Concern for the size and complexity of fish processing vessels was recognized by the Act. All fish processing vessels are to be inspected at least once every two years to ensure compliance with the regulations developed in response to the Act. Fish processing vessels that are built after or undergo a major conversion completed after July 27, 1990, must meet the survey requirements of and be classed by ABS or another similarly qualified organization accepted by the Coast Guard for that purpose.

An Advanced Notice of Proposed Rulemaking (ANPRM) was published in the Federal Register on December 29, 1988 (53 FR 52735) addressing potential requirements for uninspected fishing vessel, fish processing, and fish tender vessels. In response to that ANPRM nearly 200 comment letters were received. Each of the comment letters was considered in developing the Notice of Proposed Rulemaking (NPRM). A NPRM implementing the provisions of the Act, was published in the Federal Register on April 19, 1990 (55 FR 14924).

The Commercial Fishing Industry Vessel Advisory Committee met three times to discuss implementation of the Act and development of the regulations. The Committee discussed a myriad of topics dealing with implementing the Act including several drafts leading to the NPRM.

The basic form of proposed the regulations resulted from Committee recommendations. To a large extent the content and level of detail of the NPRM was based upon comments generated by the Committee in response to general discussions at the three meetings and review of the drafts.

The NPRM stated that although commercial fishing industry vessels are uninspected vessels, the Coast Guard will continue to do underway law enforcement boardings. Additionally, an uninspected commercial fishing industry vessel dockside boarding program is being contemplated as an aid in implementing rules, helping to educate industry personnel on the provisions of the regulations, and to ensure safety on these vessels. The Coast Guard is also considering: issuing a distinctive decal to identify vessels that have been boarded and found to be in compliance; authorizing accepted classification societies and accepted organizations, as well as the Coast Guard Auxiliary for small commercial fishing vessels to conduct voluntary safety examinations.

The Board commented on the proposed rules in a letter to Commandant (G-LRA) dated September 10, 1990.

d. Licensing and Inspection Reports

The Commercial Fishing Industry Vessel Safety Act (Pub. L. 100–424) requires the Coast Guard to submit to Congress a plan for licensing operators of documented fishing, fish processing, and fish tender vessels.

On December 19, 1989, the Coast Guard published in the Federal Register (54 FR 51964) a notice that invited public comments to identify alternatives for licensing operators of commercial fishing industry vessels. This effort is directed solely towards the commercial fishermen, not vessels upon which they serve. It is intended to improve the overall safety of commercial fishing industry vessels. On July 2, 1990, the Coast Guard also published in the Federal Register (55 FR 27325) a notice of public meetings to permit the public to orally present views on licensing, suggest alternative actions, and provide supportive information for their positions.

The Act (Pub. L. 100–424) requires the Secretary of Transportation, utilizing the National Academy of Engineering and in consultation with the National Transportation Safety Board, the Commercial Fishing Industry Vessel Advisory Committee, and the fishing industry to conduct a study of the safety problems on fishing vessels, and make recommendations regarding whether a vessel inspection program should be implemented for fishing, fish tender, and fish processing vessels, including recommendations on the nature and scope of inspections. The study and recommendations are to be submitted to Congress before January 1, 1990.

The Act (Pub. L. 100–424) also requires the Coast Guard in consultation with the Commercial Fishing Industry Vessel Advisory Committee, and with representatives of persons operating fish processing vessels to conduct a study of fish processing vessels that are not surveyed and classed by an organization approved by the Secretary of Transportation. The report is to make recommendations regarding what hull and machinery requirements should apply to fish processing vessels that are not surveyed and classed by an organization approved by the Secretary of Transportation to ensure those vessels are operated and maintained in a condition in which they are safe to operate at sea. The study and recommendations are required to be submitted to Congress before July 28, 1991.

18. VESSEL STABILITY

a. Trim and Stability Report

The original Trim and Stability Report for the ALEUTIAN ENTERPRISE was similar in format to the report that was aboard the vessel at the time of the casualty. It had been developed in 1984 by Guarino and Cox, Naval Architects of New Orleans, Louisanna. It consisted of a stability test summary, vessel particulars, twelve pictorial load conditions, recommendations for operation, and a plot of the maximum allowable metacentric height (GM) over a range of drafts and trims. Allowable GM curves were generated for 0, 1, and 3 feet of trim by the stern using the Intergovernmental Maritime Organization (IMO) stability criteria for fishing vessels. GM values for the twelve loading conditions presented in the report exceeded the allowable minimum GM required by the stability criteria.

In 1987 AAFC retained [redacted], Naval Architect and Marine Engineer of Seattle, to revise the stability instructions because the freezer holds had been extended, a ballast tank had been converted to a fuel oil tank and other structural changes had been made. [redacted] conducted an inclining of the vessel at Marco Shipyard and prepared the new Trim and Stability (T&S) Report dated August 1987. It consists of a table of contents, list of general particulars, inclining data, tank capacity table, 13 sample load conditions with diagrams and righting energy evaluations, and recommendations for loading and operations. Appendix 1 of [redacted] report was a copy of IMO Resolution A.168, "Recommendation on Intact Stability of Fishing Vessels", which was used in preparing the report. [redacted] stated that he produced a stability letter that he believed had been posted in the pilothouse. Captain Siemons testified that the August 1987 T&S Report was in the pilothouse, but he never saw a stability letter on board the ALEUTIAN ENTERPRISE.

Page 9 of the T&S Report was a summary of the lightship calculation. The vessel was equipped for fishing at the time of the 1987 inclining; many weight items which are normally not included in lightship were aboard. No attempt was made to remove them from the vessel. [redacted] estimated the weights to be removed for lightship and added each of those same weights back in each load condition as "gear." The starboard fresh water tank was pressed up at the inclining, but was not deducted in the lightship calculation.

[redacted] testimony, and notes taken during the inclining, indicated what was and was not included in lightship. Lightship included spare parts, tools, portable machinery, and galley equipment below decks along with trawl doors on the transom and a spare set of trawl doors stowed just aft of the port trawl winch. It included all twine, shackles, hammerlocks, blocks, G-hooks, tools and other equipment stowed in the permanent deck lockers. Finally, it included the cable on the trawl winch reels at the time of the inclining and one anchor with chain. It did not include the skiff and motor, nets, ground gear, floats, spare panels, spare cable, and spare parts not stowed in lockers.

In evaluating the vessel's stability [redacted] assumed watertightness up to the fishing or trawl deck that he called the "true shelter deck". He testified that a down flooding point ". . . would be like an air intake to the engineroom or a vent of some sort . . ."

[redacted] could not remember the details of the openings in the processing deck at the 1987 inclining, but testified that it's one of the details he checked. He said that he's always careful to ensure they have non-return valves or flappers and that he would have told [redacted] if they were missing. He admitted that the vessel would have been required to be more watertight if it had a loadline; he would have required positive means of closure for flappers which are only one foot above waterline, but not for those that were two feet above. Alternatively, [redacted] would have redefined hull lines down to the processing deck if non-weathertight openings were present. He would also have included the effect of free surface water on the processing deck in his stability analysis.

[redacted] the former lead captain on ALEUTIAN ENTERPRISE, said that the chute openings were originally fitted with metal flappers which could be locked down with a steel screw. According to [redacted] "The screw is sitting there. You just turn it down . . . if you took a real

heavy list and couldn't get rid of it [the list], I guess you'd close them so you couldn't get any water come aboard there."

[redacted] hadn't looked at the discard chute flappers since 1986 when one of them jammed shut. He never operated those screws, nor did he ever see anybody else try it. [redacted] the assistant engineer, said there were no securing devices for any of the flappers on the processing deck.

The sample conditions of loading, pages 11 through 43, comprised the bulk of the T&S Report. The instruction for using these sample conditions was in a single paragraph on page 44. It stated, "These can be used by the Master to assess the trim and stability characteristics of ALEUTIAN ENTERPRISE in any reasonable loading he may consider . . . For each of the loading conditions, the vessel's stability characteristics have been found to exceed the minimum recommendations for fishing vessel stability established by the Intergovernmental Maritime Organization (IMO)." The conditions presented were:

Condition 1: lightship,

Condition 2: departure for Alaska – 100% consumables (non–icing),

Condition 3: commence fishing – 100% consumables/codend on deck (non–icing),

Condition 3a: commence fishing – 100% consumables/nets and doors out (non–icing),

Condition 4: commence fishing – 50% consumables/codend on deck/hold empty (non–icing),

Condition 5: commence fishing – 50% consumables/codend on deck/hold empty (icing),

Condition 6: fishing – 50% consumables/codend on deck/hold almost full (non–icing),

Condition 7: fishing – 50% consumables/codend on deck/hold almost full (icing),

Condition 8: fishing – 10% consumables/codend on deck/hold almost full (non–icing),

Condition 9: fishing – 10% consumables/codend on deck/hold almost full (icing),

Condition 10: arrival at port – 10% consumables/hold full (non–icing),

Condition 11: arrival at port – 10% consumables/hold full (icing),

Condition 12: arrival at port – 10% consumables/hold empty (icing).

No unsafe conditions were presented. A righting arm curve and table listing the righting energies, maximum righting arm characteristics and GM values compared to the values recommended by the IMO criteria was provided for each load condition. In each case, the actual values of GM exceed the IMO recommended values by at least one foot of GM. Drake testified that there was a considerable margin of safety on the ALEUTIAN ENTERPRISE in all conditions. [redacted] Vice President of Vessel Operations, stated that Drake would have taken the completed T&S Report directly to the vessel. No one in the company would have checked it.

[redacted] said that he reviews GM "margins" with fishing industry vessel captains for each load condition. He feels that captains cannot use allowable Vertical Center of Gravity (KG) curves. If there is a case of loading that is unsafe, it would be pointed out in the book and explained to the captain. He could not remember reviewing GM margins with the ALEUTIAN ENTERPRISE captain. He has never advised owners on the training requirements for captains to use the T&S Report.

All the conditions of loading show the fresh water tanks 100% full. Each condition has at least 17 percent fuel capacity and 81.48 long tons of cargo in the holds. This occurs even when the title indicates "10 percent consumables" or "hold empty". None of the conditions have a free surface moment calculated for more than one set of fuel tanks.

Each condition shows the same set of weights for "wire on the forward reels", "gear on upper deck", "gear on fo'c'sle deck", and "gear on aft gantry"; this corresponds to the estimated weight of items in those locations at the time of the inclining. Drake was told by a representative of AAFC that the vessel used a 25 ton codend. [redacted] knew the ALEUTIAN ENTERPRISE used a 40–ton codend.

[redacted] said that it would be all right to use up to a 52 ton codend on ALEUTIAN ENTERPRISE except for the effect that it might have on trim. The T&S Report does not provide the captain with a way to evaluate the effect of trim on the margin of safety. [redacted] said, "Usually the amount of trim you need to adversely affect stability would be in excess of what I believe they would tolerate as a normal operating condition." When asked about the affect trim has on GM, Captain Siemons stated, "It would move it [GM] further up the deck and aft, depending on if you were on an even keel or not."

[redacted] used his own methods to calculate the freezer hold loads and the icing loads. Icing weight was 27.97 long tons. Weight items were not provided for the bleeding bins and the plate freezers on the factory deck. No condition included weight suspended from gilson winches or the crane. [redacted] wasn't aware that vessels picked up 10 to 15 five hundred pound crab pots. Even so, [redacted] commented that he would not be concerned about the added weight on ALEUTIAN ENTERPRISE.

Seven recommendations were given for loading and operating. The first instructed the operator to periodically evaluate the vessel's stability as consumable levels change or when there are, "Any other significant changes in the loading . . ." It did not provide a procedure to evaluate stability.

The second stated, "Watertight and weathertight closures should be kept closed and fully secured at all times when underway, except when actually used for passage under safe conditions." It did not itemize any particular closures.

Recommendation three noted, "Only one of the following three port and starboard fuel oil [F.O.] tank pairs may be partially filled at any one time: Bow F.O., No. 1 F.O., and No. 2 F.O." It also required that cross connections between port and starboard tanks be closed. No limitation was given for the No. 3 F.O. tanks. Free surface for No. 3 F.O. tanks in combination with a pair of the other tanks had been considered in the loading conditions.

The fourth required the bilges to be kept dry at all times.

The fifth recommended the operator to, "make every effort to determine the cause of any list of the vessel before taking corrective action." It did not suggest methods of determining the cause of a list nor did it recommend particular corrective action when the operator determined the cause of the list.

Recommendation six stated, "No permanent ballast or other such weights should be added, removed, altered, or relocated without first determining the effect on the stability of the vessel." No procedure was given for determining the effect of such a weight change.

The last recommendation required freeing ports and scuppers to be kept clear and open at all times. Since no specific openings were listed, it is unclear whether this or recommendation number 2 applied to the various chute openings and scuppers on the processing deck.

Captain [redacted] was not concerned about recommendations 2, 3, and 6, which deal with securing weathertight closures, minimizing slack tanks, and adding or removing weights. He followed recommendation 5 which involves determining the cause of a list before taking corrective action only, ". . . if it was more than 5 degrees." He said the cause was usually, ". . . fuel or loading the holds, on one side and not the other."

b. Loadline

The ALEUTIAN ENTERPRISE did not have a loadline. Fishing vessels on domestic voyages are exempt from loadlines under 46 USC 5101; however, fish processing vessels are not unless they are not more than 5,000 gross tons and were constructed as a fish processing vessel before August 16, 1974; or were converted for use as a fish processing vessel before January 1, 1983.

In the Fall of 1983 the ALEUTIAN ENTERPRISE, a crabber, was purchased by the present owners and converted to a catcher processor by extending the shelter deck aft to the stern, installing the processing and trawl systems and converting the live tanks into dry coil refrigerated storage holds. The conversion was completed in February 1984.

Fish processing vessels are not required to be classed by a classification society such as American Bureau of Shipping (ABS) in order to obtain a loadline. The requirements for a loadline as set forth in 46 CFR 42 through 47 include provisions for protecting the watertight integrity of the vessel, for providing adequate strength and stability in all loading conditions, for drainage of deck water, for protection of crewmembers performing outside tasks, and for periodic surveys by the assigning authority to check compliance.

A fish processing vessel as defined by 46 USC 2101(11b) is a vessel that, "commercially prepares fish or fish products other than by gutting, decapitating, gilling, skinning, shucking, icing, freezing, or brine chilling." In addition to heading and gutting, the ALEUTIAN ENTERPRISE filleted and boxed fish products for marketing.

AAFC executives were aware of the applicability of loadlines to fish processing vessels. In 1987 Halter Marine notified them of the requirement during the construction of the U.S. ENTERPRISE, a 224 foot fish processing vessel. According to [redacted] President and Chief Executive Officer of AAFC, "With the advice of legal counsel and with our history we have determined those vessels [AAFC fish processing vessels] to be fishing vessels. And that's been the general practice all along." He believed that in order to obtain a loadline the vessel had to be in class.

When asked about loadlines, [redacted] one time AAFC fleet maintenance manager said, "Yes, in either late May or early June of 1988 the Coast Guard came on board the U.S. ENTERPRISE while at Pier 28, and looked for a loadline certificate on the boat. I advised them it didn't have a loadline, so they were looking for the captain, the chief engineer, some officer of the vessel. And none of those people were present, but they came back with the article describing which boats need loadlines since a certain date, and I took that immediately over to the office, gave it to [redacted] and he said he would handle it. And that's the only occasion I've had with any discussions about loadlining". When asked if he knew if any of their vessels had loadlines, he replied, "No. I don't know of one that does."

The U.S. ENTERPRISE was not loadlined before it was delivered because [redacted] was informed by AAFC that it would not process fish. Following an investigation in 1988, the Commanding Officer of the Coast Guard Marine Safety Office, Pudget Sound, (Seattle), concluded that the vessel was a fish processing vessel and notified the owners of the loadline requirement. AAFC appealed the decision, which was denied by the Commandant on January 11, 1989. The U.S. ENTERPRISE did not attempt to obtain a loadline until the Coast Guard detained it in Puget Sound in April of 1990.

c. Stability Practices

Captain Siemons testified, "[The T&S Report"] shows you your tank capacities, how much fuel you can have – how much fuel is in each tank, the total consumption. And I also used this for finding out my overall stability – how much GM I have and also which angle I had the greatest amount of righting force. That's basically about all I used it for. . . . Condition 8 shows the closest loading condition to what we were in [at the time of the casualty]. It shows a GM of 3.03 feet, and it also shows the maximum righting energy happens at 40 degrees, 39 degrees, 30 to 40. And then it shows the IMO minimum as 1.15 foot for the GM, so it shows me I've got plenty of extra." Siemons never looked in the T&S Report on the last trip. He did not keep track of tank soundings – only when tanks became empty. He had no policy for sounding tanks daily.

Captain [redacted] never compared the "gear on deck" weights in the report with what was actually on board. He never removed weights to get the vessel closer to the stability report loading conditions. "I just looked through it and what I was really looking for was the icing conditions and how much ice was available to take aboard without the GM getting too high. . . . After fishing the boat for a couple – three years, you know what you can and can't do. In fact, we never found anything we couldn't do. It was stable enough to handle anything you wanted to do or anything you could do."

He would only check the T&S Report if he got, "lots of ice, something I'd never dealt with before . . . If you have ice where you aren't used – something that you didn't come across everyday, and you had a large buildup of ice, then this is the only thing that could tell you what weight you can bring aboard safely. That's what it's for . . . I never really had to refer to it because we never ran across anything like that."

[redacted] testified, "I think the greatest problem we have is the general lack of understanding of the problems concerning stability among the people that actually go to sea in the vessels." AAFC had placed copies of the North Pacific Fishing Vessel Owners' Association (NPFVOA), "Vessel Safety Manual" and safety training videotapes aboard the ALEUTIAN ENTERPRISE. The manual contains an illustrated chapter on stability of fishing vessels. When asked if he learned anything from the NPFVOA "Vessel Safety Manual" that was aboard, Captain Siemons said, "Yes. As far as what, I couldn't tell you."

Captain Siemons never discussed loading conditions or stability with anyone before the casualty. He said, "When I went through school to get my Coast Guard ticket, there was a small section on stability and there was a small portion on my test." When asked about stability practices during fishing operations, Captain Siemons testified, ". . . we transfer fuel before we pick the gear, if it's needed. And the reason we wouldn't transfer fuel during a haul back procedure is because he [the engineer] doesn't know what I'm doing. He doesn't know if I'm turning, he doesn't know what's going on up on top." Siemons had never asked the engineer to transfer fuel during a haul back operation. He explained, ". . . when your gear is on the bottom, it acts like a stabilizer. It keeps the boat from moving so much. The minute that gear is on board, if there's a change in our list, then I know it's because the gear is up and we need to perhaps correct the list."

Captain [redacted] testified that there wouldn't be any concern by anybody if 10 tons were placed on the center line of foc's'le level 2. "The boat would handle it." His largest catch had been 100,000 lbs. (50 Tons) 50,000 lbs. in the full codend and 50,000 lbs. in the intermediate which he said was probably 35 to 40 percent full.

The ALEUTIAN ENTERPRISE on occassion would inadvertently haul up crab pots during a trawl recovery. Captain Siemons testified that at times he has had up to 12 crab pots aboard before dumping them.

When asked if he knew what lightship is, Captain Siemons replied, "Yeah, not really." When asked if he knew how an angle of downflooding affects stability in a particular load condition he replied, "No, I wouldn't." When asked what changes would improve the T&S Report he said, "I think it would be nice to have some conditions in here that show negative stability, show some of the limitations of the vessel."

19. STUDIES AND TECHNICAL REPORTS

a. Lifesaving Equipment

The Board requested a fact finding study of the ALEUTIAN ENTERPRISE lifesaving equipment which was returned to Seattle, Washington.

Several weeks after the casualty Lieutenant Junior Grade [redacted] of Marine Safety Office Puget Sound submitted findings based on his examination of the four liferafts and other salvaged safety equipment.

The Givens 8 person liferaft (S.N. 0175) was manufactured in December 1983 and last serviced on September 22, 1987. It had a torn canopy and viewport with a 1/2" nylon line penetrating the tears. The survival gear pack was intact. The heaving line, sea anchor and CO2 inflation bottle were missing.

The Elliot 12 person liferaft (S.N. CJH5/12MN/2021) was manufactured on September 24, 1979 and last serviced on September 22, 1989. It had a small tear in the canopy, a broken heaving line and a broken sea anchor line. The manually activated EPIRB was in a plastic packet. A survival gear pack that normally contained the oars, air pump and flashlight was missing.

One of the Elliot 10 person liferafts (S.N. CJH/10MN/2051) was manufactured and last inspected by the Coast Guard on March 13, 1980 and last serviced on September 25, 1989. It had extensive tears in the canopy. The outside light was torn off. The CO2 inflation bottle and manually activated EPIRB were in place. The paddles were missing.

The other Elliot 10 person liferaft (S.N. 10S/1044) was manufactured and inspected by the Coast Guard on May 19, 1989 and had never been serviced. It had no damage except a cut painter line. It was not equipped with an EPIRB.

One Coast Guard approved ring buoy with light and line was found in working condition.

Two Coast Guard approved kapok Type I adult personal flotation devices (PFD) were found with lights and whistles missing. The PFD's were waterlogged. They were marked with the name CONCORD. They were stamped with an inspected date of 1980.

Five Coast Guard approved survival suits were found: two were Harvey's Immersion Suit, (model no. NT 2002); two were manufactured by Imperial one of which was missing the left foot valve; the fifth suit was a Bayley Exposure Suit, (issue number 1029). No other damage to the survival suits was reported.

The Board received a copy of a trip report made by [redacted] Survival Factors Investigator, National Tranportation Safety Board following his visit to Elliot Inflatable Liferaft Co. in May 1990. Three tests were conducted to examine possible reasons why one liferaft partially inflated and another never inflated.

The first test demonstrated five times that the gas cylinder regulator manufactured by Sparklet Devices, Inc. could be partially activated by gently pulling the cable and releasing it before the

actuation cam is fully rotated. The second test demonstrated that the painter leading out of the liferaft canister could not be wedged between the two canister halves unless the canister had been deformed. The third test demonstrated that the canister halves separate approximately 4" when only two of the three metal canister bands are cut.

b. Loadline Assignment

The Board initiated a fact finding study to determine the relevance of the lack of a loadline assignment on the ALEUTIAN ENTERPRISE.

On April 30, 1990 the Board requested that American Bureau of Shipping (ABS), of Paramus, New Jersey review ALEUTIAN ENTERPRISE plans and other information to determine where the loadline assignment would have been had the owners applied for a loadline. The information provided to ABS depicted the ALEUTIAN ENTERPRISE's condition just prior to the casualty.

ABS reviewed the plans and information in accordance with the "International Convention on Loadlines 1966" (46 CFR 42) and provided a report to the Board dated July 11, 1990 with two possible loadline assignments depending on the boundary of the "weathertight" superstructure. Since loadline assignment depends on whether the full superstructure, including the processing space, is weathertight, separate comments concerning the "conditions of assignment" were included in the report. Loadline conditions of assignment are design and maintenance requirements noted in 46 CFR 42.15.

(1) Vessel with Full Superstructure

According to the ABS report, the loadline mark would be placed at the minimum freeboard of 2 inches to the main deck (processing, or factory deck), corresponding to a molded draft of 15' 10 ½" if the vessel satisfied the following requirements:

(a) Openings in the side must have weathertight means of closure.

(b) Hatches in the shelterdeck (trawl deck) must be watertight since they are flush with the weatherdeck.

(c) Doors leading to enclosed deckhouses or to spaces below the shelterdeck must be weathertight and have sill heights at least 15 inches.

(d) Discharges from the factory deck must be fitted with automatic non-return valves.

(e) Ventilators, scuppers, inlets, discharges (other than those on the factory deck), manholes, side scuttles and freeing ports must comply with 46 CFR 42.15-45 through 42.15-70.

ABS noted that, "This fish processing vessel, as with many fish processors, has side openings in the freeboard deck structure for passing overboard the remains of the processed fish. The type of

closure provided, a simple, hinged flap, cannot be considered as a weathertight closure, and therefore the deck structure is not enclosed. ABS suggested that, "An acceptable arrangement for the overboard chute(s) would be to fit a 35½" coaming to the chute(s) and permanently attached, hinged weathertight hatch cover to the coaming."

(2) Vessel with Enclosed Forecastle (Deckhouse) Only

The ABS report noted that the loadline mark would be placed at a freeboard of 1' 9" to the main deck corresponding to a molded draft of 14' 3½" if the vessel satisfied the following requirements:

(a) Doors located at frame 29/30 main deck (access from the processing area to the galley and the Baader room) and foc's'le level 1 (access to the trawl deck from the passageway) are to be weathertight and have sill heights of at least 15 inches.

(b) Doors leading to the engineroom from the main deck are to be weathertight and have sill heights of at least 23½ inches.

(c) Generally all access openings leading to the enclosed deck house or to spaces below the freeboard (main) deck shall be fitted with watertight or weathertight means of closing, permanently attached.

(d) The non-enclosed deck structure which could trap water would have to be fitted with proper freeing arrangements in accordance with 46 CFR 42.15-70.

Regarding the non-enclosed processing deck structure, ABS commented, "This fitting of freeing ports and the possible freeflowing of seawater on and off the factory deck would not be practical nor safe."

On June 11, 1990 the Board sent ALEUTIAN ENTERPRISE plans and information to the U.S. Coast Guard Merchant Vessel Inspection (G-MVI) Division in Washington DC, which is responsible for oversight of loadline assignment policy. The Board asked a series of questions regarding applicability of loadline and admeasurement regulations to the ALEUTIAN ENTERPRISE processing area superstructure.

An August 22, 1990 letter response from G-MVI stated that the tonnage opening in the transom of the ALEUTIAN ENTERPRISE allowed the processing space to be admeasured as an "open superstructure". Therefore processing space scuppers or freeing ports would not be required according to the admeasurement regulations. Tonnage openings may be accepted as sufficiently weathertight, but that the preferred arrangement would be to exempt superstructure spaces from tonnage measurement without the tonnage opening by applying 46 CFR 69 Support D – Dual Measurement System. According to 46 CFR 69.175(c), spaces immediately above the freeboard deck may be omitted from tonnage provided a tonnage mark is located at the level of the uppermost part of the loadline grid.

(3) Enclosed Superstructure

The G-MVI letter stated that the entire superstructure of the ALEUTIAN ENTERPRISE would have been considered "enclosed" for loadline assignment provided:

(a) The through-hull openings in the processing area were made weathertight.

(b) The flush hatches in the shelter deck were made watertight.

(c) The weather deck doors from the trawl deck area were made weathertight with a sill height of at least 15 inches

The G-MVI letter explained that the ALEUTIAN ENTERPRISE's flapper plates would not be considered weathertight. It suggested that the through-hull openings could be made weathertight by adding sluice valves with a positive means of closure.

(4) Open Superstructure

The G-MVI letter addressed the Board's questions regarding loadline assignment requirements if the processing area superstructure is considered "open". It stated that freeing ports would be required, but that the assigning authority is given discretion to work with the owner to ensure that, "the freeing area provided is as close to that required as possible." The ALEUTIAN ENTERPRISE would have had unacceptable freeing arrangements because:

(a) Pumps are not considered adequate for rapidly freeing the deck of entrapped water.

(b) The 3" scuppers do not provide the proper back-flow prevention and are substantially deficient in meeting the required freeing area.

(c) The through-hull discharge chutes do not provide a sufficient means to free the processing deck of entrapped water.

The G-MVI letter states that stability calculations which demonstrate an equivalent level of safety, considering the weight and free surface of entrapped water, may be acceptable if adequate drainage cannot be provided with freeing ports, and if sump pumps are installed. The letter does not state that such calculations were done, nor does it provide the criteria for acceptance.

The ALEUTIAN ENTERPRISE processing deck sump and cutter pump arrangement would be, "considered adequate for dewatering the processor deck under normal operation of the vessel." The letter does not provide limitations for accepting these pumps for dewatering the processing deck.

In accordance with 46 CFR 42.15-1 and current Coast Guard policy, a stability approval letter must be issued by the Coast Guard Marine Safety Center, (MSC) Washington, DC before a U. S. documented fish processor can receive a loadline certificate. On April 30, 1990 the Board sent ALEUTIAN ENTERPRISE plans, the 1987 T&S Report, and other information to the MSC to determine whether it would have met the Coast Guard's stability criteria for loadlined fish processors.

The MSC reviewed the plans, information, and the T&S Report in accordance with the applicable sections of NVIC 15-81 and NVIC 5-86. MSC's Report dated July 27, 1990 indicated that the stability information would not have been adequate for issuance of a loadline.

(5) Inclining (Stability Test)

The MSC noted that the 1987 inclining was not witnessed by the Coast Guard or a classification society as would have been required by NVIC 15-81. The following comments were provided by the MSC:

(a) Only one pendulum was used vice the three required by NVIC 15-81.

(b) Inclining weights were not certified as required by NVIC 15-81.

(c) A non-conservative, artificial free surface correction was applied to adjust the "as inclined" GM.

(d) A non-conservative, oversight in correcting, "as inclined" GM for the weight in the starboard freshwater tank may have occurred.

(e) No deadweight survey items located below the main deck were listed as "removal items" except cardboard.

(f) A non-conservative relocation of trawl doors was applied to adjust the "as inclined" GM.

(6) Presentation of Stability Information

The MSC stated that the T&S Report would have been returned for revision. The following comments regarding the presentation of information were made by the MSC:

(a) It does not include a list of closures which must be maintained watertight.

(b) It does not contain complete tank sounding tables.

(c) It does not include a proper general arrangement drawing and freeboard reference.

(d) It does not contain maximum allowable deck loadings or crane capacities.

(e) The limited number of load cases may not have encompassed the worst case condition.

(f) Icing was not described in terms of inches of accumulation on deck.

(g) The maximum fore and aft drafts and maximum trim allowed are not specified.

(h) It does not include a fuel "burn-off" sequence.

(i) It provides no guidance for safe operation under emergency conditions.

(j) It does not contain a "warning" that outfitting or arrangement changes may require a revision of the stability analysis.

(7) Stability Criteria Evaluation

The MSC independently reviewed the stability of the vessel using the applicable criteria from NVIC 5-86. The following comments were reported:

(a) Superstructure volume considered intact and buoyant for stability calculations does not satisfy the established weathertight criteria.

(b) Overboard discharges equipped with non-weathertight flapper plates on the processing deck were not considered points of downflooding. Independent calculations illustrate that the angles of submergence (downflooding) are much too low (3 to 12 degrees) to satisfy the IMO criteria (30 to 40 degrees) minimum.

(c) Only the IMO fishing vessel stability energy (Torremolinos) criteria was used by Drake for the evaluation. NVIC 5-86 recommends using the wind and roll criteria, the towing criteria and the lifting criteria for the naval architect's stability analysis.

(d) The weight of fish in the bleeding bins and plate freezers was not included.

(e) The "10% consumables" load condition described by NVIC 5-86 was not evaluated. In no condition is fuel below 17% or freshwater below 100%.

The MSC's stability review indicated that the vessel would have satisfied the applicable stability criteria through the whole range of operating conditions if the full superstructure was maintained weathertight. However, when the superstructure aft of the deckhouse (processing area) is excluded as buoyant volume, the vessel fails the applicable criteria in all load conditions.

c. Capsizing and Flooding Study

On July 17, 1990 the Board requested that the U. S. Coast Guard Marine Technical and Hazardous Materials Division (G-MTH) in Washington DC evaluate the stability of the ALEUTIAN ENTERPRISE given a range of possible load conditions at the time of the casualty. The G-MTH study is reproduced without its enclosures in Appendix A. The Board provided a statement of work based on facts from testimony and exhibits entered into evidence. Figures (14) through (17) were provided with the work statement. Halter Marine, Inc. Dwg C-1, Hull Lines and Offsets, was provided for computer modeling. The PACIFIC ENTERPRISE videotape of the rescue operation was provided for calculation of the environmental effects.

Figures (14) through (17) are ALEUTIAN ENTERPRISE load conditions that the Board developed from the testimony and exhibits in the investigative record. The source of each weight item is listed in the right column. Separate conditions were necessary to consider the difference in deck gear described by each of the three deck crewmen and the captain.

The load conditions do not include the weight of the fish on the trawl deck or in the codend, nor do they include the weight or free surface of any loose water on board. The Board provided the following comments:

(1) Lightship Corrections: Since 1987 the vessel has been modified in several ways which effected the lightship characteristics. A doubler plate was added on the stern ramp, three sump pumps were installed in the factory, the aft gilson, and watermaker were replaced. The weight of water in the starboard freshwater tank was not deducted in the 1987 lightship calculation.

(2) Fuel: In three of the four load conditions, fuel status was taken from the assistant engineer's testimony. The captain and the assistant engineer disagreed as to the condition of the fuel tanks. The assistant engineer thought there was about 4,000 gallons left in the No. 2 P/S tanks. The captain said they were empty.

(3) Water: Neither the captain nor the assistant engineer knew specifically how much fresh water was left. They both said it was low. The captain said that the chief engineer had reported making some water shortly before the casualty.

(4) Ballast: The captain and the assistant engineer said that the aft ballast tanks were full. Only the captain testified that the forepeak was full.

(5) Free Surface: Free surface moments have not been included for the larger tanks so that the moment of transference method can be used. The effect of a small amount of liquid "pocketing" even at small angles of heel must be considered in the stability analysis.

(6) Processing Loads: The deck boss, who is normally responsible for operation of the live tank, estimated the tank was 3/4 full as opposed to the captain who said it would have been 1/2 full. They agreed that three out of four bins were full and that the starboard most bin was about 3/4 full. One of the more experienced processors provided the status of the Jackstone plate freezers. They were filled except for about 15 trays; those were almost ready to go into the freezers from a nearby table.

(7) Frozen Product: The captain and the last processor in the freezer holds agreed on the number of boxes of frozen product. There were about 9,500 boxes stowed in the holds. The freezers held between 10,000 and 11,000 boxes. The processor said there was room for about 500 more in each hold. The capacity of the freezer holds according to the crew differs substantially from the capacity calculated by Drake, the naval architect.

(8) Crew and Effects: Taken from the August 1987 T&S Report.

(9) Stores and Spares: Dry stores and spares which probably were not aboard at the 1987 inclining, were provided by a variety of witnesses. The night factory foreman testified that 2,000

H&G pans weighing 2½ pounds each were stowed on the starboard side of the factory. Only the unusual engineering spares have been included from the assistant engineer's testimony. The freon bottles were 1/2 full. The amount of fiber and plastic was taken from the inventory and company requisition records for purchases that were delivered in early March of 1990. The weight of fiber is 15.91 lbs. per cu. ft. according to Drake.

(10) Deck Gear: Generally, these items and their weights vary between witnesses. When possible, weights were taken from Arctic Alaska's weight list or a manufacturer's catalog. A set of spare doors is included in two of the condition sheets because two witnesses said there were spare doors port and starboard. Since the stowed position of the regular pair of spare doors was only on the port side, these doors would have been a third set which are not part of lightship. Other testimony and pictures from 1989 showed that a third set of doors had been aboard earlier.

(11) Winch Reels: "Wire on FWD Reel P&S" is heavier than the Drake stability report shows. The added weight takes into account the weight of two complete Aleutian Combination Nets which would have been on the reels. Also, the weight of about three layers of trawl warp has been added to the trawl winches. This accounted for the difference between the amount of cable on the drum at the time of the inclining and that for a full drum. The captain testified that the drums had recently been filled with new cable.

(12) Processing Water Supply: Two pumps located in the hold level constantly ran to supply sea water to the processing equipment and holding tanks to rinse and move the fish through the factory. Together they supplied about 1,000 gallons per minute to the processing space. Normally this water would exit the vessel through the chute openings or via the sump pumps or sump drains. The Board specified that the port sump pumps be considered inoperable based on several processor's testimony.

The Board requested that the following variables be studied:

Variable 1. Weight of Fish: The weight of fish in the codend was approximately 80,000 pounds. The crew estimated that there was about 10,000 to 15,000 pounds in the intermediate. This is not consistent with the volume of fish the intermediate could hold based on volumetric calculations of the net if it was 1/2 to 3/4 full as described by the crew. The Board specified a range of 5 LT to 30 LT for the shifting fish weight which spilled out of the intermediate net onto the port side of the deck.

Variable 2. Loose Water: Testimony provided a wide range on loose water, but at any given time and place it would have been difficult to measure the mean level for the whole area since the vessel was rolling, pitching and trimmed aft. The Board specified a range of 1 inch to 3 inches, mean level of loose water from the front of the hold tank to the forward bulkhead of the processing area. The Board requested that the pocketing effect be evaluated for each angle of heel rather than applying a free surface correction.

Variable 3. Initial List: The Board specified that the initial list range was between zero and five degrees to port based on the estimates given in testimony.

The Board requested that the following tasks be completed using appropriate computational methods, software and objective reasoning:

Task 1. Load Condition Drafts: Calculate drafts, trim, GM, and angle of downflooding for each load condition with the range of fish on deck and 1 to 3 inches of loose water in the processing area. Do not consider list.

Task 2. Righting Energy Evaluation: Calculate righting arms from 0 to 50 degrees angle of heel for the conditions calculated in Task 1. Compare the righting energy in each of these conditions with the IMO fishing vessel stability recommendations.

Task 3. Equilibrium List Angles: Calculate the equilibrium angle of heel for each load condition over the range of initial list angles for the range of shifting fish weight on deck and 1 to 3 inches of loose water in the processing area. Provide results in a tabular matrix form.

Task 4. Effect of Wind, Waves and Turn: Calculate what effect 15 knot winds and 6 foot seas on the starboard beam would have on the list angles found in Task 3, if combined with an attempted, but unexecuted hard turn to port .

Task 5. Time to Sink: Calculate the time progressive flooding would have taken to sink the vessel based on the results of Task 4. Consider each of the 3 inch sump drains, the 12" by 18" cutout with the open grate, the 18" by 24" fish discard cutout, and the normal seawater supply to the processing space as sources of flooding water.

The results of G-MTH's report show that the estimated time to sink for the range of conditions that the Board asked to be evaluated was 3½ to 19 minutes. This included the effect of the wind and waves which was interpreted from the videotape. The static analysis (excluding the wind and wave motions) shows that over the range of loading conditions evaluated, the difference between the equilibrium list angle (static list) and the progressive down flooding angle ranged from -6½ to +8 degrees. Drafts ranged from 14' 1" to 14' 4". Trim ranged from 5' 8" to 7' 8" aft. GM ranged from 2.4' to 3.1'. These results were calculated using the assumptions that the port side cutter and sump pumps were ineffective and that only half of the codend weight was supported by the vessel. The intermediate part of the net was assumed to be empty, and loose fish were assumed to be massed to port in the vicinity of the aft gantry structure.

	1	2	3	4	5	6	7	8	9	10	11
1	CONDITION OF LOADING F/T ALEUTIAN ENTERPRISE 22 MARCH 1990 * SIEMONS *								23 JUL 90		
2											
3	ITEM	CAP. (%)	FSM (FT-T)		WT. (LT)	VCG (FT)	VMOM(FT-T)	LCG (FT)	LMOM(FT-T)	SOURCE	CITE
4											
5	LIGHTSHIP (DRAKE)				955.47	17.39	16615.62	4.51	4309.17	DRAKE	EX 5
6							0.00		0.00		
7	L.S. CORRECTIONS						0.00		0.00		
8	STERN PLATE 3/4 IN				5.35	19.00	101.65	65.00	347.75	UNIMAR	EX 163
9	F.W. STBD (DELETE)	100.00			-37.50	9.45	-354.38	-31.60	1185.00	DRAKE	EX 210
10	SUMP PUMPS & PIPING	3.00			1.00	16.00	16.00	6.00	6.00	SCHMIDTKE	EX 258
11	AFT GILSON(DECREASE)				-0.15	48.00	-7.20	44.00	-6.60	IVIE	EX 202
12	WATERMAKER(INCREASE)	50.00			0.30	6.00	1.80	40.00	12.00	IVIE	EX 259
13							0.00		0.00		
14	FUEL OIL TANKS						0.00		0.00		
15	BOW F.O. PORT	0.00			0.00		0.00	-53.69	0.00	SIEMONS	P 4777
16	STBD	0.00			0.00		0.00	-53.69	0.00	SIEMONS	P 4777
17	NO. 1 F.O. PORT	0.00			0.00		0.00	-17.69	0.00	SIEMONS	P 4777
18	STBD	0.00			0.00		0.00	-17.69	0.00	SIEMONS	P 4777
19	NO. 2 F.O. PORT	0.00			0.00	0.60	0.00	7.74	0.00	SIEMONS	P 4777
20	STBD	0.00			0.00	0.60	0.00	7.74	0.00	SIEMONS	P 4777
21	NO. 3 F.O. PORT	83.40			23.44	9.00	210.96	36.84	863.53	SIEMONS	P 4777
22	STBD	83.40			23.44	9.00	210.96	36.84	863.53	SIEMONS	P 4777
23	FO DAY TK PORT	98.00	2.77		7.15	10.05	71.86	25.94	185.47	SIEMONS	P 4777
24	STBD	98.00	2.77		7.15	10.05	71.86	25.94	185.47	SIEMONS	P 4777
25							0.00		0.00		
26	FRESH WATER TANKS						0.00		0.00		
27	F.W. TK PORT	20.00			7.50	1.00	7.50	-31.60	-237.00	SIEMONS	P 4780
28	STBD	20.00			8.18	1.00	8.18	-31.63	-258.73	SIEMONS	P 4780
29							0.00		0.00		
30	BALLAST WATER TANKS						0.00		0.00		
31	FOREPEAK	100.00	0.00		11.02	12.17	134.11	-67.20	-740.54	SIEMONS	P 4780
32	AFT PEAK PORT	100.00	0.00		17.60	13.54	238.30	69.28	1219.33	SIEMONS	P 4780
33	STBD	100.00	0.00		17.60	13.54	238.30	69.28	1219.33	SIEMONS	P 4780
34	E.R. BILGE	25.00	0.00		15.08	0.25	3.77	42.00	633.36	GALLAGHER	
35											
36	MISC. TANKS						0.00		0.00		
37	MAIN ENG. LUBE OIL	30.60	2.81		2.34	3.30	7.72	21.95	51.36	GALLAGHER	P 2867
38	HYD. OIL STORAGE	40.00	2.76		1.48	3.00	4.44	21.90	32.41	GALLAGHER	P 2868
39	HYD. OIL OPERATING	98.00	2.76		3.78	12.98	49.06	22.00	83.16	GALLAGHER	P 2868
40	OILY BILGE WATER TK	0.00	0.00		0.00		0.00	51.00	0.00	GALLAGHER	P 2869
41	DIRTY OIL TK	98.00	2.29		2.61	12.01	31.35	51.80	135.20	GALLAGHER	P 2868
42	GEN.& S.T.LUBE OIL	98.00	3.25		1.29	10.71	13.82	56.39	72.74	GALLAGHER	P 2867
43	GEAR OIL TK	98.00	2.07		0.96	10.63	10.20	55.55	53.33	GALLAGHER	P 2869
44	C.P. HYD. OIL TK	98.00	0.93		0.32	10.93	3.50	58.86	18.84	GALLAGHER	P 2867
45							0.00		0.00		
46	CARGO (PRODUCT)						0.00		0.00		
47	RECEIVING TANK	50.00			13.25	17.50	231.86	49.68	658.26	SIEMONS	P 4902
48	HOLDING BINS	90.00			16.74	19.50	326.43	40.00	669.60	SIEMONS	P 4902
49	JACKSTONE FREEZERS	100.00			2.05	18.50	37.93	-8.00	-16.40	WALLACE	P 1535
50	FREEZER HOLD PORT	90.00			92.20	10.82	997.60	-3.70	-341.14	SIEMONS	P 4901
51	FREEZER HOLD STBD	90.00			92.20	10.82	997.60	-3.70	-341.14	SIEMONS	P 4901
52							0.00		0.00		
53	CREW & EFFECTS						0.00		0.00		
54	MAIN DECK				1.00	19.50	19.50	10.00	10.00	DRAKE	EX 5
55	FOCSL LVL1				2.00	28.00	56.00	-44.00	-88.00	DRAKE	EX 5
56	FOCSL LVL2				1.00	36.00	36.00	-46.00	-46.00	DRAKE	EX 5
57	PILOT HSE				0.10	45.00	4.50	-38.00	-3.80	DRAKE	EX 5
58							0.00		0.00		
59	STORES						0.00		0.00		
60	DRY STORES FWD HOLD	100.00			1.50	8.00	12.00	-40.00	-60.00	DRAKE	EX 5
61	COLD STORES MAIN DK	100.00			1.50	21.00	31.50	-46.00	-69.00	DRAKE	EX 5
62	FIBER/PLASTIC-HOLD				24.20	8.00	193.60	-1.00	-24.20	GALLAGHER	EX 171/178
63	H & G PANS-FACTORY	2000.00			2.00	21.00	42.00	1.00	2.00	MELTON	EX 127
64	FIBER FOCSL LVL1				0.20	28.00	5.60	-44.00	-8.80	SIEMONS	EX 254/178
65	FIBER/PLASTIC-BLUERM				7.30	36.00	262.80	-16.00	-116.80	SIEMONS	EX 277/178
66	FILTERS & HOSES				0.30	6.00	1.80	68.00	20.40	GALLAGHER	EX 171
67	SPARE BELTS				1.00	17.00	17.00	68.00	68.00	GALLAGHER	EX 171
68	FREON STORES	50.00			0.50	18.00	9.00	70.00	35.00	GALLAGHER	EX 201
69	TRASH STBD LVL1				0.35	18.00	6.30	-44.00	-15.40	SIEMONS	EX 277
70							0.00		0.00		
71	FOCSL LVL1 GEAR						0.00		0.00		
72	WIRE ON FWD REEL P&S				7.53	27.00	203.31	-23.00	-173.19	DRAKE	EX 5/177
73	XTRA CABLE-TRL WNCHS	3.00			0.50	27.00	13.50	40.00	20.00	SIEMONS	P 4969
74	SPOOL 1 IN WIRE	0.00			0.05	25.00	1.25	20.00	1.00	SIEMONS	EX 277
75	SPOOL 5/8 IN WIRE	0.00			0.05	24.50	1.23	20.00	1.00	SIEMONS	EX 277
76	SPOOL 9/16 IN WIRE	0.00			0.05	24.50	1.23	20.00	1.00	SIEMONS	EX 277
77	BUCKET OF CHAIN	100.00			0.05	26.00	1.30	20.00	1.00	SIEMONS	P 4976
78	SPARE BLOCKS	3.00			0.10	25.00	2.50	21.00	2.10	SIEMONS	EX 277
79	SPARE ANCHOR CHAIN	1.00			0.90	25.00	22.50	38.00	34.20	SIEMONS	EX 277
80	SPARE WEB STBD	1.00			0.02	25.00	0.50	-14.00	-0.28	SIEMONS	EX 277
81	SPARE DOOR SHOES	6.00			1.10	24.20	26.62	23.00	25.30	SIEMONS	EX 177
82	OXYGEN BOTTLES	4.00			0.10	25.00	2.50	66.00	6.60	SIEMONS	EX 277/205
83	INTERMEDIATE NET STB	1.00			0.10	24.50	2.45	1.00	0.10	SIEMONS	EX 277
84	SALVAGED WEB P&S	2.00			0.10	24.50	2.45	44.00	4.40	SIEMONS	EX 277
85							0.00		0.00		
86	FOCSL LVL2 GEAR						0.00		0.00		
87	SPARE MOTORS (PORT)	2.00			1.54	34.00	52.36	-1.00	-1.54	SIEMONS	EX 277/203
88	TOTES P&S	4.00			0.20	34.00	6.80	-20.00	-4.00	SIEMONS	EX 277
89	SPARE GAS (STBD)				0.05	32.00	1.60	-16.00	-0.80	SIEMONS	EX 277
90	GROUND GEAR (PORT)				0.53	34.00	18.02	12.00	6.36	SIEMONS	EX 277
91	GROUND GEAR (STBD)				0.53	34.00	18.02	12.00	6.36	SIEMONS	EX 277
92	COOKIE GEAR (PORT)				0.20	33.00	6.60	20.00	4.00	SIEMONS	EX 277
93	TRASH WEB (STBD)				0.07	33.50	2.35	12.00	0.84	SIEMONS	EX 277
94	COD END (STBD)	1.00			0.90	34.00	30.60	-4.00	-3.60	SIEMONS	EX 277/177
95	STEEL LINE (PORT)	1.00			0.02	34.00	0.68	1.00	0.02	SIEMONS	EX 277
96	SKIFF & MOTOR (PORT)	1.00			0.50	36.00	18.00	3.00	1.50	SIEMONS	EX 277
97	BALES OF WEB (STBD)	4.00			0.25	35.00	8.75	1.00	0.25	SIEMONS	EX 277
98	CRAB POT (STBD)	3.00			0.80	35.00	28.00	8.00	6.40	SIEMONS	EX 278
99							0.00		0.00		
100	GANTRY LVL GEAR						0.00		0.00		
101	BACK BODY NET	1.00			0.25	36.00	9.00	64.00	16.00	SIEMONS	EX 278
102	SPARE PANELS				0.20	36.00	7.20	66.00	13.20	SIEMONS	EX 278
103	TOTES OF PANELS	4.00			0.20	36.00	7.20	65.00	13.00	SIEMONS	EX 278
104	CHAFING PANEL	1.00			0.13	35.00	4.55	65.00	8.45	SIEMONS	EX 278
105							0.00		0.00		
106	TOTAL		FSM (FT-T)		WT.(LT)	VCG (FT)	VMOM(FT-T)	LCG (FT)	LMOM(FT-T)		
107			22.41		1351.82	15.91	21479.49	7.81	10556.35		

Figure 14

1	2	3	4	5	6	7	8	9	10	11
CONDITION OF LOADING F/T ALEUTIAN ENTERPRISE 22 MARCH 1990 * WILCOX *								23 JUL 90		
ITEM	CAP. (%)	FSM (FT-T)	WT. (LT)	VCG (FT)	VMOM(FT-T)	LCG (FT)	LMOM(FT-T)	SOURCE	CITE	
LIGHTSHIP (DRAKE)			955.47	17.39	16615.62	4.51	4309.17	DRAKE	EX 5	
					0.00		0.00			
					0.00		0.00			
L.S. CORRECTIONS										
STERN PLATE 3/4 IN			5.35	19.00	101.65	65.00	347.75	UNIMAR	EX 163	
F.W. STBD (DELETE)	100.00		-37.50	9.45	-354.38	-31.60	1185.00	DRAKE	EX 210	
SUMP PUMPS & PIPING	3.00		1.00	16.00	16.00	6.00	6.00	SCHMEDTKE	EX 258	
AFT GILSON(DECREASE)			-0.15	48.00	-7.20	44.00	-6.60	IVIE	EX 202	
WATERMAKER(INCREASE)	50.00		0.30	6.00	1.80	40.00	12.00	IVIE	EX 259	
					0.00		0.00			
					0.00		0.00			
FUEL OIL TANKS										
BOW F.O. PORT	0.00		0.00		0.00	-53.69	0.00	GALLAGHER	P 2848	
STBD	0.00		0.00		0.00	-53.69	0.00	GALLAGHER	P 2848	
NO. 1 F.O.PORT	0.00		0.00		0.00	-17.69	0.00	GALLAGHER	P 2848	
STBD	0.00		0.00		0.00	-17.69	0.00	GALLAGHER	P 2848	
NO. 2 F.O.PORT	18.25		6.70	0.60	4.02	7.74	51.86	GALLAGHER	P 2848	
STBD	18.25		6.70	0.60	4.02	7.74	51.86	GALLAGHER	P 2848	
NO. 3 F.O.PORT	83.40		23.44	9.00	210.96	36.84	863.53	GALLAGHER	P 2848	
STBD	83.40		23.44	9.00	210.96	36.84	863.53	GALLAGHER	P 2848	
FO DAY TK PORT	98.00	2.77	7.15	10.05	71.86	25.94	185.47	GALLAGHER	P 2848	
STBD	98.00	2.77	7.15	10.05	71.86	25.94	185.47	GALLAGHER	P 2848	
					0.00		0.00			
					0.00		0.00			
FRESH WATER TANKS										
F.W. TK PORT	10.00		3.75	1.00	3.75	-31.60	-118.50	GALLAGHER	P 2872	
STBD	10.00		4.09	1.00	4.09	-31.63	-129.37	GALLAGHER	P 2872	
					0.00		0.00			
					0.00		0.00			
BALLAST WATER TANKS										
FOREPEAK	0.00		0.00		0.00	-67.20	0.00	GALLAGHER	P 2858	
AFT PEAK PORT	100.00	0.00	17.60	13.54	238.30	69.28	1219.33	GALLAGHER	P 2858	
STBD	100.00	0.00	17.60	13.54	238.30	69.28	1219.33	GALLAGHER	P 2858	
E.R. BILGE	25.00	0.00	15.08	0.25	3.77	42.00	633.36	GALLAGHER		
					0.00		0.00			
MISC. TANKS										
MAIN ENG. LUBE OIL	30.60	2.91	2.34	3.30	7.72	21.95	51.36	GALLAGHER	P 2867	
HYD. OIL STORAGE	40.00	2.76	1.48	3.00	4.44	21.90	32.41	GALLAGHER	P 2868	
HYD. OIL OPERATING	98.00	2.76	3.78	12.98	49.06	22.00	83.16	GALLAGHER	P 2868	
OILY BILGE WATER TK	0.00	0.00	0.00		0.00	51.00	0.00	GALLAGHER	P 2869	
DIRTY OIL TK	98.00	2.29	2.61	12.01	31.35	51.80	135.20	GALLAGHER	P 2868	
GEN.& S.T.LUBE OIL	98.00	3.25	1.29	10.71	13.82	56.39	72.74	GALLAGHER	P 2867	
GEAR OIL TK	98.00	2.07	0.96	10.63	10.20	65.55	63.33	GALLAGHER	P 2869	
C.P. HYD. OIL TK	98.00	0.93	0.32	10.93	3.50	58.86	18.84	GALLAGHER	P 2867	
					0.00		0.00			
					0.00		0.00			
CARGO (PRODUCT)										
RECEIVING TANK	75.00		19.87	19.50	387.47	49.68	987.14	WILCOX	P 1333	
HOLDING BINS	90.00		16.74	19.50	326.43	40.00	669.60	WILCOX	P 1334	
JACKSTONE FREEZERS	100.00		2.05	18.50	37.93	-8.00	-16.40	WALLACE	P 1535	
FREEZER HOLD PORT	90.00		92.20	10.82	997.60	-3.70	-341.14	PHILPOT	P 51/EX 9	
FREEZER HOLD STBD	90.00		92.20	10.82	997.60	-3.70	-341.14	PHILPOT	P 51/EX 9	
					0.00		0.00			
					0.00		0.00			
CREW & EFFECTS										
MAIN DECK			1.00	19.50	19.50	10.00	10.00	DRAKE	EX 5	
FOCSL LVL1			2.00	28.00	56.00	-44.00	-88.00	DRAKE	EX 5	
FOCSL LVL2			1.00	36.00	36.00	-46.00	-46.00	DRAKE	EX 5	
PILOT HSE			0.10	45.00	4.50	-38.00	-3.80	DRAKE	EX 5	
					0.00		0.00			
					0.00		0.00			
STORES										
DRY STORES FWD HOLD	100.00		1.50	8.00	12.00	-40.00	-60.00	DRAKE	EX 5	
COLD STORES MAIN DK	100.00		1.50	21.00	31.50	-46.00	-69.00	DRAKE	EX 5	
FIBER/PLASTIC-HOLD			23.90	8.00	191.20	-1.00	-23.90	GALLAGHER	EX 171/178	
H & G PANS-FACTORY	2000.00		2.00	21.00	42.00	1.00	2.00	MELTON	EX 127	
FIBER FOCSL LVL1			0.50	28.00	14.00	-44.00	-22.00	WILCOX	EX 89/178	
FIBER/PLASTIC-BLUERM			7.30	36.00	262.80	-16.00	-116.80	MOE	EX 114/178	
FILTERS & HOSES			0.30	6.00	1.80	68.00	20.40	GALLAGHER	EX 171	
SPARE BELTS			1.00	17.00	17.00	68.00	68.00	GALLAGHER	EX 171	
FRESH STORES	50.00		0.50	18.00	9.00	70.00	35.00	GALLAGHER	EX 201	
TRASH STB LVL1			0.25	18.00	4.50	-44.00	-11.00	WILCOX	P 1386	
					0.00		0.00			
					0.00		0.00			
FOCSL LVL1 GEAR										
WIRE ON FWD REEL P&S			7.53	27.00	203.31	-23.00	-173.19	DRAKE	EX 5/177	
XTRA CABLE-TRL WNCHS	3.00		0.50	27.00	13.50	40.00	20.00	SIEMONS	P 4989	
SPOOL 9/16 IN WIRE	2.00		0.20	24.50	4.90	20.00	4.00	WILCOX	P 1377	
BARREL OF CHAIN	100.00		0.35	26.00	9.10	20.00	7.00	WILCOX	P 1382	
TOTE W/SPARE WEB	1.00		0.20	25.00	5.00	23.00	4.60	WILCOX	P 1380	
SPARE DOOR SHOES	6.00		1.10	24.20	26.62	23.00	25.30	MOE	EX 114/177	
OXYGEN BOTTLES	4.00		0.10	25.00	2.50	66.00	6.60	WILCOX	EX 89/205	
PLATE 1/4 IN STEEL	1.00		0.15	28.00	4.20	44.00	6.60	GALLAGHER	EX 172	
SPARE DOORS P&S	2.00		3.36	24.50	82.32	44.00	147.84	WILCOX	P 1387	
					0.00		0.00			
FOCSL LVL2 GEAR										
SPARE MOTORS (PORT)	2.00		1.54	34.00	52.36	-1.00	-1.54	MOE	EX 114/203	
TOTES P&S	4.00		0.55	34.00	18.70	-20.00	-11.00	WILCOX	P 1373	
SPARE PANELS (STBD)			0.20	32.00	6.40	8.00	1.60	WILCOX	P 1375	
GROUND GEAR (PORT)	1.00		0.30	34.00	10.20	8.00	2.40	WILCOX	P 1372	
GROUND GEAR (STBD)	1.00		0.40	34.00	13.60	12.00	4.80	WILCOX	P1374	
COOKIE GEAR (PORT)			0.14	33.00	4.62	12.00	1.68	WILCOX	EX 89	
SPARE WEB (STBD)	3.00		0.50	33.50	16.75	1.00	0.50	WILCOX	P 1374	
55 GAL GAS (STBD)	100.00		0.20	34.00	6.80	-1.00	-0.20	WILCOX	P 1377	
SKIFF & MOTOR (PORT)	1.00		0.50	36.00	18.00	3.00	1.50	WILCOX	P 1372	
CRAB POT (PORT)	1.00		0.35	35.00	12.25	8.00	2.80	WILCOX	P 1376	
CRAB POT (STBD)	4.00		1.40	35.00	49.00	8.00	11.20	WILCOX	P 1376	
					0.00		0.00			
					0.00		0.00			
GANTRY LVL GEAR										
HIGH RISE NET	1.00		3.76	36.00	135.36	64.00	240.64	WILCOX	P 1384	
SPARE COD ENDS	2.00		1.80	36.00	64.80	66.00	118.80	MOE	EX 115/177	
TOTES OF COOKIE GEAR	2.00		0.40	36.00	14.40	65.00	26.00	MOE	EX 115/177	
SPARE PANELS P&S			0.10	35.00	3.50	65.00	6.50	MOE	EX 115/177	
					0.00		0.00			
TOTAL		FSM (FT-T)	WT.(LT)	VCG (FT)	VMOM(FT-T)	LCG (FT)	LMOM(FT-T)			
		22.41	1361.49	16.02	21782.50	9.13	12433.62			

Figure 15

1	2	3	4	5	6	7	8	9	10	11
CONDITION OF LOADING F/T ALEUTIAN ENTERPRISE 22 MARCH 1990 * MOE *								23 JUL 90		
ITEM	CAP. (%)	FSM (FT-T)	WT. (LT)	VCG (FT)	VMOM(FT-T)	LCG (FT)	LMOM(FT-T)	SOURCE	CITE	
LIGHTSHIP (DRAKE)			955.47	17.39	16615.62	4.51	4309.17	DRAKE	EX 5	
					0.00		0.00			
					0.00		0.00			
L.S. CORRECTIONS										
STERN PLATE 3/4 IN			5.35	19.00	101.65	65.00	347.75	UNIMAR	EX 163	
F.W. STBD (DELETE)	100.00		-37.50	9.45	-354.38	-31.60	1185.00	DRAKE	EX 210	
SUMP PUMPS & PIPING	3.00		1.00	16.00	16.00	6.00	6.00	SCHMEDTKE	EX 258	
AFT GILSON(DECREASE)			-0.15	48.00	-7.20	44.00	-6.60	IVIE	EX 202	
WATERMAKER(INCREASE)	50.00		0.30	6.00	1.80	40.00	12.00	IVIE	EX 259	
					0.00		0.00			
					0.00		0.00			
FUEL OIL TANKS					0.00	-53.69	0.00	GALLAGHER	P 2848	
BOW F.O. PORT	0.00		0.00		0.00	-53.69	0.00	GALLAGHER	P 2848	
STBD	0.00		0.00		0.00	-17.69	0.00	GALLAGHER	P 2848	
NO. 1 F.O.PORT	0.00		0.00		0.00	-17.69	0.00	GALLAGHER	P 2848	
STBD	0.00		6.70	0.60	4.02	7.74	51.86	GALLAGHER	P 2848	
NO. 2 F.O.PORT	18.25		6.70	0.60	4.02	7.74	51.86	GALLAGHER	P 2848	
STBD	18.25		23.44	9.00	210.96	36.84	863.53	GALLAGHER	P 2848	
NO. 3 F.O.PORT	83.40		23.44	9.00	210.96	36.84	863.53	GALLAGHER	P 2848	
STBD	83.40		7.15	10.05	71.86	25.94	185.47	GALLAGHER	P 2848	
FO DAY TK PORT	98.00	2.77	7.15	10.05	71.86	25.94	185.47	GALLAGHER	P 2848	
STBD	98.00	2.77			0.00		0.00			
					0.00		0.00			
FRESH WATER TANKS					3.75	-31.60	-118.50	GALLAGHER	P 2872	
F.W. TK PORT	10.00		3.75	1.00	4.09	-31.63	-129.37	GALLAGHER	P 2872	
STBD	10.00		4.09	1.00	0.00		0.00			
					0.00		0.00			
BALLAST WATER TANKS					0.00	-67.20	0.00	GALLAGHER	P 2858	
FOREPEAK	0.00		0.00		238.30	69.28	1219.33	GALLAGHER	P 2858	
AFT PEAK PORT	100.00	0.00	17.60	13.54	238.30	69.28	1219.33	GALLAGHER	P 2858	
STBD	100.00	0.00	17.60	13.54	3.77	42.00	633.36	GALLAGHER		
E.R. BILGE	25.00	0.00	15.08	0.25	0.00		0.00			
					0.00		0.00			
MISC. TANKS					7.72	21.95	51.36	GALLAGHER	P 2867	
MAIN ENG. LUBE OIL	30.60	2.81	2.34	3.30	4.44	21.90	32.41	GALLAGHER	P 2868	
HYD. OIL STORAGE	40.00	2.76	1.48	3.00	49.06	22.00	83.16	GALLAGHER	P 2868	
HYD. OIL OPERATING	98.00	2.76	3.78	12.98	0.00	51.00	0.00	GALLAGHER	P 2869	
OILY BILGE WATER TK	0.00	0.00	0.00		31.35	51.80	135.20	GALLAGHER	P 2868	
DIRTY OIL TK	98.00	2.29	2.61	12.01	13.82	56.39	72.74	GALLAGHER	P 2867	
GEN.& S.T.LUBE OIL	98.00	3.25	1.29	10.71	10.20	55.55	53.33	GALLAGHER	P 2869	
GEAR OIL TK	98.00	2.07	0.96	10.63	3.50	58.86	18.84	GALLAGHER	P 2867	
C.P. HYD. OIL TK	98.00	0.93	0.32	10.93	0.00		0.00			
					0.00		0.00			
CARGO (PRODUCT)					387.47	49.68	987.14	WILCOX	P 1333	
RECEIVING TANK	75.00		19.87	19.50	326.43	40.00	669.60	WILCOX	P 1334	
HOLDING BINS	90.00		16.74	19.50	37.93	-8.00	-16.40	WALLACE	P 1535	
JACKSTONE FREEZERS	100.00		2.05	18.50	997.60	-3.70	-341.14	PHILPOT	P 51/EX 9	
FREEZER HOLD PORT	90.00		92.20	10.82	997.60	-3.70	-341.14	PHILPOT	P 51/EX 9	
FREEZER HOLD STBD	90.00		92.20	10.82	0.00		0.00			
					0.00		0.00			
CREW & EFFECTS					19.50	10.00	10.00	DRAKE	EX 5	
MAIN DECK			1.00	19.50	56.00	-44.00	-88.00	DRAKE	EX 5	
FOCSL LVL1			2.00	28.00	36.00	-46.00	-46.00	DRAKE	EX 5	
FOCSL LVL2			1.00	36.00	4.50	-38.00	-3.80	DRAKE	EX 5	
PILOT HSE			0.10	45.00	0.00		0.00			
					0.00		0.00			
STORES					12.00	-40.00	-60.00	DRAKE	EX 5	
DRY STORES FWD HOLD	100.00		1.50	8.00	31.50	-46.00	-69.00	DRAKE	EX 5	
COLD STORES MAIN DK	100.00		1.50	21.00	191.20	-1.00	-23.90	GALLAGHER	EX 171/178	
FIBER/PLASTIC-HOLD			23.90	8.00	42.00	1.00	2.00	MELTON	EX 127	
H & G PANS-FACTORY	2000.00		2.00	21.00	14.00	-44.00	-22.00	WILCOX	EX 89/178	
FIBER FOCSL LVL1			0.50	28.00	262.80	-16.00	-116.80	MOE	EX 114/178	
FIBER/PLASTIC-BLUERM			7.30	36.00	1.60	66.00	20.40	GALLAGHER	EX 171	
FILTERS & HOSES			0.30	6.00	17.00	68.00	68.00	GALLAGHER	EX 171	
SPARE BELTS			1.00	17.00	9.00	70.00	35.00	GALLAGHER	EX 201	
FREON STORES	50.00		0.50	18.00	6.30	-44.00	-15.40	SIEMONS	EX 277	
TRASH STBD LVL1			0.35	18.00	0.00		0.00			
					0.00		0.00			
FOCSL LVL1 GEAR					203.31	-23.00	-173.19	DRAKE	EX 5/177	
WIRE ON FWD REEL P&S			7.53	27.00	13.50	40.00	20.00	SIEMONS	P 4989	
XTRA CABLE-TRL WNCHS	3.00		0.50	27.00	2.50	20.00	2.00	MOE	EX 114/177	
SPOOL 1 IN WIRE	15.00		0.10	25.00	4.90	20.00	4.00	MOE	EX 114/177	
SPOOL 5/8 IN WIRE	50.00		0.20	24.50	2.45	20.00	2.00	MOE	EX 114/177	
SPOOL 9/16 IN WIRE	30.00		0.10	24.50	5.20	20.00	4.00	MOE	EX 114/177	
BARREL OF CHAIN	100.00		0.20	26.00	2.50	21.00	2.10	MOE	EX 114	
POLY LINE			0.10	25.00	2.50	21.00	2.10	MOE	EX 114	
SAMPSON LINE			0.10	25.00	7.50	23.00	6.90	MOE	EX 114	
TOTE W/FLOATS & WIRE	1.00		0.30	25.00	26.62	23.00	25.30	MOE	EX 114/177	
SPARE DOOR SHOES	6.00		1.10	24.20	2.80	66.00	6.60	GALLAGHER	EX 172/205	
OXYGEN BOTTLES	4.00		0.10	28.00	4.20	44.00	6.60	GALLAGHER	EX 172	
PLATE 1/4 IN STEEL	1.00		0.15	28.00	82.32	44.00	147.84	MOE	EX 114/177	
SPARE DOORS P&S	2.00		3.36	24.50	0.00		0.00			
					0.00		0.00			
FOCSL LVL2 GEAR					52.36	-1.00	-1.54	MOE	EX 114/203	
SPARE MOTORS (PORT)	2.00		1.54	34.00	17.00	-20.00	-10.00	MOE	EX 114	
TOTES P&S	2.00		0.50	34.00	3.30	18.00	1.80	MOE	EX 114	
2 IN STL ROPE (PORT)			0.10	33.00	3.20	8.00	0.80	MOE	EX 114/177	
SPARE PANELS (STBD)			0.10	32.00	173.40	8.00	40.80	MOE	EX 114/177	
GROUND GEAR (PORT)			5.10	34.00	57.80	8.00	13.60	MOE	EX 114/177	
GROUND GEAR (STBD)			1.70	34.00	36.30	6.00	6.60	MOE	EX 114/177	
COOKIE GEAR (PORT)			1.10	33.00	67.00	1.00	2.00	MOE	EX 114/177	
SPARE WEB (STBD)			2.00	33.50	6.80	-1.00	-0.20	MOE	EX 114/177	
5/8 IN WIRE (STBD)	100.00		0.20	34.00	17.00	20.00	10.00	MOE	EX 114/154	
CHAFING GEAR (PORT)			0.50	34.00	18.00	3.00	1.50	MOE	EX 114/210	
SKIFF & MOTOR (PORT)	1.00		0.50	36.00	8.75	8.00	2.00	MOE	EX 115	
CRAB POT (PORT)	1.00		0.25	35.00	26.25	8.00	6.00	MOE	EX 115	
CRAB POT (STBD)	3.00		0.75	35.00	0.00		0.00			
					0.00		0.00			
GANTRY LVL GEAR					135.36	64.00	240.64	MOE	EX 115/177	
HIGH RISE NET	100.00		3.76	36.00	64.80	66.00	118.80	MOE	EX 115/177	
SPARE COD ENDS	2.00		1.80	36.00	14.40	65.00	26.00	MOE	EX 115/177	
TOTES OF COOKIE GEAR	2.00		0.40	36.00	3.50	65.00	6.50	MOE	EX 115/177	
SPARE PANELS P&S			0.10	35.00	0.00		0.00			
TOTAL		FSM (FT-T)	WT. (LT)	VCG (FT)	VMOM(FT-T)	LCG (FT)	LMOM(FT-T)			
		22.41	1370.20	16.12	22071.33	9.12	12496.34			

Firgue 16

	1	2	3	4	5	6	7	8	9	10	11
1	CONDITION OF LOADING F/T ALEUTIAN ENTERPRISE 22 MARCH 1990 * SHULTZ *								23 JUL 90		
2											
3	ITEM		CAP. (%)	FSM (FT-T)	WT. (LT)	VCG (FT)	VMOM(FT-T)	LCG (FT)	LMOM(FT-T)	SOURCE	CITE
4											
5	LIGHTSHIP (DRAKE)				955.47	17.39	16615.62	4.51	4309.17	DRAKE	EX 5
6							0.00		0.00		
7	L.S. CORRECTIONS						0.00		0.00		
8	STERN PLATE 3/4 IN				5.35	19.00	101.65	65.00	347.75	UNIMAR	EX 163
9	F.W. STBD (DELETE)		100.00		-37.50	9.45	-354.38	-31.60	1185.00	DRAKE	EX 210
10	SUMP PUMPS & PIPING		3.00		1.00	16.00	16.00	6.00	6.00	SCHMEDTKE	EX 258
11	AFT GILSON(DECREASE)				-0.15	48.00	-7.20	44.00	-6.60	IVIE	EX 202
12	WATERMAKER(INCREASE)		50.00		0.30	6.00	1.80	40.00	12.00	IVIE	EX 259
13							0.00		0.00		
14	FUEL OIL TANKS						0.00		0.00		
15	BOW F.O.	PORT	0.00		0.00		0.00	-53.69	0.00	GALLAGHER	P 2848
16		STBD	0.00		0.00		0.00	-53.69	0.00	GALLAGHER	P 2848
17	NO. 1 F.O.	PORT	0.00		0.00		0.00	-17.69	0.00	GALLAGHER	P 2848
18		STBD	0.00		0.00		0.00	-17.69	0.00	GALLAGHER	P 2848
19	NO. 2 F.O.	PORT	18.25		6.70	0.60	4.02	7.74	51.86	GALLAGHER	P 2848
20		STBD	18.25		6.70	0.60	4.02	7.74	51.86	GALLAGHER	P 2848
21	NO. 3 F.O.	PORT	83.40		23.44	9.00	210.96	36.84	863.53	GALLAGHER	P 2848
22		STBD	83.40		23.44	9.00	210.96	36.84	863.53	GALLAGHER	P 2848
23	FO DAY TK	PORT	98.00	2.77	7.15	10.05	71.86	25.94	185.47	GALLAGHER	P 2848
24		STBD	98.00	2.77	7.15	10.05	71.86	25.94	185.47	GALLAGHER	P 2848
25							0.00		0.00		
26	FRESH WATER TANKS						0.00		0.00		
27	F.W. TK	PORT	10.00		3.75	1.00	3.75	-31.60	-118.50	GALLAGHER	P 2872
28		STBD	10.00		4.09	1.00	4.09	-31.63	-129.37	GALLAGHER	P 2872
29							0.00		0.00		
30	BALLAST WATER TANKS						0.00		0.00		
31	FOREPEAK		0.00		0.00		0.00	-67.20	0.00	GALLAGHER	P 2858
32	AFT PEAK	PORT	100.00	0.00	17.60	13.54	238.30	69.28	1219.33	GALLAGHER	P 2858
33		STBD	100.00	0.00	17.60	13.54	238.30	69.28	1219.33	GALLAGHER	P 2858
34	E.R. BILGE		25.00	0.00	15.08	0.25	3.77	42.00	633.36	GALLAGHER	
35											
36	MISC. TANKS						0.00		0.00		
37	MAIN ENG. LUBE OIL		30.60	2.81	2.34	3.30	7.72	21.95	51.36	GALLAGHER	P 2867
38	HYD. OIL STORAGE		40.00	2.76	1.48	3.00	4.44	21.90	32.41	GALLAGHER	P 2868
39	HYD. OIL OPERATING		98.00	2.76	3.78	12.98	49.06	22.00	83.16	GALLAGHER	P 2868
40	OILY BILGE WATER TK		0.00	0.00	0.00		0.00	51.00	0.00	GALLAGHER	P 2869
41	DIRTY OIL TK		98.00	2.29	2.61	12.01	31.35	51.80	135.20	GALLAGHER	P 2868
42	GEN.& S.T.LUBE OIL		98.00	3.25	1.29	10.71	13.82	56.39	72.74	GALLAGHER	P 2867
43	GEAR OIL TK		98.00	2.07	0.96	10.63	10.20	55.55	53.33	GALLAGHER	P 2869
44	C.P. HYD. OIL TK		98.00	0.93	0.32	10.93	3.50	58.86	18.84	GALLAGHER	P 2867
45							0.00		0.00		
46	CARGO (PRODUCT)						0.00		0.00		
47	RECEIVING TANK		75.00		19.87	19.50	387.47	49.68	987.14	WILCOX	P 1333
48	HOLDING BINS		90.00		16.74	19.50	326.43	40.00	669.60	WILCOX	P 1334
49	JACKSTONE FREEZERS		100.00		2.05	18.50	37.93	-8.00	-16.40	WALLACE	P 1535
50	FREEZER HOLD PORT		90.00		92.20	10.82	997.60	-3.70	-341.14	PHILPOT	P 51/EX 9
51	FREEZER HOLD STBD		90.00		92.20	10.82	997.60	-3.70	-341.14	PHILPOT	P 51/EX 9
52							0.00		0.00		
53	CREW & EFFECTS						0.00		0.00		
54	MAIN DECK				1.00	19.50	19.50	10.00	10.00	DRAKE	EX 5
55	FOCSL LVL1				2.00	28.00	56.00	-44.00	-88.00	DRAKE	EX 5
56	FOCSL LVL2				1.00	36.00	36.00	-46.00	-46.00	DRAKE	EX 5
57	PILOT HSE				0.10	45.00	4.50	+38.00	-3.80	DRAKE	EX 5
58							0.00		0.00		
59	STORES						0.00		0.00		
60	DRY STORES FWD HOLD		100.00		1.50	8.00	12.00	-40.00	-60.00	DRAKE	EX 5
61	COLD STORES MAIN DK		100.00		1.50	21.00	31.50	-46.00	-69.00	DRAKE	EX 5
62	FIBER/PLASTIC-HOLD				23.90	8.00	191.20	-1.00	-23.90	GALLAGHER	EX 171/178
63	H & G PANS-FACTORY		2000.00		2.00	21.00	42.00	1.00	2.00	MELTON	EX 127
64	FIBER FOCSL LVL1				0.50	28.00	14.00	-44.00	-22.00	WILCOX	EX 89/178
65	FIBER/PLASTIC-BLUERM				7.30	36.00	262.80	-16.00	-116.80	SHULTZ	EX 104/178
66	FILTERS & HOSES				0.30	6.00	1.80	68.00	20.40	GALLAGHER	EX 171
67	SPARE BELTS				1.00	17.00	17.00	68.00	68.00	GALLAGHER	EX 171
68	FREON STORES		50.00		0.50	18.00	9.00	70.00	35.00	GALLAGHER	EX 201
69	TRASH P&S LVL1				0.15	18.00	2.70	-44.00	-6.60	SHULTZ	EX 104
70							0.00		0.00		
71	FOCSL LVL1 GEAR						0.00		0.00		
72	WIRE ON FWD REEL P&S				7.53	27.00	203.31	-23.00	-173.19	DRAKE	EX 5/177
73	XTRA CABLE-TRL WNCHS		3.00		0.50	27.00	13.50	40.00	20.00	SIEMONS	P 4989
74	SPOOL 7/8 WIRE		50.00		0.25	25.00	6.25	20.00	5.00	SHULTZ	EX 104/177
75	SPOOL 5/8 IN WIRE		50.00		0.20	24.50	4.90	20.00	4.00	SHULTZ	EX 104/177
76	SPOOL 9/16 IN WIRE		50.00		0.10	24.50	2.45	20.00	2.00	SHULTZ	EX 104/177
77	BARREL OF CHAIN		300.00		0.60	26.00	15.60	20.00	12.00	SHULTZ	EX 104/177
78	TRASH WEB				0.10	25.00	2.50	44.00	4.40	SHULTZ	EX 104
79	TOTE W/FLOATS & WIRE		1.00		0.30	25.00	7.50	23.00	6.90	SHULTZ	EX 104
80	SPARE DOOR SHOES		6.00		1.10	24.20	26.62	23.00	25.30	MOE	EX 114/177
81	OXYGEN BOTTLES		4.00		0.10	25.00	2.50	66.00	6.60	GALLAGHER	EX 172/205
82	PLATE 1/4 IN STEEL		1.00		0.15	28.00	4.20	44.00	6.60	GALLAGHER	EX 172
83							0.00		0.00		
84	FOCSL LVL2 GEAR						0.00		0.00		
85	SPARE MOTORS (PORT)		2.00		1.54	34.00	52.36	-1.00	-1.54	MOE	EX 114/203
86	TOTES P&S		2.00		0.50	34.00	17.00	-20.00	-10.00	SHULTZ	EX 104
87	BRIDLES (PORT)		20.00		0.25	34.00	8.50	30.00	7.50	SHULTZ	EX 104
88	STEEL LINE (PORT)		1.00		0.10	33.00	3.30	18.00	1.80	SHULTZ	EX 104
89	TRASH WEB (STBD)				0.30	32.00	9.60	8.00	2.40	SHULTZ	EX 104
90	GROUND GEAR (PORT)		3.00		5.10	34.00	173.40	8.00	40.80	SHULTZ	EX 104/177
91	GROUND GEAR (STBD)		1.00		1.70	34.00	57.80	8.00	13.60	SHULTZ	EX 104/177
92	COOKIE GEAR (PORT)		8.00		1.66	33.00	54.78	6.00	9.96	SHULTZ	EX 104/177
93	SPARE WEB (STBD)		4.00		0.53	33.50	17.76	1.00	0.53	SHULTZ	EX 104/177
94	5/8 IN WIRE (STBD)		100.00		0.20	34.00	6.80	-1.00	-0.20	SHULTZ	EX 104/177
95	SKIFF & MOTOR (PORT)		1.00		0.50	36.00	18.00	3.00	1.50	SHULTZ	EX 104
96	CRAB POT (PORT)		1.00		0.25	35.00	8.75	8.00	2.00	SHULTZ	EX 104
97	CRAB POT (STBD)		3.00		0.75	35.00	26.25	8.00	6.00	SHULTZ	EX 104
98							0.00		0.00		
99	GANTRY LVL GEAR						0.00		0.00		
100	HIGH RISE NET		100.00		3.76	36.00	135.36	64.00	240.64	SHULTZ	EX 105/177
101	SPARE CHAFING GEAR				0.50	36.00	18.00	66.00	33.00	SHULTZ	EX 105
102	TOTES OF COOKIE GEAR		2.00		0.40	36.00	14.40	65.00	26.00	SHULTZ	EX 105/177
103	SPARE PANELS P&S				0.10	35.00	3.50	65.00	6.50	SHULTZ	EX 105/177
104							0.00		0.00		
105	TOTAL			FSM (FT-T)	WT. (LT)	VCG (FT)	VMOM(FT-T)	LCG (FT)	LMOM(FT-T)		
106				22.41	1364.83	16.08	21917.40	9.00	12283.69		

Figure 17

ANALYSIS

1. PREFACE

This analysis, based on the factual information developed, is a record of the reasoning process used by the Board in reaching certain conclusions and recommendations.

In conducting this investigation, the Board looked at company and management practices, personnel training, industry and federal standards and oversight, survival aspects, human factors, and a myriad of other issues the Board believed had an impact, or potential impact, on vessel and personnel safety. Board members also attended an industry course on fish net terminology and trawling procedures.

This investigation was hampered by the lack of up–to–date plans, maintenance and repair and safety records, and other documentation that might be expected of a public corporation that manages the number of vessels and employs the number of people that AAFC does. Because of this and the lack of candor and cooperation on the part of AAFC officials, the Board found it necessary to pursue many avenues it believed could provide information to determine the cause of the casualty and to make recommendations to prevent similar casualties from occurring in the future. During the course of this investigation, the Board heard testimony from 42 witnesses, entered 299 exhibits into the official record, and conducted 23 days of formal hearings.

This investigative report is organized to initially provide the reader with background information in topic format to assist in understanding the circumstances surrounding the casualty. While the evidence developed may not be indicative of the fishing vessel industry as a whole, it documents the practices of one of its largest companies; one that employs approximately 1,600 personnel, a large number of whom are processors on vessels at sea.

2. VESSEL CAPSIZING AND FLOODING

The ALEUTIAN ENTERPRISE capsized, flooded and sank after an overloaded fishing net failed while being hauled aboard, releasing a large volume of fish on deck that shifted to port. The port side processing deck through–hull openings became submerged and sea water rapidly flooded the processing space. Progressive flooding through open, nonexistent, or missing watertight doors caused it to sink in about 10 minutes. The weather was clear with 15 to 20 knot winds, and 5 to 6 foot seas off the starboard bow.

The captain and deck crew described the sequence of hauling the net aboard in detail. The Board did not conclude that the capsizing was caused by tripping of the vessel by the trawl because it remained astern and was visible to the crew. It was not caused by a severe upward shift of the vertical center of gravity during the lifting operation since the lifted weight was never freely swinging from the gilson winch or turning block.

The sudden increase in list to port occurred after the intermediate section of the net parted. The wind and seas were off the starboard bow, causing the ALEUTIAN ENTERPRISE to roll in the trough of the seaway. The deck crew testified that the vessel rolled to port after the intermediate ripped, eventually causing most of its contents to shift to that side. They saw fish flow to and over the top of the gunwale on the port side. Captain Siemons stated that there were 10–15,000 pounds of fish in the intermediate section of the net. This is not consistent with the weight of fish the intermediate could hold based on volumetric calculations if it was 1/2 to 3/4 full as described by the crew. A full intermediate has a capacity of 30 to 40 tons. The Board specified a range of 5 to 30 long tons (LT) of shifting fish weight for the stability study performed by the Marine Technical and Hazardous Materials Division (G–MTH) in Washington DC. According to the study, the vessel would have listed at least 5 degrees with only 5 LT and up to almost 17 degrees with 30 LT, assuming no initial list.

Undersized and partially blocked portside freeing ports prevented the shifting fish from spilling off the listing vessel. Wilcox, the deck boss, tried to block the freeing ports with an old tire so they wouldn't loose the fish over the side.

The Board concluded that the vessel had a port list before the casualty occurred. Several crewmembers testified that a list to one side or the other was very common on the ALEUTIAN ENTERPRISE. At least five crewmen testified that the vessel was listing to port before the last haulback. That the initial port list and the effect of hauling in the net using the port net reel and gilson contributed to the casualty is supported by the G–MTH study.

The Board concluded that nonexistent or poorly maintained watertight closures on the portside through–hull openings allowed seawater to flood the processing deck. Several processors observed water pouring in through the fish discard chute while the vessel listed. They saw [redacted] the factory foreman, trying to hold back the water by pushing the discharge chute cover outboard. They also saw water "swirling up" in the vicinity of the NMFS observer's station.

The assistant engineer, [redacted] testified that the hold tank flume drain was not fitted with a flapper plate and that the 3" sump and deck drains were not plugged at sea. He said that the fish discard chute flapper plate had "rotted out" in the past and had required repairs. The Board concluded that the flapper plates and deck drain plugs were not effective watertight and weathertight closures. Marine type non–return fittings with a positive means of closure should have been installed.

The Board concluded that the submerged through–hull openings on the port side of the processing deck allowed seawater to progressively flood the vessel. The G–MTH study calculated that with only a one foot head, water would flow onto the processing deck at a rate of over 33 cubic feet per second. As the list increased, the water pressure increased. The added weight of seawater on the port side progressively increased the vessel's draft and list eventually causing the vessel to capsize. The chute coamings inboard of each discharge opening prevented water that had flowed in at that pressure from flowing back out, even if the outside water level momentarily decreased due to the motion of the vessel. The vessel would have continued to

flood because the mean outside water level was always higher than the inside water level once the fish discard chute became submerged.

The vessel's heaving and rolling motion in the seaway increased the submergence of the port side openings periodically during the early stages of the capsizing. The effect of wind and waves on the ALEUTIAN ENTERPRISE was evaluated using the videotape of the rescue. The NORTHWEST ENTERPRISE, with a hull very similar to the ALEUTIAN ENTERPRISE, appeared in the video which was taken just minutes after the casualty. Since it was almost stopped, the NORTHWEST ENTERPRISE would have been rolling and heaving similar to the ALEUTIAN ENTERPRISE at the time of the casualty. The NORTHWEST ENTERPRISE was clearly seen in the first few minutes of the videotape rolling about 2 to 3 degrees with the wind and waves on the port bow; it was also heaving. The range of the average significant vessel response amplitudes was 5 to 6 feet according to the rise and fall of the water level on the starboard side of the hull. The period was about 5 to 6 seconds. The Board concluded that downflooding through the fish discard chute would have been effected by the rising and falling of the sea level on the port side of the ALEUTIAN ENTERPRISE according to the vessel's response amplitude and period ranges above.

Two pumps, located in the hold level, constantly ran to supply sea water to the processing equipment and holding tanks to rinse and move the fish through the factory. Together they supplied about 1,000 gallons per minute to the processing space. Normally this water would exit the vessel through the chute openings or via the sump pumps or sump drains. The Board concluded that the port cutter and sump pump were inoperable based on several processor's testimony. Processor, Philpot testified that the forward sump pump had clogged up earlier on the day of the casualty and that he tryed to start it during the casualty. Other processors described the constant problems they had with the cutter pumps and sump pumps because knives, plastic, large fish and other debris would clog the impellers. Testimony that there was loose water on the processing deck when the vessel had a port list prior to the casualty indicates that the port cutter pump was not working at that time.

Testimony from the processors on watch provided a wide range on the initial level of loose water on processing deck. At any given time and place it would have been difficult to measure the mean level for the whole area since the vessel was rolling, pitching and trimmed aft. The Board specified a range of 1 inch to 3 inches (mean level of loose water from the front of the hold tank to the forward bulkhead of the processing area) for the G–MTH study. The Board requested that the pocketing effect be evaluated for each angle of heel rather than applying a free surface correction. The results indicated that each additional inch of loose water initially on the processing deck would add about 2 degrees to the equilibrium list angle. The Board concluded that the buildup of water due to the ineffective sump pump system accelerated the capsizing.

The Board concluded that Captain Siemons' attempt to correct the port list by putting the starboard engine ahead full while initiating a turn 45 degrees to port did not contribute to the capsizing because he quickly aborted the maneuver and there was no evidence to suggest that the vessel listed further due to the action. The Board disagreed with Captain Siemons' action and concluded that had he persisted in this maneuver it would have accelerated the capsizing.

The Board concluded that missing and nonexistent watertight doors, port and starboard in the forward processing deck bulkhead, at the elevator shaft, and at the top of the stairwell to the hold from the processing deck level, permitted flooding forward through the galley and Baader room and down into the hold level. Non-watertight hatches on the port and starboard chutes from the processing deck to the freezers contributed to flooding of the hold. Open weatherdeck watertight doors to the port quarter processing deck access and main deckhouse between the net reels accelerated the flow of water into the vessel when it reached a large angle of heel.

The results of the G-MTH study showed that the estimated time to sink for the range of conditions the Board asked to be evaluated was 3½ to 19 minutes. This included the effect of the wind and waves observed in the videotape. The static analysis (excluding the wind and wave motions) showed that over the range of loading conditions evaluated, the difference between the equilibrium list angle (static list) and the progressive downflooding angle ranged from -6½ to +8 degrees. The Board concluded that the actual condition of the vessel at the time of the casualty was near the mean of the conditions studied by G-MTH.

Figure (18) illustrates one of the conditions near the mean. G-MTH calculated a time to sink of just over 6 minutes for this condition which is based on Moe's weight testimony, 2½ degrees initial list, 15 long tons of fish weight, and 2 inches of initial loose water on the processing deck.

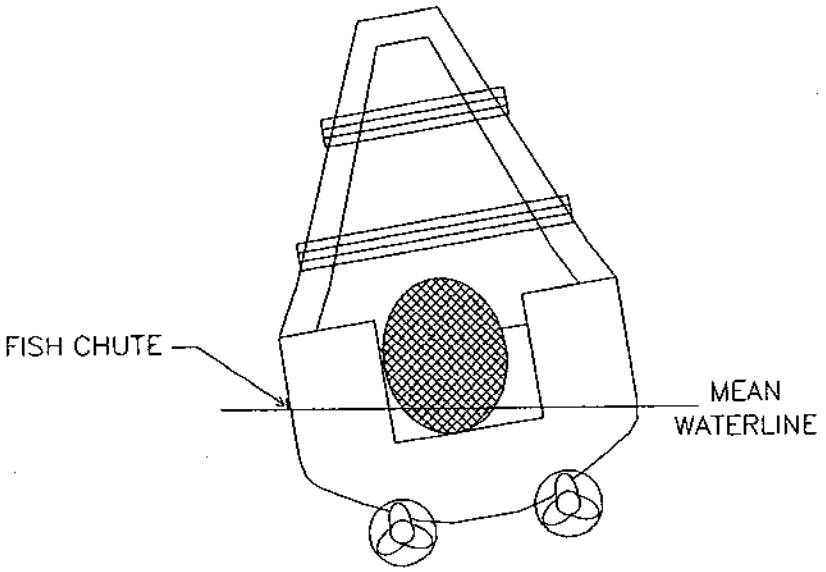
3. POSSIBILITY OF STRUCTURAL FAILURE

The board considered the possibility that structural failure of the hull may have caused or contributed to the cause of the flooding and capsizing, but discounted it due to lack of evidence and its low probability of occurrence. None of the survivors reported hearing or seeing anything that would indicate that the hull had cracked or collapsed or failed in any way. One of the processors was in the port freezer hold and did not report anything abnormal. The chief engineer, who was in a position to see the engineroom and the hold passageway up to the bow fuel oil tank, did not report any such failure during his two telephone conversations with the captain. Survivors that ended up on the keel of the over-turned vessel did not observe anything unusual about the hull.

The possibility that a port side double bottom fuel tank may have collapsed or failed without being detected by the chief engineer was considered because of survivors reports of diesel fuel in the water after abandoning the vessel. The Board rejected this theory because of its extremely low probability, and the coincident timing of the capsize with the shifting fish on deck. The common fuel oil vent that served the starboard double bottom tanks would have allowed the fuel to spill out as soon as the vessel rolled over on its beam, which would account for the fuel that the crew encountered.

ALEUTIAN ENTERPRISE

EQUILIBRIUM LIST ANGLE FOR LOAD CONDITION 5 M 2



RESIDUAL RIGHTING ENERGY

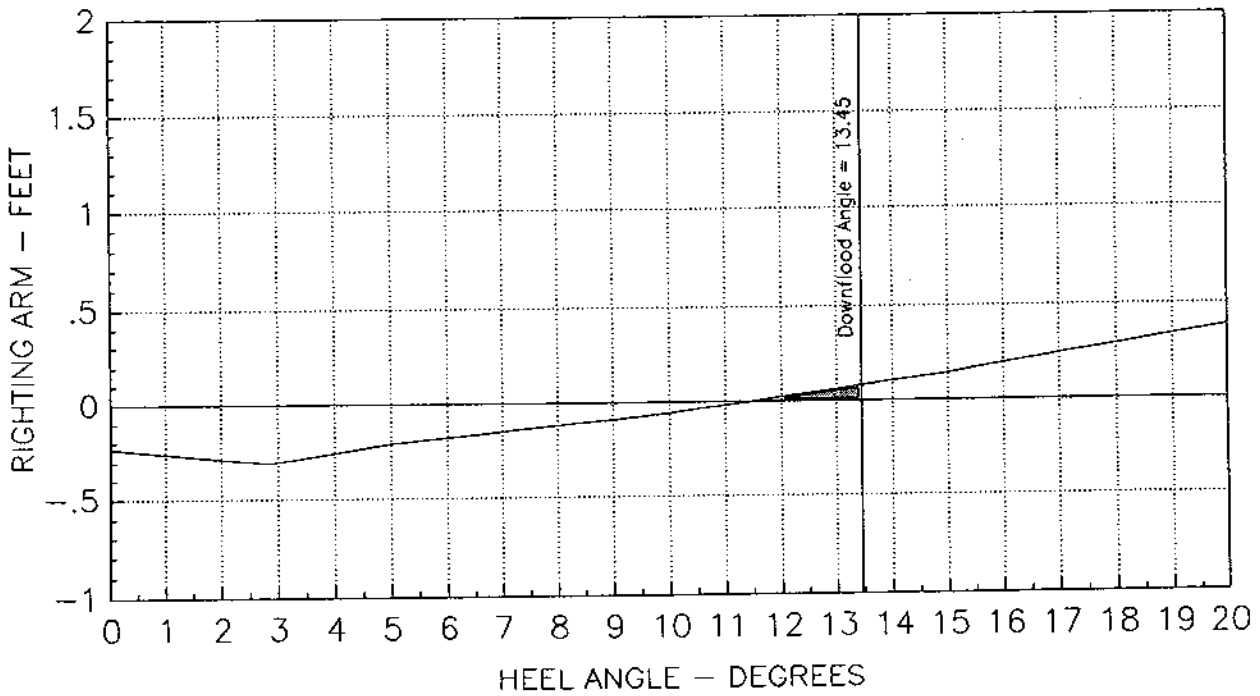


Figure (18)

4. CHIEF ENGINEER'S ACTIONS

The actions taken or being taken by the chief engineer did not cause or contribute to the cause of the casualty. The Board considered the possibility that the chief engineer may have been transferring fuel from the starboard tank to the port tank just before the captain noticed the unusual port list. This could have contributed to the sudden list to port; however, the Board believes the captain's testimony that the chief engineer would not have transferred fuel without his permission. Since no prior permission was requested of the captain it is unlikely that the chief engineer would have transferred fuel while the net was being hauled on board.

The unusual length of time taken by the chief engineer to answer the captain's initial call, and the captain's testimony taken when he first arrived in Dutch Harbor suggests the chief engineer may have discovered the sudden unexplained list and started to take emergency action either shortly before or as he was being called by the captain. Testimony indicates that transfer from the port tank to the starboard tank was a simple task. It would have been difficult to make an error and transfer fuel in the opposite direction and contribute to the port list.

Given this situation and the experience level of the chief engineer it is highly unlikely that he was transferring fuel to the port tank. The Board believes that he was in the process of transferring fuel from the port tank to the starboard tank. Whether fuel actually started to be transferred could not be determined.

5. LACK OF SAFETY OVERSIGHT AND VESSEL MAINTENANCE

AAFC's oversight mechanism to ensure that the vessel's overall material condition was maintained in accordance with good marine practice was virtually nonexistent. AAFC did not conduct regular inspections or surveys, nor did it require periodic safety inspections by the crew. Maintenance and repair records of the ALEUTIAN ENTERPRISE consisted mainly of invoices and an equipment list. Up-to-date plans of the vessel were nonexistent; review of log books by personnel in the repair and maintenance department was cursory at best. Vessel personnel were permitted to make repairs and alterations, some of which affected the vessels watertight integrity, without prior approval or oversight. AAFC did not have a system in place to ensure that repair recommendations by the marine surveyor were completed. The condition and valuation surveys conducted by the marine surveyor were simply an updating of the list of equipment on board for insurance purposes. They did not include a complete inspection of equipment, machinery, and lifesaving equipment. The survey reports were not distributed to the vessels, so the captains and engineers did not benefit from them. The turnover of captains and engineers on the ALEUTIAN ENTERPRISE also contributed to haphazard oversight of vessel maintenance.

Insurance companies did not require surveys, nor did they inquire into marine casualties unless they resulted in a claim or exceeded the deductible. The ALEUTAIN ENTERPRISE was not classed by ABS or any other recognized society nor did it have a Certificate of Inspection issued by the U.S. Coast Guard. Either would have provided evidence of meeting the insurance

companies requirement for recognized standards addressing structural integrity, vessel and personnel safety. A Coast Guard Certificate of Documentation was allowed to meet the P&I insurance "club rules" requirement for a U.S. Coast Guard Certificate of Inspection. The Certificate of Documentation issued to the ALEUTIAN ENTERPRISE provided evidence of ownership, authorized service, and vessel characteristics. It did not indicate that the vessel met any recognized construction or safety standards.

On the ALEUTIAN ENTERPRISE, sump pumps and cutter pumps were installed without check valves. Equipment and steel plating was added to the vessel without regard for its effect on vessel stability. The existence of proper marine deck drains and discard chute closure fittings was overlooked. The general alarm was rarely if ever tested. Preventative maintenance of the flappers that were in place was nonexistent. Watertight doors were removed. A non-watertight opening was cut into a watertight bulkhead. The tonnage opening plate on the transom was welded closed.

The vessel was operated without a loadline. It continued to operate for several months with bottom damage due to an unreported grounding. It continued to operate without a repair or modification after experiencing flooding in a storm. It operated routinely with small holes and cracks through the stern.

The captain of the ALEUTIAN ENTERPRISE telexed his needs for new fishing gear, a new net sounder, and new processing area stereo speakers, but never reported missing a watertight door or cutting through a watertight bulkhead. He depended on AAFC personnel in Dutch Harbor to deal with the cracks in the stern, the cause of flooding in the storm, and welding the tonnage opening. Responsible AAFC managers did not actively monitor safety and maintenance on the ALEUTIAN ENTERPRISE and did not properly instruct the captain, or the Dutch Harbor manager to do so either.

6. CAPTAIN'S KNOWLEDGE OF STABILITY

Captain Siemons was unfamiliar with the vessel's Trim and Stability (T&S) Report, particularly its recommendations for preserving adequate stability. Therefore, he did not recognize that the vessel's fuel transfer procedures, codend size, deck loads, and actual draft, and trim varied substantially from those represented in the T&S Report. In fact, the buoyant volume, lightship characteristics, and general operating procedures of the vessel were substantially different from those represented in the T&S Report. He should have read the report and taken action to ensure that it was accurate and usable.

At the time of the casualty, the vessel was not loaded or operated in accordance with the August 1987 T&S Report. The captain exceeded the applicable loading condition weight allowance on or above the weatherdeck by approximately 27 long tons of fish and 25 long tons of excess equipment (including the 3/4" doubler) and supplies. He used a 40 ton codend instead of a 25 ton codend as listed in the T&S Report. He rarely checked the vessel's draft. He did not compare his vessel's fuel transfer procedures with the conditions and recommendations of the T&S Report.

The Board believes the reasons for Captain Siemons' disinterest in the T&S Report were his lack of training and experience, lack of oversight of the vessel's operation by AAFC, lack of time to devote to the stability instructions due to the demands of fishing, the poor presentation of the stability information, and primary focus of the vessel and company on the need to catch and process fish.

AAFC priorities on hiring, training, and oversight did not ensure that its vessel's captains were knowledgeable and conscientious about stability. This investigation illustrated that maintaining a watertight, stable vessel was second to maintaining production, maximizing profits, and minimizing costs.

Coast Guard license examinations for masters and mates of fishing industry vessels do not include detailed coverage of operational stability. The Coast Guard should require fishing vessel stability exams similar to radar exams, including appropriate endorsements on licenses. The licenses of individuals who presently serve or intend to serve on fishing industry vessels should not be renewed until the holder passes a detailed examination on fishing vessel operational stability.

7. LACK OF LOADLINE ASSIGNMENT

The requirements for a loadline as set forth in 46 CFR 42 through 47 include provisions for protecting the watertight integrity of the vessel, for providing adequate strength and stability in all loading conditions, for draining deck water, for protecting crewmembers performing outside tasks, and for periodic surveys by the assigning authority to check compliance.

A fish processing vessel as defined by 46 USC 2101(11b) is a vessel that commercially prepares fish or fish products other than by gutting, decapitating, gilling, skinning, shucking, icing, freezing, or brine chilling. In addition to heading and gutting (H&G), the ALEUTIAN ENTERPRISE filleted and boxed the fish products for marketing.

AAFC executives were aware of the applicability of loadlines to fish processing vessels. In 1987 Halter Marine notified them of the requirement during the construction of the U.S. ENTERPRISE, a 224 foot fish processing vessel. According to [redacted] President and Chief Executive Officer of AAFC, "With the advice of legal counsel and with our history we have determined those vessels [AAFC fish processing vessels] to be fishing vessels. And that's been the general practice all along." AAFC appealed a Coast Guard order to loadline U.S. ENTERPRISE based on this argument, but the Commandant denied the appeal on January 11, 1989. AAFC made no effort to loadline any of its vessels until after the Coast Guard detained the U.S. ENTERPRISE in Puget Sound in April of 1990.

Loadlining the ALEUTIAN ENTERPRISE would have necessitated fitting automatic non-return fittings and positive closures in the through-hull openings on the processing deck. The American Bureau of Shipping (ABS) noted that, "This fish processing vessel, as with many fish processors, has side openings in the freeboard deck structure for passing overboard the remains

of the processed fish. The type of closure provided a simple hinged flap, cannot be considered as a weathertight closure and therefore the deck structure is not enclosed." ABS suggested that, "An acceptable arrangement for the overboard chute(s) would be to fit a 35½" coaming to the chute(s) and permanently attached, hinged weathertight hatch cover to the coaming."

Regarding the non-enclosed processing deck structure, ABS commented, "This fitting of freeing ports and the possible freeflowing of seawater on and off the factory deck would not be practical nor safe."

Commandant (G-MTH), in response to the Board's letter inquiry regarding loadlines, noted that the ALEUTIAN ENTERPRISE flapper plates would not be considered weathertight. G-MTH suggested that the through-hull openings could be made weathertight by adding a sluice valve with a positive means of closure.

Coast Guard Marine Safety Center's (MSC) stability review indicated that the vessel would have satisfied the applicable stability criteria through the whole range of operating conditions if the full superstructure was maintained watertight or weathertight. When the superstructure aft of the deckhouse (processing area) is excluded as buoyant volume, the vessel fails the applicable criteria in all load conditions.

AAFC's failure to loadline the ALEUTIAN ENTERPRISE contributed to the lack of maintenance of through-hull fittings in the processing deck. This resulted in the hazardous condition that allowed the vessel to flood and sink. If AAFC had sought a loadline for the ALEUTIAN ENTERPRISE, the classification society involved would have ensured that the processing deck through-hull openings were fitted with proper weathertight/watertight closures. During annual loadline examinations the classification society would have ensured that these openings were properly maintained. As part of the loadline process, Coast Guard MSC would have reviewed the T&S Report and returned it for revision. MSC would have issued a stability letter and required that it be posted in the pilothouse of the ALEUTIAN ENTERPRISE to remind the captain of the operating conditions of the vessel.

The entire loadline process would have educated AAFC officials and Captain Siemons and made them sufficiently sensitive to watertight integrity issues so as to possibly prevent the circumstances that ultimately resulted in the capsizing and sinking of the ALEUTIAN ENTERPRISE.

8. PROCESSING DECK DEWATERING

The ALEUTIAN ENTERPRISE processing deck dewatering system was not adequate for preventing a dangerous buildup of loose water. The processing operation required hundreds of gallons of water per minute to move and clean the product. The sump pumps that must remove this water constantly became clogged or otherwise inoperable. Water built up on deck whenever one of the pumps was not operating. The design was such that water and debris would collect around an inoperable pump when the vessel listed and the other pumps could not remove that water.

There is a need to ensure that fishing industry vessels that use large volumes of water in their activities (e.g., cleaning or processing) have the ability to pump that water off. On fish processors there should be an independent dewatering capability sufficient to remove the water pumped onto the processing deck.

Cutter type pumps or similar equipment used to macerate fish carcasses should not be considered in the dewatering capacity. This equipment is susceptible to clogging and breakdown from knives, debris and large fish carcasses and therefore is not a reliable dewatering source. There are fishing industry vessels other than fish processors that use large amounts of water in their operation, such as head and gut operations on fish tenders. These vessels also need to ensure that sufficient dewatering capacity is present, excluding cutter type pumps.

9. T&S REPORT INFORMATION AND USE

The T&S Report was inaccurate because of the naval architect's unprofessional work. The vessel was equipped for fishing at the time of the 1987 inclining; many weight items which are normally not included in lightship were aboard. No attempt was made to remove them from the vessel. Lightship included spare parts, tools, portable machinery and galley equipment below decks. It also included trawl doors on the transom and a spare set of trawl doors stowed just aft of the port trawl winch. Included was all twine, shackles, hammerlocks, blocks, G–hooks, tools and other equipment stowed in the permanent deck lockers in addition to the cable on the trawl winch reels at the time of the inclining, and one anchor with chain. It did not include the skiff and motor, nets, ground gear, floats, spare net panels, spare cable, and spare parts not stowed in lockers. It would have been impossible for the captain of the ALEUTIAN ENTERPRISE to know what was included in the lightship weight because these details were not in the report.

[redacted] failure to deduct the weight of the pressed up starboard fresh water tank resulted in the vessel appearing 37½ long tons heavier than it should have been in all the load conditions presented in the report. Each load condition showed too much trim by the bow because the starboard freshwater tank is located 31 feet forward of amidship.

[redacted] reluctantly admitted that the vessel would have been required to be more watertight if it had a loadline. Coast Guard MSC identified several non–conservative errors in the T&S Report. No unsafe conditions were presented in [redacted] report. None of the conditions had a free surface moment calculated for more than one set of fuel tanks. No condition included weight suspended from gilson winches or the crane. The operating recommendations did not itemize any particular openings that should be maintained to prevent water from coming in or to allow water and fish to go out. Since no specific openings were listed. It is unclear whether [redacted] recommendation number 2 (requiring closure of weathertight fitting) or recommendation number 7 (requiring open freeing ports) applied to the various chute openings and scuppers on the processing deck.

The icing conditions were often referred to for determining the amount of "built in" reserve. Each of the licensed captains with extensive fishing industry vessel experience testified that they would not be concerned about exceeding the non–icing conditions because the icing conditions demonstrated that the vessel had reserve stability. [redacted] said that there was a reserve margin of

stability in each load condition, but he could not say how much. He did not advise AAFC on the training the captains should have to use the T&S Report.

[redacted] poorly presented stability report did not directly contribute to the casualty. The T&S Report should have confused and alerted Captain Siemons had he tried to use it because the vessel could not achieve the draft and trim conditions of the loading conditions, and the recommendations were not consistent with normal vessel operations.

An industry standard should be developed for fishing industry vessel lightship definitions. This investigation revealed that the Coast Guard, ABS or other qualified organizations should periodically review fishing industry vessel stability calculations and stability instructions for completeness and conformance with appropriate industry standards.

10. ADMINISTRATION OF ADMEASUREMENT REGULATIONS

The processing space was exempted from tonnage as an open superstructure pursuant to 46 CFR 69.117(d). The ALEUTIAN ENTERPRISE did not utilize the dual tonnage measurement system referred to at 46 CFR 117(a)(6).

[redacted] and [redacted] had designed the processing space to be exempt from tonnage through the use of tonnage openings in the trawl deck and live or hold tank according to the rules for open shelter decks. The Certificate of Admeasurement issued on February 6, 1984 shows that most of the volume of the processing space was exempted as an "open house". A tonnage opening in the port transom that did not appear in the plans, was present in Bender photos before the vessel was delivered. It was probably made to bring the vessel below 200 gross tons since processing equipment located directly below the trawl deck hatch opening negated that opening for tonnage admeasurement purposes. The admeasurement regulations, 46 CFR 69.117(e)(2)(vi), for open shelter deck exemptions precludes the installation of the processing equipment below the trawl deck hatch opening. The opening in the transom exempted the space as an "open house" under 46 CFR 69.117(d)(2)(ii) rather than an open shelter deck as the naval architects had planned.

The tonnage opening in the transom became a constant source of leaking after the vessel went into service. Captain [redacted] testified that the tonnage opening was a constant problem, because the trawl door always hit it during fishing operations. It was very close to the waterline and was probably partially submerged when the vessel was fully loaded. Captain Siemons ordered that it be welded closed after he saw it leaking.

Commandant (G-MVI), in response to the Board's letter inquiry, noted that the tonnage opening in the transom of the ALEUTIAN ENTERPRISE allowed the processing space to be admeasured as an "open superstructure", therefore processing space scuppers or freeing ports would not be required by the admeasurement regulations. G-MVI's response explained that tonnage openings may be accepted as sufficiently weathertight, but that the preferred arrangement for the vessel would have been to exempt the processing space from tonnage measurement without the tonnage opening by applying 46 CFR 69 Subpart D – Dual Measurement System. When the dual tonnage system is used and a single tonnage is assigned according to 46 CFR 69.175(c), spaces

immediately above the freeboard deck may be omitted from tonnage provided a tonnage mark is located at the level of the uppermost part of the loadline grid.

The ALEUTIAN ENTERPRISE would have been a safer and easier vessel to maintain if the dual tonnage measurement system had been used to exempt the processing deck rather than cutting the opening in the transom. Subpart D measurement rules at 46 CFR 69 should be encouraged in the fishing industry vessel community by ABS and the Coast Guard.

11. ADMINISTRATION OF TITLE XI PROGRAM

The Board noted that considerable funds for AAFC managed vessels are guaranteed by the federal government under the Title XI FOG program. NMFS relies on the vessel owners, marine surveyors, and insurance companies to ensure that vessels in the program meet periodic inspection and survey requirements. This investigation revealed that the vessel owners, the operating manager (AAFC), and the insurance company did not require a regular maintenance program or surveys. The marine surveyor did not conduct the type of periodic comprehensive inspection the Board believes was envisioned by the NMFS. The insurance company did not require minimum safety standards or establish a schedule of surveys or place safety equipment or construction standards on vessels they underwrite. AAFC did not make notification of reportable vessel casualties to the Coast Guard, nor did it report them to the insurance company if they did not exceed the deductible. Safety could be enhanced and the financial interests of the FOG program furthered if NMFS required that vessels in its portfolio periodically be surveyed by an independent surveyor (a surveyor not affiliated with the owner or insurance company).

The Coast Guard and NMFS should explore the feasibility of adding vessel and personnel safety measures to the FOG program. Reports of casualities required to be filed with the Coast Guard could be used by NMFS for monitoring vessels in the FOG program.

12. HUMAN FACTORS ENGINEERING

During the course of this investigation it became evident that several elements of Human Factors Engineering (HFE) were involved. Below is a brief discussion of the HFE elements that existed on the ALEUTIAN ENTERPRISE. The intent here is not to conduct a comprehensive study of HFE, but to acknowledge that HFE played a role in this casualty, no matter how slight, and to increase awareness in HFE.

a. Engineroom Alarm System The engineroom alarm system was designed to alert the mate and engineering officer on watch of certain conditions critical to safety, e.g. water in the bilges, low lube oil, etc. However, the system on the ALEUTIAN ENTERPRISE was routinely used as a means to summons the engineer on watch. The processors in the factory deck were aware of this practice and became accustomed and conditioned to it. When Captain Siemons discovered that the general alarm did not work as the vessel was capsizing, he tried to alert the crew by energizing the engineer alarm, which flashes all through the house, including the wheelhouse. Several of the processors saw the engineer alarm flashing in the processing area. It did not mean

to them that a life threatening situation had developed. The true seriousness of the situation became known to them through other indicators, e.g. water entering the processing deck, personnel giving verbal warnings. It is possible that the chief engineer observed the engineer alarm light flashing a third time, attempted to answer it and lost his life in the process. The general alarm, which was designed to alert the crew of danger, was inoperative.

b. Video Cameras Video cameras and monitors used to monitor certain locations had been removed from the vessel. Television monitors at one time were located within view of personnel stationed at the aft trawl console in the pilothouse. Testimony indicated that other AAFC vessels employed video monitors to monitor areas on the processing deck. Such a device could have provided the watchstander with an extra set of eyes, particularly in remote or critical parts of the vessel, e.g. bleeding area, engineroom.

c. Phone System

At the time of the casualty the captain was bringing the fish net on board when he noticed the vessel was listing to port. The captain wanted to discuss the problem with the chief engineer. The phone in the pilothouse was located away from the aft trawl console. If the phone or repeater had been located by the aft trawl console the captain could have observed what was happening on deck aft and could have relayed addition instructions to the deck crew if needed, while talking to the engineer. According to testimony, the deck crew made connections to the net without the captain's knowledge while the captain was away from the aft console talking to the chief engineer on the phone.

Similarly, the phone for the engineroom was located outside the engineroom which required the engineer on watch to leave the space to use it. The phone was located beyond a watertight door between the engineroom and the forward passageway. The engineer would have likely left the watertight door open or un-dogged since opening and closing it to answer the phone is inconvenient. Therefore, the watertight door was ineffectual. A suitable sound proof phone booth fitted in the engineroom would have afforded the engineer the opportunity to quickly report by telephone conditions in the engineroom, while maintaining watertight integrity in that space.

d. Training Many of the crew, particularly fish processors, lacked safety training. Several crewmembers had survival suits in hand and discarded them. Some attempted to put them on, but could not do so. Others had no idea how to put them on. Safety training, including donning the suits and entering the water would have reinforced the importance of this device to individual survival in frigid waters. The degree of hands-on-training, especially in emergency procedures, e.g. abandon ship, donning of survival suits, etc., would have improved crew survivability.

e. Obstruction of Passageways On the ALEUTIAN ENTERPRISE, fiber and other materials were stowed throughout the vessel in a manner that reduced the clearance of critical passageways, blocked exit doors or otherwise restricted free movement. As the vessel rolled to port, fiber broke loose from its fastenings and further obstructed passageways. The vessel had more fiber and materials than needed. Better inventory and control of fiber and materials could have reduced the need for storage in passageways. More storage for fiber and materials should

have been designed into the vessel, particularly on vessels that operate away from their sources of supply for extended periods. The blocking, and partial blocking of passageways as well as the permanent securing of exit doors could have adversely impacted the crews ability to escape from spaces throughout the ship.

f. Working Environment and Fatigue

The work environment has an effect on the ability to perform assigned tasks and to recognize unsafe conditions. The crew worked 16 hours on, 8 hours off. Processing personnel were instructed not to leave their work station without permission. If they did not perform their assigned tasks according to certain standards, they were required to work extra hours ("overtime") until they improved. In some instances, overtime was assigned to keep pace with the amount of fish being caught. This practice shortened the time available for sleep and training. The cold (no heat on processing deck) and damp (water on processing deck) conditions they worked under, coupled with repeated physical movements, e.g. packing, sorting, cutting, etc. had a negative effect on their physical condition. One of the processor's hands became swollen, which could have impaired his ability to perform emergency tasks, e.g. zipper closed a survival suit, handle lifesaving and firefighting equipment, etc.

On prior trips, loud music was played in the factory deck. This could have had adverse effects on health, (e.g., hearing loss) and reduced the chances of hearing alarms or emergency instructions.

Fatigue impacts the ability to respond in an emergency and to survive. Crewmembers worked long arduous hours with little sleep in between work shifts. Crewmembers who had just come off their work shift and were asleep at the time of the incident had probably been resting for four hours, at most. Their ability to collect their thoughts and escape to safety may have been adversely impacted by chronic fatigue generated by their work routine, schedule, and environment.

g. Quick-Acting Watertight Doors Multiple dogs on watertight doors made it less likely that frequently accessed doors would be properly closed, and infrequently accessed escape doors would be easily opened. On the ALEUTIAN ENTERPRISE few, if any, normally used watertight doors were properly closed, and several important escape doors were not effective because they were dogged closed. An efficient means of closing doors, e.g. quick acting watertight door, would encourage users to properly secure them or use them in an emergency, while preserving the watertight integrity of the vessel.

h. Processing Equipment Layout The placement of processing equipment in the processing space made it difficult for personnel to exit the space quickly. They were required to climb, step over, or crawl under machinery and troughs when moving about the factory deck. Exiting this space in an emergency was difficult for personnel positioned behind such equipment.

i. Cutter Sump Pump Indicators No one on duty in the processing space on the ALEUTIAN ENTERPRISE was assigned the responsibility of ensuring that the cutter sumps (used to remove fish parts and water from the factory deck) were on and operating during processing operations.

Personnel testified that their primary concern was processing of fish. They further indicated that the primary indicator that these pumps were not operating was the buildup of fish parts around the cutter sumps. If the cutter sumps were operating and noise level permitted, personnel could "hear" the pumps. Some of the pumps had red (off) and green (on) push switches – some had rotating controls. They were not fitted with visual indicators to show whether they were off or on, nor an audible alarm to indicate pump failure. A means to readily determine whether the cutter sumps were on, e.g. visual indicator lights or audible alarm, would have permitted personnel in the area to determine if the pumps were working, particularly since the proper functioning of this equipment was vital to vessel stability, e.g. keeping water on deck to a minimum.

j. Emergency Equipment Accessibility Survival suits should be located so that crewmembers can have easy and quick access. In determining location, consideration must be given to the crew's normal work routine so that survival suits, etc. are accessible to the greatest number of personnel on watch. In doing so it may be necessary to carry more survival suits than the number of personnel on board to provide rapid access. In the case of the ALEUTIAN ENTERPRISE, survival suits were located at various levels adjacent to staterooms. This reduced the ability of personnel exiting the factory deck to get survival suits. Their reaction was to go to the first available locker. When the demand exceeded supply they went to the next available location and the next. This resulted in panic, loss of valuable time, and the perception on the part of some that there was an insufficient number of survival suits on board. The time lost in searching for survival suits could have been spent donning them and escaping. At times, as many as two-thirds of the crew can be working on the processing deck. A sufficient number of survival suits should be readily accessible to all workers in the processing space in addition to crewmembers in their staterooms, on deck, in the engineroom, and in the pilothouse. The stowage of deck equipment on top of survival suits in the locker on foc's'le level 1 limited accessibility.

k. Overboard Discharges Overboard discharge chutes and lines designed to discard fish, fish parts and water did not have the ability to keep sea water from entering the processing deck. The use of manual watertight closures on discard chutes would be ineffective if they could not be closed against incoming water, particularly under emergency conditions. Reliable check valves would be effective in pipe discharge lines. A hydraulic means of closing discharge chutes should be devised that would be available and operate under a head of water, with a mechanical backup in the event of a power outage.

l. Presentation of Stability Information & Testing

Stability data provided vessel personnel should include information and tools necessary for the user to make informed decisions when needed. The format in which it is presented must recognize the level of training of the user and the nature of the vessels operation. In the case of the ALEUTIAN ENTERPRISE the captain had very little stability training. Even though he was licensed he recalled only a few questions on his examination addressing stability. A certain level of expertise must be developed through mandated training and verified through specific testing to demonstrate that the user can efficiently and effectively perform the task of evaluating the fishing vessel's stability under all operating conditions.

The Trim and Stability Report for ALEUTIAN ENTERPRISE did not comply with the recommendations of Navigation and Vessel Inspection Circular (NVIC) 5-86. The NVIC recommends several stability information formats. [redacted] elected the "Pictorial Format" for the ALEUTIAN ENTERPRISE T&S Report. Even if it had satisfied all the recommendations, the pictorial format would have made it difficult for the operator to know he was exceeding the limits of stability because it did not describe the maximum allowable draft, trim or Vertical Center of Gravity (VCG) and provided no limiting load conditions. Since loading occurs at sea, fishing vessel captains must know the limitation of loading without having to interpolate between precalculated load conditions. While it may be clear which conditions depicted are safe or unsafe it is very difficult for the captain to determine whether the actual condition of the vessel is safe. The report did not provide him with a clear description of the stability limits of the vessel. The naval architect did not present the vessel's stability at the extreme range of draft, trim, VCG and extreme loading combinations.

The "Simplified T&S Book Format" as depicted in NVIC 5-86 provides the limiting stability conditions for the vessel, but requires the operator to perform calculations to determine VCG and Longitudinal Center of Gravity (LCG). There was testimony that fishing vessel captains cannot be expected to perform these calculations particularly since operations which approach the stability limits usually require the captain's attention elsewhere.

The "Simplified Letter Format" discussed in NVIC 5-86 gives the operator the needed stability limitations without requiring calculations to determine VCG and LCG. The simplified stability letter describes the limits in terms understandable to fishing vessel captains. The naval architect must pre-calculate the stability for many loading conditions to determine the limits that are described in the stability letter. The operator can freely operate the vessel in an infinite number of loading conditions bounded by the limits predetermined by the naval architect.

A stability letter or placard should be posted in the pilothouse. It should define the operating limits of the vessel including activities that would adversely alter the vessel's stability characteristics. The weight limitation for each deck should be defined. Specific limitations on modifying the vessel's underwater shape, adding downflood points and deleting buoyant volume, should be included. The captain must be held responsible for operating the vessel in accordance with the stability letter or placard.

m. Captain's Workload The captain on the ALEUTIAN ENTERPRISE had a wide spectrum of duties and responsibilities. In addition to carrying out the functions of command, e.g. vessel and crew safety, training, vessel maintenance, navigation, crew pay, medical care, complying with federal and state regulations, discipline, etc. he was also responsible for ensuring the vessel was successful in carrying out the primary function it was designed for – catching and processing fish. Part of his duties included standing pilothouse watches. He stood them alone during which he conducted fishing operations while simultaneously communicating with personnel on deck, monitoring radio communications, making radio calls, passing instructions to the engineer on watch, and ensuring the vessel remained within stability limits. The captain had to process an abundance of information rapidly. This can result in information overload and stress. At the

time of the casualty he had to deal with all these factors as well as the added stress created by not having an immediate plan of action to deal with the casualty situation. All these factors effected his decision making ability during this life threatening situation. This overload could be reduced by adding another pilothouse watchstander to assist the captain, or by redesigning the system to compensate for the limitations of a single person under these circumstances.

n. Liferaft Design Personnel on ALEUTIAN ENTERPRISE abandoned ship in one degree centigrade water after the vessel capsized, but before it sank. Had the vessel sank immediately the painter lines would have pulled out of the liferaft canisters and inflated the liferafts. While the vessel floated upside down, at least three rafts did not inflate. Crewmembers were able to inflate liferafts, only with great difficulty, because of numbness due to cold water and the requirement to pull lengthy painter lines from the canisters. Critical minutes and energy were lost by survivors in attempting to inflate the rafts prior to the actual sinking of the vessel. Although their estimated time in the water was five to fifteen minutes, each survivor experienced varying degrees of debilitation due to numbness of extremities, disorientation and fatigue. One survivor dove under water several times pulling out portions of the sea painter. He finally gave up and moved to another raft. Another survivor moved to the same raft and continued pulling on the painter until the raft finally inflated. Liferaft inflation design should consider the environment under which vessels operate and the conditions that users will be exposed to. Liferafts should be fitted with a means to quickly inflate, once in the water. The addition of an emergency actuator, such as a short cord of four to six feet attached to the inflation cylinder, could have served such a purpose.

o. Evacuation Alarm Personnel had little advance warning of the need to abandon the vessel. Such a warning could have afforded them the opportunity to undertake a timely and organized evacuation which could have resulted in the saving of additional lives. ALEUTIAN ENTERPRISE had a general alarm; it was not operable at the time of the casualty. An alternate means to notify the crew of the emergency, e.g. a public address (PA) system, was not installed. There is no requirement to have a general alarm or public address system on uninspected fishing industry vessels. Nevertheless, an operable crew alerting system, such as a general alarm or PA system, could have been used to provide the crew early warning of the danger.

p. Communicating with and Monitoring Deck Personnel

To communicate with personnel on deck the captain relied on the use of a fixed loud hailer. The system was designed so that the deck crew could talk to persons in the pilothouse without having to leave their stations. The captain testified that he lowered the "talk back" volume so he could monitor radio communications. With the loud hailer so adjusted he could not hear the deck crew if they tried to talk to him. The deck crew used body motions and facial expressions to communicate with the captain. When the deck crew did not see the captain at the bridge aft trawl control station they assumed he was calling the engineer on watch to correct the list. During this time they either stood by awaiting further instructions or took independent action to assist in bringing the net aboard.

The captain did not have a clear view of the trawl deck. His view was partially obstructed by the net which hung in the air at an angle. The aft deck winches, gear on deck, and aft gantry also obstructed his view. This precluded him from fully observing what the crew was doing, (e.g., closing of the stern ramp doors, preventing fish from flowing down the stern ramp, etc.).

CONCLUSIONS

1. The apparent cause of the casualty was that at about 1:30 P.M. on March 22, 1990, the fishing net failed while being hauled aboard, releasing a large volume of fish on deck that shifted to port increasing an existing port list, submerging port side processing deck through-hull openings resulting in rapid progressive flooding and subsequent capsizing of the ALEUTIAN ENTERPRISE. The vessel sank in about 10 minutes, in approximately 400 feet of water at Latitude 56 13' 22" North, Longitude 169 48' 56" West. The weather was clear with 15 to 20 knot winds, and 5 to 6 foot seas off the starboard bow.

2. AAFC's and Captain Siemons' failure to maintain and/or provide weathertight or watertight closures on the following portside through-hull openings allowed seawater to enter the processing space which contributed to the casualty:

a. 18" x 24" fish discard chute opening

b. 12" x 18" hold tank flume drain

c. 12" x 18" chute opening adjacent to the bleeding bins

d. 12" x 18" chute opening adjacent to the fillet machines

e. 3" diameter sump and deck drains

f. 8" diameter cutter pump overboard discharge opening

3. AAFC's and Captain Siemons' failure to provide watertight doors and hatches in the following locations allowed progressive flooding of the vessel which contributed to the casualty.

a. Forward processing deck watertight doors, port and starboard.

b. Processing deck level watertight door to hold level.

c. Elevator opening shaft on the processing deck level.

d. Hatches on the port and starboard chutes from the processing deck to the freezers.

4. The vessel's initial 2 to 5 degree port list and the effect of hauling in the net using the port net reel and gilson, contributed to the casualty.

5. The port aft cutter sump pump and the port forward sump pump were not in operation prior to

the capsizing which severely limited the ability to dewater the processing deck. This allowed 1 to 3 inches of water to accumulate on the processing deck port side, which accelerated the capsizing.

6. Failure to train the crew in donning survival suits and abandoning ship contributed to loss of life.

7. Captain Siemons' failure to provide timely notice to crew of the impending danger contributed to the loss of life.

8. Captain Siemons did not determine the operating condition of the general alarm prior to the casualty. Its failure to operate when actuated may have contributed to the loss of life.

9. The exit door from fo'c'sle level 2 accommodations was blocked by fiber and plastic and was tied shut. This may have contributed to the loss of life.

10. Storage of fish packing fiber in passageways inhibited escape and may have contributed to the loss of life.

11. Fatigue due to excessive work hours and primitive working conditions may have contributed to the loss of life.

12. There may have been a sufficient number of survival suits on board for all personnel, however they were not readily accessible to personnel working on deck, in the engineroom, and in the processing space. This may have contributed to the loss of life.

13. The stowage of deck equipment in the fo'c'sle level 1 multi-purpose locker with survival suits inhibited access and may have contributed to the loss of life.

14. The actions of the chief engineer did not cause or contribute to the casualty.

15. There is no evidence to suggest that a structural failure caused or contributed to the casualty. The fuel observed in the water following the capsizing most probably escaped from the vessel as it rolled on its beam and sank.

16. The ALEUTIAN ENTERPRISE experienced wave and response amplitudes and periodic ranges similiar to those experienced by the NORTHWEST ENTERPRISE while it was on scene shortly after the capsizing.

17. Captain Siemons' attempt to correct the port list by putting the starboard engine ahead full while initiating a turn 45 degrees to port did not contribute to the capsizing. The Board disagrees with Captain Siemons' action and concludes that had he persisted in this maneuver it would have accelerated the capsizing.

18. Captain Siemons failed to exercise good judgement in attempting to bring the overloaded net aboard just prior to the casualty. At the time of the casualty, the vessel was not loaded or operated in accordance with the vessel's Trim and Stability (T&S) Report. The weatherdecks

were loaded with approximately 25 long tons of excess equipment (including a steel doubler on the stern ramp) and supplies. The codend and intermediate weighed 50,000 to 100,000 lbs. more than allowed for in the T&S Report.

19. The difficulty that several survivors experienced in donning survival suits was due in part either to the lack of training or lack of maintenance.

20. AAFC did not have a safety education and training program for the ALEUTIAN ENTERPRISE.

21. Although AAFC provided formal safety training to its supervising personnel no one on the ALEUTIAN ENTERPRISE recieved such training. "Green horns" (processors) were not eligible for formal safety training by AAFC because of their high turnover rate (50%).

22. Captain Siemons did not conduct safety education and training for crewmembers aboard the ALEUTIAN ENTERPRISE.

23. Crewmen Houston, Davis and Marciel became trapped in their staterooms which were located on the port side of the vessel. They may have been unable to escape because of the severe list angle and shifting objects in the staterooms and passageways.

24. The following crewmembers died as a result of drowning:

John A Dieterich
Nello G. Marciel
Joseph Alaimo
Robert W. McCord
Mathew J. Schneider
Javier Martin Castro Valenzuela
Robert W. Davis, Jr.
Jeffrey A. Houston
David J. Jefferies

25. Actions taken by [redacted] are worthy of special note. At risk to his own life, [redacted] ran throughout the vessel alerting fellow crewmembers of the impending danger. Several crewmen, asleep in their rooms, were awakened by [redacted] and ultimately escaped safely off the vessel. While standing on the overturned hull, he helped another crewman don a survival suit. He inflated one of the liferafts, assisted other crewmembers into it. He was the last person to board. [redacted] efforts saved the lives of several crewmembers.

26. Captain Siemons had experienced flooding of the processing deck on the previous voyage. He was aware of the lack of watertight integrity of the processing deck sideshell and missing watertight doors on the processing deck level, but failed to take corrective action.

27. AAFC failed to ensure that the vessel's overall material condition was maintained in

accordance with accepted marine practices. No company official demonstrated responsibility for the maintenance and repair of the ALEUTIAN ENTERPRISE.

28. AAFC's Dutch Harbor operation was authorized to permit vessel repairs within the limits of resources at Dutch Harbor. Management of vessel maintenance activities at Dutch Harbor was without proper direction and oversight of AAFC.

29. AAFC had no procedure for vessel condition surveys to ensure that:

a. They were regularly conducted, (AAFC's alleged unwritten policy of condition surveys every 18 to 24 months was not followed on the ALEUTIAN ENTERPRISE);

b. They were conducted in accordance with accepted marine practices;

c. All vessel's spaces were surveyed within a given period of time,

d. The surveyor's recommendations were followed to conclusion;

e. Survey reports were disseminated to company officials and vessel personnel for informational purposes.

30. [redacted] the marine surveyor, conducted condition surveys of the ALEUTIAN ENTERPRISE that were not sufficient to assess the vessel's actual condition, and not in accordance with accepted marine practices. The surveys were mostly inventories for insurance purposes.

31. AAFC provides a yearly bonus incentive for captains who save money in maintenance and safety costs.

32. The ALEUTIAN ENTERPRISE was not constructed to ABS standards nor was it classed by ABS.

33. AAFC did not follow the voluntary standards for fishing industry vessels in Navigation and Vessel Inspection Circular No. 5-86 regarding stability, emergency procedures and drills, watertight integrity, and maintenance and upkeep in maintaining and operating the ALEUTIAN ENTERPRISE.

34. AAFC did not follow the guidelines established by the North Pacific Fishing Vessel Owners' Association's "Vessel Safety Manual" regarding vessel familiarity, stability, working conditions, safety equipment and survival procedures, vessel systems, seamanship and nomenclature, and watchkeeping in maintaining and operating the ALEUTIAN ENTERPRISE.

35. AAFC did not employ human factors engineering principles on the ALEUTIAN ENTERPRISE regarding fatigue, evacuation alarms, internal vessel communication systems,

training, stability guidance, accessibility of survival suits, and stowage of equipment and supplies.

36. Captain Siemons probably did not read the vessel's T&S Report prior to the capsizing. If he did, he did not understand it. Captain Siemons did not recognize that the buoyant volume, lightship characteristics, and general operating procedures of the vessel were substantially different than those represented in the T&S Report. The vessel's fuel transfer procedures, codend size, deck loads were varied substantially from those represented in the T&S Report. He could not have achieved an actual draft and trim that agreed with the load conditions listed.

37. [redacted] the naval architect, did not ensure that the T&S Report was accurate. He made errors in calculating the lightship characteristics, developed the loading conditions with incorrect information, and failed to consider the necessary operations of the vessel when developing operating recommendations.

38. [redacted] the naval architect, did not follow the guidelines in NVIC 5-86 for the ALEUTIAN ENTERPRISE T&S Report. He did not follow the recommendations for conducting the deadweight survey and inclining. He used only one of the recommended stability criteria, neglecting to evaluate wind and roll, towing, lifting and damage stability. He did not provide a list or diagram of closures that must be maintained watertight. He did not follow the recommendations for evaluating water on deck and icing.

39. Critical minutes and energy were lost by survivors in attempting to inflate the rafts because of the difficulty crewmembers experienced pulling out a long sea painter while rapidly succumbing to the effects of hypothermia.

40. Elliot liferaft, serial no. 10S/1044, failed to inflate due to the sea painter being jammed between the canister halves. The sea painter probably became jammed as a result of an impact that occurred during the vessel capsizing.

41. Elliot liferaft, serial no. CJH5/12MN/2021, failed to inflate automatically and had to be pried apart by a crewmember in the water. The actuator probably was damaged as a result of an impact that occurred during the vessel capsizing.

42. The net failed due to wear and tear of extended use and the overload of fish in the intermediate during the final haulback.

43. The Board is unable to conclude if the device observed in the water by Captain Siemons was an EPIRB or a flotation light. No EPIRB signals were received.

44. AAFC did not have the drug and alcohol testing, indoctrination and training program required by 46 CFR 4.06-1(e) in place for its vessels, including the ALEUTIAN ENTERPRISE.

45. AAFC did not have the urine specimen collection and shipping kit required by 46 CFR 4.06-20(b) available and ready for use following this marine accident.

46. AAFC did not obtain Siemons' urine sample as soon a practicable following the occurrence of the casualty.

47. AAFC did not supervise Siemons' urine collection as required by 46 CFR 4.06–20(d).

48. AAFC did not ship Siemons' urine sample to the testing laboratory by an expeditious means or provide for cooling of the sample as required by 46 CFR 4.06–40.

49. The Board cannot determine if Siemons was under the influence of drugs or alcohol at the time of the capsizing. The following circumstances relative to the taking of the urine sample from Siemons creates substantial doubt as to the validity of the test results:

a. AAFC waited over 40 hours before taking a urine sample from Siemons.

b. Siemons' urine collection was not supervised by the marine employer, therefore the origin of the sample is not conclusive.

c. The sanitary condition of the lube oil sample bottle that was used for Siemons' urine sample is unknown.

d. The urine sample was not kept cool during the two day period before reaching the laboratory.

50. The lack of a significant regulatory or statutory penalty for use against owners, operators or masters for failure to comply with the provisions of the drug and alcohol testing regulations has made them ineffective for fishing industry vessels.

51. AAFC did not follow its own drug and alcohol policy specifically concerning pre–employment testing, training for sampling and testing, sample collection and handling, and test kit availability.

52. A tonnage opening in the transom which exempted the processing space as an open superstructure (46 CFR 69.117(d)) was difficult to maintain weathertight prior to being welded closed because the trawl door routinely slammed into it.

53. A normal watertight door with 8 individual dogs is not a suitable closure device for preventing progressive flooding or for quick escape in an emergency. These doors are susceptible to being secured open, or removed when frequently accessed, or securely closed when needed for escape.

54. The pictorial stability information format described in NVIC 5–86 makes it difficult for the captain to determine when he is exceeding the limits of stability since it does not describe the maximum allowable draft, trim or VCG, nor does it provide limiting load conditions. Because loading occurs at sea, a fishing vessel captain must have the limitation of loading in a simplified form.

55. NMFS provided comprehensive vessel safety and lifesaving training to observer Robert McCord prior to his first trip.

56. While the ALEUTIAN ENTERPRISE was not a participant in the Title XI FOG program, many of the vessels managed by AAFC are. This program provides significant monetary guarantees to the fishing industry. The Board believes that given the practices uncovered during this investigation, many of the vessels managed by AAFC that are participating in the FOG program may not be operating in compliance with the terms of the program established by NMFS.

57. While marine insurance policies may appear to protect the government's interest and meet the basic requirements of the NMFS FOG program, many of the requirements are waived, or reduced in scope, without notice to NMFS, and may not meet the intent of the program regarding surveys, maintenance and vessel safety.

58. OSHA's and the Coast Guard's safety programs for uninspected fishing vessels, while ostensibly mutually exclusive, frequently overlap causing consternation, confusion, and inconvenience to the fishing industry.

59. The Coast Guard's at-sea fishing vessel boarding program is limited to fisheries law enforcement and the safety equipment requirements of 46 CFR Subchapter C. The program is not broader in scope because of limited resources and training.

60. The marine insurance industry has not developed a program of encouraging the fishing industry to reduce losses through improved safety training, personnel qualifications, vessel maintenance and repair.

61. Captain Siemons was not required to have a Coast Guard license as a condition of employment as captain of the ALEUTIAN ENTERPRISE. Therefore, the Coast Guard has no jurisdiction over his license regarding his actions or omissions in this casualty.

62. There is evidence of violation on the part of AAFC of the following laws and regulations. These matters have been referred to Commander, Thirteenth Coast Guard District for further investigation:

a. The port quarter tonnage opening that was required by 46 USC 14701 and 46 CFR 69.19 to exempt approximately 323.5 tons in the admeasurement of ALEUTIAN ENTERPRISE was welded closed.

b. Written reports of the groundings of the ALEUTIAN ENTERPRISE and the BERING ENTERPRISE in 1988, and the power failure and flooding incident on the ALEUTIAN ENTERPRISE in February 1990 were not submitted to the Coast Guard as required by 46 USC 6101 and 46 CFR 4.05-1.

c. The ALEUTIAN ENTERPRISE did not have a loadline assigned as required by 46 USC 5103(a).

d. Immersion suits were not readily accessible as required by 46 CFR 25.25-9(a).

63. In order to obtain a loadline the ALEUTIAN ENTERPRISE would have had to be fitted with automatic non-return fittings and positive closures in the through-hull openings on the processing deck.

64. There is evidence of violation of 18 USC 1115, Misconduct or neglect of ship officers, on the part of AAFC and Captain Siemons. This matter has been referred to the Commander, Thirteenth Coast Guard District for possible referral to the U.S. Attorney.

65. Armando B. Valencia, a processor on the ALEUTIAN ENTERPRISE, was not granted status that would allow him to be legally employed in the United States.

66. There is evidence of violation of 8 USC 1324a on the part of AAFC for illegally employing an alien. This matter has been referred to the U.S. Immigration and Naturalization Service.

67. With the exception of the above there is no evidence of actionable misconduct, inattention to duty, negligence, or willful violation of law or regulation on the part of any licensed or certificated persons; nor evidence of inspected material or equipment; nor evidence that any personnel of the Coast Guard, or of any other government agency, or any other person contributed to the cause of this casualty.

RECOMMENDATIONS

1. The Coast Guard should increase efforts to enforce compliance with the loadline laws on uninspected fishing industry vessels.

2. The Coast Guard should increase efforts to enforce the casualty reporting regulations on uninspected fishing industry vessels.

3. The Coast Guard should periodically examine fishing industry vessels for overall seaworthiness, safety and maintenance in accordance with accepted marine practices and the applicable regulations.

4. The Coast Guard, ABS or other qualified organization should periodically review fishing industry vessel stability calculations for completeness and conformance with appropriate industry standards, and stability instructions for ease of use by the vessel's master.

5. The Coast Guard should require that there be sufficient de-watering capacity on the processor deck to remove the total volume of water being pumped to the processing deck in any condition of trim or list. Cutter pumps or similar carcass removal pumping systems should not be included as part of the de-watering system.

6. The Coast Guard should require automatic or remotely actuated closures, with mechanical back-ups during power loss, for fish debris overboard chutes on fishing industry vessels.

7. The Coast Guard should require that the stability evaluation for fishing industry vessels include the weight and free surface correction for processing water and fish whenever a continuous uncontained flow is used inside the vessel during its normal operation at sea.

8. The Coast Guard should require that fishing industry vessels use the "simplified letter format" described in NVIC 5-86.

9. The Coast Guard should require that fishing industry vessel stability letters or placards define the operating limits of the vessel, including limits of modifications and additions that would invalidate the stability letter.

10. The Coast Guard should require that the stability letter or placard for fishing industry vessels be posted in the pilothouse.

11. The Coast Guard should require that loadlined fishing industry vessels employ a licensed master, mate and chief engineer while underway. The sophistication of systems and operations of loadlined fishing industry vessels requires a level of qualifications not recognized under the existing licensing scheme.

12. The Coast Guard should develop a stability examination specifically for masters and mates of fishing industry vessels that are loadlined or subject to the requirements of the Officers

Competency Certificators Convention of 1936. It should cover the fishing industry operational stability issues of loading at sea, loose processing water, and maintaining watertight integrity.

13. The Coast Guard should require that masters and mates pass a fishing industry vessel stability examination, and have an endorsement on their licenses attesting to this fact prior to service on fishing industry vessels. This requirement should apply to all individuals who desire to serve on fishing industry vessels under the authority of their master's or mate's inspected or uninspected licenses.

14. The Coast Guard should require a minimum ratio of height to width of freeing ports on fishing industry vessels so that loose fish can be rapidly cleared off the deck in an emergency.

15. The Coast Guard should require escape route passageways, doors and scuttles on fishing industry vessels be clearly marked and free of obstruction.

16. The Coast Guard should require quick-acting watertight doors for egress out to the lowest weather deck in an emergency, and in internal watertight bulkheads to hasten evacuation and to prevent progressive flooding.

17. The Coast Guard should require that every person employed on a fishing industry vessel that operates in cold water receive instruction in donning an immersion suit prior to employment on the vessel.

18. The Coast Guard should require masters of fishing industry vessels to ensure that emergency drills are conducted at least once a month.

19. The Coast Guard should redouble its efforts to encourage the use of Human Factors Engineering in the fishing vessel industry.

20. The Coast Guard should not rely on the insurance industry for oversight of safety training, vessel maintenance, or accident reporting.

21. The Coast Guard should require a general alarm or loud speaker system on fishing industry vessels that is audible over all ambient noise in normally manned spaces. This system should be tested upon departing port and during monthly drills.

22. The Coast Guard should require immersion suits on fishing industry vessels to be stowed where the crew can quickly access them in an emergency. Immersion suits must be available at the egress of the engineroom, pilothouse, processing spaces, and accomodations for the maximum number of personnel that work and sleep in those areas. More than one immersion suit per individual on board will be necessary to satisfy accessibility arrangements on most fishing industry vessels.

23. The Coast Guard should require that immersion suits on fishing industry vessels be accessible and not stowed with other items or materials. Crewmembers must have immediate access to immersion suits so that they do not have to search for immersion suits during a casualty such as a capsizing or sinking.

24. The Coast Guard should require that an emergency inflation actuator be added to inflatable liferafts used in cold water areas.

25. The Coast Guard should encourage the use of the Dual Tonnage Measurement System on fishing industry vessels when exempt superstructure spaces are desired. When the dual tonnage system is used and a single tonnage is assigned according to 46 CFR 69.175(c), spaces immediately above the freeboard deck may be omitted from tonnage provided a tonnage mark is located at the level of the uppermost part of the loadline grid. Tonnage openings that are susceptible to damage, leaking, and blocking would not be necessary.

26. The Coast Guard should require that fishing industry vessels have on board, in addition to the Certificate of Documentation, a description of tonnage openings on the vessel to assist boarding personnel and vessel operators to identify and/or preserve tonnage openings and other admeasurement requirements.

27. Coast Guard should develop guidelines for fishing industry vessel inclinings, deadweight surveys and lightweight determinations. They should address the treatment of processing and deck equipment, and seasonal fisheries gear changes that are unique in this industry.

28. The Coast Guard should extend the drug and alcohol testing requirements concerning pre-employment testing, kit availability, etc. to all fishing industry vessels that require a loadline.

29. The Coast Guard should seek the authority to impose significant penalties for failure to comply with the drug and alcohol testing regulations to encourage compliance in the fishing industry.

30. The Coast Guard should amend 46 CFR 4.06, which currently requires urine sample collection to be supervised, to require that sample collection be witnessed.

31. The Coast Guard should amend 46 CFR 4.06 to provide for a legal presumption that a urine sample is invalid if not presented in a sterile sample bottle.

32. The Coast Guard should amend 46 CFR 4.06 to require the cooling of the sample if transportation to the laboratory could exceed 18 hours.

33. The Coast Guard should amend 46 CFR 4.06 to indicate that if a post accident urine sample is not taken within 4 hours after a casualty because of the owner's, operator's, master's or donee's misfeasance or malfeasance, negative samples will be presumed invalid.

34. The Coast Guard should enter into a memorandum of understanding with the National Marine Fisheries Service (NMFS) regarding the use of observers to assist in fishing industry vessel safety. Observers could be trained to identify safety equipment deficiencies and poor safety practices for input to the Coast Guard's safety enforcement program.

35. The Coast Guard should enter into discussions with NMFS to encourage that agency to upgrade its enforcement of the TITLE XI Loan Guarantee Program with particular emphasis on the requirement of triannual surveys by a competent, impartial authority. The Coast Guard

should discuss the feasibility of strict safety, personnel, and maintenance and repair requirements as conditions precedent to the acquisition of new loan guarantees.

36. The Coast Guard and the Occupational Safety and Health Administration (OSHA) should enter into a memorandum of understanding that clearly sets forth the extent of each agency's responsibilities regarding fishing industry vessels.

37. Coast Guard boarding officers should be capable of reading and understanding stability letters and placards, and qualified to examine fishing vessels for unsafe alterations and excess loading.

38. On April 18, 1990, the Board identified what appeared to be an industry wide failure to obtain loadlines. The Board recommended immediate enforcement action by the Coast Guard to bring fishing industry vessels into compliance. The Board understands that the Coast Guard has increased its enforcement posture in this regard and recommends that the current level of enforcement be maintained until full compliance is achieved.

39. Inasmuch as this casualty constitutes a major marine casualty, a copy of this report should be forwarded to the National Transportation Safety Board.

40. Inasmuch as this casualty constitutes a serious casualty, a copy of this report should be forwarded to the International Maritime Organization.

41. A copy of this report should be provided to members of the Fishing Vessel Advisory Committee, OSHA, and Arctic Alaska Fisheries Corporation, manager of the ALEUTIAN ENTERPRISE.

42. A copy of this report should be filed in Docket Number CGD88-079, Commercial Fishing Industry Vessel Regulations, Notice of Proposed Rulemaking for consideration prior to publication of the final rule.

43. A copy of this report should be provided to the Chief, Financial Services Division, and the Chief, Fisheries Management Division, National Marine Services, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, Washington, DC for information and further dissemination.

44. This report should be given wide dissemination throughout the commercial fishing industry vessel community including major fisheries journals, the National Council on Fishing Vessel Safety and Insurance, the North Pacific Fishing Vessel Owners' Association, Factory Trawler's Association and other major fishing industry vessel associations and in the Pacific Northwest.

45. This casualty investigation be closed.

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[redacted]

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