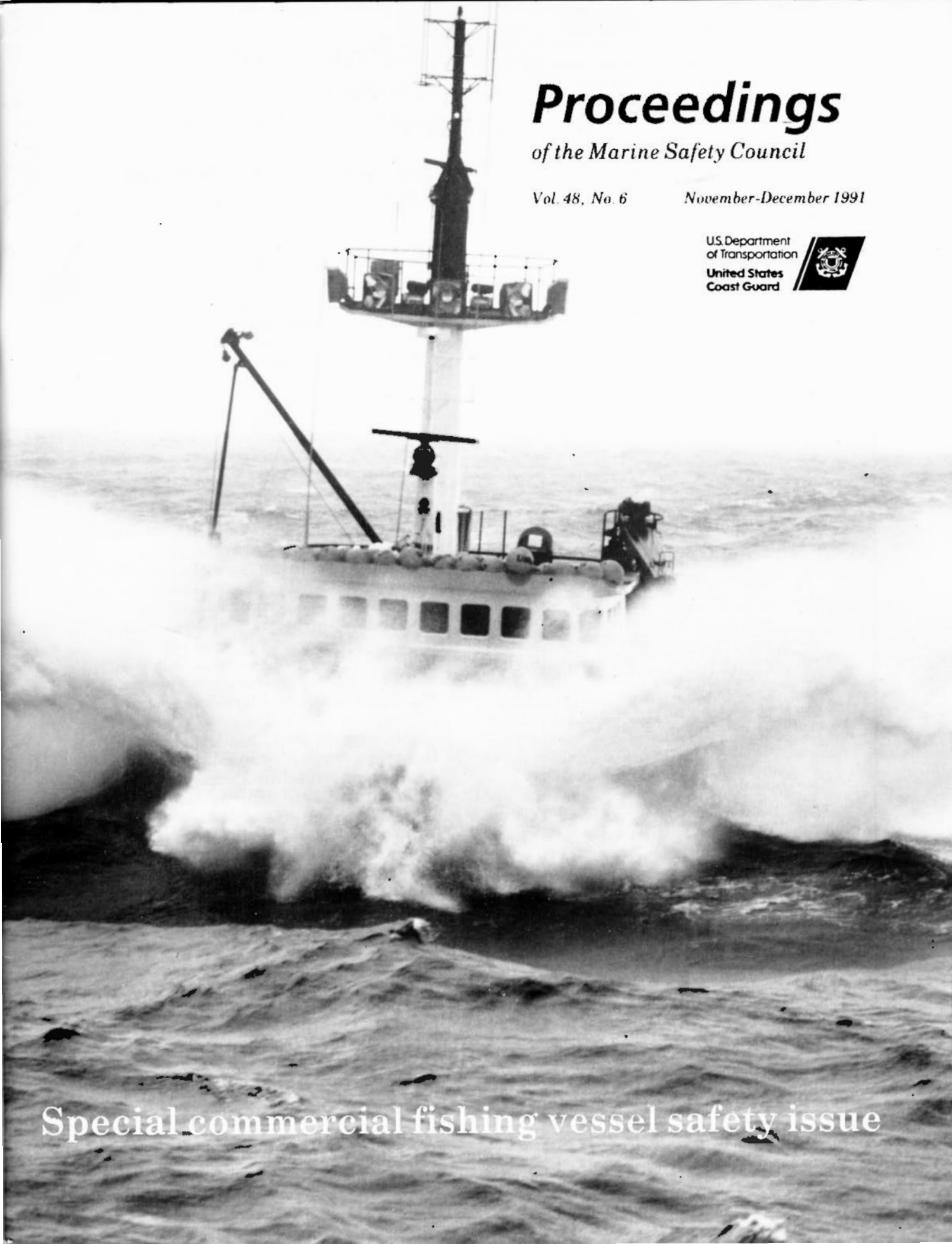

Proceedings

of the Marine Safety Council

Vol. 48, No. 6 *November-December 1991*

U.S. Department of Transportation
United States Coast Guard

Special commercial fishing vessel safety issue

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Proceedings

of the Marine Safety Council

November-December, 1991 *Vol. 48, No6*

Special issue on commercial fishing vessel safety

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Coast Guard promotes commercial fishing vessel safety

RADM A. E. "Gene" Henn

The Coast Guard has a lengthy history and tradition as the service responsible for protecting lives and preventing injuries at sea.

Safety on commercial fishing vessels has long been a matter of concern to the Coast Guard and we have taken a number of approaches during the past two decades to effectively deal with this problem.

Coast Guard actions

In 1971, the Coast Guard did a cost benefit analysis documenting the fishing industry's poor safety record. We concluded that one of the primary causes was that, with few exceptions, commercial fishing vessels have been traditionally exempted from safety regulations.

The study recommended licensing masters; mandatory safety standards, full inspection and certification for new vessels; and a combination of mandatory and voluntary standards for existing vessels.

The Coast Guard established a voluntary dock-side examination program in 1978 to improve safety throughout the country's uninspected commercial fleet, including fishing vessels.

In 1984, the Office of Merchant Marine Safety established a full-time task force to develop an initiative to reduce the number of commercial fishing vessel casualties by ten percent without additional regulations. The task force developed a two-pronged voluntary safety program.

Part one of the initiative was designed to promote vessel safety through voluntary standards published in five Navigation and Vessel Inspection Circulars (NVICs). These standards were written primarily for fishing vessel designers, builders, outfitters and marine surveyors.

The second part promoted safety through a guide which was developed jointly by the Coast Guard and the North Pacific Fishing Vessel Owners Association.

In January 1987, the voluntary safety initiative became part of the Coast Guard's marine safety program

1988 safety act

The Commercial Fishing Industry Vessel Safety Act of 1988 is the first comprehensive safety legislation enacted in the United States to apply specifically to commercial fishing vessels. The implementing regulations issued by the Coast Guard were published in the *Federal Register* and were effective September 15, 1991.

The Coast Guard's goal remains unchanged -- saving lives and preventing injuries at sea. The legislative and regulatory effort is not the conclusion of this goal, but the beginning of the most important step -- implementation.

This step requires the cooperation of government and industry. Within the Coast Guard, the Offices of Law Enforcement and Defense Operations; Marine Safety, Security and Environmental Protection; Readiness and Reserve; and Navigation and Waterways Safety are all working together, playing especially vital roles in the at-sea boarding and dock-side examination programs. Continued teamwork will be necessary as this program matures.

The act deals almost exclusively with safety equipment. Fishermen must know how to use that equipment, which requires education and training. We believe that training is the key to minimizing risks in the industry.

In addition, continued reliance will be placed on the work of the Commercial Fishing Industry Vessel Advisory Committee. This group of fishing industry experts and safety advocates has been enormously helpful in drafting the regulations. Their continued support and assistance in the implementation is crucial.

The success of this program depends on the enthusiastic support of all participants. We in the Coast Guard have a tremendous number of new customers with whom to communicate. We've got to get out and meet them. The message we must get across is *"Safety first."*

I am confident we will provide the dedication and leadership necessary to accomplish this mission and there will be significant safety improvements in the commercial fishing industry.

On February 10, 1902, the fishing schooner Elsie M. Smith was beached during snow squalls at Orleans, Massachusetts. Two crewmen drowned when their dory capsized in heavy surf. Photo by H. K. Cummings, courtesy of William P. Quinn of Orleans.

Commercial fishing vessel safety . . . a legislative history

CDR Raymond G. Magno and Mr. Richard C. Hiscock

Introduction

United States commercial fishing vessels, with few exceptions, have been traditionally exempted from safety regulations.

As a general rule, any passenger and/or commercial vessel that requires inspection, must have a licensed master or operator. **However, there are no specific licensing requirements for masters, operators or other personnel for commercial fishing vessels.**

A provision of the "Officers' competency certificates convention, 1936" [46 United States Code (USC) 8304] does require licensed masters, mates and engineers on all documented vessels over 200 gross tons operating on the high seas.

However, less than [illegible] percent of United States fishing vessels are in this category. Tonnage measurement rules permit many large fishing vessels to measure just under 200 gross tons, thus avoiding licensing requirements.

Attempts to enact safety legislation for motor fishing vessels was defeated in the 1930s by the fishing and tow boat interests. Consequently, the category of "uninspected vessel" was established. Serious limitations in the regulation of fishing vessels have occurred due to this designation.

1910 Motor Boat Act

The first statute to address motor boat and vessel safety was the Motor Boat Act of 1910. It dealt primarily with navigation lights and sound signals, and required that motor vessels carry life preservers and fire extinguishers.

1940 Motor Boat Act

The Motor Boat Act of 1940 [illegible] correct some of the deficiencies of the 1910 legislation and to improve recreational motor vessel safety. It repealed the Motor Boat Act of 1910.

The 1940 act applied to commercial as well as pleasure motor vessels, but its primary purpose was to correct unsatisfactory conditions in the regulation of motor vessels used for recreational purposes.

The law was not intended to address commercial vessel safety and did not include construction standards nor provide for inspection. Operators were not required to be licensed and authority was limited to the few safety requirements which were specified in the 1940 law.

1941 proposal

In 1941, Representative Thomas A. Flaherty from Massachusetts introduced bill H.R.3254 specifically addressing fishing vessel safety. It proposed "to place fishing boats (15 or more gross tons) fishing outside inland waters under the supervision of the Bureau of Marine Inspection and Navigation."

The bill outlined specific requirements for watertight bulkheads, bilge pumps, ring buoys, lifeboats and radio, and inspections and licensing of operators.

Hearings were held on the bill in October 1941, but no further action was taken because of the nation's involvement in World War II.

1958 boating act

The Federal Boating Act of 1958 amended the 1940 legislation, making it applicable to "every motor boat or vessel on the navigable waters of the United States, its territories and the District of Columbia, and every motor boat or vessel owned in a state and using the high seas."

This act required the numbering of all vessels propelled by machinery of more than 10 horsepower, and established a system whereby individual states could adopt a uniform numbering and certificate system. The act further required that accidents involving numbered vessels be reported to the state, and subsequently reported to the Coast Guard.

1971 boating act

Congress enacted the Federal Boating Safety Act of 1971 to establish manufacturer and operator requirements, and a boating safety council to work with the Coast Guard in adopting regulations affecting recreational boating safety.

This law created a new category of "uninspected vessels." It defined a boat as, "a vessel manufactured or used primarily for noncommercial use; or leased, rented or chartered to another for the latter's noncommercial use; or engaged in the carrying of six or fewer passengers." The legislation created two distinct groups of uninspected vessels: recreational boats and all other uninspected vessels.

Vessel categories

In addition to uninspected vessels categorized as either recreational or commercial use, vessels are further divided into those which are documented and those which are numbered. This is an important distinction, because there are different casualty reporting requirements applicable to documented and numbered uninspected commercial vessels.

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The remains of the fishing schooner Evelyn & Ralph, which struck a bar in fog off Nantucket, Massachusetts, on December 6, 1924. Upon impact, the foc'sle stove tipped over and set the vessel afire.

Photo courtesy of Charles F. Sayle, Nantucket

Continued from page 3

Casualty and accident reporting requirements for all numbered vessels and vessels used for recreational purposes are found in 33 CFR 173.51.

All fishing vessels over five net tons are required by law, 46 USC 12108(b), to be documented and licensed. Broader casualty reporting requirements for documented vessels apply under the provisions of 46 CFR 4.05-1.

Safety risks

Economic pressure stemming from foreign competition, limited seasons, quotas and escalating operational costs have caused some fishermen to take additional risks to stay in business.

Postponing maintenance, loading extra equipment on board or going to sea in rough weather conditions have contributed to the poor safety record of the commercial fishing industry Stability-related casualties are often traced to overloading of catch or improper ballasting by operators.

1971 Coast Guard study

A 1971 Coast Guard study entitled, "Cost benefit analysis of alternative safety programs for U.S. commercial fishing vessels," documented the fishing industry's poor safety record. It concluded that one of the primary reasons was that fishing vessels, with few exceptions, have traditionally been exempted from safety regulations.

The study recommended licensing of masters; mandatory safety standards, including full inspection and certification of new vessels; and mandatory and voluntary standards combined with inspection and certification of existing vessels.

The Coast Guard incorporated recommendations of the study and proposed legislation entitled "Fishing Vessel Safety Act," which was forwarded in 1974 to the Office of Management and Budget (OMB) and other appropriate government agencies for comment and/or recommendations.

Commerce proposal

The National Marine Fisheries Service of the Department of Commerce recommended that action be deferred on any legislation requiring inspection of commercial fishing vessels. At that time, the fisheries service was sponsoring a study on commercial fishing vessel insurance.

In 1975, the Department of Commerce recommended an alternative proposal for a voluntary safety program for commercial fishing vessels. The Coast Guard's legislative proposal was held in abeyance while a study of the Commerce proposal was undertaken.

1975 proposed bill

The "Vessel safety and fisherman's benefit act of 1975" (H.R.9716) was introduced by Congressman Thomas Downing of Virginia. This bill encroached upon the traditional and statutory responsibilities of the Coast Guard by authorizing the Department of Commerce to issue safety and health standards, inspect fishing vessels, and issue Certificates of Inspection. No action was taken on the bill.

1978 voluntary program

The Coast Guard established a voluntary dock-side uninspected vessel examination program. Forty-five new billets were requested in the FY 1979 budget for a Coast Guard-wide boarding and examination program to improve safety throughout the United States uninspected commercial fleet. A project was started to develop a triennial dock-side educational examination program. However, the billets were cut due to budget reductions in 1981.

1978 analysis

In 1978, RADM William J. Ecker (then a commander) prepared "A safety analysis of fishing vessel casualties" for the 66th National Safety Congress and Exposition. His objective was to examine "some of the more frequent types of marine casualties involving fishing vessels and to highlight the salient aspects of those casualties as they relate to circumstances, location, fishing fleet type and the subsequent result of these casualties, be it loss of vessel, loss of life, or other."

He concluded that "there would appear to be ample evidence to warrant additional study and research into those incidents resulting in loss of life and loss of vessel for the purpose of ameliorating those circumstances and conditions that frequently precede tragic consequences."

1980 paper

In 1980, the Coast Guard's Office of Marine Safety presented a paper entitled, "Life safety approach to fishing vessel design and operation," to the spring meeting and ship technology and

research symposium of the Society of Naval Architects and Marine Engineers.

Drawing on the 1971 Coast Guard study and the 1978 analysis by RADM Ecker, this paper suggested that training combined with the recently initiated Coast Guard education and voluntary dock-side boarding program should have a positive effect on casualties.

The paper echoed past findings with the following conclusions and recommendations:

1. Casualty statistics for fishing vessels are increasing at an alarming rate.

2. The fishing industry should increase its efforts to upgrade the safety of its vessels and their operation. Potential for loss of life can be significantly reduced by incorporating safety-related features into vessel design and carrying recently-developed emergency equipment.

3. The carriage of exposure suits, emergency position indicator radio beacons (EPIRBs) and improved liferafts is having a positive effect on lifesaving. However, the root causes of fatalities are the vessels and their operation

4. Education and training programs sponsored by local or regional fishing associations can have a positive impact on the overall safety of the fishing fleet

5. The Coast Guard's voluntary dock-side boarding program should aid the industry education and training programs by pointing out and helping solve problem areas.

6. If casualties continue to increase, there will be significant pressure to obtain federal government intervention into fishing vessel design and operation.

Unfortunately, the voluntary dock-side boarding program was terminated due to budget [illegible]. The paper, however, laid a solid foundation for many of the arguments and much of the testimony which was to follow.

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Three men on board the grounded fishing trawler Oriental are basket-hoisted by a Coast Guard helicopter. The trawler foundered and broke up in heavy surf on the Outer Banks near Nags Head, North Carolina, on December 31, 1969. The vessel reportedly served as a private yacht of Adolph Hitler's during World War II.

Photo by Aycock Brown of Nantso, N.C.

Volunteer firemen drag an inflatable boat from the surf after rescuing the crewmen from Miss Elenor, a stern clammer which ran aground at Island Beach State Park, New Jersey, in January 1988. *Photo by Tom Spade*

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Chapter 41

In 1983, the Motor Boat Act of 1940 applying to commercial fishing vessels was codified. It is in Chapter 41 of title 46 USC, called "Uninspected vessels generally."

The 1940 act differs from most legislation in that it limited the regulatory authority to the few items it set forth. Only four requirements applied to commercial fishing vessels: fire extinguishers, life preservers, flame arrestors, and ventilation of engine and fuel tank compartments.

The restrictive nature of Chapter 41 did not authorize the Coast Guard to impose construction or operating standards for these vessels.

1983 hearings

The House Merchant Marine and Fisheries Subcommittee on Coast Guard and Navigation held a series of hearings on marine safety in 1983. During one of the sessions, the committee heard testimony from three individuals representing very different points of view.

A) A marine safety consultant testified on the need to establish a comprehensive program for fishing vessel safety in the Office of Marine Safety, to improve casualty data collection, to coordinate ongoing safety projects and to update the Coast Guard 1971 safety study.
It was also suggested that Chapter 41 of title 46 USC (uninspected vessels) be amended with the same language as in Chapter 43 (recreational vessels) to permit the Coast Guard to develop comprehensive regulations for all uninspected vessels.

B) A National Federation of Fishermen's representative opposed mandatory requirements for commercial fishing vessels. The representative preferred to leave safety to voluntary efforts of industry organizations such as the Massachusetts Inshore Draggerman's Association.

the Massachusetts Lobstermen's Association, the Point Judith Fishermen's Cooperative and the North Pacific Fishing Vessels Owners Association.

3) A third individual representing the Pacific Seafood Processors Association opposed the upcoming requirement that fish processors less than 5,000 gross tons and fish tenders less than 500 gross tons be inspected.

Proposed Coast Guard requirements to bring these vessels under inspection had been postponed several times by Congress. Northwest vessel owners and operators wanted amendments to permit the continued operation of these "uninspected" vessels.

1984 amendment

In July 1984, Congress amended Title 46 USC with the Fishing Vessel Industry Act (P.L. 98-364). This act:

1) defined fishing, fish tender and fish processing vessels;

2) exempted fishing tender vessels of less than 500 gross tons and fish processing vessels of less than 5,000 gross tons from inspection; and

3) adopted a new chapter 45 setting forth requirements for "fish processing vessels."

An advance notice of proposed rule making regarding regulations to implement the new chapter 45 was published in the *Federal Register* by the Coast Guard in July 1987. Chapter 45 was amended by substitution in 1988.

1984 Coast Guard initiatives

The Coast Guard Office of Merchant Marine Safety set a goal in 1984 to reduce the number of uninspected commercial fishing vessel casualties by at least ten percent. This decrease was to be accomplished by 1991 without a net increase in the level of commercial vessel safety resources.

The secretary of transportation established a departmental safety initiatives task force to develop a program to permit the department to perform its safety function without additional regulations.

In August 1984, the Coast Guard established a full-time task force to determine the best way to set up the safety program. They developed a two-pronged approach.

1) To promote vessel safety through voluntary standards written by the Coast Guard in five Navigation and Vessel Inspection Circulars (NVICs). The standards were proposed in NVICs 5-85 through 9-85, and were revised and consolidated in NVIC 5-86. They were written primarily for fishing vessel designers, builders, outfitters and marine surveyors.

2) To promote crew safety through a guide developed jointly by the Coast Guard and the North Pacific Fishing Vessel Owners' Association. About 80 percent of the guide pertains to the fishing industry nationwide, and the remainder is tailored to regional fisheries.

The safety initiative became part of the Coast Guard Marine Safety Program on January 1, 1987. The policy establishing the program was published in commandant instruction 16711.10 on November 6, 1987.

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Insurance in the 1980s

The economy nationwide was affected by a lack of insurance availability in the 1980s. The effect on the fishing industry was debilitating.

Because of the industry's poor safety record, many fishermen could not obtain insurance When insurance was available, many could not afford the premiums and stay in business.

1984 hearings

In 1984, the House Committe on Merchant Marine and Fisheries began hearings on the availability and cost of insurance for commercial fishing vessels.

The insurance industry cited as a major cost factor the special treatment afforded seamen by the unseaworthy doctrine under admiralty law, and the Jones Act (46 USC 688), which permits an injured seaman the right to a jury trial.

As a result of those hearings, members of Congress began to develop legislative proposals addressing liability and insurance issues.

1985 tragedy

In August 1985, a commercial fishing vessel tragedy occurred at Maremot Bay, Alaska that had a profound effect, not only on the families of those who were lost, but on fishing vessel safety legislation.

F/V Western Sea, a 70-year-old purse seiner, departed Kodiak, Alaska, with six persons on board to fish for salmon. There was no indication that the vessel was in trouble until the body of crew member Peter Barry was recovered from the sea by *F/V Dusk*. An intensive search by Coast Guard cutters and aircraft failed to locate any survivors.

After the death of their son, Robert and Peggy Barry galvanized support from safety advocates, government officials, the legislature and surviving families of other commercial fishermen lost at sea to renew the campaign for mandatory safety regulations.

1986 proposals

In 1986, three bills (H.R.4407, H.R.4415 and H.R.4465) were introduced specifically addressing fishing vessel insurance and liability issues. Some of the proposed legislation called for the adoption of mandatory requirements for the carriage of certain lifesaving equipment (EPIRBs, liferafts and exposure (immersion) suits) on commercial fishing vessels. Hearings on the bills were held by subcommittees of the House Merchant Marine and Fisheries Committee in April.

After much deliberation, a compromise bill, "The commercial fishing vessel liability and safety act," (H.R.5013) was reported to the House by the committee. This bill limited the liability of fishing vessel owners to a maximum of $500,000 in cases of permanent injury, except where there was gross negligence or willful misconduct. It also required that the vessels carry additional lifesaving equipment, including visual distress signals, EPIRBs, liferafts, exposure (immersion) suits, radio and other equipment to reduce the risk of injury.

After intense lobbying by the American Trial Lawyers Association, H.R.5013 was defeated in the House on August 13, 1986. This placed added emphasis on the Coast Guard's voluntary initiative, and sparked the development of new bills to be introduced in the next Congress.

EPIRB requirements

In November 1986, as part of the Coast Guard Authorization Act (P.L. 99-640), Congress amended Chapter 41 USC to require EPIRBs for fishing industry vessels operating on the high seas. The regulations, published in the *Federal Register* in August 1988, became effective in May 1990.

1987 bills

In March 1987, two bills dealing with fishing vessel safety and insurance liability were introduced in the House

Backed by Mr. and Mrs. Robert Barry, H.R.1836 dealt specifically with inspection, equipment requirements, licensing and training

The chairman of the Subcommittee on Fisheries and Wildlife Conservation and the Environment introduced H.R.1841, which addressed liability and safety, but did not propose inspection or licensing.

Hearings were held on both bills in the House in June 1987, and on companion bill S.849 in the Senate in September and December 1987.

NTSB study

In September 1987, the National Transportation Safety Board (NTSB) published a comprehensive study, "Uninspected Commercial Fishing Vessels," (NTSB/SS-87/02). It recommended the establishment of minimum safety training standards requiring:

A) captains/owners to provide minimum safety training for all crew members;

B) the carriage of basic lifesaving equipment, including exposure suits, flooding detection and dewatering systems, fire detection and fixed firefighting systems;

C) the carriage of lifeboats or liferafts, emergency radios, and EPIRBs;

D) safety certification and periodic inspection;

E) the prohibition of the use of alcohol or drugs when engaged in commercial fishing activities;

F) education regarding the dangers of toxic gas exposure in unventilated spaces; and

G) the need to examine and conduct research on stability issues.

The NTSB testified in support of its recommendations at both Senate hearings.

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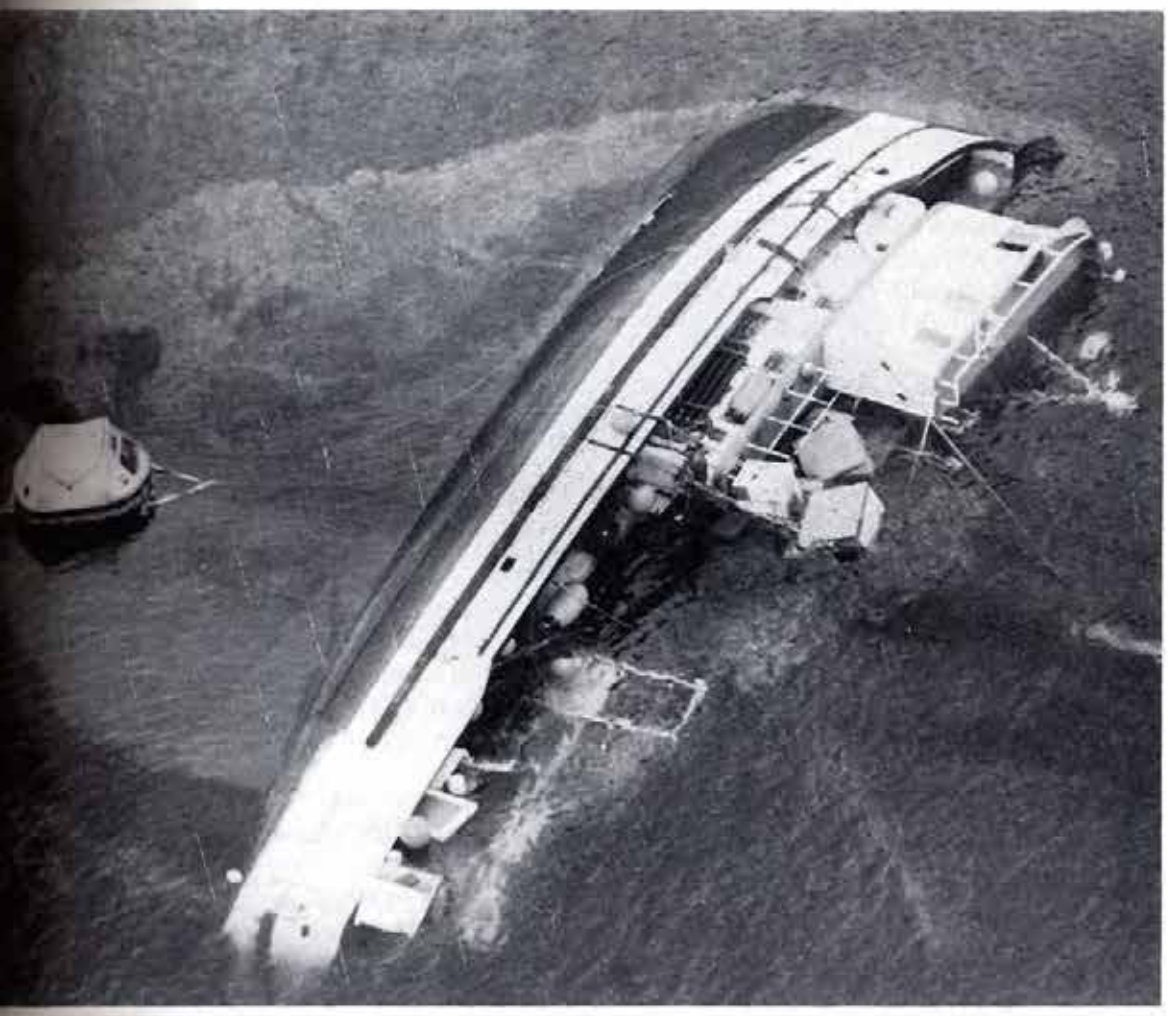
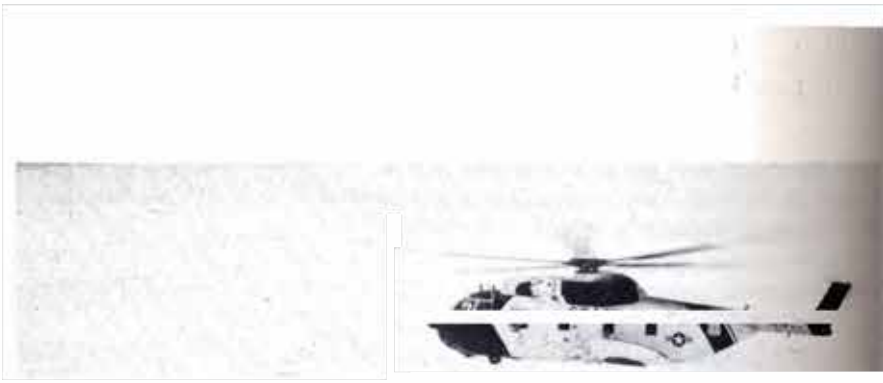


On August 19, 1988, the fish tender Melissa Chris capsized in the Peril Strait, 30 miles north of Sitka, Alaska.



A Coast Guard helicopter prepares to hoist six crewmen from the ice-bevel Alaskan Monarch off St. Paul Island in the Bering Sea on March 15, 1990

Photo by Gary Doily

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1988 House action

In February 1988, the full House committee met to consider H.R.1841, as amended by the subcommittees. At that time, action on Title I addressing liability was delayed because agreement on its provisions had not been reached by the Fisherman's Alliance for Insurance Reform and the American Trial Lawyers Association. Title II, dealing with fishing vessel safety, with the addition of a technical amendment, was unanimously adopted by the committee.

In April, Title I was amended making the compensation system for temporary injuries mandatory rather than voluntary. Title II was amended requiring that processing vessels be subject to classification by the American Bureau of Shipping or a similar organization. In addition, a study by the National Academy of Engineering on the safety problems of fishing industry vessels was mandated.

Efforts by the committee in the spring of 1988 to reach an agreement on the liability provisions of Title I were unsuccessful. Thus the amended bill did not contain any provisions regarding liability.

The bill did require the Coast Guard to develop a licensing plan and conduct studies on fishing industry vessel inspection and unclassified fish processing vessels.

H.R.1841 contained a new chapter of Title 46 regarding fishing voyages which require fishing and wage agreements; and prompt notification of illness, disability and injury on fishing industry vessels.

H.R.1841, as amended, was favorably reported to the House by a unanimous vote of the committee, and was passed by the House on June 27, 1988. The Senate passed the House version on August 11, 1988.

Safety act of 1988

On September 9, 1988, the president signed into law the Commercial Fishing Industry Vessel Safety Act of 1988 (P.L.100-424) -- the first comprehensive safety legislation ever enacted specifically for commercial fishing vessels in the United States.

CDR Raymond G. Magno is assigned to work on fishing vessel safety in the Merchant Vessel Inspection and Documentation Division of the Coast Guard's Office of Marine Safety, Security and Environmental Protection. Telephone: (202) 267-1083

Mr. Richard C. Hiscock is the founder and president of ERE Associates, LTD, an organization in Chatham, Massachusetts dedicated to marine and fishing vessel safety. He is a member of the Society of Naval Architects and Marine Engineers, and the Commercial Fishing Industry Vessel Advisory Committee. Telephone: (508) 945-2182

Passage of the 1988 Safety Act

President Ronald Reagan's signature on the Commercial Fishing Industry Vessel Safety Act of 1988 was welcomed by the many people who had worked toward legislative protection for those engaged in commercial fishing.

World War II led to extensive research on survival and safety equipment, and lifesaving methods. Despite this, there was no systematic attempt to require such equipment on vessels harvesting fish for the market. Efforts had been made to involve Congress in discussions of the problems which were turning commercial fishing into the most dangerous occupation in the country, but they were unsuccessful for a variety of reasons.

Coast Guard efforts

Testifying before the House Committee on Merchant Marine and Fisheries on April 17, William Kime, t[illegible]ant of the Coast Guard ADM J[illegible] hen chief of the Office of Merchant Marine Safety, stated:

"We did a cost-benefit analysis in 1971 which recommended licensing masters, full inspection and certification of new vessels, and a combination of mandatory and voluntary standards for existing vessels. . . . In 1975, we drafted legislation to bring those into effect. . . .We received no support from the industry and not enough support from the Congress to bring this into effect, and the reason was that the economic burdens were cited as being too great to justify the potential safety improvements."

In 1978, the Coast Guard started a voluntary dock-side boarding program, only to have the allocated resources cut back by 30 percent within the next eight years.

The Coast Guard responded to the twin dilemmas of a problem to solve and no money with which to do it by summoning available

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A fisherman kisses his wife after being delivered safely with two crewmen by the Coast Guard to Sitka, Alaska, on October 5, 1988. The men, all wearing survival suits, spent seven hours in the water after their fishing vessel, Skylo, sank near Cape Cross.

Photo by James Poulson Sitka Sentinel.

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resources. A Fishing Vessel Safety Task Force was formed, which developed a set of minimum safety standards for the industry.

A lengthy set of voluntary standards for United States uninspected commercial fishing vessels was consolidated and published as a Navigation and Vessel Inspection Circular (NVIC 5-86). This covered a wealth of vital material, including stability, communications, fire safety, emergency lifesaving equipment anc safety drills.

But **no one had to conform** to the standards. Many individuals would, but there would always be some who would not.

Industry developments

In the mid 1980s, several developments contributed to a significant increase in congressional interest in fishing vessel safety.

- A 200-mile exclusive fishing zone made fishing a bigger business.
- More new boats were constructed and more old boats operated farther from shore.
- More inexperienced people went to sea and more accidents happened.
- As insurance rates increased, many marginal operators could not afford the premiums. And unless a vessel had a mortgage, it was not required to be insured
- A vocal group of families who had lost loved ones in fishing disasters began to question the almost complete lack of safety regulations on fishing vessels. They began to say that Congress had to assume partial responsibility for these tragic deaths through its lack of attention to protective legislation.

1986 hearings

In April 1986, the House Committee on Merchant Marine and Fisheries called a hearing on behalf of three of its subcommittees. There were five bills before the committee. Two dealt only with insurance relief, primarily in the form of liability caps. The other three made minimal survival equipment, such as liferafts, survival suits and EPIRBs mandatory.

Committee members, government agenc representatives, various fishing industry representatives and related professionals such as marine lawyers, and a handful of private citizens made dozens of statements d course of eight hours.

The significance of this hearin members of the committee began t safety on its own merits, not as a pe issue. The focus was changing.

An editorial in *The Journal of Commerce* on May 7, 1986, referred to the hea

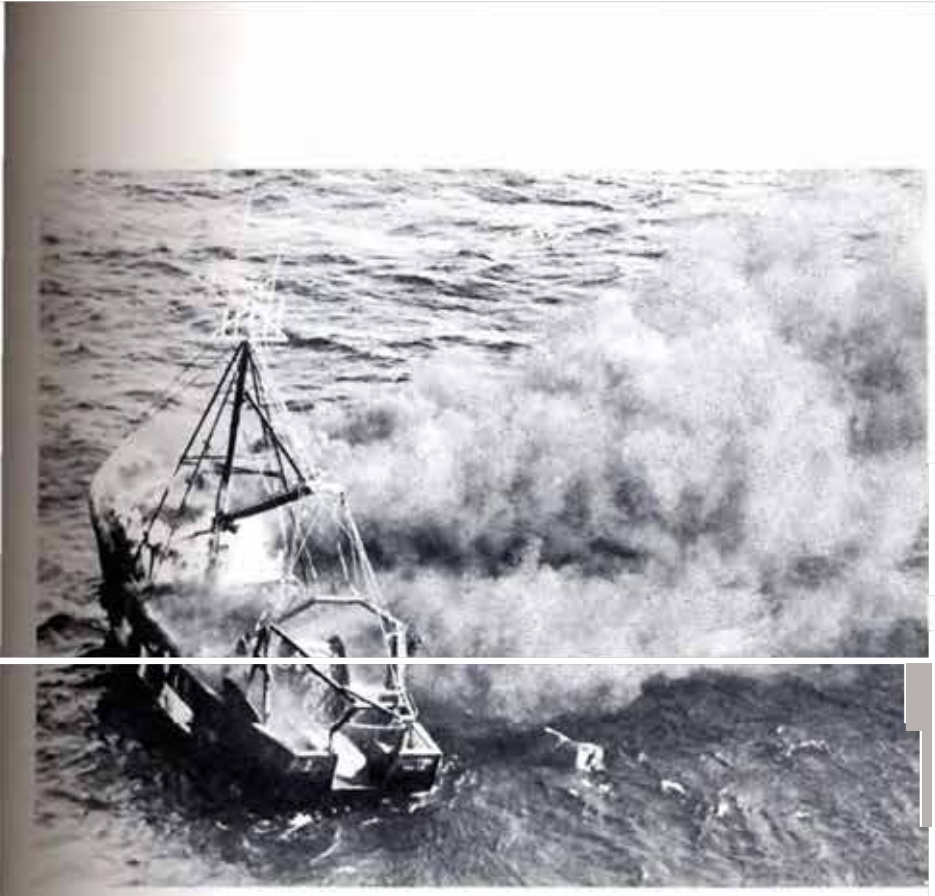
> *"Emotion should not shape our laws, but all present realized that members of the Congress at the April 17 hearing were deeply moved, and rightly so, by the testimony of three women — Rosemary Hofer and Peggyn the wreck mothers of young men lost i of the fishing boat Western Alaskan waters last August, and Mary Hoyt, mother of a young captain of a 78 foot steel-hulled commercial fishing boat that disappeared off Rhode Island.*
>
> *"Our view is that the fishing industry's problems of safety, insurance and liability cannot be remedied in broad legislation. . . It is with unique problems. Its need for firmly enforced safety standards must be remedied without delay."*

The bill which was forged from the five proposals included a liability cap on damages a seaman could collect from the owner of a vessel. The American Trial Lawyers Association put on a powerful last-minute lobbying effort, and the bill was defeated when it came to a vote in August 1986.

1987 legislation

Two new fishing vessel safety bills were developed in the Committee on Merchant Marine and Fisheries in 1987.

Congressman Mike Lowery of Washington introduced H.R.1836, a bill which required crew licensing and safety training, inspection of fishing vessels, presence of survival equipment and the inclusion of a safety impact assessment in fishery management plans. The fishing industry



A short circuit in the electrical junction box caused a fire that destroyed the fishing vessel St. Jude on March 24, 1986, 40 miles east of Cape Cod, Massachusetts. The Coast Guard brought the crew ashore by helicopter.

Photo courtesy of William P. Quinn.

objected to the increase in governmental regulations, and the bill never left the committee.

At the same time, Congressman Gerry E. Studds of Massachusetts, Committee Chairman Walter B. Jones of North Carolina and some ten other members of Congress introduced H.R.1841.

This bill did not call for licensing, inspection or safety training, and required less in the way of safety equipment. It included guidelines for timely compensation for temporary injury of seamen.

Like the other bill, H.R.1841 provided for an advisory committee made up largely of representatives of the fishing industry. It also included a naval architect or marine surveyor, a manufacturer of fishing or safety equipment, a safety trainer, an insurance underwriter and members of the general public. The committee was to advise and consult with the Coast Guard on matters relating to the safe operation of fishing vessels. The members also were to help develop the regulations to carry out the mandates in the act.

Hearings were held on the proposed legislation in the House and Senate during the summer and fall of 1987. It became clear that H.R.1836 was going to encounter strong opposition by the commercial fishing industry. It also appeared that the section of H.R.1841 dealing with compensation for temporary injuries would be controversial.

The final bill included a brief section requiring fishing agreements between masters and seamen, and another regulating the reporting of an illness or injury. Otherwise, it was a safety bill.

It was the end of a long road when the bill became the Fishing Vessel Safety Act of 1988 (Public Law 100-424). But it was only the beginning of a another long road.

The regulations which will translate this act into a safer commercial fishing industry went into effect on September 15, 1991. Their success will lie in their enforcement.

This was a major step toward a safer workplace for the seaman, for the worker on a fish processor, for the college student on summer employment, and for all who earn their living from the sea.

Mrs. Peggy Barry is the vice chairman of the Commercial Fishing Industry Vessel Advisory Committee.
Telephone: (202) 363-1295.

Developing the regulations

CDR Mike Rosecrans

Immediately after the passage of the Commercial Fishing Industry Vessel Safety Act of 1988, the Coast Guard began several actions.

Advisory committee

An announcement was published in the *Federal Register* in October 1988 soliciting applications for membership on the Commercial Fishing Industry Vessel Advisory Committee. The committee is authorized by Congress to advise the Coast Guard and Congress on matters concerning fishing industry vessels.

The committee, which meets at least once a year, consists of 17 members representing all facets of the industry who serve three-year terms. Announcements soliciting membership are published in the *Federal Register* every summer.

Advance rule notice

At the same time, an advanced notice of proposed rulemaking (ANPRM) was developed for publication in the *Federal Register*. This is a formal notice generally stating the intention to develop regulations and to whom those regulations are to be applied.

Since the act was specific as to which items should be addressed in the mandated regulations, the ANPRM for commercial fishing vessel safety contained a complete outline of the areas the regulations were to address, applicable vessels and the reasons why the Coast Guard felt regulations were necessary in certain areas.

Since the main purpose of the ANPRM was to gather information, comments on the proposed regulations and the areas they addressed were requested over a six-month period, until April 15, 1989. Thousands of comments were received in nearly 200 letters.

The Administrative Procedure Act governing the rulemaking procedure requires that each comment received in response to an ANPRM be considered in developing the actual regulations. This consideration does not necessarily dictate changes in the proposed regulations. However, the Coast Guard frequently does make alterations based upon comments, and even has canceled rulemaking projects because of public response.

Rulemaking notice

The newly formed advisory committee played an important role in developing the notice of proposed rulemaking (NPRM), which was published in the *Federal Register* on April 19, 1990. (Far more specific than the ANPRM, the NPRM presented the proposed regulations in final form, and included a preliminary analysis of the costs involved in carrying them out.)

A comment period was provided to permit interested parties to submit recommendations concerning the proposed regulations. In this case, the period was extended from the usual 45 days or less to 120 days to allow commercial fishermen ample time to receive the NPRM, analyze the content and respond. Nearly 500 comment letters were received and reviewed by individuals involved in drafting the final regulations.

Public hearings

Additionally, the Coast Guard conducted 13 public hearings throughout the country to allow fishermen and other interested individuals to present oral arguments and make recommendations on the proposed regulations. The written comments, and oral responses became part of the official public docket. All information pertaining to the rulemaking is on file and is available to the public. Both oral and written comments were considered in the development of the final regulations.

Following each of the public hearings, informal sessions were held to allow interested individuals to exchange information with the Coast Guard and ask questions. This proved to be helpful to all in understanding the rulemaking process, the fishing vessel safety act and fishermens' concerns. Comments made at this time, however, did not become part of the official public docket.

Supplemental notice

Shortly after the comment period on the NPRM closed, the Coast Guard separated several portions for further study, based on the public response. They included proposed regulations for stability of vessels less than 79 feet in length, requirements for survival craft on vessels opera

Fishing is inherently dangerous

Two North Pacific fishermen operate on the trawl deck at night in the Bering Sea.

Photo by Brad Matsen

ing near the boundary lines with fewer than four individuals on board and the administration of the exemption provisions provided in the act.

On August 31, 1990, the Coast Guard announced its intention to address these topics in a supplemental notice of proposed rulemaking, which should be published shortly. This supplemental notice will have a comment period and may i[illegible]ve public hearings.

Final rule

After the final rule and economic analysis were prepared and approved by all levels of the Coast Guard, the Department of Transportation reviewed the regulations for its approval. They then were reviewed by the Office of Management and Budget, the final approval authority for the executive branch of the government.

After the final approval, the regulations were printed in the *Federal Register* on August 14, 1991 with an effective date of September 15, 1991. They were incorporated into the Code of Federal Regulations.

CDR Mike Rosecrans was the executive director of the Commercial Fishing Industry Vessel Advisory Committee until being assigned in July as chief of the Inspection Department, Marine Safety Office, Hampton Roads, Virginia Telephone: (804) 441-3287.

Coast Guard requirements

This article highlights the most universally applicable requirements. It does not cover all aspects of the regulations.

The Commercial Fishing Industry Vesse Safety Act of 1988 requires the Coast Guard to issue regulations for safety equipment and operating procedures on United States fishing, fish tender and fish processing vessels.

The act also requires the reporting of injuries or loss of life sustained by seamen on board commercial fishing industry vessels.

The regulations apply to all United States uninspected commercial fishing, fish tender and fish processing vessels, whether documented or state registered. Compliance with specific regulations may be based upon: type and length of vessel, location of operations, seasonal conditions, number of persons on board, whether documented or state registered, and the date built or converted.

Boarding vessels

Coast Guard boarding of fishing industry vessels occurs on a random basis. This practice will continue. In addition, a dockside examination program has been developed.

Dockside safety examinations are performed upon request. If a boarding takes place when the vessel is underway, efforts will be made to keep it brief. Vessel owners and operators can assist by becoming familiar with the requirements, and being prepared and cooperative when boarded.

If deficiencies are found during a boarding, a violation report may be written which could lead to a civil penalty of up to $5,000. A person willfully violating these regulations may be fined up to $5,000, imprisoned for no more than one year, or both. See 46 USC 4507.

If a boarding officer determines that especially hazardous conditions exist, it is possible for a vessel's operations to be terminated.

1991 pamphlet

A pamphlet published by the Coast Guard in October 1991 contains a synopsis of the new federal requirements for fishing industry vessels. It can be obtained from a district fishing vessel safety coordinator. (Owners and operators may be required to comply with additional state regulations.)

The pamphlet summarizes the regulations that apply to most vessels. It is not intended to be all inclusive.

Additional details on requirements can be found in the respective Code of Federal Regulations (CFR) cited. Copies of CFRs can be obtain at public libraries, government book stores or by contacting:

Superintendent of Documents
Government Printing Office
Washington, D.C. 20402
Telephone: (202) 783-3238

Requirements for all vessels

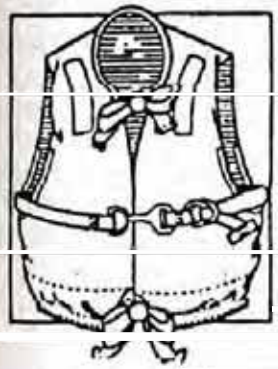
Lifesaving equipment

PFDs and immersion suits

After November 15, 1991, each vessel must carry at least one Coast Guard approved personal flotation device (PFD) of the proper size for each person on board, as shown in Table 1. (Immersion suits are also called exposure or survival suits.)

All devices are required to have 31 square inches of retroreflective tape on the front and back of each reversible side. All devices on vessels on ocean, coastwise and Great Lakes voyages are required to have a Coast Guard approved PFD light (approval series 161.012).

46 CFR 28.105 46 CFR 28.110
46 CFR 28.135 46 CFR 28.140



Type I PFD (Off-shore life jacket)

TABLE 1

PFDs and immersion suits

Operation Area	Vessel Type	Device
Seaward of the boundary line, north of 32°N; or south of 32°S; or Great Lakes	Documented vessels	Immersion suits
Coastal waters or beyond, cold waters	All vessels	Immersion suits
All other waters	40 feet and longer	Type I, & V commercial hybrid, or immersion suits
All other waters	Less than 40 feet	Type I, II, III & V commercial hybrid or immersion suits

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Definition of terms

Boundary lines: These are lines drawn following the general trend of the seaward, high-water shorelines and cross entrances to small bays, inlets and rivers. For specific descriptions, see **46 CFR part 7**.

Coastal waters: They include United States waters of the Great Lakes, territorial seas of the United States, and those waters directly connected to the Great Lakes and territorial seas where any entrance exceeds two nautical miles between opposite shorelines to the first point where the largest distance between shorelines narrows to two miles.

Cold water: This is where the monthly mean low water temperature is normally 59°F or colder.

Warm water: This is where the monthly mean low water temperature is normally more than 59°F

(For a description of seasonal cold and warm waters in your area, see the Coast Guard's "Navigation and Vessel Inspection Circular No. 7-91" or contact a district fishing vessel safety coordinator or a local association.)

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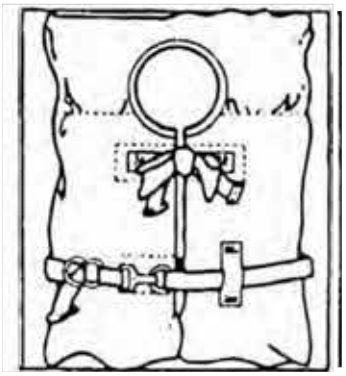


Type II PFD (Near-shore buoyant vest)

Type III PFD (Flotation aid)

Table 2

46 CFR Tables 28.120(a)(c)

Survival craft requirements for all documented vessels and undocumented vessels with more than 16 persons aboard

Operation area	Vessel type	Requirement
Beyond 50 miles from coastline	All	Inflatable liferaft with SOLAS A pack*
Between 20-50 miles of coastline, cold waters	All	Inflatable liferaft with SOLAS B pack**
Warm waters between 20-50 miles of coastline	All	Inflatable liferaft with coastal pack
Cold waters beyond boundary line, within 20 miles of coastline	All	Inflatable liferaft with coastal pack
Warm waters beyond boundary line, within 20 miles of coastline	All	Life float
Cold waters inside boundary line, or lakes, bays, sounds or rivers	36 feet or more in length	Inflatable buoyant apparatus
Cold waters inside boundary line, or lakes, bays, sounds or rivers	Less than 36 feet in length	None
Warm waters inside boundary line, or lakes, bays, sounds or rivers	All	None
Cold waters, Great Lakes	36 feet or more in length	Inflatable buoyant apparatus
Cold waters, Great Lakes	Less than 36 feet in length	Buoyant apparatus
Warm waters, Great Lakes beyond three miles of coastline	All	Buoyant apparatus
Warm waters, Great Lakes within three miles of coastline	All	None

* A SOLAS A pack is equivalent to a pack formerly approved as ocean service.
** A SOLAS B pack is equivalent to a pack formerly approved as limited service.

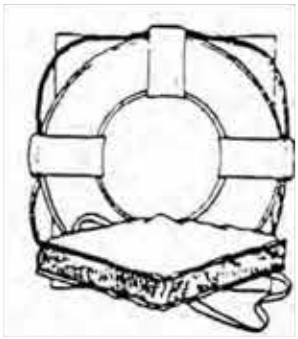
rvival craft

Surv val craft are required for the total ber of persons on board as determined by les 2 and 3. Vessels with less than four viduals on board that operate within 12 s of the coast line are not required to carry ival craft. (Requirements for those vessels be addressed in future rulemaking.)

46 CFR 28.120 46 CFR 28.125
46 CFR 28.130 46 CFR 28.135
46 CFR 28.140

Survival craft installed aboard a vessel fore September 15, 1991, may continue to be ed to meet the requirements if it is of the same pe required, is maintained in good and service-le condition, and can safely hold all persons oard.

An approved inflatable liferaft(s) installed board a vessel before September 15, 1991, may ntinue to e used to meet the approved liferaft quiremen ng as it is serviced yearly, is fitted wi h the required equipment pack and ely holds all persons aboard. Where no equip-nt pack is specified in the table, a coastal uipment pack is required.



Type IV PFD (Throwable device)

A Coast Guard approved life boat(s) with the capacity for the number of persons aboard the vessel may be substituted for any survival craft, provided it is installed and equipped in accordance with 46 CFR subchapter J.

An auxiliary craft carried on board which is integral to and necessary for normal fishing operations will satisfy requirements for survival craft (except for an inflatable liferaft) if it is readily accessible and is capable of safely holding all persons on board.

Vessels less than 36 feet that meet the positive flotation requirements of 33 CFR part 183, are not required to carry survival craft on rivers or waters within 12 miles of any coastline

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Table 3

46 CFR Table 28.120(b)
Survival craft requirements for undocumented vessels with 16 or fewer persons on boa rd

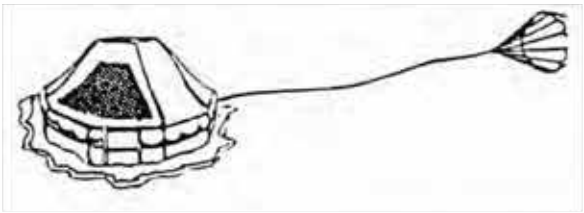
Operation area	Vessel type	Requirement
Beyond 20 miles of coastline	All	Inflatable buoyant apparatus
Cold waters beyond boundary line, within 20 miles of coastline	All	Inflatable buoyant apparatus
Warm waters beyond boundary line, within 20 miles of coastline	All	Life float
Cold waters inside boundary line, lakes, bays, sounds or rivers	36 feet or more in length	Buoyant apparatus
Cold waters inside boundary line, lakes, bays, sounds or rivers	Less than 36 feet in length	None
Warm waters inside boundary line, lakes, bays, sounds or rivers	All	None
Cold waters, Great Lakes	All	Buoyant apparatus
Warm waters beyond three miles of coastline, Great Lakes	All	Buoyant apparatus
Warm waters within three miles of coastline, Great Lakes	All	None

Continued from page 18

Ring life buoys

After November 15, 1991, each vessel must carry Coast Guard approved throwable flotation devices as determined in

46 CFR 28.115.



Survival craft stowage

Each inflatable liferaft that is required to be equipped with a SOLAS A or B equipment pack must be stowed so as to float free and automatically inflate in the event the vessel sinks.

Each inflatable liferaft, inflatable buoyant apparatus and any auxiliary craft used in their place must be readily accessible for launching or be stowed so that they will float free if the vessel sinks.

Each hydrostatic release unit used in a float-free arrangement must have a Coast Guard approval number starting with 160.062.

Each float free link used with a buoyant apparatus or a life float must be certified to meet 46 CFR 160.073.

46 CFR 28.125

Life float and buoyant apparatus

Each life float and buoyant apparatus must be fitted with a lifeline, pendant, painter and floating electric water light that has a Coast Guard approval number starting with 161.010.

46 CFR 28.130

Equipment marking

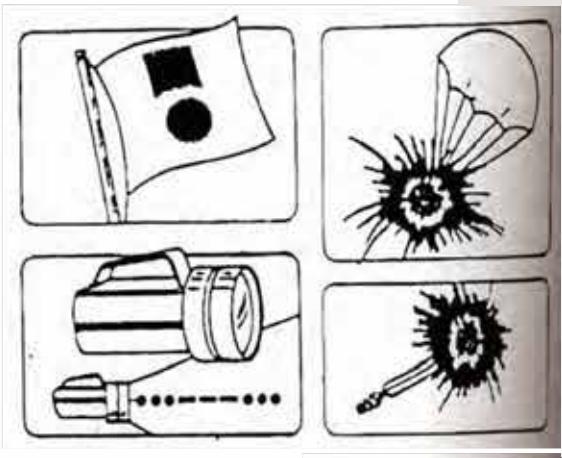
After September 1, 1992, all lifesaving equipment must be marked with vessel names. Clarifications and exceptions are spelled out in

46 CFR 28.135.

Maintenance

The master of a vessel must assure that each item of lifesaving equipment is in good working order, ready for immediate use and readily accessible whenever the vessel is operated. A maintenance schedule for each item of safety equipment can be found in

46 CFR 28.140.



Distress signals

Vessels operating on ocean waters more than 50 miles from the coastline are required to carry three parachute flares (Coast Guard approval series 160.136), six hand flares (Coast Guard approval series 160.121) and three smoke signals (Coast Guard approval series 160.122).

Vessels operating on ocean waters between three and 50 miles from the coastline or more than three miles from the coastline Great Lakes are required to carry three parachute flares (Coast Guard approval series 160.036 or 160.136), six hand flares (Coast Guard approval series 160.021 or 160.121) and three smoke signals (Coast Guard approval series 160.022, 160.037 or 160.122).

Vessels operating on coastal waters (excluding the Great Lakes) or within three miles of the coastline on the Great Lakes are required to carry night and day visual distress signals. Night signals can be either one electric distress light (Coast Guard approval series 161.013) or three Coast Guard approved flares (any series). Day signals can be either one distress flag (Coast Guard approval series 160.072) or three Coast Guard approved smoke signals (any series). If flares are carried, some three flares may be counted toward meeting both the day and night requirements.

These requirements are effective on November 15, 1991.

46 CFR 28.145

EPIRB requirements

Vessels operating beyond coastal waters are required to have an FCC-type accepted category 1, float-free, automatically activated 406 MHz emergency position indicating radio

beacon (EPIRB). This requirement does not apply to:

1. A skiff or workboat if its "mother ship" carries the required EPIRB, and the skiff or workboat is carried aboard the mother ship, or
2. A fishing vessel if it does not have berthing facilities and does not have a galley.

(Note: The above requirements are the subject of future rulemaking. Up-to-date requirements will be widely publicized by district fishing vessel safety coordinators.)

46 CFR 25.26 46 CFR 28.150

Fire extinguishing equipment

Fire extinguishers must be Coast Guard-approved and in the minimum amounts specified in Table 4.

46 CFR 28.155 46 CFR 28.160
46 CFR 25.30

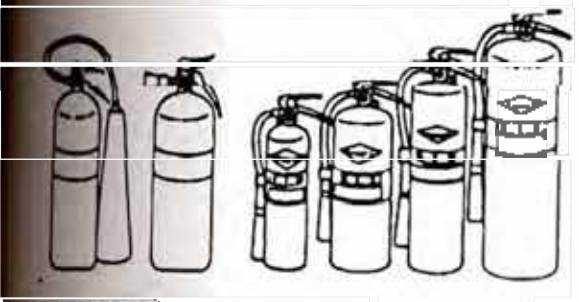


Table 4

Number of B-I hand portable fire extinguishers required for vessels less than 65 feet in length

(One B-II hand portable fire extinguisher may be substituted for two B-I extinguishers.)

Length (feet)	With no fixed fire extinguishing system in machinery space	With fixed fire extinguishing system in machinery space
Under 16*	1	0
16, but under 26*	1	0
26, but under 40	2	1
40, but under 65**	3	2

*Outboard boats less than 26 feet are not required to carry extinguishers if their construction will not trap flammable vapors or more.

**Fire extinguisher requirements for vessels 65 feet or over are in 46 CFR 28.140.

Notice

REPORT ALL INJURIES

United States law, 46 United States Code 10603, requires each seaman on a fishing vessel, fish processing vessel or fish tender vessel to notify the master or individual in charge of the vessel or other agent of the employer regarding any illness, disability or injury suffered by the seaman when in service to the vessel not later than seven days after the date on which the illness, disability or injury arose.

Casualties and injuries

A placard at least five by seven inches reading as above is required to be posted in a prominent place.

The person who receives any injury report may be required to notify the Coast Guard or the vessel's insurance company.

If any of the following incidents occur, the master or other vessel representative must as soon as possible contact the nearest Coast Guard Marine Safety Office and submit a written report on form CG-2692 within five days:

- groundings;
- loss of main propulsion or primary steering;
- loss of life;
- injuries which require professional medical treatment beyond first aid and render the individual unfit to perform vessel duties;
- any damage over $25,000; and
- any occurrence affecting the seaworthiness of the vessel, such as fire, flooding, or the failure or damage to fixed fire extinguishing systems, lifesaving equipment, auxiliary power-generating equipment or bilge pumping systems.

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The following incidents must be reported by the master or other vessel representative to the underwriter of primary insurance for the vessel or to an organization accepted by the commandant of the Coast Guard:

- an injury to an individual that causes that individual to remain incapacitated for more than 72 hours; and
- damage to or by a vessel, its cargo, apparel or gear, except for fishing gear while not on board a vessel, or that impairs the seaworthiness of the vessel, or that is initially estimated at $2,500 or more

46 CFR 28.080 46 CFR 28.090
46 CFR 28.165

Rules of the road

Vessels more than 12 meters (39.4 feet) in length that operate inside the COLREGS demarcation lines are required to carry on board a copy of the Inland Navigation Rules

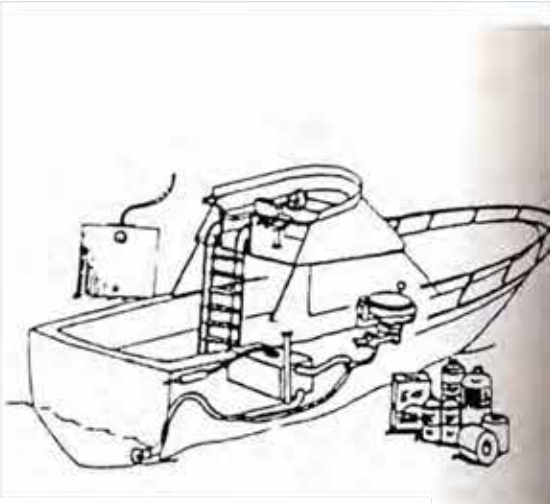
33 CFR 88.05

Drug testing requirements and operating a vessel while intoxicated

An individual directly involved in a "serious marine incident" must be tested for evidence of both dangerous drugs and alcohol See 46 CFR 4.03-2 for the definition of "serious marine incident." Other testing requirements (pre-employment, periodic, random) are found in 46 CFR parts 4 and 16

An individual is considered intoxicated when he or she operates a vessel and has an alcohol concentration of .04 percent by weight or more in the blood. The operator is also considered intoxicated when his or her manner, disposition, speech, muscular movement, general appearance or behavior is observed to be impaired due to the consumption of alcoholic beverages.

46 CFR parts 4 and 16.
33 CFR part 95



Marine sanitation devices

All vessels with installed toilet facilities must have an operable Coast Guard-certified marine sanitation device. These systems are so labeled except for some holding tanks, which are certified by definition under the regulations, if they store only sewage and flushwater at ambient air pressure and temperature

33 CFR part 159

Pollution prevention

Vessels 26 feet or longer are required to post an oil pollution placard and a garbage placard. Each vessel 40 feet or longer, which is or has been on an ocean voyage, must have a written solid-waste management plan that describes procedures for collecting, storing and discharging garbage, and designates a person in charge of carrying out the plan.

Dumping of plastics into the ocean or navigable waters is prohibited. See 33 CFR 151 for restrictions on dumping other trash/garbage into the ocean or navigable waters of the United States

33 CFR 151, 155

Officer's competency certificates

The master, mates and engineers on vessels of 200 gross tons or more that operate beyond the boundary lines must have the appropriate United States Coast Guard license.

46 USC 8304

Sexual abuse act of 1986

If any member of the crew is a victim of a sexual offense, that individual should immediately report the incident to the master. It is then the responsibility of the master to report to the Coast Guard any complaints of sexual offenses, including aggravated sexual abuse, sexual abuse, sexual abuse of a minor or ward, and sexual contact per

46 USC 10104.

Alaskan fishermen learn how to put out fires on a training program sponsored by the North Pacific Fishing Vessel Owners' Association.

Photo courtesy of NPFVOA

Additional requirements for documented vessels operating beyond the boundary line or with more than 16 persons on board

Firemen's outfits and breathing apparatus

If a vessel has more than 49 individuals on board, at least two fireman's outfits, stowed in widely separated locations, are required. A fireman's outfit consists of one pressure-demand, open-circuit, MSHA/NIOSH* approved, self-contained breathing apparatus with a 30-minute air supply and a full face piece, one lifeline with a belt or suitable harness, flashlight, rigid helmet, boots, gloves, protective clothing, a fire axe and a spare air bottle.

Vessels using ammonia in refrigeration systems, must have at least two self-contained breathing apparatus with spare air bottles for each. (This requirement is the subject of future rulemaking.)

*Mine Safety and Health Administration/ National Institute of Occupational Safety and Health.

46 CFR 28.205

First aid equipment and training

Each vessel must have on board a first aid manual and a medicine chest of a suitable size in a readily accessible location. Training and other requirements are found in

46 CFR 28.210.

Guards for exposed hazards

Guards, hand covers or railings are required in way of hazardous machinery, such as gearing, chain or belt drives and rotating shafting without restricting access to the fishing equipment, including winches, drums and gurdies. Internal combustion engine exhaust pipes within reach of personnel must be insulated or otherwise guarded to prevent burns.

46 CFR 28.215

Navigation information

The following navigational information must be on board for the vessel's operating area

- currently corrected charts of appropriate scale for safe navigation; and
- a currently corrected copy (or applicable extract) of the U. S. Coast Pilot, Coast Guard light list, National Ocean Service tide tables and National Ocean Service tidal current tables. Vessels operating only on rivers must substitute a U.S. Army Corps of Engineers or river authority current publication for tidal current tables.

46 CFR 28.225*Continued on page 24*

Continued from page 23

Compass

Each vessel must be equipped with an operable magnetic steering compass with a compass deviation table at the operating station

46 CFR 28.230

Anchors and radar reflectors

Each vessel must be equipped with appropriate anchor(s) and chain(s), cable or rope.

Each non-metalic hull vessel must be equipped with a radar reflector, unless it is rigged with gear that can provide a radar signature at six miles.

46 CFR 28.235

General alarm system

After September 1, 1992, if an accommodation space or work space is remotely located from the operating stations, a general alarm system suitable for notifying individuals on board is required with a contact maker at the operating station. The system must be capable of notifying individuals in any accommodation or work space. In noisy work spaces, a flashing red light is also required.

Each general alarm bell and flashing red light must be identified with red lettering at least 1/2-inch high as follows:

> ATTENTION GENERAL ALARM -
> WHEN ALARM SOUNDS,
> GO TO YOUR STATION

A public address system may be used instead of a general alarm system if it complies with the above requirements and can be activated from the operating station. The general alarm system must be tested prior to getting underway and at least once each week while underway.

46 CFR 28.240

Communication equipment

Each vessel must have VHF radio-telephone communication equipment operating within the 156-162 MHz band.

If operating more than 20 miles from the coastline, vessels must also have radio-telephone communication equipment operating within the 2-4 MHz band, but if more than 100 miles from the coastline, this additional radio-telephone must operate within the 2-27.5 MHz band. Exceptions to this additional radio-telephone are vessels operating in waters near Alaska, where no public coast station or Coast Guard station is within range on the 156-162 or 2-4 MHz bands. The additional radio-telephone for such vessels must operate within the 2-27.5 MHz band.

A single radio transceiver meeting the requirements of all of the above is acceptable.

A cellular telephone or satellite communication system servicing the area of vessel operation is also acceptable.

A radio-telephone transceiver installed on board before September 15, 1991, operating on 4-20 MHz band may continue to be used to satisfy the above requirements for vessels operating more than 100 miles from the coastline or in the Alaskan waters.

All communications equipment must be able to be operated from the vessel's operating station and must comply with Federal Communication Commission requirements, including possessing a ship radio station license. An emergency source of power must be provided for continuous operation for at least three hours.

33 CFR 26.03 **46 CFR 28.245**
46 CFR 28.375 **47 CFR part 80**

High water alarms

High water alarms are required for vessels 36 feet or more in length. Alarms are to be both visual and audible, and installed at the operating station. They are to indicate high water levels in each of the following normally unmanned spaces:

- a space with a through-hull [illegible] the deepest load waterline;
- a machinery space bilge, bilge well, shaft alley bridge, or other space subject to flooding from seawater piping within the space; and
- a space with a non watertight closure such as a non-watertight hatch on the main deck.

46 CFR 28.250

Bilge systems

All vessels must be equipped with a bilge pump capable of draining any watertight compartment, other than tanks and small buoyancy compartments, under all service conditions. If a portable bilge pump is used to

The Alaska Marine Safety Education Association conducts emergency training in Sitka. Photo courtesy of AMSEA.

meet this requirement, a suitable suction hose and discharge hose must be provided that will reach the bilges of all watertight compartments it must serve and ensure overboard discharge. The portable pump must be capable of dewatering each space at a rate of at least two inches of water depth per minute. Specific requirements, especially for larger vessels, are found in **46 CFR 28.255.**

Position-fixing devices

A vessel 79 feet or longer must be equipped with an electronic position-fixing device, such as SAT NAV, GPS, LORAN, OMEGA or RDF that can provide accurate fixes for the area of operation.

46 CFR 28.260

Emergency instructions

Emergency instructions are required, including, as applicable:

- survival craft embarkation stations and personnel assignments;
- fire, emergency and abandon-ship signals;
- immersion suit location and donning information;
- procedures for making distress calls;
- list of individual responsibilities in emergency situations; and
- emergency and special evolution procedures.

More specific details, including posting requirements are in

46 CFR 28-265.

Safety Instructions and drills

At least once a month, the master must ensure that drills are conducted and instructions are given to each person on board. The person conducting those drills and instructions need not be the master, individual in charge of the vessel or a member of the crew. The drills and instructions are to include:

- abandoning the vessel;
- fire fighting;
- man overboard recovery;
- stabilizing vessel after unintentional flooding;
- launching survival craft and recovery of life and rescue boats;
- donning immersion suits, PFDs, fireman' outfits and breathing apparatus;
- radio and visual distress calls and signals
- activating the general alarm; and
- reporting of all inoperative alarms and fire-detection systems

Viewing of videotapes followed by a discussion led by a knowledgeable person can be used for the instruction requirements above, but not as a substitution for drills.

The master must ensure that all individuals who have not received this instruction or participated in the drills receive a safety orientation before the vessel may be operated. This safety orientation must explain the emergency instructions required by **46 CFR 28.265**, and cover the activities listed above.

After September 1, 1994,only trained individuals can conduct drills and give instructions. Individuals licensed for inspected vessels more than 100 gross tons need not have additional training to comply. This will be the subject of future rulemaking.

46 CFR 28.270

Continued on page 26

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Requirements for vessels which had their keels laid or were at a similar stage of construction or which underwent major conversions on or after September 15, 1991, and that operate with more than 16 individuals on board

These additional requirements involve fire extinguishing and detection systems, lifesaving and signaling equipment, galley hoods, fuel systems, ventilation of enclosed spaces, electrical systems, structural fire protection, means of escape, radar and depth-sounding devices, hydraulic equipment, and rails and other hand grabs.

Specific information on these requirements are found in

46 CFR part 28, subpart D.

Stability requirements

Commercial fishing industry vessels 79 feet or more in length, which are not required to be issued a load line, must meet certain stability requirements contained in

46 CFR, part 28, subpart E.

Processing vessel requirements

Uninspected fish processing vessels must be examined at least once every two years by the American Bureau of Shipping (ABS), a similarly qualified organization or a surveyor of an accepted organization.

Fish processing vessels built or converted after July 27, 1990, will be required to be classed by ABS or another similarly qualified organization.

Fish processing vessels over 100 gross tons have certain crew requirements specified in **46 USC 8701 and 8702,** with exceptions permitted in **46 USC 8104**

A seine skiff on deck can have an adverse effect on stability

Photo by Bruce Ada

Additional federal regulations

applicable to commercial fishing industry vessels

Source	Requirements
46 USC 11101	Living and berthing spaces, and possibly hospital spaces are required for crew in vessels 100 gross to
46 USC 10601	Fishing agreements must be written for all seamen employed on ves tons.
46 USC 10602	Under the fishing agreements, seame have rights to recover wages and shares of proceeds.
46 USC 4505	Operati on may be terminated by Coast G uard boarding officers if conditions are considered espe- cially hazardous. See NVIC 12-91.
46 USC	Except for certain vessels, only United States citizens may serve as masters, chief engineers, radio officers or officers in charge of deck or engineering watches on docum ented vessels.
33 CFR	Except for certain exempted vessels, self-propelled vessels of less than five net tons must be numbered
46 CFR 67-69	Vessels of at least five net tons must be measured and documented, display name, hailing port and official number.
46 CFR 25	Flame arrestors are required on carburetors of gasoline engines, except on open vessels.

Source	Requirements
33 CFR 81	Light, shape and sound signal provisions of 72 COLREGS may apply to certain vessels. For applicability, see proper 72 COLREGS and parts/annexes for regulation requirements. A horn or whistle is required on a vessel under 12 meters (39.3 feet) long. A bell is also required on a vessel longer than 12 meters.
33 CFR 130	Federal Water Pollution Control Act applies to all vessels 300 gross tons or more using U.S. ports. Certificates of financial responsibility must be on board.
33 CFR 155	Certain vessels are prohibited from carrying oil in the forepeak tank or forward of the collision bulkhead. No oil may be intentionally drained into bilges.
33 CFR 156	There are certain requirements for oil transfer procedures for vessels with capacities of 250 or more barrels of oil.
33 CFR 26	Radio-telephones are required for most vessels of 300 gross tons or more.
47 CFR 80	Other radio-telephone requirements for vessels more than 300 gross tons.
46 CFR 26	Vessels of more than 150 gross tons and on international voyages must have signal lights.
46 CFR 105	Certain vessels have requirements concerning petrolium product dispensing.

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Coast Guard District Fishing vessel safety coordinators

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Telephone: (617) 223-8444

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Second Coast Guard District
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Fifth Coast Guard District
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Portsmouth, VA 23704-5004
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Commander
Seventh Coast Guard District
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Miami, FL 33131-3050
Telephone: (305) 536-5651

Commander
Eighth Coast Guard District
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Education and Enforcement

LCDR Edward J. McCauley

Background

It has been estimated that there are approximately 131,000 uninspected commercial fishing industry vessels operating in the United States. These vessels run the gamut from lobster boats in Maine and shrimpers in the Gulf of Mexico to fish processing vessels operating in the Bering Sea. Some 100,000 of these vessels are documented. They typically operate with small crews.

The remaining documented vessels are larger, more sophisticated, and operate with larger crews. The largest are fish processing vessels, which can exceed 400 feet in length and employ more than 150 crew members. They may process their own catch as well as fish caught by

During the past ten years, the annual casualty rate in the commercial fishing industry has averaged 250 vessels and 100 lives. In 1988, Congress set the stage to reverse this trend with the Commercial Fishing Industry Vessel Safety Act. The subsequent regulations were designed to save lives and property in the fishing industry.

Safety standards

Unlike other regulatory efforts in which the Coast Guard was given broad authority, Congress was very specific in its fishing vessel safety legislation. In essence, tiered safety standards were established for three categories of vessels. They are:

- **All vessels;**
- **Documented vessels operating beyond the boundary line or with more than 16 individuals on board; and**
- **New vessels.**

The act also provided for penalties, fish processing vessel examinations, termination of unsafe operations, and the establishment of an advisory committee to recommend measures to the Coast Guard for the safe operation of fishing industry vessels. The committee has met numerous times, providing valuable insight and advice, especially during the rulemaking process and in the development of enforcement strategy.

Education and training

The act deals primarily with equipment. For this equipment to be effective, it must be properly maintained and fishermen must be trained in its use. The regulations require that the masters of certain commercial fishing vessels ensure that drills are conducted and that instruction is provided each month.

Safety training may be provided in conjunction with the drills to make sure that crew members are familiar with emergency procedures. These procedures include: activating the general alarm, recovering an individual from the water, abandoning the vessel, donning immersion and firefighting suits, voice radio and visual distress signals, and launching survival craft. The Coast Guard recommends this practical hands-on training for all commercial fishermen.

At sea and dockside

Recognizing the diversity and independence of the commercial fishing industry, a program of at-sea boarding and voluntary dockside examinations was developed.

- At-sea boardings are conducted by Coast Guard floating units in conjunction with search and rescue, and law enforcement missions.

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A Coast Guard boarding team approaches the fishing vessel Deborah Lee from Point Judith, Rhode Island.

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- Voluntary dockside examinations focus on education, informing operators of the requirements of the new regulations in a nonadversarial way. The vast majority of the Coast Guard's contact with the fishing industry is, and will continue to be, dockside.

Enforcement resources

Fishing vessel safety is not a single program issue, but one that crosses many boundaries. Education and enforcement strategies involve the cooperative efforts of multiple Coast Guard offices, the American Bureau of Shipping (ABS) and other marine safety organizations.

Coast Guard offices having responsibilities in education and enforcement programs include Marine Safety, Security and Environmental Protection; Navigation Safety and Waterways Services; Law Enforcement and Defense Operations; and Readiness and Reserve. Here's how it all comes together.

- Coast Guard cutters and small boats conduct safety equipment checks. A specific boarding check-off list assists boarding officers in their inspections.

- Marine safety office, reserve and auxiliary personnel conduct voluntary dockside examination and education programs. Vessels successfully completing dockside examinations are issued decals documenting their satisfactory completion.

- Third party organizations were conducting surveys of commercial fishing vessels before the act was passed. As an extension of other services, including classification, load line and insurance condition surveys, these agencies now provide fishing vessel owners and operators with Coast Guard compliance surveys and decals.

It is noteworthy that the Coast Guard has developed strong working relationships (beyond the traditional connections with ABS) with other marine surveying organizations, which play a vital role in promoting safety by increasing the number of fishing vessels examined each year.

Safety coordinators

In FY 1991, full time fishing vessel safety coordinators were placed at each Coast Guard district office. (See page 28 for list.) These individuals perform a variety of services for Coast Guard units in their districts and the commercial fishing industry. These services include:

- multi-media safety campaigns,
- coordinating at-sea and dockside examinations,
- acting as liaisons with third party examiners, and
- providing uniform interpretation of the law and regulations.

Conclusion

Fishing vessel safety must improve. Thanks to Congress' passage of the Commercial Fishing Industry Vessel Safety Act, the regulations have been developed by the Coast Guard with the help of the advisory committee.

All efforts must now be directed toward informing the industry about the new regulations and the benefits of compliance. Immediate success can be measured each time a casualty is prevented. Long-term success will be demonstrated by a drastic reduction in casualties, and when fishermen automatically think...

SAFETY FIRST.

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Why safety training is vital

Ms. Leslie J. Hughes

The commercial fishing industry was in a crisis in 1985, when the North Pacific Fishing Vessel Owners' Association began to address safety concerns. A rash of North Pacific capsizing and sinkings – with substantial loss of life – had everyone from government officials to insurance company executives wondering aloud about the future of the fishing industry.

Faced with the prospect of controls designed and enforced by the government, as well as concerns about the cost and availability of insurance, the North Pacific association developed a voluntary safety training program, which is now in its seventh year of operation.

The success of this Vessel Safety Program is based on three critical elements:

1. full involvement and cooperation with the Coast Guard,
2. a training system stressing hands-on experience, and
3. participation by professionals knowledgeable about the practical aspects of operating fishing vessels in remote areas under adverse weather conditions.

Coast Guard initiatives

Recognizing the importance of vessel safety standards and crew safety awareness/training, but lacking the authority to regulate the commercial fishing industry, the Coast Guard started a unique voluntary safety program in 1984.

When the Coast Guard learned that the North Pacific Fishing Vessel Owners Association had already embarked upon a safety program for its fishermen, it joined efforts. This union produced a set of comprehensive standards aimed at vessel safety and personnel/operation safety awareness and education.

With the cooperation of the commercial fishing industry, the Coast Guard developed voluntary technical vessel standards that target vessel owners, insurance companies, shipyards, naval architects and surveyors. These standards are found in the Navigation and Vessel Inspection Circular (NVIC) 5-86.

In turn, the fishing association, with help from the Coast Guard, designed a three-part personnel safety awareness and education program with operational standards set forth in the Vessel Safety Manual.

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Fishermen learn to right a liferaft in a safety equipment and survival class conducted by the North Pacific Fishing Vessel Owners' Association.

Photo courtesy of NPFVOA.

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Vessel Safety Program

There are three parts to the North Pacific Fishing Vessel Owners' Association's Vessel Safety Program: the Vessel Safety Manual, the Safety and Survival at Sea videotape series and the Crew Training Program. The educational materials provide the backbone, and the practical instruction provides the heart of the program.

Funded from 1985 to 1987 through Saltonstall-Kennedy Funds sponsored by the National Marine Fisheries Service, the Vessel Safety Program has since been self-supporting. It now depends upon proceeds from training and sales of educational materials to sustain ongoing safety enhancement efforts.

Safety manual

The Vessel Safety Manual was published in 1986 and updated in 1990, anticipating forthcoming regulations under the Commercial Fishing Industry Vessel Safety Act of 1988. To date, 5,500 copies have been purchased by industry members.

The manual provides practical solutions to a wide-range of problems facing the mariner, including normal and emergency situations. Designed as a set of operational recommendations for skippers and crews, it includes 300 pages of text and more than 300 illustrations. It covers a variety of subjects ranging from vessel familiarity for the new hand to stability for the owner and skipper.

The Coast Guard recognizes 90 percent of the subject matter, including fire prevention and control, rules of the road and medical emergencies at sea to be applicable nationwide. However because a few topics, such as gear-handling techniques, vary from region to region, two adaptations of the manual have been designed for the Gulf and Atlantic regions.

Videotapes

The Safety and Survival at Sea videotapes are designed to complement hands-on training classes for the following subjects: safety equipment and survival procedures, medical emergencies at sea, fire prevention and control, and vessel stability.

Each videotape is presented in modules permitting a trainer to focus on specific areas, i.e., a five-minute segment on liferafts or immersion suits can be shown before an abandon ship drill.

The tapes serve as stand-alone education aids and as refresher courses to reinforce information provided in the Vessel Safety Manu... and Crew Training Program.

Training program

Using hands-on practice to dramatize and enliven the information presented in themanual and videotapes, the Crew Training Program offers both shipboard and classroom exerc...

The program consists of 14 eight-hour courses taught by instructors who are profe...sionals in their specific fields. All classes provide as much hands-on training as possible, as well as lectures, videos, hand-outs, displays and simulated exercises.

The primary philosophy behind the training program is, "Be prepared. Commercial fishing is dangerous." There are no ways to remove all the hazards of the sea, nor can human error be entirely eliminated. While the dangers inherent in commercial fishing cannot be avoided, they are magnified or minimized by the actions of a vessel's skipper and/or crew.

Feedback from individuals who have taken the courses attests to the value of the training program. Veteran fishermen continually report that the instruction provided them with their first experience wearing immersion suits and seeing liferafts inflated.

Participants are encouraged to practice using their own equipment whenever possible. And when they do, it is common for them to discover defects, such as rusted zippers on immersion suits -- certainly a more welcome re... in a pool than in the ocean. Also, many vessel owners have stopped stowing immersion suits in staterooms, and have built watertight lockers for them on deck, so that they are readily accessible.

After conducting drills on board their ships, numerous owners have relocated life... to make them more accessible, purchased slings for rescuing a man overboard, and discovered escape hatches that were carpeted ove...

After participating in the program, a number of operators have upgraded their firefighting equipment and first-aid kits.

To date, more than 5,100 crew members have completed training classes, and the attendance rate is expected to exceed 2,500 annually starting this fall. Some companies require safety training as a condition of employment.

North Pacific Fishing Vessel Owners' Association training prepares fishermen to deal with sudden, life-threatening emergencies.

Photo courtesy of NPFVOA

The Crew Training Program includes the following courses.

Safety equipment and survival

Survival theory instruction using vivid visual aids is followed by in-the-water exercises with immersion suits, inflatable liferafts and other gear. Instruction includes survival at sea recommendations, treatment of hypothermia, and search and rescue procedures. Hands-on training covers signaling devices, man-overboard and abandon-ship emergencies, proper water entry, liferaft boarding and cold-water survival techniques.

Medical emergencies at sea

This specialized course is approved by the Coast Guard for first aid and CPR licensing requirements. It focuses on the unique problems encountered in performing first aid at sea, where the victim has only his shipmates to rely on. Each commercial fisherman has a responsibility to learn as much first aid as possible.

Training by medical professionals includes hands-on practice at patient assessment wound management, CPR, transporting the injured and other emergency procedures. The course concludes with a practical scenario and drill, featuring a radio call for help.

Fire prevention and control

Participants learn fire-control theory and gain experience, individually and as part of teams, using portable fire extinguishers, fixed fire suppression systems and water hoses. Hands-on practice at fighting fires under realistic circumstances takes place in a 147-foot vessel simulator at the Washington State Fire Training Center in Seattle.

Navigation: collision avoidance

This course is recommended as a refresher for the experienced seaman as well as for the beginner. It covers watchkeeping standards, an overview of rules of the road and casualties caused by violations, and voyage planning, including chart problems.

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Vessel stability

Using a variety of training aids, students learn how to calculate and evaluate various conditions affecting stability. When possible, students conduct actual rolling tests aboard a vessel. At the conclusion of the course, students must demonstrate a basic understanding of the stability booklet, load lines, load limitations, effects of icing, free surface, following seas and other conditions.

Introduction to SCBA

Drills using self-contained breathing apparatus (SCBA) are conducted under conditions of fire, smoke and fumes, and include moving through a maze of crawl spaces in darkness. This course is also taught at the Washington State Fire Training Center, where students learn how to use a variety of firefighting apparatus and how to enter contaminated spaces.

Emergency drill workshop

This course is intended for masters and senior shipboard personnel charged with conducting and supervising a vessel's safety and emergency training program. It covers procedures for conducting and evaluating training drills; station bills; and scenarios involving abandoning ship, fighting a fire, recovering a man overboard, minimizing the effects of unintentional flooding, launching and recovering survival craft, and donning immersion suits and other personal flotation devices.

Advanced medical emergencies

This class teaches suturing, treatment of eye injuries and dental problems, splinting and injections. It also includes refresher training for skills taught in the basic course in medical emergencies at sea.

Survival afloat seminar

Conducted on board a vessel, this emergency training program is designed to train entire crews in the fundamentals of firefighting damage-control, man-overboard and abandon-ship procedures, taking into account the ship's equipment and operational practices. Crews develop detailed station bills and conduct a variety of drills based on various emergency situations.

Present and future outlook

At the end of 1990, the North Pacific Fishing Vessel Owners' Association decided to focus solely on safety issues. It is now a non-profit association of vessel owners and support industries totally dedicated to safety education and training. Industry members are now willing to identify and fund additional programs where training is needed.

Five-part safety program

The association offered a new five-part industrial safety program this fall. Funded by the American Factory Trawler Association, the training program was directed toward the factory trawler fleet, but was also applicable to other fleets, as well as shoreside processing plants.

The Coast Guard and Occupational Safety and Health Administration contributed their expertise in developing the courses, which addressed safe crane operations and maintenance, safe cargo handling operations, factory trawl deck safety, and body mechanics and ergonomics.

Summary

The government moved from a *voluntary* to a *regulatory* phase by requiring fishing vessels to carry basic lifesaving equipment and other improvements. However, all the best equipment in the world is useless if the operators don't maintain it, and know how to use it properly and promptly.

The new mandatory rules include very important provisions on drills and training. These are key features in making the rules effective.

The North Pacific Fishing Vessel Owners' Association's Vessel Safety Program, in cooperation with the Coast Guard, demonstrates the effectiveness of close collaboration between industry and government working toward a common goal. Both organizations believe that:

> *"Training is the key to improving the poor safety record of the commercial fishing industry."*

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Watch for "loose cannons" aboard fishing vessels

Mr. Thomas J. Pettin

There are a variety of "loose cannons" lurking around commercial fishing vessels that are lying in wait for accidents to happen. Turning drums, winches and lines are among the potential hazards that merit caution.

During the past ten years, 23 commercial fishermen have lost their lives and 310 have been injured when they lost their footing and fell into the rotating gears of a winch. Hands guiding the lay of a cable on a turning drum (an extremely dangerous practice) have been snagged by cable barbs. Numerous casualties have been caused by loose fitting clothing getting caught in winches.

Winch accidents

Working around a winch in the best of conditions is dangerous work. Vessels roll and decks become slippery, which are deadly combinations with drums turning at high-speed. However, the causes most often cited in Coast Guard official casualty records for winch casualties are unsafe practices and carelessness.

Working close to a winch may create greater control, but, from a safety standpoint, this practice creates a greater possibility for an individual to become quickly entangled in the cables.

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The casualty described in this article took place on this vessel.

(Above) The mechanical dog on t[he] center of the drum. The bolt through the ratchet assembly serves as the brake for the drum.

(Left) The damaged port cathead that most probably caused the accident has been removed from the winch. Note the brake foot pedal is broken off

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A recent casualty...

Recently, a deckhand left alone to hoist in a net got tangled up in a cable and drum. He was wearing a loose leather jacket that got snagged by a cable barb.

The captain checked on the deckhand after hearing the winch running after a long period of time. He found him lying under the port cathead. He was completely disrobed. His trousers had been yanked down around his ankles and his shirt had been ripped off. Both arms had been torn from his body and were lying aft of the center cathead.

The captain turned the winch off and ran inside to call for help. A Coast Guard helicopter arrived on the scene and took the victim to a hospital where he was pronounced dead

...could have been prevented.

This casualty and many others like it could have been prevented by observing simple safety precautions. **One should not wear scarves, loose clothing or long hair on fishing vessels.** They can get caught in winches very easily and very quickly.

Also contributing to the casualty, the brakes for the drum had been removed and the brake pedal was broken, rendering the braking system inoperable.

New regulations

The new federal regulations for fishing industry vessels specifically address this problem. Hydraulically-operated machinery must be equipped with a holding device to prevent uncontrolled movement of the equipment when there is a loss of hydraulic system pressure (46 CFR, part 28, [illegible]).

This requirement affects commercial fishing vessels with more than 16 persons on board, with a construction or keel laying date on or after September 15, 1991. The requirement also affects vessels which have undergone major conversions on or after that date.

Obey the rules

The Coast Guard stresses the urgency for commercial fishermen to comply with all the new regulations, particularly those dealing with crew safety.

Above all, be wary . . . remember the old adage, "an ounce of prevention is worth a pound of cure."

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Death on *Miss Linda*

PSCS Harvey Harrison

On the afternoon of May 23, 1990, the crew of the 76-ft. trawler Miss Linda was fishing off the northern California coast. It was a good day with clear weather and moderate winds and swells from six to eight feet.

The crew was in the process of spooling wire, bringing up the fishing nets as they had done hundreds of times. Everything was as it should be when the unthinkable happened. One of the crew members was caught in a winch he had been operating. The winch kept turning and, before other members of the crew could [illegible] mutilated and killed

On this day, the victim, who had performed the same task on the vessel for over a year, slipped or fell into the turning drum. His left hand, which was operating the wire guide, got caught between the wire and the spool, and he was dragged into the turning drum. Because of the noise of the hydraulic winch, no one knew that he had died, even though his fellow crewman was less than ten feet away.

The individuals involved in the operation had done their jobs so routinely, that they tended to take safety for granted . . . that is, until this tragedy occurred

Where it happened on Miss Linda.

How could this have happened?

How can fishermen do a job hundreds of times without so much as a bruise, and one day the same job results in the death of a shipmate?

In this particular operation, two winches were used both starboard and port. Two crewmen stood back to back, each attending to his respective winch. They work a manual wire guide, a heavy cumbersome piece of gear with two vertical rollers that allow the operator to spool heavy wire evenly onto the winch drum. The winch operates the drum, enabling the crew to lower and raise the fishing nets.

Safety violations

Coast Guard inspectors who responded to the casualty readily spotted unsafe procedures and equipment being used. The first thing they noticed was that the crew had piled two rows of eight-foot boards in a one-foot stack to gain leverage on the wire guide they used to spool the wire onto the drum. These boards were loosely stacked and could move as the vessel rolled and pitched at sea.

The investigating officers suggested that a steel platform with a grated footing be welded to the deck to provide traction for the operator.

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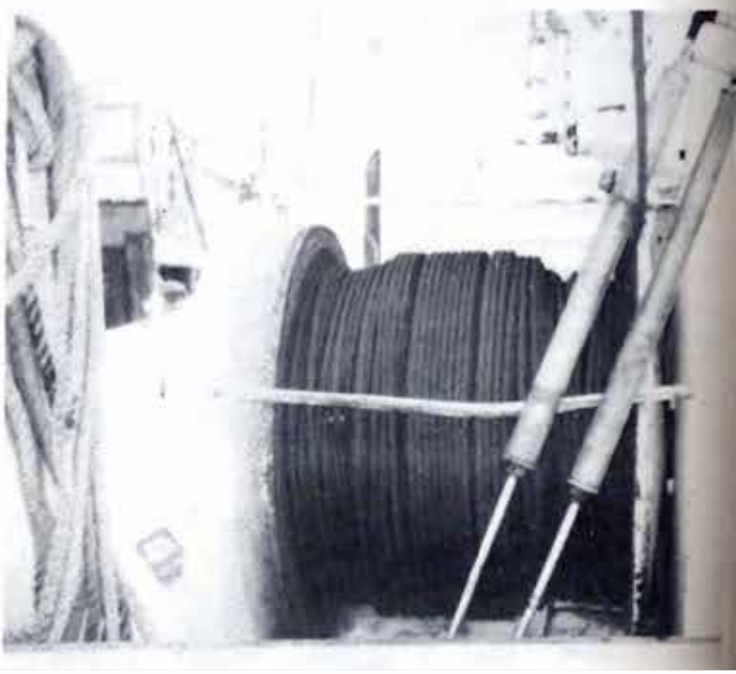

This is the winch in which the crewman was caught. The vertical dual bars with rollers is a manual threader which the user pushes back and forth to thread the wire line onto the spool while the winch is being operated.

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The second problem observed was that, although the wire drum had a safety screen in the rear, the drum was open and exposed on the working side where the wire was delivered.

It was suggested that either a wire guard be installed with horizontal rollers which would allow the wire to run onto the spool, or that a partial guard be installed between the operator's working position and the drum. A final suggestion was to install an automatic "kill switch" to stop the operation of the drum in the event the operator loses balance or is in some way incapacitated. The switch could be placed near the hydraulic controller where the operator holds one hand.

The Coast Guard has previously addressed some of these problems in NVIC 5-86, "Voluntary standards for United States uninspected commercial fishing vessels." Now the new regulations issued under the Commercial Fishing Industry Safety Act have mandatory requirements for guards for exposed hazards and for pressure-relief devices for hydraulic systems.

Aftermath

After hearing the Coast Guard's suggestions, the captain of *Miss Linda* stated that he wouldn't put to sea until all necessary improvements were made to insure the safety of his crew.

It is tragic that it took a crew member's death for these improvements to be made.

Lessons learned

This casualty demonstrates clearly that vessel personnel should not become complacent about doing routine operations, regardless of their repetitive nature. It is a good idea to step back and check your work every now and then to be sure that it is being done as safely as possible.

PSCS Harvey Harrison is a [illegible] officer with the Marine Safety Office, San Francisco Bay, Coast Guard Island, Alameda, California 94501-5100. Telephone: (415) 437-3142.

Marine safety training . . .a must in Alaska

Mr. Jerry Dzugan

What could be more important than marine safety training in a state where so many people make their living on the water? In Alaska thousands of people are engaged in commercial and charter fishing, while many others enjoy recreational boating, kayaking and canoeing along 36,000 miles of coastal waters.

The extreme cold water and air temperatures found in and around Alaska demand that the boating public, both commercial and recreational, be prepared in the event of an emergency. One must keep in mind that the moment a person enters these icy waters, his or her chance for survival diminishes rapidly. Furthermore, the risk of death from hypothermia is nearly as high in the summer as in the winter.

These dangers are compounded by the fact that help from Coast Guard or other vessels is not always within close range. This frequently delays vital search and rescue efforts that must be performed within short time periods.

These are some of the reasons why marine safety and survival training is so important in Alaska.

AMSEA

Formed in the early 1980s, the Alaska Marine Safety Education Association (AMSEA), prepares the boating public to meet emergency situations with teams of highly trained instructors conducting classes throughout the state.

A non-profit corporation, AMSEA was established by representatives of Alaska organizations who were concerned about the lack of resources for marine safety education in the state, as well as the lack of standardized educational materials on marine safety relevant to the Alaskan environment.

Agencies involved in AMSEA include the University of Alaska's Marine Advisory Program, the Alaska Department of Public Safety, the Alaska Vocational Technical Center and the Coast Guard's 17th District.

AMSEA's goal is to reduce injury and loss of life in the Alaskan marine environment through public education provided by a statewide network of qualified volunteer marine safety instructors.

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Crab fishermen of the Bering Sea know the hazards of their occupation first hand, and value safety and survival training.

Photo by Brad Matsen

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Accomplishments

Working closely with other Alaskan marine safety-minded agencies, AMSEA has achieved the following.

- Developed and maintained a marine safety and survival curriculum appropriate to the Alaskan environment, and emphasizing "hands-on" training with survival equipment;
- Trained more than 160 marine safety instructors, who, in turn, have trained more than 17,000 people (5,000 in 1990 alone);
- Developed realistic safety training standards for instructors, including applied training with survival equipment, including liferafts, immersion suits, videos and other training aids.
- Publishes and distributes a quarterly marine safety update, providing the latest news on safety and survival methods.

AMSEA courses

A flexible curriculum provides a range of training from one-hour talks on survival kits to school children to 40-hour courses on safety and survival for commercial fishermen. Brief descriptions of the three courses most in demand follows

Marine safety equipment/survival

Designed for commercial fishermen, this course emphasizes cold water survival skills with "hands-on" training with EPIRBS, liferafts, immersion suits and other equipment. Closely paralleling the IMO's personal survival course, it is typically 16 hours long. It trains vessel operators on what to cover and how to conduct safety drills.

As of now, drills must be held on documented fishing vessels at least once a month. By September 1, 1994, all individuals who conduct such drills must be trained in the proper drill procedures.

Shipboard medical emergencies

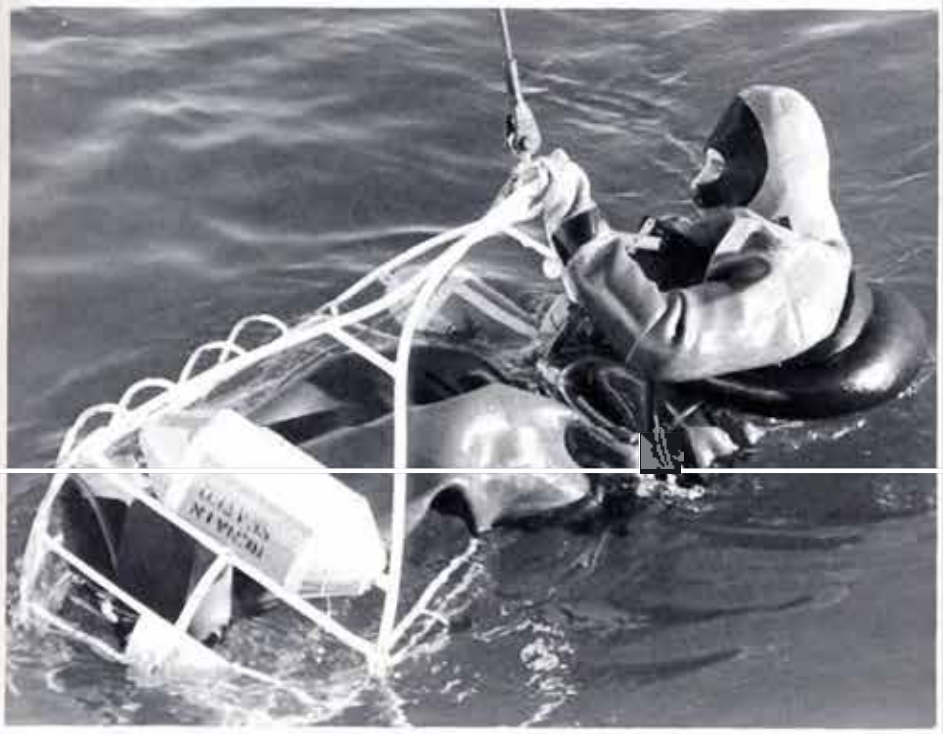
Running from eight to 16 hours, this course is designed to help crewmembers deal with medical emergencies. Stressing "hands-on" practice with first-aid equipment, the instruction covers underlying principles in emergency care, and the use of everyday boating materials to treat medical emergencies.

Shore survival

This course is important because many marine casualty victims end up on Alaska's isolated shoreline, which extends for thousands of miles. Ranging from one to 40 hours depending on the audience, the course is most often presented to school children and recent arrivals to the Alaska environment

AMSEA survival training in Sitka.

Photo courtesy of AMSEA



Fishermen practice entering a Coast Guard rescue basket during survival training in Seward Alaska. Photo courtesy of the Alaska Vocational Technical Center.

An expanded, more intensive version is given to Coast Guard aviation and boat crews. It covers the seven steps to survival, shelter, signals, and fire starting, along with water acquisition and food gathering.

Other subjects

AMSEA safety and survival courses also include instruction on the following:

1) Preparation for an emergency
2) Cold water near drowning
3) Hypothermia
4) Cold water skills
5) Sea survival
6) Necessary survival equipment
7) Use and maintenance of survival equipment

Training results

In May 1990, AMSEA conducted surveys of instructors, students and a random sampling of commercial fishing permit holders to determine the effectiveness of marine safety and shore survival training in Alaska. The surveys demonstrated that:

- At least 21 lives were saved.
- More than 40 dangerous or life-threatening situations were dealt with successfully.
- About 82 percent of the respondents stated that their marine safety behavior was influenced through training.
- Nearly 58 percent of the students purchased additional safety equipment or updated existing equipment, upon completion of classes.
- Life and safety drills are conducted on 41 percent of the vessels operated by respondents.

Specific success stories

In the spring of 1991, a fishing vessel capsized in gale conditions off the south end of Admiralty Island. The two crew members had to exit their vessel, don survival suits and enter their liferaft in 40°F water. They were rescued eventually by a Coast Guard H-3 helicopter. In 1990, AMSEA had conducted a marine safety and survival course for this same crew in their

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Seven steps to survival

RECOGNITION

Admit your life is in danger.

INVENTORY

Decide what can help and hurt you. Do first aid.

SHELTER

Preserve body heat with insulating materials.

SIGNALS

Help rescuers find you

WATER

Find a source of safe water. Drink six pints a day.

FOOD

After you are safe and warm, food will help keep you going.

PLAY

Stay busy and keep a positive mental attitude.

Caution and creativity are your best friends -- USE THEM!

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small village. One of the crew said that the training they had received the previous season had made the difference in their survival. They had trained with their equipment and had a good idea of what to expect.

In another capsizing, the crew began to panic when they had trouble donning immersion suits. One member had just completed an AMSEA cold-water survival practice session, and was able to don his suit easily and help the others with theirs. This restored confidence to the crew, and the rest of the abandon-ship procedure and subsequent rescue went smoothly.

Another success story involved a crew member who had attended an AMSEA course, which covered extra equipment, including miniflares, that could be carried in a survival suit pocket. The individual had purchased a set of miniflares and put them in her suit. Several weeks later, when her fishing vessel sank from under her, she signaled for help from a passing vessel with her flares and was rescued.

Responsibility

A close working relationship with and support from members of the Coast Guard's 17th district brought about much of AMSEA's success. The two individuals most responsible are LCDR Glenn Sicks, the fishing vessel safety coordinator for Alaska, and CDR Ken Co[illegible]nd, a helicopter pilot who retired in October. All credit for the success AMSEA has experienced to date from its training must be shared in large measure with the personal dedication, time, efforts and skills of these two men, as well as the support of the entire 17th district throughout the years.

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The fishing fleet gathers in the port of Sitka, Alaska

Boarding for safety in Alaska

Ms. Shirley Melillo

About 80 commercial fishing fatalities and several losses occur in Alaskan waters every year, demonstrating the urgent need for ongoing public awareness of safety and survival at sea. Coast Guard personnel at the Marine Safety Office (MSO) in Juneau promote commercial fishing safety and pollution prevention by examining as many vessels over 65 feet of the southeast Alaska fishing fleet as possible every spring.

The first opening of the year of the Herring Sac Roe Fishery takes place in March in the waters of Sitka Sound and Kah Shakes, about 25 miles southeast of Ketchikan. This opening affords the opportunity for large scale boardings in a concentrated area before the fishing vessels disperse into remote fishing areas.

Another large opening usually takes place in April or May at the Black Cod Fishery off of Yakatat and the Seymore Canal (Point Hugh to Sore Finger Cove). However, there was no opening this year.

Inspections

Fishing vessel boardings are also conducted year round at random locations by Coast Guard boarding teams from various districts.

The teams inspect each vessel for adequate fire extinguishers, personal flotation devices, immersion suits and EPIRBS. Oil pollution containment equipment, transfer systems, marine sanitation devices (toilets) and

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MSO Juneau, Air Stations Sitka and Juneau personnel prepare to conduct boardings

(Above) Personnel from the Coast Guard Reserve and 17th District join boarding team.

Boarding team member MST2 Vicki Brandt inspects survival suit (right) and checks lifeboat inspection label (below).

Continued from page 43

waste management plans are checked in the interests of environmental protection. Navigational equipment, including vessel lights, whistles and charts are also examined for safety reasons.

Results

The failure to have proper catch basins for fuel overflow was the most common violation (of the pollution prevention regulations under 33 CFR) found this spring among 35 vessels boarded in a two-day period at the Herring Sac Roe Fishery. Lifesaving equipment was found to be in good condition on all vessels, with only one vessel requiring additional gear. There were fewer safety equipment violations noted than in previous years.

Checklist

With each boarding, the awareness of regulatory requirements fosters a growing sense of safety and environmental consciousness among the members of the commercial fishing community. To promote this awareness, Coast Guard personnel in Juneau prepared a comprehensive eight-page checklist featuring all the necessary safety and pollution prevention requirements for commercial fishing vessels.

Recently updated to include the new regulations under the Commercial Fishing Industry Vessel Safety Act of 1988, the list is mailed upon request. It will also be circulated at upcoming boat shows and safety awareness meetings throughout the Pacific Northwest.

Fishermen are encouraged to examine their own vessels, and present their checklist results to Coast Guard boarding officers. This will save time, and could also save lives and vessels.

"The photographs accompanying this article were taken by Marine Safety Office Juneau personnel last March at the Herring Sac Roe Fishery opening in the port of Sitka, Alaska.

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How safety "paid off"

Mr. Dennis W. Nixon

Background

In 1986, the Point Judith Fishermen's Cooperative in Narragansett, Rhode Island, suffered the loss of a group insurance program that had been in effect for more than 30 years.

The commercial insurance market was in chaos, with few choices available, even for good risks. Cooperative members discussed the grim prospects of operating without insurance or simply tying up their boats until an alternative could be found.

The primary problem was with protection and indemnity coverage, which is intended to support the vessel owner when faced with the [illegible] refusal of a member injured in the course of his employment. The expansion of the United States fishing industry grew in the early 1980's resulted in many insurance companies leaving the industry altogether

The Point Club

The Point Judith cooperative president James McCauley, unhappy with the traditional commercial insurance market, investigated the prospects for achieving financial independence through a self-insurance program of some type. He contacted Ocean Marine Underwriters, a fishing vessel insurance broker, for advice on the design and feasibility of such a proposal.

Coincidentally, Ocean Marine Underwriters had already begun feeling out Sunderland Marine Mutual Insurance Company, the largest fishing vessel mutual insurance company in the world, to see if they would be interested in the cooperative development of an insurance program for the best vessels in New England.

Sunderland Marine agreed to join forces with a core group of fishermen who believed that

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The owner of this vessel is a member of the Point Club

Photo by Brian Turnbaugh

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their operations were safer than the industry norm, and the Point Club was established in July 1986.

Although much of the risk was commercially reinsured, the club would clearly succeed or fail based on the actual losses sustained by vessels in the program.

After five years, extra attention to safety has "paid off." No lives have been lost, injured crew members have been compensated promptly and fairly, and the club's financial reserves have continued to grow.

How did the Point Club make safety "pay off?"

1) Selectivity

It was clear at the start that the club could not insure all the vessels in the Point Judith cooperative, and achieve its objective. A selective approach was taken to bring in only the best operators, who had already demonstrated a commitment to safe operating practices.

Every new member must be personally known by a member of the Point Club board of directors and approved by the entire board, which consists of fishermen and underwriters. Preference is given to owner-operators who typically have a safe operating record.

2) Vessel safety

As the club began before the Commercial Fishing Industry Vessel Safety Act of 1988 was signed, there was little guidance available on how to improve the physical condition of fishing vessels to enhance their safety and survivability.

Starting from scratch, a safety committee was formed to work with surveyors and naval architects on this project. Together, they developed lists of minimum standards for inshore, offshore and lobster vessels.

After several years and thousands of hours of volunteer labor, safety recommendations were produced which were adopted in 1989 as requirements for all club vessels. (These requirements are listed in an appendix in the recently published *Atlantic Coast Fishing Vessel Safety Manual*, developed by the Rhode Island Sea Grant Program in cooperation with the Coast Guard.)

Old members faced with new regulations and individuals seeking admission to the club have spent thousands of dollars upgrading their vessels to comply with club rules. Because of the rigid standards and survey requirements, vessels registered with the club have demonstrated a better resale value than other vessels in the area.

Since most of the ideas for safety requirements originated with vessel owners themselves, little time was wasted "fighting" regulations imposed by "authorities" in Washington, D.C. The independent-minded fishermen accepted determinations by their peers.

3) Crew training

The third element in the risk management program of the club involves crew training levels. Once the vessel safety standards project was underway, the club began to develop a crew safety training program modeled after the pioneering efforts of the North Pacific Fishing Vessel Owners' Association. A committee of fishermen worked with the Rhode Island Sea Grant Commercial Fisheries Specialists to develop a program to fit the Point Club's needs.

Co-sponsored by the Sea Grant Marine Advisory Service and the Rhode Island Cooperative Extension Service, a comprehensive safety and survival course is available to club members.

Ironically, attendance has lagged in the past year, while licensing requirements for commercial fishermen have been actively debated in the fishing trade press. Since the course is not yet certified by the Coast Guard, many fishermen are holding back until they know exactly what is expected of them.

The owner of this fishing vessel was a member of the Point Club for only three days when it sank, sustaining major hull damage. The club raised the vessel, had it repaired and back fishing in a very short time.

Summary

In conclusion, a group of fishermen, who came together to face a crisis in vessel insurance, has learned that it pays to make safety the highest priority in vessel operations.

In five years of existence, the Point Club has grown from 49 to 71 member vessels. Not one life has been lost.

As Harold Ongstad of the United Marine Fund in Seattle, Washington, once said, "*It seems when a man becomes a member of the pool, he automatically becomes an excellent risk. There is no one to get the money out of, but his fellow members, who may be his relatives, neighbors, etc. There is an esprit de corps not found in most businesses.*"

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Welding operations set fire to packing boxes aboard the fishing vessel Prince William Sound, on April 23, 1991, in Captains Bay, Unalaska, in the Aleutians.

Value of casualty statistics

Ms. Noreen D. Arralde

The current national focus on safety in the commercial fishing industry is long overdue Historically regarded as one of the most dangerous occupations, commercial fishing has, until recently, lacked even the barest of safety standards

The new trend toward a safer fishing fleet has been fueled primarily by a few highly visible casualties, by the untiring efforts of some dedicated individuals and by an unstable marine insurance market. Safety standards in the commercial fishing industry have had to rely on these factors, because there has been a virtual lack of accurate information on the safety record of the industry

Need for statistics

The need for statistics is clear. Commercial fishermen, as businessmen, rely on statistics to make their management decisions. Safety issues should not be treated differently from other management issues.

Why is it that a fisherman will enthusiastically invest in high tech fish-finding equipment, but only reluctantly (if at all) invest in safety equipment? This is due largely to manufacturers touting the effectiveness of their equipment, backed by impressive statistics on its success

Safety advocates have not been able to quote statistics demonstrating the success of their programs, because, up to this point, those statistics have not been readily available or accurate

In order to design an effective safety program, a great deal of information is needed regarding vessels, casualty rates and causes. Without statistical data, a safety manager operates in a void. Statistics can focus attention on problem areas and document safety initiatives that are needed

Once a safety program is established, statistics are the key to assessing its adequacy, providing the data needed to measure its successes and failures, and keeping it current in changing environments. With accurate statistics, safety managers can evaluate whether a program is meeting its objectives

Benefits of statistics

There are three distinct benefits to be derived from reporting accurate casualty statistics in the commercial fishing industry:

1) to increase safety through improved vessel design, construction and maintenance:

2) to create an economic environment that encourages safety initiatives, such as installing safety equipment and training personnel; and

3) to provide a more stable marine insurance market, accounting for differences among various fishing occupations.

To educate fishermen on the long-term value of safety, the economic benefits of increased safety measures and adequate crew training need to be documented by statistics.

1) Vessel design

It is not known how many casualties are caused annually by improper vessel design or inadequate maintenance. The Coast Guard data base (CASMAIN), and search and rescue data indicate that vessel deficiencies account for some casualties in all commercial fishing occupations. In some cases, a vessel's stability was not a proper consideration in its design. In other cases, improperly constructed machinery or work spaces have contributed to casualties. There is overwhelming anecdotal material citing poorly maintained equipment and materials as causes of vessel casualties.

Statistics are needed to properly identify areas of greatest concern, and address them with adequate and appropriate regulatory standards.

In addition, statistics can be used for a thorough cost-benefit analysis to determine the economic feasibility of the proposed standards.

2) Economic environment

It is clear that the current economic environment in the commercial fishing industry does not encourage or support additional safety improvements. A bottom-line mentality has sometimes led to a practice of rewarding vessel managers for keeping maintenance and safety costs down.

The strict regulation of some fisheries, such as salmon and halibut in Alaska, has forced fishermen to operate in adverse weather conditions for frenzied 48-hour stretches with whatever crew is available, properly trained or otherwise. During these limited openings, safety usually takes a back seat to achieving the maximum allowable catch. Some regional councils are evaluating the wisdom of these short seasons, and are considering adding fishing days to compensate for adverse weather.

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A close-up view of the damage to Prince William Sound.

Photos of this casualty are courtesy of the Scandanavian Marine Claims Office, Inc.

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Data is needed on the casualty rates during these limited seasons for the government to evaluate the entire practice of strict regulation.

3) Insurance market

Many commercial fishermen feel that their best interests are not being served by the insurance community. Casualty statistics are badly needed by insurers to properly underwrite risks.

Fishermen believe that underwriters have not paid enough attention to the difference in risk among fisheries. This may be a result of inadequate fishing vessel casualty statistics.

Statistics could assist insurers in analyzing vessel risks based on more relevant criteria. Fishermen could then be assured that insurance premiums are based on actual (and not assumed) loss experiences in particular fisheries.

There would be a greater incentive for operators to improve their own safety records, if this would contribute to a better safety record for the entire fishery. This practice has been used successfully by self-insured groups, who maintain their own statistics and place a high premium on safety.

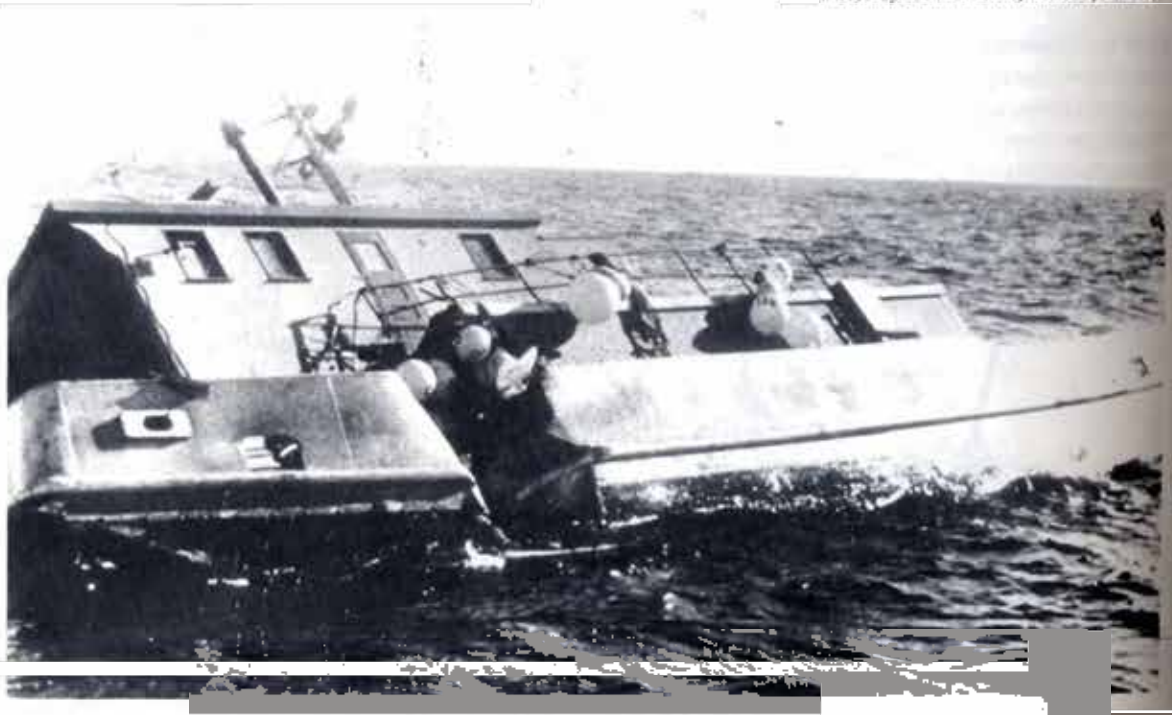
Legislative mandate

Due to the mandate of the Commercial Fishing Industry Vessel Safety Act of 1988, a nationwide body of statistics should be developed in the not too distant future. This act seeks to involve the marine insurance community in its broad safety initiatives by requiring casualty information to be reported to the Coast Guard as a qualified third party to compile casualty statistics. The Marine Index Bureau (MIB) has assisted in carrying out this mandate.

Carrying out this mandate has presented a great challenge, because a great deal of United States fishing vessel insurance is written in the international market, and in various self-insured pools and mutuals in various

The fishing vessel Beluga capsized after a collision

Photo by Norm Holm, Kodiak, Alaska.



The right safety standards may allow "one of the most dangerous occupations" to change its reputation for the better.

The trawler Trade Wind struck a steel buoy and sank at the west end of Cape Cod Canal on May 6, 1988. The vessel lay on the bottom for a week before being refloated and towed to New Bedford, Massachusetts. Photo by William P. Quinn.

MIB has taken the initiative in identifying insurers who are active in this market, both domestic and foreign, and informing them about the reporting requirements.

Now that the final rules of the safety act have been published, MIB expects the full participation of the fishing insurance industry. By offering several reporting options, MIB has successfully encouraged both insurers and those who are self-insured to participate in the claims reporting program.

Conclusion

The data fields that insurers will be required to report will help develop a comprehensive data base of casualty statistics, which will provide the information necessary to create effective fishing vessel safety standards.

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What is stability?

CAPT T. E. Thompson

Throughout my Coast Guard career -- whether conducting classes or stability tests (inclining experiments), or just talking to crew members during vessel casualty investigations or routine inspections -- I have been confronted with such questions as, "Did we pass the (stability) test?" "Is this all the weight we can carry?" or "You know, that boat looked like it was going to turn over" (after a fishing vessel capsized with the loss of all hands).

In discussing these issues, terms such as "metacenter," "GM" and "righting energy" are often used. While these and other concepts are rudimentary to the naval architect, they are usually foreign to the lay person.

The purpose of this article is to familiarize lay people with vessel stability and its terminology.

Types of stability

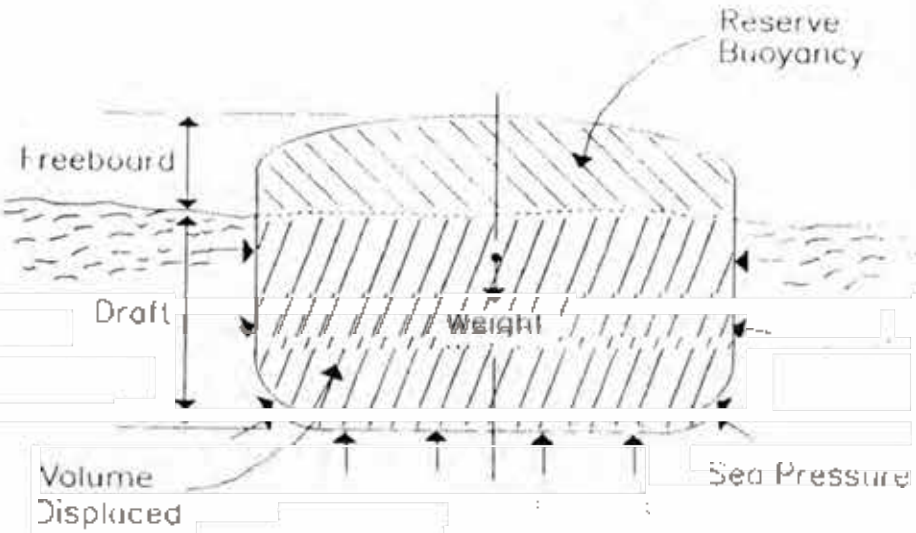
Stability is generally divided into two categories -- **damaged stability** and **intact stability**.

Damaged stability is the ability of the vessel to stay afloat and reasonably upright after the hull is holed and certain portions flooded, or other damage is inflicted. Although most larger vessels will survive some flooding due to available reserve buoyancy, most small vessels will not survive flooding that goes unnoticed or is beyond the capacity of on board pumps. Even large vessels must be very carefully designed to survive hull damage.

Intact stability, in general, is a vessel's tendency to remain upright or return to an upright position after such gyrations as rolling in a seaway or strong wind, hauling in a catch of fish or making a sharp turn. Intact stability implies by its very name that the vessel is not flooded and the hull is not damaged in any way.

Intact stability basically depends on two factors -- **reserve buoyancy** and **righting energy**

Crab fishing vessels carry high, heavy deck loads. This practice can threaten the vessel's stability. *Photo by Bruce Ada*

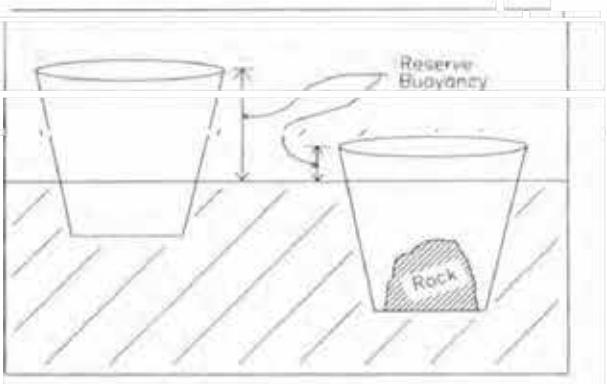


Reserve buoyancy

Reserve buoyancy can be described as the volume of the hull that can be flooded or the weight that can be added to a vessel before it sinks.

The Greek mathematician and inventor, Archimedes, who was born more than 2,000 years ago, discovered while taking a bath the weight of the body floating in water is equal to the weight of the volume of water that is displaced. If the body is floating, the force of its weight downward is neutralized by the upward pressure of the water holding it up (buoyancy).

The simple home experiment at right illustrates this principle. Take an empty ceramic or metal bowl and float it in water. The distance from the waterline of the bowl to its rim represents its reserve buoyancy. Place a rock (cargo) in the bowl. Note that it sinks further in the water and there is less distance from the waterline and the rim. The bowl still has reserve buoyancy, but not as much. It would not take as much water to sink the bowl holding the rock as the empty bowl.



Small boats, such as fishing vessels, do not usually have much reserve buoyancy. Flooding from leaking shaft penetrations, deteriorated sea valves, leaking hatch covers, weeping hull seams or holes rusted through the hull can quickly use up the reserve buoyancy of a vessel and cause it to sink. This is a major cause of fishing vessel casualties.

Righting energy

The concept of **righting energy** is more complex than that of reserve buoyancy. There are three terms that need to be understood define righting energy. They are **center of buoyancy (B), center of gravity (G) and metacenter (M).**

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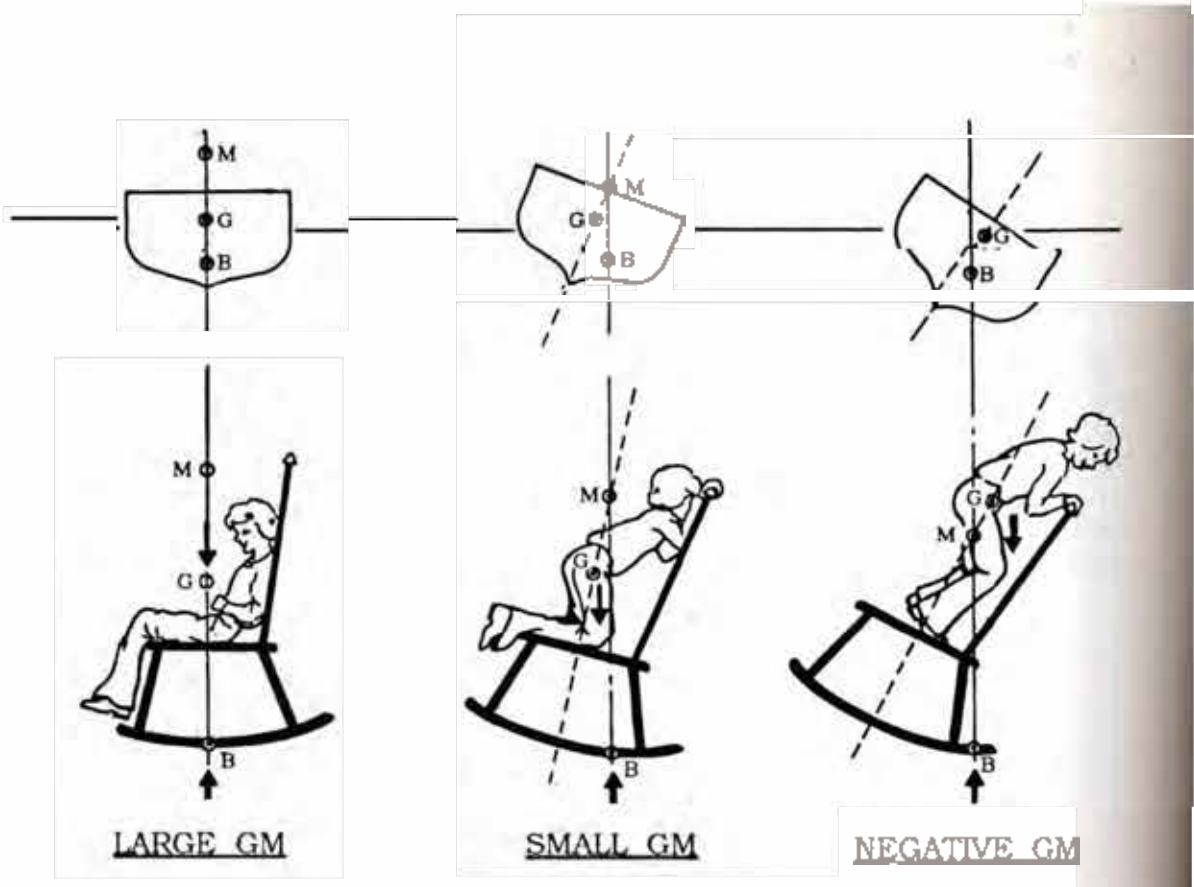

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Center of buoyancy - B

The center of buoyancy is the point through which all the forces of buoyancy are acting. As shown in the illustration above, it can be thought of as the point at which a rocking chair contacts the floor. In a ship, it is the geometric center of the underwater volume of the hull. The center of buoyancy, if you will, is the balance point for the buoyant forces holding the vessel up.

Center of gravity - G

The center of gravity can be described as the one point through which the entire weight of the vessel is concentrated. If you could place a pencil tip at this point, the vessel would be perfectly balanced in all directions. The addition, subtraction or movement of weight (people, fuel, water, supplies, fishing gear, fish, cargo, etc.) on board a vessel will move the center of gravity. It is well illustrated by what happens when a person stands up in a rocking chair.

Metacenter - M

The metacenter is a point located on a vertical line drawn through the center of the vessel. In the upright rocking chair, the metacenter could be thought of as the center of the curvature of the rockers. If the rockers formed part of a circle as in a wheel, the metacenter would be the center of the circle or the hub of the wheel.

As the vessel rolls, the shape of the volume of the submerged portion of the hull changes, and the center of buoyancy shifts slightly. When another line is drawn vertically upward from the new center of buoyancy, the point of intersection of the original vertical line is the metacenter. As a vessel's draft increases, the location of the metacenter lowers.

GM

The location of the metacenter in relation to the center of gravity -- the distance GM or metacentric height -- is an excellent indicator of stability. When M is above G (positive GM), a vessel will tend to right itself when it rolls. In other words, it has positive upright stability. Like a rocking chair in normal, moderate motion, the upward force of buoyancy through B and the downward force of the weight through G are offset so that the chair will right itself. On a vessel, this force is called **righting energy**.

When the GM is large, the righting energy is large and the vessel tends to be stiff. When GM is small, the righting energy is lower and the

vessel is more tender. When the metacenter is below the center of gravity, the GM is negative. In this situation, the vessel is unstable and will capsize.

Finding GM

An incline experiment locates a vessel's center of gravity. Using this, a naval architect can calculate the initial GM of a vessel as well as the value of GM for various loading conditions and angles of heel as the vessel rolls. These calculations can guide the master on how to load and operate the vessel. Even more important, the master will know how not to load the vessel. Losses of initial GM due to vessel modifications such as adding heavy fishing equipment or loading cargo to an unsafe height, or due to excessive free surface are also major causes of fishing vessel casualties.

Free surface

Any tank that is partially filled with a fluid, such as water or fuel, or a cargo that may act like a liquid, such as grain or fish, has a free surface. The effect of free surface on a vessel is to raise the center of gravity, causing a smaller GM and less stability without increasing the draft or the amount of cargo carried.

Free surface effect is proportional to the moment of inertia of the liquid in the tank, and is based upon the geometry of the tank. Basically, this means that free surface effect is proportional to the length or the width of the tank cubed.

For example, a tank that is three feet wide will have an effect of 27 or 3X3X3, while a tank that is only two feet wider (five feet) will have a factor of 125. The effect of the five-foot wide tank is four and one half times as great. If a compartment the width of a vessel were to flood, such as the lazarette, or if the vessel had water on the deck due to blocked freeing ports, and the vessel was 15 feet wide, the effect would be 125 times as great.

Free surface has a dramatic and often tragic effect on stability. It can result from partially filled tanks, water on the deck or in the engine room bilges, and unintentional flooding of an otherwise dry compartment due to a leaky or improperly secured cover.

Compare carrying a tray full of water with carrying the same tray full of glasses of water and you have the effect of free surface.

Conclusion

Stability is extremely important to vessel safety and should not be guessed at. Even a vessel which has safely operated in a given trade or fishery, or in the same location for years, should be reevaluated when changing fisheries, geographic location of operations, or when adding, subtracting or moving major weight inside.

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(Illustrations accompanying this article, except for the bowls of water, are courtesy of the Petroleum Extension Service, University of Texas at Austin.)

All hands were lost when F/V Americus capsized in the Bering Sea in February 1983. The proximate cause of the casualty was improper loading of crab pots. *Photo courtesy of Bruce Adee.*

Small vessel stability

Mr. Bruce H. Adee

Introduction

Why do we lose so many commercial fishing vessels each year in stability-related accidents? Why do so many commercial fishermen have to die in these accidents year after year?

Recent years have witnessed the development of marvelous locating and rescue equipment which has saved many fishermen. Yet all of the new equipment seems only to have kept the casualties at an even level.

Many of the stability losses can be attributed to the fact that the vessel was not prepared to go to sea. This would be the responsibility of the operator.

A number of fishermen, however, deny the dangers of the sea, believing their own inner strength will carry them through.

A far more sensible course would be to admit that there are dangers, along with areas where the operator's knowledge may not be complete. Careful examination of the potential dangers reveals strategies for safe operation.

After all, no commercial airline pilot would take off without going through an extensive safety check list. Why should commercial fishing vessel operators be any different?

Small vessels

There is no exact line of demarcation which separates a small commercial fishing vessel from a large one. Over the years, an arbitrary distinction has been set at 79 feet in length. Using this definition, about 97 percent of documented and 100 percent of state-numbered commercial fishing vessels should be classified as small. This represents a total of more than 100,000 vessels.

Stability analysis

Is stability analysis a "do-it-yourself" proposition? **Absolutely not!** You wouldn't dream of trying to find the bad electronic chip in a failed fish finder. And to design and install a new refrigeration system, you wouldn't hesitate to call on an expert.

Sure, a stability analysis doesn't put a dollar in your pocket. Without a fish finder you may not be able to locate any fish to catch. If your refrigeration system fails, the catch may spoil. But, if you lose stability, you will be in the water without a boat.

Hire the best person you can find to form a stability analysis, and insist that he or she works carefully with you to produce something useful for your operation.

What is stability?

Simply put, a stable vessel tends to return to the upright position after it is disturbed by a wave wind or any other force. Using this interpretation, you might be tempted to say that an extensive stability analysis is not necessary. The stable vessel floats upright and continues to do so.

Think of it as a bank account without overdraft protection. A little emergency may require a small unexpected withdrawal. A large catastrophe may wipe you out financially.

Vessel stability is similar. You must have a certain level of stability to operate safely and survive the difficulties you should expect to encounter.

Stability standards

In the United States, the creation of stability standards for the fishing fleet was ordered by the Commercial Fishing Industry Vessel Safety Act of 1988. There has been considerable debate about what the standards should be for small fishing vessels, and the Coast Guard is still drafting them. They will be released in a Supplemental Notice of Proposed Rulemaking in the *Federal Register*.

International stability standards have been established for larger fishing vessels by the International Maritime Organization (IMO). These standards have been in use for many years and have been readily accepted by designers of large vessels. They serve at least as a starting point for the small vessels.

Most stability analyses performed on small vessels are based on the IMO standards as contained in the Coast Guard's "Voluntary standards for U.S. uninspected commercial fishing vessels," (NVIC 5-86)

Stability test

Once you have decided to have your vessel's stability analyzed, a test will be required. It only takes a few hours, during which time you can not use your vessel.

The test, however, is only a small portion of the effort. It takes many hours for a naval architect to perform a full stability analysis and assemble the data in a usable format.

In order to complete the stability analysis, a lines plan for the vessel indicating the shape of the hull is required. If this is not available, the vessel will have to be drydocked to carefully measure the hull shape.

The test itself consists of two parts. In the first part, the weight or displacement of the vessel is determined. For some vessels, this can actually be done on a scale or a lift equipped with a scale. In most cases, it is done indirectly by measuring the position of the vessel's waterline and the density of the water. With this data, the weight of the hull and the fore and aft position of the center of gravity can be calculated. This is the weight at the time of the test.

The second part is the inclining experiment. It involves moving weights across the vessel to various positions and measuring the angle of heel with pendulums. This determines the vertical position of the center of gravity.

Since the results of the test depend upon the loading condition of the vessel at that time, a light ship condition is usually calculated. In this condition, all the variable weights (including fuel, water, consumables, etc.) are taken from the vessel, while any permanent equipment not present at the time of the test is added.

There are several important steps which the vessel operator can take to assist the naval architect. Number one, he or she can carefully plan the test, including where and when it will be performed to minimize external effects. In addition, the loading condition during the test should be carefully chosen in cooperation with the naval architect.

The operator must also discuss the fisheries in which the vessel will operate. For example, the same vessel may operate as a salmon seiner, a Dungeness crabber and as a tender during different seasons. For each of these fisheries, the weight of the equipment (winches, nets, reels, etc.) must be carefully

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Long pendulums hung in the hold and drums filled with water are used to heel the vessel in an inclining experiment.

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determined. The most effective way to present this information is to list every item which will be added or removed from the vessel. List its weight and location vertically, athwartship, and fore and aft. Additional data concerning fuel, water and crew required is critically important.

Once the test is completed, the naval architect will prepare a stability booklet based on the results of the extensive analysis.

Stability booklet

The formats of the stability booklets vary, but they usually contain information about your vessel, including the stability test results and the analysis of a series of different loading conditions. Loading conditions suggested by IMO, as well as those which accurately reflect the way your vessel will be loaded during typical operations for the fisheries in which you are engaged should be examined.

Most booklets suggest only loading conditions which meet the stability guidelines used by the naval architect. You should also discuss with the naval architect loading conditions to be avoided, as they would endanger your vessel.

Improving stability

If you are not satisfied with the results of the stability analysis of your vessel and would like to improve its stability, there are some options open to you. Appropriate means of improving the stability of your vessel should be suggested and evaluated by the naval architect.

For example, lowering the vertical center of gravity improves stability. The best way to do this is to remove weights located high in your vessel. Another method is to add ballast low in the vessel. The latter requires careful analysis, because it also adds weight and decreases freeboard, which generally has an adverse effect. (Freeboard is the distance from the lowest point of the deck to the water surface.)

Freeboard often is a critical problem in small fishing boats. A carefully planned reduction in the weight of the vessel can dramatically improve stability, particularly as the vessel heels to angles of greater than 15 or 20 degrees.

The size of the fish hold is another important stability parameter. This has become particularly important as vessels have converted from traditional ice to refrigerated seawater systems. With refrigerated systems, the vessel's hold may be filled with seawater at the start of the trip as opposed to the slow increase in weight as fish are added to the ice in the hold. Reducing the size of the hold may be appropriate to increase stability.

Another more drastic approach which has been employed successfully in the Pacific Northwest is the addition of sponsons or watertight chambers which increase the beam of the hull. They can provide a dramatic improvement in stability, particularly on vessels which were relatively narrow to begin with.

Longline fishing vessels may add shelters on aft decks, increasing the height of the center of gravity

A load of fish is rolled from the seine into the hold. Such operations can dramatically affect vessel stability.

In any of these approaches, consultation and communication with the naval architect are critical to successful results.

Everyday operation

Decisions you make concerning the everyday operation of your vessel may have a profound effect on its stability.

Managing liquid levels

Fuel, water and other liquids on board play a vital role in determining the stability and trim of your vessel.

Most fishermen prefer operating a vessel with a little trim by the stern. You should be aware that for typical house-forward open-deck-aft fishing vessels, stability generally decreases as trim by the stern increases. This may be particularly important when trawl nets are hauled over the stern. There may be a critical point in this operation where the vessel stability is compromised by excessive trim by the stern.

Free surface (partially filled tanks) should be minimized. In smaller vessels, there may be only one set of each type tank, so there may be no choice. You should also recognize that the free-surface effect is much smaller for narrow wing tanks than it is for full width tanks.

Liquid levels also affect stability by their impact on total displacement and, hence, the remaining freeboard, and their influence on the vertical position of the center of gravity.

The master has direct control of the management of liquids on the vessel. Thus, clear knowledge of the effect on stability is important to the safety of the vessel.

The hold

Fishing vessels are different from other seagoing vessels in that they generally open their holds while underway and take on additional cargo.

In most cases, holds which keep fish in refrigerated seawater should either be empty or completely full. Filling the holds should be done under controlled conditions in sheltered water. During the filling operation, the vessel may have only a small stability reserve to prevent it from capsizing as a result of free surface in the hold.

Loads on deck

Many fishing operations require carrying heavy loads on deck during transit to or from the fishing grounds. For small vessels, the least stable operating condition may be in transit with the deck loaded. Great care must be taken in managing the total load on the vessel to ensure that a stable operational loading has been achieved. Here detailed knowledge of the stability of your vessel is essential.

Many fishermen believe that to carry a load on deck, the hold should also be filled with seawater. This may not be the case. Only a careful stability analysis can indicate the best way to operate a vessel.

Lifting loads

Many fishing operations require lifting heavy loads such as hauling pots or bringing a net aboard. A vessel may be inadvertently put in a position equivalent to lifting a heavy load. This might occur when the net gets hung up on the bottom or a pot gets caught.

These operations should be carefully examined during a complete stability analysis and provide a strong argument for maximizing reserve stability.

You should also be aware that lifting a weight from a boom high up on the vessel is equivalent to adding that weight at the location of the block on the boom.

Blocking scuppers

The reason for placing scuppers (openings) in the bulwark is to quickly clear water off the deck of a vessel. Water trapped on the deck can be extremely dangerous. It increases the weight, raises the center of gravity, and adds a very large free-surface effect. Thus, it is critical that the scuppers remain open at all times.

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An enclosed bridge adds weight to a vessel and raises the center of gravity.

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A load of fish on deck also acts in a similar fashion to water and may be very dangerous. There have been many cases where vessels have been lost due to fish on deck, and crew members have been severely injured when crushed by a load of fish which has shifted on deck.

Watertight integrity

Maintaining the watertight integrity of a vessel is critical for safe operation and is the direct responsibility of the master. Regular inspection and maintenance of through-hull fittings should take place on a scheduled basis. (A marine surveyer's report may be invaluable here.) Above deck areas also deserve regular scrutiny. Water or weathertight doors should always be operational and closed when underway.

The point where downflooding occurs should also be well known. This is where there is a permanent opening in the vessel. If this point is submerged, the interior of the vessel can be rapidly flooded. A good example would be the air intake for the engine room. These openings should be located as high as possible and close to the centerline.

All hatches should be completely watertight and the holds capable of being completely sealed. Water entering a hold which was supposed to be completely empty has led to several disasters.

...e emergency pumping systems should be as simple as possible and their operation well known. There should be a capability to pump every com...partment in the vessel. Depending on ...drain in a critical compartment is not sufficient.

...ny vessels have been lost as a result of lazarette flooding. (The lazarette is usually the farthest aft compartment, where the rudder post and steering equipment are normally located.) ...the person on watch does not even realize the vessel is flooding until the stern goes under water. The vessel soon capsizes because there is little that can be done.

A functioning and well placed alarm system is critical for safety. In addition to the engine room, critical compartments, including the lazarette, should be protected. Knowing what you would do if the lazarette was flooding is also a critical part of the advance preparation for an emergency.

Knowledge and preparation are the critical keys to safe and stable operations.

Within the vessel, watertight integrity is also critically important. A vessel which can quickly flood from stem to stern is a potential death trap. As a minimum in all but the smallest vessels, the following watertight bulkheads should be present:

- a collision bulkhead forward,
- bulkheads on each end of the engine room,
- bulkheads on each end of the hold, and
- a bulkhead isolating the lazarette.

These bulkheads must be kept watertight.

Correcting a list

Everyone should consider the problem of correcting a sudden list. A quick assessment of the situation is imperative. If the list is caused by an uneven distribution of fuel in the tanks, then correcting the condition is simple, so long as no added large free-surface effects are created by moving liquids to compensate for the list

On the other hand, if the list is caused by partial flooding of the vessel, then moving liquid in tanks may exacerbate the problem and delay the correction of a dangerous situation. In this case, emergency pumping or possibly counter-flooding may be required.

For such situations, it is critical to always know your level of stability and have a well-established plan of response to emergencies

Icing

Fishermen have claimed that one of the most frightening experiences they have encountered is serious icing. This condition occurs when cold weather, strong winds and high seas combine to cause ice to build up on the vessel.

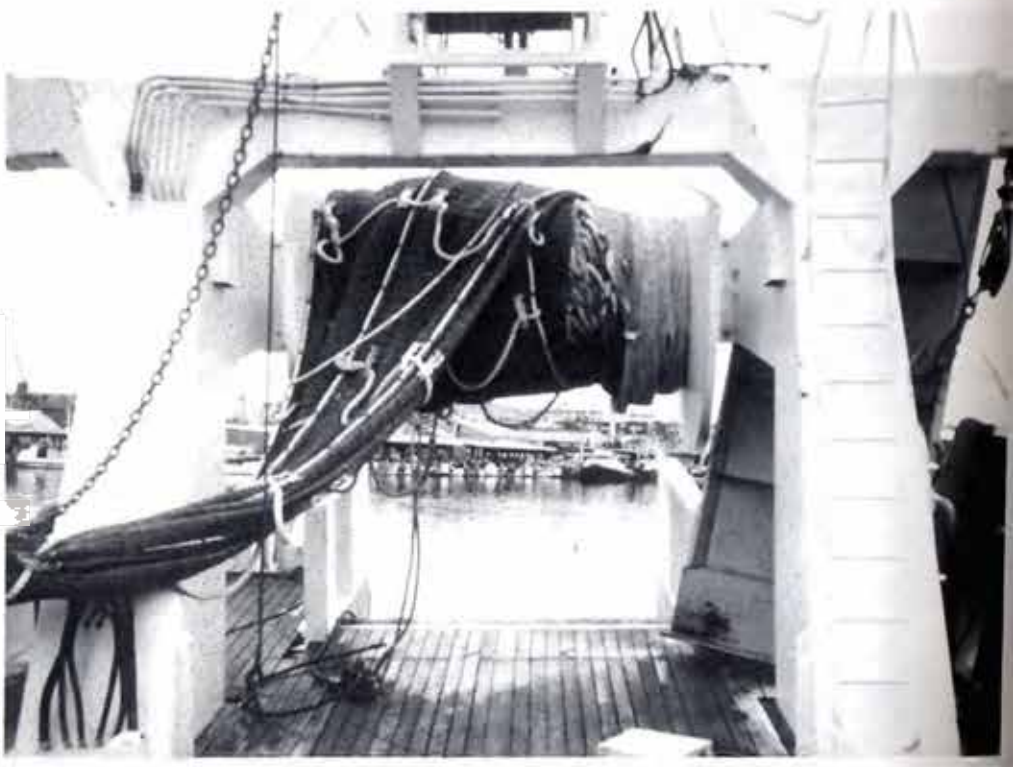
Corrective action may include a very slow and careful change of heading, slowing down, physical removal of ice and heading away from land.

The response which is best for a particular situation depends on local factors and the stability level of the vessel before the icing began. For winter fishing operations, preparation and knowledge are the keys to surviving an icing incident.

Conclusion

One way to help avoid a catastrophic loss is to be prepared. This means always operating the vessel with an adequate reserve of stability, anticipating problems which may occur and knowing how you will react to each contingency you can imagine.

Photos accompanying this article were taken by Mr. Bruce H. Adee. He is a professor in the Department of Mechanical Engineering at the University of Washington in Seattle
Telephone: (206) 543-5090



Conversion to trawling requires the addition of a heavy stern gantry and net reel. This changes the vessel's stability characteristics dramatically.

Photo by Bruce Adee.

Factory trawler stability

Mr. David L. Green

Background

Throughout history, individuals going down to the sea in ships have faced the perils of the deep as a condition of their chosen profession. Lives lost in the fishing industry are memorialized by statues or plaques in virtually every fishing homeport throughout the world. These memorials were usually erected in memory of fearless fishermen who ventured forth in small vessels of yesterday

Since the mid 1980s, a fleet of significantly larger fishing vessels has emerged in the Pacific Northwest and Alaskan waters -- the factory trawlers. While these United States-flag vessels are larger, their operation is not free from the perils faced by the fishermen in the small boats

Traditional major perils of the sea include. founderings, flooding, fire and man overboard This article addresses founderings and flooding

Trawler fleet

As in any industry, safety in fishing depends upon both the quality of the equipment and the knowledge and skills of the users.

Today's factory trawler fleet includes many fine vessels. A substantial number were constructed or converted under ship c[redacted]fica-tion society survey, and the Coast Guard has been aggressively enforcing load line require-ments, as applicable.

There are, however, some other vessels without third party oversight. Their construc-tion frequently departs from accepted standards.

The manning of this new fleet has strained the supply of both licensed and non-licensed personnel. The factory worke[redacted]nd their supervisors are generally not seagoing personnel, but fish processors and packers with little experience or knowledge of the sea.

Stability traits

As a class of vessel, factory trawlers are generally very seaworthy. Characteristics common to most of these vessels are:

- Minimum reserve stability at operational light ship (a fully equipped and manned vessel ready for sea except for fuel, water, cargo and consumable stores); and
- A superstructure deck to enclose factory facilities. Providing the superstructure and hull are kept tight, they have the potential for maintaining positive stability at large heeling angles.

This means that their basic intact stability (vessel stability without uncontrolled flooding and free surface) depends upon the quantities and locations of liquid loads (fuel and water), and the accumulated cargo. The ability to survive large angles of vessel heel depends upon maintaining watertight integrity.

Stability variables

Stability variables are the same for any vessel:

- **vertical and longitudinal center of gravity,**
- **free surface and**
- **flooding control.**

The specifics of these basic items as they relate to factory trawlers deserve review.

First: Is operational light ship accurate? It is absolutely essential that operators disclose all weights to be added to the stability report compiler. This includes rigged nets, doors, wires, ground gear, and also the full scope of spares. Any omission represents a proportional error in later calculations and stability evaluation.

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A typical large factory trawler, this vessel can produce up to 80 tons of surimi per day.

Photo courtesy of the National Fisherman Magazine.

A typical factory trawler *Photo courtesy of the American Factory Trawler Association.*

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Second: The two major variables for vessel displacement and center of gravity changes are liquid loading and accumulated cargo. The actual quantities and locations of fuel, water and cargo determine the vessel's basic stability status during a voyage.

Third: Hauling the catch aboard is very important. Hauls of 60 to 100 or more tons are common. Also it is not uncommon to keep a haul on deck for several hours before its contents are dumped to below deck bins for processing. Whenever a haul is brought aboard, there must be sufficient stability reserve to permit carrying this high, heavy weight.

Fourth: This is just as important as cargo placement and stowage. The typical unit of frozen fish product is a 20-kg block in a fiber box. These are ordinarily layered in holds much like unmortared bricks. When stowed in this fashion the chances for a shift in cargo are minimal. Alternate stowage plans must include battens or other restraints to prevent movement in a seaway.

Fifth: Free surface and flooding control are the most vital variables. The previous variables all concerned center of gravity control for the vessel to respond to calculated intact stability characteristics. Excess free surface or any flooding impair intact stability.

Every factory trawler must collect and dispose of water used on the factory deck, as well as up to approximately 80 percent of the round weight of the fish caught.

To maintain the vessel's intact stability characteristics, water and fish waste must be efficiently collected and ejected through hull connections. These connections, however, must also prevent sea water from flowing in, should they become submerged. No accumulation of water on the factory deck can be permitted.

Risk management

The basics of managing stability risks for a factory trawler start with the fundamentals applicable to any vessel, but also include surveillance over particular factory operations.

The master of a vessel is responsible for the following stability risk management duties:

- Be thoroughly familiar with the vessel's stability report and instructions.
- Control weights added that will alter calculated light ship conditions. When equipment or gear is added, professional advise on its effect should be obtained.
- Forecast stability trends based upon cargo accumulation and fuel expenditure rates.

- Maintain sufficient stability reserve for hauling catch aboard.

- Maintain control over factory operations as they affect vessel stability.

The last responsibility represents control of matters which can place a vessel in extreme peril due to impaired intact stability.

Non-seagoing factory personnel, including supervisors, assume "normal" is what they have experienced that has not hindered their operations. They cannot anticipate the unexpected in ship operation.

If water accumulates on deck without tragic results, that is "normal." If a hull connection backflow device becomes plugged with fish waste and is removed, that is "normal." A nice open scrap chute can be "normal."

A single or several "normal" conditions such as these, uncontrolled by both factory supervision and the master, renders the vessel stability report, as well as any prior stability calculations or planning, invalid.

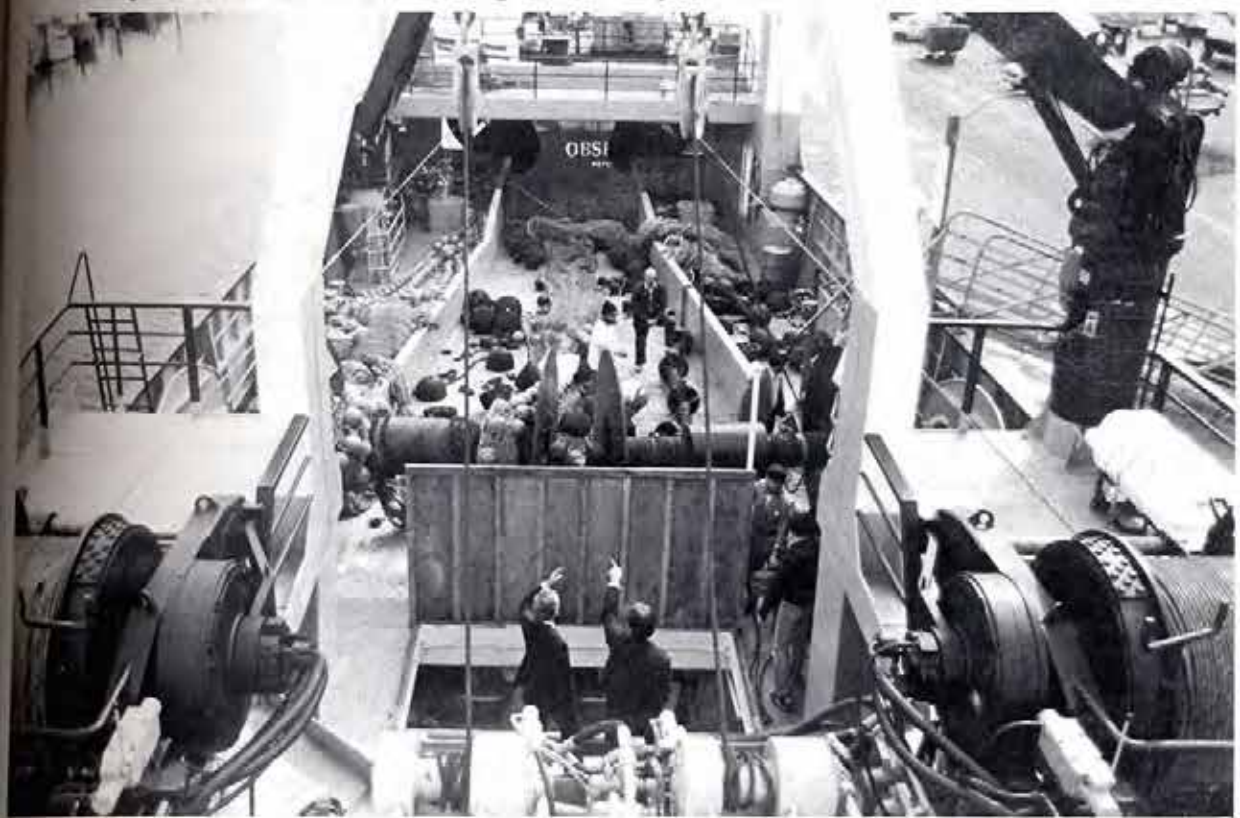
Continuous production on a factory trawler is a basis for its economic success. However, continuous production with faulty or missing hull closure devices exposes the vessel to the perils of flooding and/or excess free surface. This has led to vessel foundering and loss.

Conclusions

The federal regulations for fishing industry vessels require safety instruction and training. While there is no need to train processing personnel in vessel stability, there is a clear responsibility to orient these usually non-seagoing personnel to the perils related to unguarded openings in the hull and accumulated water on deck.

The bottom line on management of factory trawler stability risks requires both routine attendance to weight placements and continuing attention to factory operations as related to free surface and flooding hazards.

Mr. David L. Green is the president of Jensen Maritime Consultants, Inc., a firm of naval architects and marine engineers in Seattle, Washington.
Telephone: (206) 284-1274.



Looking aft on a small factory ship.

Photo by Bruce Buls, courtesy of National Fisherman Magazine

Complete stability submittals

An open letter
to fishing vessel industry personnel and naval architects

Stability analysis of fishing vessels and fish processing vessels is often complex, usually requiring much documentation. The following letter was prepared by the Coast Guard Marine Safety Center (MSC) in response to an incomplete and unacceptable stability submittal.

The letter is reprinted here for two reasons. First, it demonstrates the extent of the Coast Guard review that was conducted, as well as the elements being reviewed. Second, MSC customers will discover that submittals taking this much time to review and comment upon tend to increase the "backlog" -- the amount of waiting time before plans come up for review.

In general, complete, accurate submittals are in the best interests of everyone. I hope that this reprint is useful and informative. It is not intended to be an all-inclusive guideline for stability submittals for fish processing vessels, but rather shed some valuable insight on the requirements.

More detailed information on stability requirements and policy interpretations are in Title 46 CFR, parts 170 to 174 (subchapter S -- Subdivision and Stability), and in NVIC 5-86. Detailed guidance for conducting stability tests (inclinings and deadweight surveys) can be found in the new American Society for Testing and Materials (ASTM) specification F 1321-90.

T. E. Thompson

Captain, U.S. Coast Guard
Chief, Marine Technical and Hazardous Materials Division
by direction of the Commandant

28 May 1991

Subj: 178'-8" x 40' x 18'-6" Fish processing vessel
Exposed waters
Stability for load line

Ref: (a) Letter dated 24 April 1991
(b) Fax dated 13 May 1991

Dear Mr. _____

The following comments are offered as a result of our oversight review of the approved stability information forwarded with references (a) and (b). These items need to be addressed prior to our issuance of a stability letter:

1. The lightest load for which compliance is demonstrated contains 14% fuel and 20% catch. If a stability letter is to be used as the stability guidance in place of a Trim and Stability Booklet, which we presume is the case here, the full range of possible vessel operation must be examined for compliance. For this vessel, compliance must be shown in a 10% "burned-out" condition with no cargo. Our experience indicates that these vessels typically have difficulty complying in the light displacement conditions, which leads the naval architects to use catch as a form of "ballast." Because there is no guarantee that fish will be caught or even placed in the proper location, we require that compliance be shown for a 10% "burned-out" condition with no cargo. In addition, the stability letter must reflect any special loading requirements (such as ballasting) applicable to these conditions. When stability guidance is provided solely with a stability letter, it is presumed that all loading conditions are within the operating envelope defined by the restrictions of the letter. So, in absence of ballasting or other guidance, compliance should be shown for the "burned-out" condition.

Note: Showing a "burned-out" loading condition would not be specifically required if the stability guidance were a Trim and Stability Booklet. Unlike the stability letter, the booklet is required to provide the master with a method for determining the acceptability of any loading condition. This method must cover the entire range of possible vessel operation, including operations in or near the "burned-out" condition. The presumption being that the master can determine the acceptability of operating near "burn--out," even when a "burned-out" condition has not been expressly provided.

2. The loading conditions have not examined the effect of having a cod-end hauled onto the trawl deck. Cod-end weights significantly affect the transverse stability of processing vessels and must be adequately examined. In addition to the inclusion of cod-end weights, the weight of the fish being held in the fish bins for processing must be included in the vessel's loading conditions. In most cases, the cod-end and fish in bins should both be included, since it is normal for both of these to contain fish at the same time when the vessel is processing. When examining the effects of the cod-end weight, it should be applied at the highest location the "hauling" wire rotates over.

3. We note that an "unloading-at-sea" condition has been included. If the vessel intends to unload cargo at sea, the distribution of the cargo weight must reflect this condition. For example, if cargo is transferred to a higher deck prior to transfer, the effect of this movement should be reflected in the loading conditions. Additionally, more guidance should be provided to the master on the required condition of the vessel during this operation (i.e., can they have a cod-end on deck at the same time? Can he process while unloading? Can he unload when icing? In what order should the holds be emptied? etc.) This condition should also reflect the VCG increase caused by hoisting cargo with the crane.

4. Reference (b) increased the operating draft for the vessel. To allow the increased draft, the submitter must demonstrate compliance with the severe wind and rolling, towing and lifting criterion at the increased draft.

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5. We note that 80 LT of fishing gear has been included in the loading conditions, being considered approximately three feet above the trawl deck. The stability study should show a breakdown of all gear that has been included and its location. This list should be provided to you as both a record of exactly what equipment has been considered and "proof" that the naval architect adequately considered the fishing configuration of the vessel. Our experience has been that a vessel of this size carries approximately 100 LT of fishing equipment (including spares) that can easily be centered more than three feet above the trawl deck depending on configuration and placement of spares. A more detailed analysis should be considered in this case.

6. No guidance is provided for cargo handling. Cargo hold #3 should only be loaded after holds #1 and #2 are filled.

7 No downflooding point has been specified. We note that 40 degrees was used in the calculation of the toremolinos criteria, but an angle of less than 40 was used in the evaluation of the severe wind and rolling criteria. The downflooding point must be determined and used for all criteria in all loading conditions.

8. Compliance with the severe wind and rolling criteria has only been demonstrated for two loading conditions. This is not acceptable because there has been no restriction placed on ballasting, fuel, and cargo loading and unloading sequences. Without specific loading guidance, the vessel could be loaded in different values of KMT. Without proper guidance, inadvertent noncompliance could result. As with all criteria, the naval architect must examine the entire boundary of the operating envelope to s how that the vessel complies with all requirements when operating in this envelope.

***9.** In order to allow operation within a specified trim range, compliance must be demonstrated with all stability criteria for the desired trim range over the entire range of operating displacements. To do this, most submitters will provide a maximum KC plot that contains curves for various trims. If this is not desirable, sufficient operating restrictions must be provided such that the vessel's trim will remain consistent with that shown in the approved loading conditions.*

10. The trim range provided in the draft stability letter appears to be in degrees vice feet as shown These presented values actually represent the vessel's trim in degrees over the LEP of 186 feet

11. No details have been provided on the scrap chute. The scrap chute must be fitted with a suitable remotely actuated closure that can be operated by one person in a flooding emergency. This requirement is a direct result of commandant's review action of the Coast Guard marine board of investigation's report of marine casualty for the Aleutian Enterprise.

12. The loading conditions do not use the free surface effect required by 46 CFR 170.285. This free surface should be used regardless of the actual tank configuration.

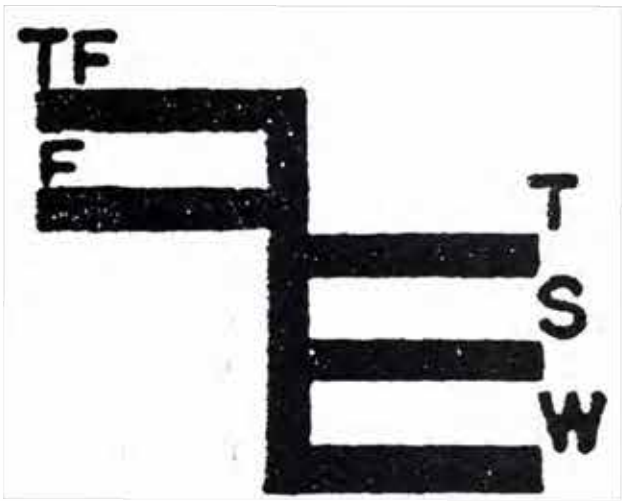
13. Guidance should be included in the stability letter or Trim and Stability Booklet requiring that processing operations be terminated if water accumulates on the processing deck or if any ejector sump pumps are inoperable.

14. The free surface effect of the ballast tanks has not been included in the loading conditions. If the tanks are permitted to be ballasted when the vessel is underway, the free surface of the tank must be included in the loading condition when the tanks are permitted to be ballasted.

15. A vessel equipped to trawl by the stern must demonstrate compliance with the towing criteria of 46 CFR part 173, subpart E.

Sincerely,

oad line vessel markings



Load line requirements

LCDR Guy R. Nolan

Load line laws

Load line legislation dating back to 1929 has been designed to ensure safe loading of vessels through adequate strength, stability and reserve buoyancy for the protection of the crew and property. These criteria are checked by examining a vessel's structure, evaluating its stability in each loading condition and seeing that there are adequate closures to maintain watertight integrity at sea.

A vessel judged satisfactory receives a load line certificate, which includes a freeboard assignment. A mark (load line) corresponding to the freeboard assignment is placed on the side of the vessel, establishing the maximum draft allowed. This provides a master with a simple and effective means of verifying that a vessel has not been overloaded.

Applicability

Load line regulations were developed to apply to what can be called standard merchant vessels. These vessels have standard ship-shaped hulls, and load cargo or passengers in port or protected waters. Hatches are secured at sea and remain watertight for the duration of the voyage.

Although many fishing vessels have similar hull forms to standard merchant vessels, the nature of their operations tends to encourage designs with low freeboard. In addition, their hatches are commonly opened at sea as part of normal operations.

Exemption

These differences led the International Maritime Organization (IMO) to specifically exclude fishing vessels from load line requirements. Current United States load line statutes [46 USCA 5102(b)(3)] also specifically exempt fishing vessels. However, the international standard does not prevent any government from requiring domestic load lines.

Processors

Fish processors began appearing in significant numbers during the 1960s. Often called "factory vessels" or "mother ships," these vessels normally did not fish themselves, but relied on other vessels to supply fish to be processed.

Fish processors are much larger than traditional fishing vessels, and are more like

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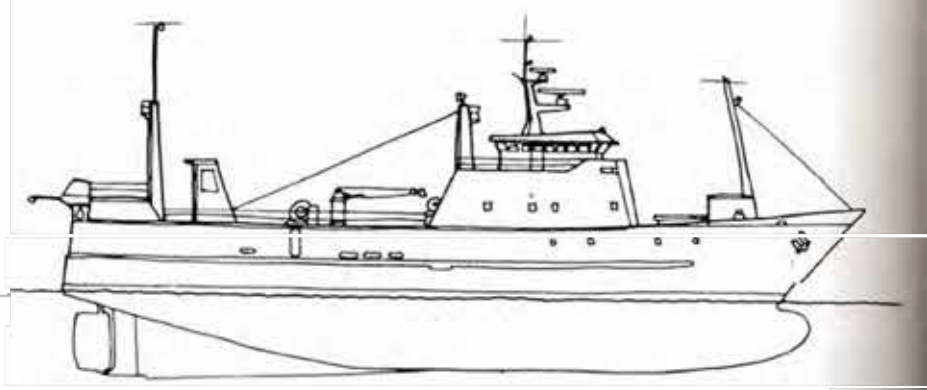

This 201-ft. fish processor/trawler is not exempt from load line requirements.

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standard merchant vessels. They are not considered fishing vessels and must have load lines.

The Commercial Fishing Industry Vessel Act of 1984 (See page 7.) makes it clear that any activity beyond catching and preserving fish by freezing is considered fish processing. This definition excluded specific preparations necessary to preserve fish quality to ensure that traditional fishing vessels continue to be exempt from load line requirements.

A trend among newer processing vessels is to conduct some fishing operations in addition to processing. Some owners incorrectly believed that their fishing activities exempted their vessels from load line requirements, even though their vessels were also fish processors.

The investigation following the sinking of the fish catcher/processing vessel, *Aleutian Enterprise*, on March 22, 1990, revealed that a significant number of similar vessels had been operating without the required load lines.

Interim operations

Recognizing that immediate actions were necessary to ensure the safe operation of these vessels, the Coast Guard developed a program permitting the interim operation of these fish catching/processing vessels until they could be made available for complete surveys, stability reviews and load line assignments.

To qualify, the owner of a fish processing vessel requiring a load line first applies to an approved classification society. In addition, the owner provides the Coast Guard with a letter attesting that the vessel substantially meets applicable stability criteria, that the master is given suitable stability guidance, and that the vessel would not be altered without first determining the effect on stability.

Next, the classification society conducts an initial survey to verify the vessel's watertight integrity. It evaluates the degree to which the vessel meets the conditions of the load line requirements and verifies that minimum safety requirements for uninspected vessels are met.

Satisfactory vessels are allowed to continue operations while formal surveys, stability reviews and load line assignments are in progress.

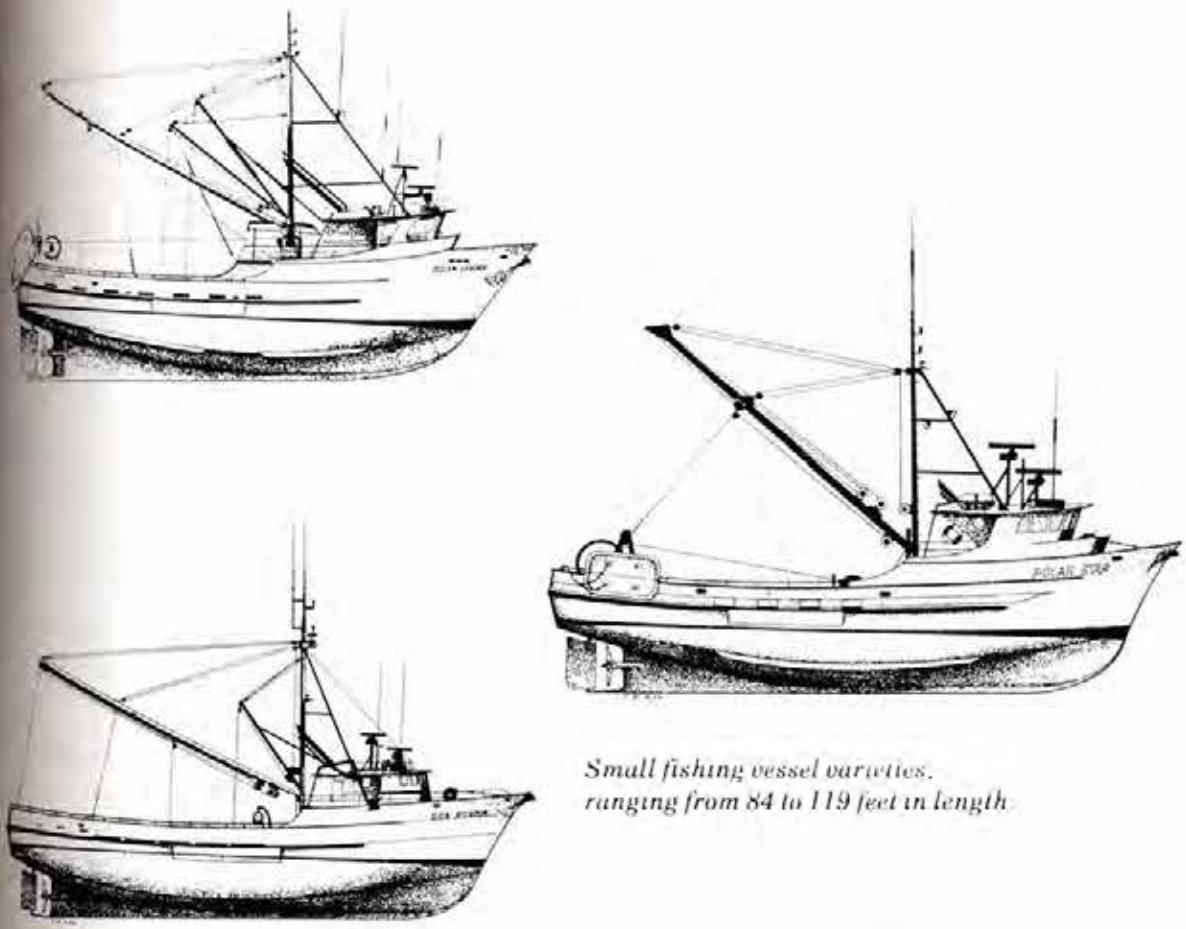
This interim program will conclude when all fish processing vessels requiring load line assignments have completed the process.

Unfortunately, fish processors make up only a small portion of the industry. In order for load lines to play a significant role in reducing the number of casualties due to overloading, inadequate stability or loss of watertight integrity, a much larger portion of the fleet would need to obtain load line assignments.

Voluntary load lines

Recently, some owners of uninspected fishing industry vessels have expressed interest in obtaining load line certificates, even though their vessels are not currently required by law to have them.

A Coast Guard review of fishing vessel casualties revealed that a loss of watertight integrity due to inadequate closures is a common cause of vessels sinking. Subsequently, the American Bureau of Shipping (ABS) was autho-



Small fishing vessel varieties, ranging from 84 to 119 feet in length.

rized by the Coast Guard to assign limited domestic service load line certificates upon request to qualified uninspected United States flag fishing vessels.

This voluntary load line assignment includes ABS approval of stability calculations, operating manual and stability instructions. The load line certificate includes guidance on operating with open hatches. In addition, an annual load line survey assures that watertight integrity is maintained.

Vessels less than 79 feet

Load line regulations have never been applied to vessels less than 79 feet long. However, these smaller vessels would also benefit from annual surveys, appropriate stability analyses and operating instructions.

The Coast Guard has taken the innovative step of allowing vessels less than 79 feet in length to be assigned voluntary load lines, provided they meet the appropriate criteria, modified to account for the size of the vessels.

Challenge to insurers

The insurance industry can play a major role in improving fishing vessel safety by recognizing that vessels maintaining load line certificates will be far better risks than those that do not. If insurance premiums are adjusted to reflect the reduced level of risk, it may provide the monetary incentive necessary to ensure the success of the voluntary program.

LCDR Guy R. Nolan is head of the Stability and Subdivision Section of the Naval Architecture Branch, Marine Technical and Hazardous Materials Division, Office of Marine Safety, Security and Environmental Protection. Telephone: (202) 267-2988.

Vietnamese fishing vessel safety

LTJG Marc H. Nguyen

LTJG Marc H. Nguyen reported for his first tour of marine inspection duty to the Coast Guard Marine Safety Office (MSO) in New Orleans, Louisiana, on July 27, 1990. Because of his Vietnamese heritage and his strong background in fisheries law enforcement, he was assigned to work with a growing community of Vietnamese fishermen to help improve their poor record of compliance with fishery and safety regulations. The following is his account of his efforts

The problem

A large Vietnamese fishing community began to develop in the Gulf region starting in the early 1980s. Almost from the outset, the Coast Guard has had to issue thousands of fishing citations annually to the Vietnamese fleet.

These law enforcement actions created tension between the Coast Guard and the Vietnamese community, as well as turbulent and, sometimes, violent struggles between the more established American fishermen and the recent arrivals from Southeast Asia.

Shortly after reporting to the MSO, I took several steps to gain a better understanding of the problems facing the Vietnamese fishermen. I attended a community relations service seminar hosted by the Department of Justice, as well as a hearing hosted by the Coast Guard and the Mississippi River Pilots Association. Both of these meetings addressed issues concerning the Vietnamese fishermen.

Their ignorance of basic navigation rules caused traffic problems and many near misses during the shrimping season. Also their improper use of VHF radio on the Coast Guard working channels impeded search and rescue operations.

In addition, many of the Southeast Asian fishermen did not fully understand the United States fishery laws, and often failed to adhere to Coast Guard vessel safety standards. They also were not complying with environmental regulations requiring the use of turtle excluder devices, which protect turtles by allowing them to escape from fishing nets.

It was concluded that a lack of communication was at the root of all the problems

Obstacles to solution

Armed with a list of the problems, I optimistically approached the task of fixing them one by one. However, I was in for a rude awakening.

The first obstacle was that there was no formal organization of the fishermen. Therefore, I could not address the problems to them as a group. The second and more formidable barrier was that the Vietnamese fishermen did not trust me. Although I am Vietnamese, I was more obviously a Coast Guard law enforcement officer. A traditional attitude of "us versus them" was deeply rooted in most of the fishermen. Since they viewed me as one of "them," I knew it would take time to gain their confidence.

Plan of action

Determined to overcome these obstacles, I decided to reside in a Vietnamese community to relearn my culture and to be accessible to the fishermen. I put out the word that I was there to help them by translating the fishing regulations and posting them at various shrimp houses.

I made weekly visits to the docks to discuss any problems they were having or just to casual conversation about the fishing business. A few fishermen were pleasantly surprised when I boarded their vessels while deployed on fisheries patrol on the Coast Guard cutter *Pt. Se*

Turtle excluder devices installed in nets.

Dilapidated rubberholding fishing gear break (stopper)

Typical problems

(Left) Rusted lifesaving equipment
(Below) Bulkhead not watertight due to improper penetration

My encounters with the fishermen gave me chances to further explain the regulations first hand, and try to create a positive working [illegible] between the fishermen and the Coast Guard. It also reinforced the idea that I [illegible] assistance.

Progress

[illegible] months, I was receiving [illegible]s at my home. Over cups of tea, we discussed many issues including Coast Guard boarding, fishing regulations, safety standards and the importance of using turtle excluder devices. The tensions and shooting incidents between the established American and the Vietnamese fishermen were also frequent topics of our discussions.

[illegible] that these problems were caused by cultural differences compounded by the language barrier, resulting in a very volatile work atmosphere.

By working closely with a local Vietnamese priest and receiving strong support from my command, I was able to teach a rules of navigation class to about 15 fishermen. I used this opportunity to educate them concerning the cultural problems.

Results

Since the education program began, the number of search and rescue cases involving the Vietnamese fishing fleet has been reduced. The fishermen are in the process of forming a Vietnamese fishermen's association to educate themselves on fishing regulations and safety requirements, and to work more closely with the Coast Guard.

Although they are far from compliance with all fisheries laws and safety regulations, I believe that they have taken a significant step toward that goal.

Our experience offers a solid lesson for maritime law enforcement officials

Education and communication are essential components to any program aimed at increasing compliance with regulations and safety requirements.

LTJG Marc H. Nguyen is a marine inspection officer with the Marine Safety Office 1440 Canal Street, New Orleans, Louisiana. Telephone: (504) 589-6273

Chemical of the month *4/C Daniel J. Allman*

Hexanol

Hexanol is a colorless, sweet-smelling liquid, also known as hexyl alcohol, amylcarbinol and hydrohexane. Used mainly in pharmaceuticals, including hypnotics, antiseptics and perfume esters, hexanol has the formula $C_6H_{13}OH$. It is also used as a solvent, a plasticizer and as an intermediate for textile and leather finishing agents.

The chemical can be produced in small amounts in a lab by the action of butylmagnesium bromide on ethylene oxide. It is produced commercially by the reduction of ethyl caproate with sodium in absolute alcohol, or it is produced from olefins by the Oxo process.

Hexanol is soluble in alcohol and ether, but is only slightly soluble in, and floats on, water. It will react with oxidizing materials. It is combustible under ordinary conditions when it is introduced to flame.

Hazards

The hazards from spilling hexanol are relatively few, because it has little effect on marine life. However, it may foul shorelines, and may be dangerous if it enters water intakes.

The vapors of hexanol are harmless, but consumption or contact can be painful. If it is swallowed, and the victim is still conscious, have him or her drink water or milk.

Symptoms of contact are eye burns and skin irritation. Short exposure can cause first-degree burns, and long exposure may cause second-degree burns. When a person comes in contact with hexanol, he or she should remove all contaminated clothing and shoes, and flush the affected area for at least 15 minutes. Chemical gloves and goggles should always be worn.

Hexanol is classified as a flammable liquid (3.3) by the IMDG code. If the chemical should catch fire, alcohol foam, CO_2 or dry chemical are the most effective ways to put out the flames.

Shipping

Hexanol is carried in one- to five-gallon cans, and in 55-gallon drums. It is also carried in bulk on ships and barges. No inert atmosphere or storage temperature is required, but open ventilation is suggested.

Shipping standards for hexanol set by the Coast Guard are found in subchapter D of 46 CFR. The Department of Transportation's regulations for transporting hexanol can be found in title 49, subchapter C.

Daniel J. Allman was a fourth class cadet at the Coast Guard Academy when this article was written as a special chemistry project for LCDR Thomas Chuba.

Hexanol

Chemical name:	Hexanol
Formula:	$C_6H_{13}OH$
Synonyms:	Hexyl alcohol, amylcarbinol and hydrohexane
Chemical family:	Alcohols
Physical description:	Colorless, sweet-smelling liquid

Physical properties:

Boiling point:	314.8°F (157.1°C)
Freezing point:	-48.3°F (-44.6°C)
Vapor pressure (at 24.4°C):	1 mm

Threshold limit value:

Time weighted average:	Data unavailable
Short-term exposure limit:	Data unavailable

Flammability limits in air:

Lower flammability limit:	1.2%
Higher flammability limit:	7.7%

Combustion properties:

Flashpoint (c. c.):	145°F (62.8°C)
Autoignition temperature:	559°F (292°C)

Densities:

Vapor (air = 1):	3.52
Specific gravity (at 20°C):	0.850
Density (at 20°C):	0.8186

Identifiers:

IMO class	3.3
U.N. number:	2282
CHRIS code:	HXN
CAS registry no.:	111-27-3
Cargo compatibility group:	20 (alcohol, glycol)

NFPA:

Health hazard:	1
Flammability:	2
Reactivity:	0

Nautical queries — *November-December, 1991*

The following items are examples of questions included in the third assistant engineer through chief engineer examinations and the third mate through master examinations.

Engineer

1. In accordance with Coast Guard regulations, a nonmetalic flexible hose used in a nonvital freshwater system operating at 125 psi must be constructed _____.

A. with a self-extinguishing type covering.
B. with a fiber reinforcement.
C. in short reasonable lengths for the purpose of flexibility only.
D. all of the above.

2. Which of the following liquids could be discharged overboard without processing through an oily water separator?

A. Cargo tank ballast.
B. Segregated ballast.
C. Engineroom bilges.
D. Cargo pumproom bilges.

3. When you send air under pressure into one of the glands (tires) of an air-bladder clutch, the _____

A. inside diameter of the clutch gland increases.
B. inside diameter of the clutch gland decreases.
C. gland rotates out of contact with the drums.
D. clutch begins to rotate with the engine.

4. Fireside burning of boiler tubes is usually the direct result of _____

A. high furnace temperatures.
B. gas laning in tube banks.
C. oxygen corrosion of metallic surfaces.
D. overheating due to poor heat transfer.

5. Used engine oil may be properly disposed of by _____

A. draining it into the bilges.
B. discharging it to a dock-sided oil waste station.
C. pumping it over the side in port.
D. dumping it in a fuel tank.

6. During the regular operation of a soloshell double-effect unit, when the vapor passes through a first-effect vapor separator, it goes on to a vapor feed heater. At this point in the cycle, what would be flowing through the tubes of this vapor feed heater?

A. Pure distillate.
B. Brine.
C. Condensed vapor from the second effect.
D. Salt or freshwater feed, depending on where the vessel was operating.

7. The formation of a pit in a boiler tube is most likely to occur when _____

A. waterside deposits are present.
B. sludge is present.
C. the tube metal acts as an anode.
D. dissolved minerals are present.

8. Panting or rumbling in a boiler furnace is usually caused by _____

A. too much air.
B. not enough air.
C. low fuel temperature.
D. low fuel pressure.

9. When a load is applied to an under-inflated air bladder clutch, you can expect _____

A. chipped reduction gear teeth.
B. overheating because of slipping shoes.
C. pneumatic seizure.
D. excessive wear on the thrust bearings.

Deck

1. Your vessel has been in a collision and after assessing the damage, you begin down flooding. This will cause the KB to _____.

A. fall.
B. remain stationary.
C. rise.

[illegible] shift to the high side.

2. A tropical wave is located 200 miles due west of your position, which is north of the equator. Where will the wave be in 24 hours?

A. Farther away to the west.
B. Farther away to the east.
C. In the same place.
D. Closer and to the west.

3. Determine the free surface constant for a fuel oil tank 30-ft. long by 40-ft. wide by 15-ft. deep. The specific gravity of the fuel oil is .85 and the ship will float in saltwater (S.G. = 1.026).

A. .83.
B. 42.7.
C. 3787.
D. 4571.

4. On a vessel displacing 8,000 tons, what is the reduction in metacentric height due to free surface when a tank 45-feet long and 45-feet wide is partly filled with salt water?

A. 1.22 feet.
B. 1.16 feet.
C. 1.13 feet.
D. 1.10 feet.

5. INTERNATIONAL ONLY -- A vessel constrained by its draft may display _____

A. three all-round red lights, instead of the lights required for a power-driven vessel of its class.
B. the same lights as a vessel restricted in its ability to maneuver.
C. three all-round red lights in addition to the lights required for a power-driven vessel of its class.
D. the lights for a power-driven vessel which is not under command.

6. You have steamed 132 miles and consumed 14.0 tons of fuel. If you maintain the same speed, how many tons of fuel will you consume while steaming 289 miles?

A. 21.6 tons.
B. 24.5 tons.
C. 27.9 tons.
D. 30.7 tons.

7. For an upright vessel, draft is the vertical distance between the keel and the _____

A. waterline.
B. freeboard deck.
C. plimsoll mark.
D. amidships section.

8. If you are fighting a fire below the main deck of your vessel, which action is most important concerning the stability of the vessel?

A. Shutting off electricity to damaged cables.
B. Draining fire-fighting water and pumping it overboard.
C. Maneuvering the vessel so that the fire is on the lee side.
D. Removing burned debris from the cargo hold.

9. When the pilot is embarked, he _____

A. is a specialist hired to give navigational advice.
B. is solely responsible for the safe navigation of the vessel.
C. relieves the master of his duties.
D. relieves the officer of the watch.

Answers

Engineer
1-A, 2-B, 3-B, 4-D, 5-B, 6-D, 7-C, 8-B, 9-B

Deck
1-C, 2-A, 3-C, 4-A, 5-C, 6-D, 7-A, 8-B, 9-A

If you have any questions concerning "Nautical Queries," please contact U.S. Coast Guard (G-MVP-5), 2100 Second St., S.W., Washington, D.C. 20593-0001 Telephone (202) 267-2705.

Final rule

CGD 88-079, Commercial fishing industry vessel regulations (46 CFR part 28) RIN 2115-AD12 (August 14).

The Coast Guard is issuing regulations for U.S. documented or state numbered uninspected fishing, fish processing and fish tender vessels to implement provisions of the Commercial Fishing Industry Vessel Safety Act of 1988. These regulations are intended to improve the overall safety of commercial fishing industry vessels.

Date: This final rule was effective on September 15, 1991. In sections 28.110, 28.115, 28.120, 28.135, 28.145, 28.150, 28.210 and 28.270, vessel operators have been given delayed implementation dates. The incorporation by reference of certain publications listed in the regulations was approved by the director of the *Federal Register* as of September 15, 1991.

Addresses: The materials referenced in this final rule are on file with the executive secretary, Marine Safety Council, Coast Guard headquarters, Room 3408, 2100 Second St., S.W., Washington, D.C. 20593-0001.

A regulatory evaluation has been placed in the public docket for this rulemaking, and may be inspected and copied at that address.

For further information, contact: LCDR Ed McCauley, Fishing Vessel/Offshore Activities Branch, Merchant Vessel Inspection and Documentation Division, room 1405, Coast Guard headquarters. Telephone: (202) 267-2307.

Notice of study results

CG 91-037, Omega validation of the Mediterranean Sea (August 26).

Notice is hereby given that the Coast Guard has completed a validation study of the Omega radio-navigation system coverage in the Mediterranean Sea. The study measures the Omega system performance and provides information about anomalies and signal interference patterns in the region.

Date: The report was available as of August 26.

Addresses: The report of the study's findings is available from the National Technical Information Service, Springfield, Virginia 22161. The report is identified by government accession number AD-236887.

The address of the Coast Guard command responsible for the report and the Omega validation effort is: Commanding Officer, Omega Navigation System Center, 7323 Telegraph Road, Alexandria, Virginia 22310-3998.

For further information, contact: Verbal inquiries may be made to LT Clement D. Ketchum, Signal Analysis and Control Division, Omega Navigation System Center. Telephone: (703) 866-3822.

Advance notice of proposed rulemaking

CGD 91-034/90-068, Vessel response plans and carriage and inspection of discharge-removal equipment (33 CFR part 155) RIN 2115-AD81 and 66 (August 30).

The Coast Guard is soliciting comments relating to response plans for all vessels carrying oil as cargo, and carriage and inspection of discharge-removal equipment. Regulations requiring response plans and carriage of oil spill removal equipment are mandated by the Federal Water Pollution Control Act of 1990. The purpose of requiring response plans and carriage of discharge-removal equipment is to minimize the impact of oil spillage.

Dates: Comments must have been received by October 16, 1991. A public workshop will be held

...November 14, 1991 at Coast Guard headquarters, room 2415, from 9 a.m. to 5 p.m. Persons interested in attending the workshop should contact LCDR Glenn Wiltshire, project manager, Oil Pollution Act (OPA-90), telephone: (202) 267-6739, between 7 a.m. and 3:30 p.m., workdays.

The executive secretary maintains the public docket for this rulemaking. Comments are part of the docket and are available for inspection or copying at room 3406, Coast Guard headquarters. A summary of the discussions and issues covered at the workshop will become part of the docket.

For further information, contact: LCDR Glenn Wiltshire at the number and times above.

Notice of proposed rulemaking

CGD 90-055, Documentation of certain vessels for purposes of oil spill cleanup (46 CFR part 68) RIN 2115-AD65 (September 11).

The Coast Guard is proposing procedures for documenting certain vessels with a limited coastwise endorsement. This rulemaking implements provisions of the Oil Pollution Act of 1990 (OPA 90) under which the United States citizenship requirements for vessel documentation are relaxed for vessels which are used to clean up and transport oil discharged into the navigable waters of the United States or the exclusive economic zone. These regulations are intended to improve oil spill cleanup resources.

Date: Comments must have been received by October 28, 1991.

The executive secretary maintains the public docket for this rulemaking. Comments are part of this docket and are available for inspection or copying at room 3406, Coast Guard headquarters.

For further information, contact: Mr. Ray L. Bunnell, project manager, OPA 90. Telephone (202) 267-6778

Notice of meeting

Commercial Fishing Industry Vessel Advisory Committee: Meeting (September 19).

Pursuant to section 10(a)(2) of the Federal Advisory Act (Pub. L. 92-463; 5 U.S.C. App. I), notice is hereby given of a meeting of the Commercial Fishing Industry Vessel Advisory Committee. The meeting will be held on November 4-5, 1991, in room 4234 at the Department of Transportation, 400 Seventh Street, S.W., Washington, D.C. The sessions will begin at 9 a.m. and end at 5 p.m. each day. Attendance is open to the public.

Topic: The committee will discuss recommendations made by the unclassified fish processor vessel working group on hull and machinery standards for unclassified fish processors. The committee will then make recommendations to the Coast Guard.

For further information, contact: LCDR Ed McCauley, Fishing Vessel/Offshore Activities Branch, Merchant Vessel Inspection and Documentation Division, room 1405, Coast Guard headquarters. Telephone: (202) 267-2307

Notice of proposed rulemaking

CGD 91-031 Hazards to navigation (33 CFR part 64) RIN 2115-AD83 (September 23).

Recent statutory amendments mandate the establishment of standards for what constitutes a hazard to navigation. The Coast Guard proposes to satisfy the congressional mandate by revising 33 CFR part 64 to include a list of factors which are to be considered when determining whether any obstruction constitutes a hazard to navigation, and a definition for such a hazard. Providing a list of factors and a definition supplies the owners of obstructions with guidelines to consider when evaluating whether an obstruction is a hazard to navigation which requires marking.

Date: Comments must be received by November 7, 1991.

Addresses: Comments may be mailed to the executive secretary, Marine Safety Council (G-LRA-2/3406) (CGD 91-031), Coast Guard headquarters, or may be delivered to room 3406 at Coast Guard headquarters between 8 a.m. and 3 p.m., Monday through Friday, except federal holidays. Telephone: (202) 267-1477.

Continued on page 80

Continued from page 79

The executive secretary maintains the public docket for this rulemaking. Comments are part of this docket and are available for inspection or copying at room 3406, Coast Guard headquarters.

For further information, contact: Mr. Frank Parker, Navigation Rules and Information Branch. Telephone: (202) 267-0357.

Notice of proposed rulemaking

CGD 91-005, Financial responsibility for water pollution (vessels) (33 CFR parts 130, 131, 132 and 137) RIN 2115-AD76 (September 26).

The Coast Guard is proposing regulations to implement the provisions concerning financia responsibility for vessels in the Oil Pollution Act of 1990 and the Comprehensive Environmental Response, Compensation and Liability Act, as amended (Acts).

These provisions require owners and operators of vessels over 300 gross tons (with certain exceptions) to establish and maintain evidence of insurance or other evidence of financial responsibility sufficient to meet their potential liability under the Acts for discharges or threatened discharges of oil or hazardous substances.

The proposed regulations are administrative in nature and concern procedures for evidencing financial responsibility.

Date: Comments must be received on or before November 25, 1991.

Addresses: Comments may be mailed to the executive secretary, Marine Safety Council (G-LRA-2/3406) (CGD 91-005), Coast Guard headquarters, or may be delivered to room 3406 at Coast Guard headquarters between 8 a.m. and 3 p.m., Monday through Friday, except federal holidays. Telephone: (202) 267-1477.

The executive secretary maintains the public docket for this rulemaking. Comments are part of this docket and are available for inspection or copying at room 3406, Coast Guard headquarters.

For further information, contact: Mr. Robert M. Skall, National Pollution Funds Center. Telephone: (703) 235-4704.

Check your spaces

In 1988, a foreign national board of inquiry investigated a marine casualty in which two crew members of a vessel had died of asphyxia. It was established that the deaths were caused by a cargo of timber.

The 890-ton single-hold vessel carried Portuguese eucalyptus and pine. The cargo had been on board for four and five days before the casualty occurred. It had been stored in the open air and was loaded in a dry condition in dry weather. There was no ventilation of the hold during the voyage.

When the vessel lay in port, a crew member entered the bow-thruster compartment, which was connected to the hold by a manhole. The manhole was not sealed gas-tight.

The investigation revealed that the crew member died of asphyxia caused by carbon dioxide gases, which had developed from oxidation of the cargo and had entered the bow-thruster compartment through the manhole.

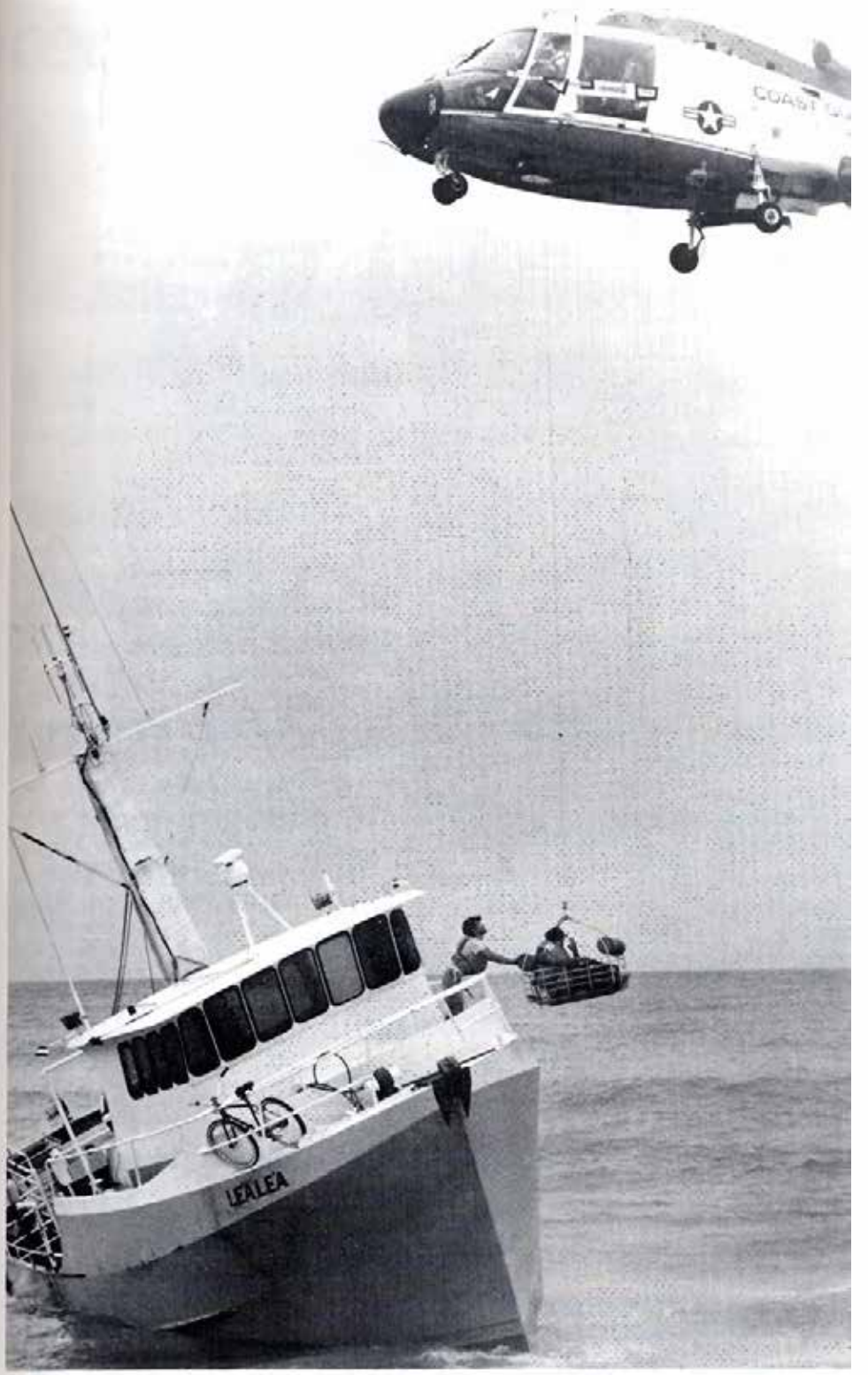
Another crew member, who entered the compartment to recover the casualty, also died in the prevailing atmosphere.

Measurements taken immediately after the casualties indicated an oxygen content of 17 percent by volume of the air in the bow-thruster compartment, whereas the carbon dioxide content was so high that it was beyond the measuring range of the detector.

It is very possible that the atmosphere of holds may be enriched with carbon dioxide and depleted of oxygen through the activity of bacteria forming on wet wood as it begins rotting.

Conclusion

Entering holds containing timber, banana or any organic material of a certain moisture content, or rooms adjacent to such holds, may be hazardous, even fatal.



(Above) A Coast Guard helicopter hovers above the 58-foot fishing vessel, Lea Lea, which ran aground in shallow water on the Diamond Head side of Honolulu Harbor on November 19, 1990. The crew members were hoisted to safety.
Photo by PA1 Keith A. Spangler

(Front cover) This photo of a commercial fishing vessel is featured on the cover of the North Pacific Fishing Vessel Owners' Association's Vessel Safety Manual.
Photo courtesy of Brad Matsen.