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**46 CFR Part 28
Commercial Fishing Industry Vessel
Regulations; Final Rule**

DEPARTMENT OF TRANSPORTATION

Coast Guard

46 CFR Part 28

[CGD 88-079]

RIN 2115-AD12

Commercial Fishing Industry Vessel Regulations

AGENCY: Coast Guard, DOT.

ACTION: Final rule.

SUMMARY: The Coast Guard is issuing regulations for U.S. documented or state numbers 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.

DATES: This final rule is effective on September 15, 1991. In §§ 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 is 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, U.S. Coast Guard, room 3406, 2100 Second Street, SW., Washington, DC 20593-0001.

A Regulatory Evaluation has been placed in the public docket for this rulemaking, and may be inspected and copied at the address listed above.

FOR FURTHER INFORMATION CONTACT: Commander Mike Rosecrans, Office of Marine Safety, Security and Environmental Protection (G-MTH-4/13), room 1304, U.S. Coast Guard Headquarters, 2100 Second Street, SW., Washington, DC 20593-0001, (202) 267-2960.

SUPPLEMENTARY INFORMATION:

These regulations apply to all U.S. commercial fishing industry vessels, whether existing before, or built or altered after September 15, 1991, and provide requirements for their equipment, design, and operations. Additional equipment is required for documented vessels that operate beyond the Boundary Lines or that operate with more than 16 individuals on board. Design and construction requirements that apply to vessels built after or which undergo a major conversion completed after September 15, 1991, are also included, if those vessels operate with more than 16 individuals on board. Additionally,

casualty and injury reporting requirements are included that apply to all underwriters of primary insurance for commercial fishing industry vessels, owners of commercial fishing industry vessels, and all employees injured on such vessels.

Public Hearings and Meetings

Thirteen public hearings were held to receive comments on the proposed rules. The public hearings were held in the Alaska, the Gulf Coast, the East Coast, and the West Coast regions. These meetings were announced in a Federal Register notice (55 FR 24131) on June 14, 1990.

A public meeting, announced in a Federal Register notice on September 15, 1989 (54 FR 38316), concerning implementation of the Commercial Fishing Industry Vessel Safety Act of 1988 ("the Act") was held at the offices of the American Institute of Marine Underwriters in New York, NY, on October 12, 1989. This meeting gave the insurance industry an opportunity to present their views on the proposed requirements related to casualty data collection and development of the regulations concerning collection of casualty information required by the Act.

Drafting Information

Several offices at Coast Guard Headquarters contributed to drafting this final rule, but the principal authors are Commander Mike Rosecrans, Office of Marine Safety, Security and Environmental Protection and Lieutenant Commander Don Wrye, Office of Chief Counsel.

Background and Regulatory History*Commercial Fishing Industry Vessel Safety Act of 1988*

On September 9, 1988, title 46 United States Code, was amended in chapter 45 (Uninspected Commercial Fishing Industry Vessels, sections 4501 through 4508) by the Commercial Fishing Industry Vessel Safety Act of 1988, Public Law 100-424 ("the Act"). This chapter, as amended, is applicable to all U.S. uninspected commercial fishing vessels, fish processing vessels, and fish tender vessels, except fish processing vessels of more than 5000 gross tons and fish tender vessels of more than 500 gross tons since they are subject to inspection under 46 U.S.C. 3301 (11) and (12). Also, it does not apply to vessels engaged solely in sport fishing that are subject to inspection under 46 U.S.C. 3301(8) as small passenger vessels and are regulated under 46 CFR subchapter T, or to vessels carrying 6 or less

passengers which operate as uninspected passenger vessels regulated under 46 CFR subchapter C. Vessels that alternate between commercial and sport fishing must comply with the requirements for the service in which they are engaged.

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

The Act calls for regulations concerning the following equipment:

1. For all vessels. The regulations developed for this class of vessels should concern:

- (a) Fire extinguishing equipment.
- (b) Life preservers.
- (c) Backfire flame arrestors for gasoline engines.
- (d) Ventilation of enclosed spaces.
- (e) Visual distress signals.
- (f) Buoyant apparatus.
- (g) Alerting and locating equipment, including emergency position indicating radio beacons (EPIRBs.)
- (h) Placards informing seamen of the duty to report injuries.

2. For vessels which are documented and operate beyond the Boundary Lines described in 46 CFR part 7 or are documented and operate with more than 16 individuals on board. The regulations developed for this class of vessels should also concern:

- (a) Alerting and locating equipment including, EPIRBs.
- (b) Lifeboats or liferafts.
- (c) An immersion suit for each individual on board.
- (d) Radio communication equipment.
- (e) Navigation equipment including compasses, radar reflectors, nautical charts, and anchors.
- (f) First aid equipment.
- (g) Any other equipment required to minimize the risk of injury.

3. For vessels which are built after, or which undergo a major conversion completed after, the effective date of the regulations and operate with more than 16 individuals on board. The regulations developed for this class of vessels should also concern:

- (a) Navigation equipment, including radars and fathometers.
- (b) Life saving equipment, immersion suits, signaling devices, bilge alarms, bilge pumps, life rails and grab rails.
- (c) Fire protection and firefighting equipment.

(d) Use and installation of insulation material.

(e) Storage of flammable and combustible material.

(f) Fuel, ventilation, and electrical equipment.

The Act also addresses a major operational problem encountered by commercial fishing industry vessels by requiring regulations for operational stability. The Act states that those regulations are to apply to all vessels which are built, or which are substantially altered in a manner that affects operational stability, after December 31, 1990.

The Act requires that in the regulations the Coast Guard—

(1) Consider the specialized nature and economics of the operations and the character, design, and construction of commercial fishing industry vessels; and

(2) Not require the alteration of a vessel or associated equipment that was constructed or manufactured before the effective date of the regulations.

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

Commercial Fishing Industry Vessel Advisory Committee

The Act requires formation of a 17 member Commercial Fishing Industry Vessel Advisory Committee ("the Committee"). The Executive Secretary of the Committee is appointed by the Secretary of Transportation, and the Federal Advisory Committee Act (5 U.S.C. app. 1 *et seq.*) applies to the Committee. The Committee terminates on September 30, 1992. A solicitation for membership on the Committee was published in the Federal Register on September 23, 1988 (53 FR 37075). That solicitation also explained the constituency of the Committee.

The Committee has met three times to discuss implementation of the Act and development of the subsequent regulations. The meetings were held twice in Washington, DC and once in Seattle, WA. Announcements of these meetings appeared in the Federal Register on March 13, 1989 (53 FR 10473), March 24, 1989 (53 FR 12367),

June 6, 1989 (53 FR 24071), and September 27, 1989 (53 FR 39621).

The Committee has discussed a myriad of topics dealing with implementing the Act including several drafts leading to a Notice of Proposed Rulemaking (NPRM) and this final rule. The basic form of the regulations resulted from Committee recommendations. To a large extent the content and the level of detail of the final rule is based upon comments generated by the Committee in response to general discussions at the aforementioned meetings.

During the first meeting of the Committee, a Chairman and Vice Chairman were chosen and lots were drawn to determine the term of each member. A normal term is three years; however, in order to stagger members' terms, 6 member's terms are for one year, 6 member's terms are for two years, and 5 member's terms are for the full three years. Members whose terms have expired may be reappointed. Subsequent appointments will be for three years or until termination of the Committee. As previously mentioned, the Act provides for termination of the Committee on September 30, 1992, unless extended. The Chairman of the Committee has recommended to Congress that a five year extension of the Committee be authorized citing the significant efforts needed to ensure smooth implementation of the Act, the pending study of safety problems by the National Academy of Engineering, and the Coast Guard's plan for licensing operators of documented commercial fishing industry vessels which was recently submitted to Congress as required by the Act.

Aleutian Trade Act of 1990

On November 16, 1990, the President signed Pub. L. 101-595, The Aleutian Trade Act of 1990 (the ATA). The ATA provides for continued cargo service to remote communities in Alaska while ensuring better safety standards for fish tender vessels operating in the Aleutian trade. "Aleutian trade" is defined as "the transportation of cargo (including fishery related products) for hire on board a fish tender vessel to or from a place in Alaska west of 153° West longitude and east of 172° East longitude, if that place receives weekly common carrier service by water, to or from a place in the United States (except a place in Alaska)."

The ATA amends certain provisions of the Commercial Fishing Industry Vessel Safety Act of 1988 to require fish tender vessels to be subject to the provisions of section 4502(b) of the Act the same as documented vessels which

operate beyond the Boundary Lines or that operate with more than 16 individuals on board. Section 4502(c) of the Act is also amended to include fish tender vessels in the Aleutian trade with those which are built after or which undergo a major conversion completed after December 31, 1988, and which operate with more than 16 individuals on board. Fish tender vessels engaged in the Aleutian trade would also be subject to the revisions of section 4502(f) of the Act which requires that they be examined at least once every 2 years for compliance with 46 U.S.C. chapter 45 and the implementing regulations.

Regulations implementing provisions of the ATA are expected to be included in the Supplemental Notice of Proposed Rulemaking (SNPRM) discussed below. Further discussion of the ATA is expected to be included in the preamble to the SNPRM.

Certain provisions of the ATA are applicable regardless of the status of the regulations. In particular, the ATA modifies 46 U.S.C. 3302(c) to exempt a fishing, fish tender, or fish processing vessel in the Aleutian trade from consideration as an inspected vessel if the vessel:

1. Is not more than 500 gross tons;
2. Has an incline test performed by a marine surveyor; and
3. Has written stability institutions posted on board the vessel.

This change to 46 U.S.C. is effective on May 16, 1990. The regulations in subpart E of this final rule are considered appropriate for vessels in the Aleutian trade and may be used as guidance until regulations are finalized to implement this portion of the ATA.

Advance Notice of Proposed Rulemaking

An Advance Notice of Proposed Rulemaking (ANPRM) was published in the Federal Register on December 29, 1988 (53 FR 52735), addressing potential requirements for uninspected fishing, fish processing, and fish tender vessels. In response to that ANPRM nearly 260 comment letters were received. Each of the comment letters has been considered in developing the Notice of Proposed Rulemaking (NPRM) that was published in the Federal Register on April 19, 1990 (55 FR 14924).

Supplemental Notice of Proposed Rulemaking

A notice of intent to publish a Supplemental Notice of Proposed Rulemaking (SNPRM) appeared in the Federal Register (55 FR 35694) on August 30, 1990. An SNPRM is being developed to address:

(1) Stability for fishing vessels less than 79 feet in length.

(2) Requirements for survival craft on fishing vessels operating inside or near the Boundary Line with fewer than four individuals on board, and

(3) Administration of exemptions authorized by 46 U.S.C. 4506 in relationship to high vessel density and limited duration fisheries.

Separation of these topics from this rulemaking is a result of comments presented at the public hearings. The major concern expressed was the application of the International Maritime Organization stability standards to vessels less than 79 feet in length. The Coast Guard is currently conducting research into the stability of these smaller, but more prevalent, vessels. The Consultation with many naval architects experienced in the design and stability characteristics of fishing industry vessels continues. Most notable among contacts is an ad hoc group based in Seattle, WA, calling themselves "Naval Architects for Fishing Vessel Safety." They submitted numerous calculations and examples to explain their arguments that the criteria in the NPRM for vessels less than 79 feet in length was too severe. In their statements at the public hearing in Seattle, WA on the NPRM, they asked that the comment period for the NPRM be extended to allow additional study on the topic of stability of fishing industry vessels less than 79 feet in length, especially the manner in which any stability criteria compares to proven seaworthy designs.

As a consequence of their comments and others received at other public hearings, the Coast Guard decided to separate the three areas listed above from this final rule. In this way all final rules would not be delayed, yet the topics which generated the most public concern could be adequately addressed.

Effective Date of Regulations

The effective date of the final rule is September 15, 1991. The Coast Guard anticipates that these rules will have a major beneficial impact on safety in the commercial fishing industry, and has chosen an effective date which is slightly longer than the 30 day minimum for non-emergency rulemakings. There are delayed implementation dates for some survival equipment to allow manufacturers to prepare for increased demand without compromising safety. The final rule has taken this into consideration in §§ 28.110, 28.115, 28.120, 28.135, 28.145, 28.150, 28.210, and 28.270.

Units of Measure

It is recognized that English units of measure are still the preferred unit used in this country; however, in keeping with the trend to convert to international units, they are also used in this rulemaking. The exception to this is the use of nautical mile, which is universally used in the maritime industry and the units used in this preamble which are in English units only.

Discussion of Comments and Changes

In response to the NPRM nearly 500 comment letters were submitted. Some of these were very detailed in the comments and suggestions, while others consisted of form letters showing simply opposition or support on a section by section basis without detailed comments or suggestions. Due to the large number and repetitiveness of many of the comments, each one will not be addressed here. Each comment letter, as well as each oral presentation made at the 13 public hearings, has been considered in development of these final rules.

Subpart A—General Provisions

This subpart applies to all commercial fishing industry vessels and contains the definitions of terms used in part 28, except for definitions that relate to the stability requirements in subpart E, reporting requirements for casualties and injuries, and other administrative provisions. The rules in this subpart are applicable to all vessels, vessel owners, underwriters of primary insurance, and seamen employed on commercial fishing industry vessels.

Section 28.40 Incorporation by Reference

This section lists the industry standards that are incorporated by reference and the corresponding sections where each standard is referenced as the governing requirement.

In the interest of keeping the regulations as uncomplicated as possible, the number of standards incorporated by reference has been minimized. Instead, performance type standards have been used extensively. There were no significant comments submitted which addressed these standards; however, some minor corrections have been made.

In November, 1989, the International Maritime Organization (IMO) published Resolution A.658(16) "Use and Fitting of Retro-Reflective Materials on Life-Saving Appliances." This has been incorporated into this final rule. It supersedes Maritime Safety Committee

(MSC) Circular 513 "Guidelines Concerning the Use and Fitting of Retro-reflective Materials in Life-Saving Appliances" which was listed in the NPRM, but contains the identical information.

American Boat and Yacht Council (ABYC) Project H-32-1987, "Ventilation of Boats Using Diesel Fuel" has been changed to H-2-1989 "Ventilation of Boats Using Gasoline" in § 28.335, which deals with ventilation of spaces containing gasoline. Project H-2 is considered to be a more appropriate standard for spaces containing gasoline and is very similar in content to Project H-32. Project H-2 will add ventilation requirements not included in Project H-32. Project H-32 did not address the need to ventilate spaces which could contain gasoline vapors, a known explosion hazard. Additionally, Project H-33-1984, "Diesel Fuel Systems," has been changed to H-33-1989. This updating from the 1984 version to the 1989 version will not change the requirements markedly. The 1984 version of this standard can no longer be obtained since it has been superseded by the 1989 version.

Underwriters Laboratories standard 710-1984, "Exhaust Hoods for Commercial Cooking Equipment" has also been updated to the 1990 version, which is now entitled "Exhaust Hoods for Commercial Cooking Equipment." Standard 710-1990 differs from the earlier 1984 version in technical areas affecting only the manufacturers.

The American Society for Testing and Materials (ASTM) has recently published standard F 1321 "Standard Guide for Conducting a Stability Test (Inclining and Lightweight Survey) to determine the Lightship Displacement and Centers of Gravity of a Vessel." This standard has not been incorporated here, but is expected to be proposed for incorporation by reference in the SNPRM to supplement the information in §§ 28.535 and 170.185.

The National Fire Protection Association Standard 70 (also known as ANSI/NFPA 70) has recently been updated and republished as NFPA 70-1990. The NPRM proposed NFPA 70-1984. This rule incorporates the new edition, NFPA 70-1990, since earlier editions can no longer be obtained. There are no substantial differences between the two versions of NFPA 70 in the sections referenced, 310-13, 310-15, and 250-95. Section 28.040 of the NPRM incorrectly omitted reference to § 28.370 which refers to NFPA 70. This omission has been corrected in this final rule.

Section 28.50—Definition of Terms Used in This Part

This section has been modified to include additional requirements for "North Pacific Area." The NPRM referenced 50 CFR 210.1 for this definition. Rather than reference another regulation, the definition has been included here for both clarity and convenience by both the industry and the Coast Guard enforcement officials.

The definitions of "accepted organization" and "similarly qualified organization" have been simplified to refer to two new sections, §§ 28.073 and 28.076, which describe the criteria for designation as one of the organizations. The criteria in these sections are similar to the definitions in the NPRM.

Section 28.73—Accepted Organizations

This section has been added to clarify that organizations must request in writing designation as an accepted organization and the criteria under which those requests will be evaluated. See also the discussion under § 28.050.

Section 28.76—Similarly Qualified Organizations

This section has been added to clarify that organizations must request in writing designation as a similarly qualified organization and the criteria under which those requests will be evaluated. See also the discussion under § 28.050.

Section 28.80—Report of Casualty

This section has been slightly modified based upon comments received in response to the NPRM, including those from the Marine Index Bureau. The Coast Guard published a notice in the Federal Register (55 FR 21477) on May 28, 1990, accepting the Marine Index Bureau as an organization authorized to receive and process commercial fishing industry vessel casualty data.

Weather conditions must be included in a report of casualty only if the weather caused or contributed to the casualty. The NPRM had indicated that weather conditions were to be reported for every casualty.

Information concerning fishing license numbers and type of fishing gear in use at the time of a casualty is not needed for statistical or enforcement purposes and these provisions have been removed from the listing of required information in the final rule.

The proposed requirement for a report of a casualty to include the seaworthiness of the vessel after a casualty has been removed from the final rule, since this information can be

derived from the other information reported.

If the casualty is required to be reported to a Coast Guard Marine Safety or Marine Inspection Office on Form CG 2692, in accordance with 46 CFR part 4, a separate report to the Coast Guard is not required from the owner, agent, operator, master, or individual in charge to comply with the requirements of this section. However, that casualty would also be reported to the Marine Index Bureau by the underwriter of primary insurance under the provisions of paragraph (b).

Currently, 46 CFR 4.05-1 requires the following casualties to be reported to the nearest Coast Guard Marine Safety or Marine Inspection Office as soon as possible after the casualty:

(1) All accidental groundings and any intentional grounding which meets any of the other criteria listed below or which causes a hazard to navigation, the environment, or the safety of the vessel.

(2) Loss of main propulsion or primary steering, or any associated component or control system, the loss of which causes a reduction of the maneuvering capabilities of the vessel.

(3) An occurrence which materially and adversely affects the vessel's seaworthiness or fitness for service or route.

(4) Loss of life.

(5) Injury which requires professional medical treatment beyond first aid and, in the case of an individual engaged or employed on board a vessel in commercial service, which renders the individual unfit to perform routine vessel duties.

(6) An occurrence not meeting any of the above criteria but resulting in damage to property in excess of \$25,000.

The owner, agent, operator, master, or individual in charge of the vessel is required to report the casualty to the underwriter of primary insurance for the vessel or to the Marine Index Bureau. The underwriter of primary insurance is required to report each casualty to the Marine Index Bureau within 90 days of receiving notice of the casualty and whenever it pays a claim resulting from a casualty. Information furnished by underwriters of primary insurance to comply with the provisions of this section is exempt from disclosure under the Freedom of Information Act because it is commercial and financial information which, if disclosed, would be likely to cause substantial harm to the competitive position of the underwriter. The Coast Guard intends to treat such information as exempt from disclosure. However, compiled information that does not contain information that is likely to cause harm

to the competitive position of underwriters of primary insurance will be releasable.

Section 28.90—Report of Injury

This section requires each individual when in the service of a commercial fishing industry vessel, to report every injury or illness to the master, individual in charge of the vessel, or other agent of the employer within seven days of the injury or illness. The purpose of this provision is to ensure that the employer, or his representative on board the vessel, is aware of all injuries and is provided with an opportunity to correct an unsafe or dangerous condition.

Subpart B—Requirements for all Vessels

This subpart contains regulations which apply to every commercial fishing industry vessel in response to section 4502(a) of the Act. The requirements of this subpart are in addition to the remainder of the requirements of 46 CFR subchapter C, which also apply to commercial fishing industry vessels. A statement to that effect has been added to § 28.100 for clarity.

Section 28.105—Lifesaving Equipment—General Requirements

This section simply restates the existing requirement that life preservers, immersion suits, and other lifesaving equipment required in 46 CFR part 25, subpart 25.25 be carried on board commercial fishing industry vessels. This is in addition to the requirements in this subpart.

The Coast Guard considered requiring work vests (Type V personal flotation devices approved under 46 CFR 160.053) for those individuals working on the open deck of commercial fishing industry vessels. The Committee recommended that work vests not be required because work vests are bulky and interfere with the normal work of personnel on the decks of commercial fishing industry vessels. In some evolutions on commercial fishing industry vessels wearing a work vest may actually add to the hazards since the work vests can be snagged by nets being paid out and increase the likelihood of individuals entering the water accidentally. For these reasons work vests are not worn by most commercial fishing industry individuals. The Coast Guard agreed with the Committee recommendation and no work vests are required in this final rule. The Coast Guard does support the voluntary use of work vests, whether approved or not, when such use will not create an added safety hazard.

Section 28.110 Life Preservers or Other Personal Flotation Devices

In addition to the requirements of 46 CFR part 25, subpart 25.25, this section requires installation of life preservers, immersion suits, and other personal flotation devices (PFDs) on certain vessels. Equipment which is in addition to that already required under 46 CFR part 25, subpart 25.25, is required to be on board after November 15, 1991, as explained below.

Specific comments were requested from equipment manufacturers on their ability to meet an increased demand for the life preservers, immersion suits, and the other personal lifesaving devices in the NPRM. Several of these manufacturers indicated that there would be a problem with adequate supply of personal lifesaving equipment as a result of this rulemaking. Manufacturers are generally not willing to increase stocks of equipment in anticipation of changes in regulations.

The reason for this is that the regulatory process has inherent uncertainties including delayed rulemaking, requirements which differ between the NPRM and the final rule, grandfathering provisions, and delayed implementation dates, none of which are known until publication of the final rule. This uncertainty can place manufacturers at economic risk if they produce products in anticipation of a final rule that are not required by the final rule. In other words, the regulations create a demand and there is no supply until that demand is created. For this reason a delayed implementation for PFDs, ring life buoys, and distress signals has been included in this rulemaking. The delay is for approximately 3 months after publication of these rules in the Federal Register, which corresponds to November 15, 1991.

Paragraph (b) has been added to this rule to amplify the intent of 46 CFR part 25, subpart 25.25 and section 4502(b) of the Act. The intent of these sections is to have the required wearable PFDs so located on board the vessel that in an emergency, such as the rapid sinking of the Aleutian Enterprise, individuals on board do not have to search throughout the vessel to find a PFD. In some instances this will require that immersion suits or other wearable PFDs be provided in duplicate for some individuals such as those whose normal work station is not near their berthing area, where may wearable PFDs are typically stowed. This may be the case on larger fish processing vessels for processor workers, engineering department personnel, or deck

watchstanders. This requirement is considered to simply be a reiteration of the requirement of 46 CFR part 25, subpart 25.25, as referenced in paragraph (a) of this section. Section 4502(b)(3) of the Act calls for regulation which require "at least one readily accessible immersion suit for each individual on board * * *."

Section 28.110 also requires that each documented vessel that operates on the Great Lakes or on waters seaward of the Boundary Lines, except those that operate between 32° N. and 32° S. latitude, carry at least one immersion suit or exposure suit of the proper size for each individual on board. At least one immersion suit or exposure suit is also required for individuals on board a vessel that operates on cold waters on either coastal waters or more exposed routes. Present regulations for freight vessels and tank vessels, in which exposure suits are required, establish exemption lines at 35° N. and 35° S. worldwide, except in the Atlantic Ocean, where the lines are 32° N. and 32° S. Since the winter water temperatures in the Pacific Ocean near the coastline of the U.S. are colder than in the Atlantic Ocean at the same time of the year, 32° N. and 32° S. exemption lines are established for commercial fishing industry vessels. The expected water temperature at 32° N. is at least 59 °F. at all times during the year in the coastal areas of North America. Reference to the "high seas" in the NPRM has been deleted for simplicity. This is not expected to affect safety.

The immersion suits are required to be of the proper size for each individual on board. Until recently, the Coast Guard approved three sizes of immersion suits. These sizes are: "Child/small adult" for individuals between 20 kg (196 Newtons or 44 lb.) and 50 kg (490 Newtons or 110 lb.), "adult" for individuals between 50 kg (490 Newtons or 110 lb.) and 150 kg (1471 Newtons or 330 lb.), and "oversize adult" for individuals over 150 kg (1471 Newtons or 330 lb.). These size classes were originally intended for large inspected vessels, where the "adult" suit would be adequate, if not well fitting, for almost every individual on board. The "child/small adult" and "adult oversize" suits are available for the few individuals outside the normal adult suit size range. This sizing philosophy allows for suits to be stowed on the vessel without being assigned to any one particular individual.

The Coast Guard recently approved intermediate sizes of immersion suits, as being equivalent to the "adult" size when they are assigned to an individual.

Many comments submitted in response to the NPRM and at the public hearings revealed that the layout of table 28.110 in the NPRM was confusing. The table has been rearranged to alleviate the confusion. The primary entry criteria for each table should be the waters on which the vessel is to be operated. This is necessary to comply with the intent of the Act which requires immersion or exposure suits for certain waters. The Coast Guard believes that immersion suits are of critical importance in cold waters where hypothermia can cause death in a matter of only minutes. The immersion suits provide a measure of thermal resistance to temperatures to allow enough time for rescuers to reach individuals in the water. Therefore, they are required equipment for all vessels in cold waters, except well sheltered waters such as rivers as allowed by the definition of "coastal waters" in § 28.050. In other waters, the type of PFDs required is dependent upon vessel length to remain consistent with the current requirements for uninspected vessels.

Some comments correctly indicated that there are currently no approved immersion or exposure suits for individuals under 44 pounds. As indicated in the NPRM, the Coast Guard has requested that immersion suit manufacturers consider development of performance standards and design guidelines for immersion suits suitable for individuals weighing less than 20 kg (196 Newtons or 44 lb.), which might be appropriate for children. To date there are still no approved immersion suits suitably sized for an individual weighing less than 44 pounds (196 Newtons).

This is a particular problem in the north Pacific area where there are a large number of family operations. In these operations, the entire family, including young children, participate in the fishing activities. These children could not legally participate, as proposed in the NPRM, since there would have to be an approved, appropriately sized immersion suit for each individual on board, yet there is no immersion suit approved which is of an appropriate size.

As a consequence, provisions have been added to table 28.110 to allow substitution, for the next four years, of another type of PFD for individuals under 44 pounds (196 Newtons) where an immersion or exposure suit is required. This period should allow interested manufacturers time to design and obtain approval of those size immersion suits.

One comment pointed out that manned barges employed in commercial fisheries were exempt from the PFD requirements as proposed. The wording of § 28.110(a) has been revised to ensure that this type of vessel is included in the final rule.

Section 28.115 Ring Life Buoys

This section expands the requirement for ring life buoys set forth in 46 CFR subpart 25.25 for vessels of more than 65 feet (19.8 meters) in length by requiring 2 additional ring life buoys. Currently, 46 CFR part 25, subpart 25.25 requires only one ring life buoy for a vessel of more than 26 feet (7.9 meters) in length. The purpose of this rule is to ensure that there are sufficient ring life buoys on board so that at least one is readily available at various points on the vessel.

Working on an open deck in a harsh environment, such as is done on board commercial fishing industry vessels, is hazardous, especially in light of the large openings in railings and bulwarks that are necessary for setting and retrieving fishing gear. Ring life buoys, conveniently located on deck, could be crucial in aiding an individual that has fallen or been washed overboard.

Several comments indicated that the NPRM would require owners of vessels between 26–65 feet (7.9–19.87 meters) in length to purchase a 24 inch (0.61 meters) ring life buoy to replace a perfectly good 20 inch (0.51 meters) ring life buoy that is currently on board their vessels or to replace previously approved white ring life buoys. The Coast Guard agrees that this would be an unnecessary added expense. Therefore, an existing 20 inch (0.51 meters) or larger ring life buoy will be permitted to remain on board regardless of color (white or orange) to meet the requirements of this section as long as it is in good and serviceable condition.

Several comments expressed the opinion that a line 90 feet (27.4 meters) in length attached to a ring life buoy was excessive. The Coast Guard agrees that this length is not necessary for smaller vessels as was proposed. Therefore, vessels under 65 feet (19.8 meters) in length need only be equipped with a line of 60 feet (18.3 meters) in length.

Some comments stated that a ring life buoy is an unnecessary piece of equipment on board a vessel with only one individual on board. The Coast Guard disagrees. A ring life buoy is a relatively inexpensive piece of equipment which is invaluable when rendering assistance to others. Also, in the event of a capsizing, it should be available for use by the operator. The

current regulations for pleasure vessels over 16 feet (4.9 meters) in length require a Type IV PFD regardless of the number of individuals on board.

As previously mentioned in the discussion of § 28.110, a delayed implementation until November 1, 1991, has been included for ring life buoys to permit manufacturers to meet the expected increased demand.

It should be noted that ring life buoys with approval numbers in the 160.009 series are no longer obtainable. However, those ring life buoys are still acceptable if in good and serviceable condition.

Section 28.120 Survival Craft

This was § 28.125 in the NPRM. The requirements for survival craft are contained in this section. A survival craft such as a lifeboat or liferaft extends survival time by keeping survivors of a casualty out of the water to prevent death from hypothermia and drowning. Survival craft become more important when the vessel operates in colder waters, waters further from potential rescuers, and in more adverse weather and sea conditions. Immersion suits play an important role in extending survival time, but they do not replace and are not as effective as survival craft that keep individuals out of the water.

The requirements for survival craft are graduated based upon the area of operation. The minimum requirement for the most exposed routes is inflatable liferafts with enough total capacity to accommodate all individuals on board. The inflatable liferafts must be of the same "ocean service" or "SOLAS" (International Convention for the Safety of Life at Sea, 1974, as amended) (SOLAS 74/83) type that are currently used on inspected commercial vessels that operate in ocean service.

For vessels on less exposed routes (generally closer to shore), a less sophisticated liferaft may be used. The Coast Guard is considering approval of a "coastal" liferaft that would not include as much equipment, and might not be required to have an inflatable floor or insulated canopy. The details of the proposed standards for "coastal" liferafts will be published in the Federal Register under CGD 85–205, RIN 2115–AC51.

The inflatable buoyant apparatus is another device accepted for use in less exposed waters, and for vessels in ocean waters where the Act only provides authority to require buoyant apparatus. This device resembles an inflatable liferaft, except that it has no canopy or equipment packs, and can be used effectively while floating either side up.

In waters close to the coastline where water temperature is normally above 59 °F (15 °C), the minimum required equipment is a buoyant apparatus (rigid) or life float. These devices provide some flotation for survivors, but do not support them completely out of the water. They are suitable for use only where rescue is close at hand and hypothermia is not an immediate threat. In other warmer, more protected waters, survival craft would not be required. The life preservers and, in some cases, immersion suits would provide flotation in most abandon-ship emergencies.

Section 28.105 would also require survival craft required by § 28.120 to be Coast Guard approved. However, unapproved survival craft of a type similar to that required by § 28.120 will be permitted on vessels fitted with them, if that survival craft was on board on the effective date of these regulations, is serviced annually as required by § 28.140, and remains in good and serviceable condition.

Paragraph (e) explains that for unapproved inflatable liferafts, table 28.120 (a), (b), or (c) may not specify an equipment pack; in these instances a coastal equipment pack is required. Under § 28.130, unapproved inflatable liferafts on vessels in ocean service that operate beyond 50 miles from the coastline or beyond 20 miles from the coastline in cold waters, have to be provided with the survival equipment packs appropriate for their service.

Under § 28.120 there is a graduated implementation schedule for having survival craft on existing commercial fishing industry vessels. Existing, documented vessels that operate in the North Pacific area (generally north of the Strait of Juan de Fuca) would have to comply by September 1, 1992. Existing, documented vessels that operate on the Great Lakes or in the Atlantic Ocean, north and east of a line drawn at a bearing of 150° true from Watch Hill Light, Rhode Island, must comply with this section by September 1, 1993. All other existing, documented vessels must comply with this section by September 1, 1994. By September 1, 1995, all vessels, including state numbered vessels, would have to comply with this section.

Under § 28.305, there is no graduated implementation schedule for survival craft on vessels built after or which undergo a major conversion completed after the effective date of the regulations. On the date they first operate, or the date on which they first operate after the conversion is completed, survival craft are required to comply with § 28.120.

After reviewing a draft of the NPRM, the Committee recommended to the Coast Guard that the proposed requirements for survival craft applicable to vessels that operate beyond the Boundary Lines include a requirement to carry an inflatable liferaft. While the Coast Guard agreed in principle with the Committee, the Act gives limited authority in the area of survival craft, and inflatable liferafts cannot be required on all vessels that operate beyond the Boundary Lines.

Two other rulemakings would require certain inspected vessels to increase the number of inflatable survival craft which they carry. One of these rulemakings involves the proposed revision of the requirements for small passenger vessels published on January 30, 1989 (54 FR 4413), CGD 85-080, RIN 2115-AC22, 46 CFR Subchapter T, Small Passenger Vessel Inspection and Certification. The second is a proposed revision to the lifesaving requirements for large inspected vessels published on April 21, 1989 (54 FR 16198), CGD 84-069, RIN 2115-AB72, 46 CFR Subchapter W, Lifesaving Equipment.

The Coast Guard is concerned about the combined effect of these rulemakings on the ability of the inflatable survival craft industry to respond to the demand without having an adverse affect on the quality of the survival craft and the cost to the purchaser. As a consequence, the phased implementation schedule for requiring inflatable survival craft on commercial fishing industry vessels is intended to spread out the demand for inflatable survival craft, while ensuring that vessels subject to the higher risks, such as those in the north Pacific area, are equipped with survival craft at the earliest practicable date.

Some comments stated that proposed table 28.125 was difficult to comprehend due to the many variables needed to determine the type of survival craft required. The Coast Guard agrees and the table has been split into three separate tables, one for documented vessels, one for undocumented (state registered) vessels with less than 16 individuals on board, and one for undocumented vessels with more than 16 individuals on board. Further clarification is provided by using the Boundary Lines to describe the areas of operation as an entry variable for the tables, but without regard to the location of "high seas." It was felt that some of the confusion caused by the table in the NPRM resulted from trying to describe the area of operation in reference to two lines of demarcation, namely the Boundary Lines and the line marking the

territorial seas, seaward of which is the high seas. This is not expected to degrade safety but simply allow for easier use of the tables by all interested parties.

The tables in § 28.120 are complicated by the need to ensure that every combination of vessel type, number of individuals, area of operation, water temperature, and vessel length are included, even though some combinations are unlikely. For instance, table 28.120(c), undocumented vessels with more than 16 individuals on board, contains an entry for a vessel less than 36 feet (11 meters) in length. While a vessel operating in such fashion is possible, it is unlikely.

Some comments stated that existing unapproved inflatable liferafts should be allowed to continue in service. The Coast Guard agrees and this section has been modified to allow for continued use of unapproved inflatable liferafts installed before September 15, 1991, so long as these liferafts meet the annual servicing requirements in § 28.140, are equipped with the required equipment pack, and are maintained in good and serviceable condition.

Several comments stated that the rules should allow a skiff or other auxiliary craft carried on board and normally used in fishing operations to be substituted for an inflatable liferaft, as well as for other survival craft, since this was the intent of the drafters of the Act. The Coast Guard disagrees that the intent of the Act was to allow substitution of any auxiliary craft on board a vessel for any required survival craft.

The Act does not address substitution of survival craft. In fact, section 4502(b)(2) of the Act requires regulations for lifeboats or liferafts on documented vessels operating outside the Boundary Line or with more than 16 individuals on board. The legislative history of the Act does address the matter of a skiff or a small vessel being used as a substitute for survival craft. However, inasmuch as the Act is clearly worded and does not address this substitution, the Coast Guard's opinion is that Congress intended the Coast Guard to have discretion in choosing the conditions under which such a substitution is appropriate. A skiff, a small vessel, or another auxiliary craft is, in most cases, an open vessel, or another auxiliary craft is, in most cases, an open vessel without built-in internal buoyancy. This type of craft may provide comparable protection as a buoyant apparatus, life float, or inflatable buoyant apparatus but is not considered to provide protection comparable to that offered by

an inflatable liferaft. Consequently, substitution of an auxiliary craft for an inflatable liferaft will not be authorized.

The NPRM contained provisions for substitution of auxiliary craft for buoyant apparatuses, life floats, and inflatable buoyant apparatuses under certain conditions. These provisions have been retained and this paragraph has been redrafted to clarify the conditions under which an auxiliary craft may substitute for a required survival craft.

One comment recommended that a short emergency actuator cord be installed in inflatable liferafts so that the entire painter need not be pulled from the container to inflate the raft. During the investigation of the sinking of the M/V Aleutian Enterprise, one of the survivors stated that having to pull the entire painter from the canister containing an inflatable liferaft while wearing his immersion suit took a very long time. This delayed inflation of the liferaft. While this did not result in any additional fatalities in this instance, in more adverse conditions rapid manual deployment of an inflatable liferaft could mean a higher probability of individuals surviving a casualty. The idea of making inflatable liferafts easier and quicker to deploy manually has merit, but is beyond the scope of this rulemaking. Interested manufacturers may wish to pursue this recommendation as a change to their presently approved rafts or when new rafts are submitted for approval.

Several comment letters and oral comments delivered at the public hearings expressed the opinion that survival craft should not be required on a vessel if it is unsinkable. The Coast Guard partially agrees with this concept and has added paragraph (h). This paragraph permits certain vessels which comply with 33 CFR part 183 for quantity of flotation to be exempt from the requirements for survival craft. These vessels must be less than 36 feet in length and generally operate within 12 miles of the coastline. While a craft that does not sink offers some flotation aid, it does not offer the same level of protection that survival craft provide. For this reason it is felt that the exemption for survival craft should be limited to those vessels which operate not more than 12 miles from the coastline.

Many comments expressed the opinion that survival craft are not necessary when operating near the coastline with only a small number of individuals on board. They also pointed out that small vessels did not have the room for the stowage of survival craft,

especially inflatable liferafts. They further pointed to problems, especially on trollers, with inflatable liferafts being unable to float free from a small capsized vessel because of the possibility of the liferaft hanging up on the vessel's rigging. Nearly all of the individuals submitting comments pointed to the high cost of inflatable liferafts in relation to the cost of their vessels and their income derived from commercial fishing activities.

The Draft Regulatory Evaluation identified this segment of the industry as being especially hard hit economically by the proposed rules. The Coast Guard is sensitive to the burden placed on owners of small commercial fishing industry vessels, especially those operating singly or with a crew of one or two individuals. Requirements for survival craft on these small vessels will be addressed in the SNPRM as previously mentioned. In the interim, vessels with less than 4 individuals on board operating within 12 miles of the coastline are exempted from this section by paragraph 28.120(b). This exemption was specifically chosen as a clear method for operators and enforcement officials to determine the need for survival craft since it does not vary geographically and is not tied to the location of the Boundary Lines. Most of the Boundary Lines are located closer to shore than 12 miles. However, where a Boundary Line is beyond 12 miles from the coastline, survival craft may be required.

Some comments stated that the definitions of "cold water" and "warm water" were not concise enough to be complied with or to enforce. The definitions remain unchanged in this rule, however, on May 20, 1991, the Coast Guard published Navigation and Vessel Inspection Circular (NVIC) 7-91, "Determination of Cold Water Areas" to provide guidance for all interested parties.

Section 28.125 Stowage of Survival Craft

This was § 28.130 in the NPRM. Survival craft are of no use to personnel if the survival craft are trapped by a sinking vessel. This section requires that survival craft be arranged to automatically float free from a sinking vessel or be readily accessible for launching. A float-free arrangement ensures that the survival craft will be available if the vessel sinks before the crew can prepare the survival craft for launching. Many capsizings and sinkings have occurred where there was no time to prepare survival craft prior to individuals abandoning the vessel. A recent sample of this was the sinking of

the M/V Aleutian Enterprise, in which the vessel sank in less than 10 minutes.

The NPRM specifically requested comments on the feasibility of the proposed requirement for all affected vessels. The Coast Guard requested information from owners of vessels that may not have room to stow float-free survival craft and alternative recommendations were solicited. As mentioned in the discussion of § 28.120, many owners of small vessels stated that the only location for survival craft was the top of the deckhouse. This caused concern because of the relatively high weight of some of the survival craft coupled with the relatively high height of stowage resulted in degradation of operational stability. While nobody was opposed to float-free survival craft, there were no recommendations for improvements to the stowage requirements proposed.

Section 28.130 Survival Craft Equipment

This was § 28.135 in the NPRM. This section requires survival craft equipment which is similar to those for inspected vessels. Inflatable liferafts are required to be packed with SOLAS A, SOLAS B, or Coastal Service equipment packs. Life floats, inflatable buoyant apparatus, and buoyant apparatus are not required to be equipped with equipment packs but would be required to be fitted with a lifeline, pendants, a painter, and a light.

Additionally, this section prohibits the carriage of survival craft other than inflatable liferafts, life floats, inflatable buoyant apparatus, or buoyant apparatus unless that survival craft complies with the requirements for installation, arrangement, equipment, and maintenance contained in 46 CFR part 94.

One comment suggested that the regulations be specific concerning the type of light that is required for survival craft. The Coast Guard agrees and amplifying information has been added. A floating electric water light with Coast Guard approval number series 161.010 is required (specification 46 CFR 161.010). A light is not required for inflatable buoyant apparatus, since a condition of approval is inclusion of a light.

Section 28.135 Lifesaving Equipment Markings

This was § 28.140 in the NPRM. Marking requirements for lifesaving equipment are contained in this section and are similar to the requirements published for inspected vessels in proposed 46 CFR subchapter W, Lifesaving Equipment, CGD 84-069, RIN 2115-AB72 (NPRM published April 21,

1989 at 54 FR 16198). Most floating items of survival equipment are required to be marked with the name of the vessel and with retroreflective material in accordance with the internationally agreed upon manner as outlined in the IMO Resolution A.658(16) (previously Maritime Safety Committee Circular 513), "Use and Fitting of Retro-Reflective Materials on Life-Saving Appliances." Inflatable liferafts and inflatable buoyant apparatus are exempt from the marking requirements of this section, since they are affixed with identification and retroreflective material, prior to packing, which can be used to identify them.

Marking of lifesaving equipment is intended to assist search and rescue operations by making the lifesaving equipment more visible and identifying the individual or the vessel from which the equipment originated. The NPRM proposed delayed implementation of up to one year for these requirements. The final rule retains this provision, although early marking is highly recommended.

The marking requirements for immersion suits in this section are related to the sizing issue discussed previously under § 28.110. Immersion suits may be marked with either the name of the vessel or the individual to whom the immersion suit is assigned. The main purpose for the marking of survival equipment is to enable identification of the vessel the equipment belongs to, in case it is found at sea or washed ashore. Marking an immersion suit with the name of the suit's owner or the individual to whom it is assigned would allow the suit to move with the individual from vessel to vessel without the need to continually remark it. Some fishermen have purchased personal immersion suits. This would also be especially helpful for those who have purchased the smallest and largest sizes of immersion suits. Having the name of the individual marked on the suit should still allow the vessel involved to be identified.

Section 28.140 Operational Readiness, Maintenance and Inspection of Lifesaving Equipment

This was § 28.145 in the NPRM. This section requires all (approved and unapproved) inflatable liferafts and inflatable buoyant apparatuses to be inspected and serviced annually at a Coast Guard approved liferaft servicing facility. New inflatable liferafts and inflatable buoyant apparatus would not have to be serviced until after they were two years old. A Coast Guard marine inspector is not required to witness

servicing of equipment for uninspected vessels.

The Coast Guard is considering approval of servicing facilities to service unapproved liferafts, as permitted in § 28.120(c), in order to facilitate the inspection and maintenance requirements for all liferafts, whether Coast Guard approved or not. Approval and servicing of inflatable liferafts is the subject of another regulatory project (CGD 85-205, RIN 2115-AC51). An NPRM on this subject is expected to be published in the Federal Register in 1991.

Many comments stated that the regulations should permit a three year interval between servicing for inflatable liferafts, because of servicing costs. The Coast Guard disagrees. Packed inflatable liferafts contain dated survival equipment which must be replaced. Additionally, manufacturers feel that the varying conditions of stowage and the fact that they have no control over those conditions or treatment of the liferafts after they are placed on board vessels makes annual servicing necessary to ensure reliability. During the course of an annual cycle the liferafts are subject to extreme temperature and humidity changes throughout which could effect the performance of a liferaft, if not serviced on an annual basis.

In a recent casualty in which there were no survivors, the vessel's inflatable liferaft was found. The annual servicing was more than a year overdue. This inflatable liferaft had one of the two buoyancy chambers ruptured. It is not clear whether the overdue servicing played a role in the chamber failure, or if the liferaft failure played a role in the fatalities, but any degradation or damage to the liferaft may have been discovered at the annual servicing.

Paragraph (d) has been added to this section to indicate that escape routes must not be obstructed. A recent casualty investigation questioned whether the escape routes were blocked by temporary stowage of materials being used on board the vessel. Good safety practice requires that escape routes not be in any way reduced in size or accessibility by ship's equipment, especially by temporary stowage of equipment or materials. The Act does not address such an obvious practice as ensuring escape routes are not blocked. The Coast Guard's position is that specific authority is unnecessary for a requirement such as this, which is clearly in keeping with the intent of the Act and requires no equipment modifications.

Section 28.145 Distress Signals

This was § 28.150 in the NPRM. This section requires visual distress signals on all commercial fishing industry vessels, except those operating on well sheltered waters such as rivers, as allowed by the definition of "coastal waters." Visual distress signals can be used to attract the attention of nearby vessels and aircraft, and are useful in alerting them to an emergency situation, or directing them to a vessel in distress. As specified in this section, vessels that operate beyond three miles from the coastline are required to carry the same type of flares and smoke signals as vessels that operate more than three miles from the coastline on the Great Lakes. In addition, vessels carrying inflatable liferafts must have distress signals packed in the liferafts as part of the SOLAS A, SOLAS B, or Coastal Service equipment packs required by § 28.130.

Vessels that operate in coastal waters, as defined in 33 CFR 175.105(b), and within three miles of the coastline on the Great Lakes are required to carry the visual distress signals required for recreational boats under 33 CFR part 175, subpart C. Coastal waters include certain large bodies of water such as bays, sounds, harbors, rivers, and inlets where any entrance exceeds 2 nautical miles between opposite shorelines.

Distress signals complying with these requirements must be on board affected vessels not later than 2 months after the effective date of the regulations. In the NPRM, the Coast Guard requested that equipment manufacturers specifically identify problems with supplying large numbers of distress signals on relatively short notice. While there were few comments directed to this concern, the discussion in § 28.110 concerning delayed implementation dates is applicable.

One comment indicated that the Boundary Line geographical break point in table 28.150 (now Table 28.145) caused confusion in interpreting the table. The confusion resulted from the fact that the Boundary Lines extend more than 3 miles from the coastline in some areas. The Coast Guard agrees and the wording has been clarified by deleting the Boundary Lines as a delineator from the table.

A few comments pointed out typographical errors in approval numbers in table 28.150 of the NPRM, now table 28.145. There was one typographical error which has been corrected, but discussion here of approval number series in general should alleviate some confusion. Several items of survival equipment with

approval number series that begin with 160.0XX can also receive the approval number 160.1XX. The "1" replaces the "0" when the approved item also meets the requirements of SOLAS 74/83. For vessels more than 50 miles from the coastline, table 28.145 requires specific SOLAS 74/83 equipment. For vessels closer to the coastline, an option is provided since SOLAS 74/83 approved equipment is not required.

Some comments opposed the requirement for distress signals close to shore. The Coast Guard's position is that this equipment is essential for all vessels not in well sheltered waters. It is recognized that in an emergency a radiotelephone is often used to summon nearby vessels or rescue resources. However, because radiotelephones are dependent upon an electrical source of power they are not always reliable, even when equipped with an emergency source of electrical power. If distress signals are not available, the vessel will have no means to summon assistance. For vessels close to the coastline, the signal requirements are the same as those which have been in effect for recreational boats for over 10 years.

Section 28.150 Emergency Position Indicating Radio Beacons (EPIRBs)

This was § 28.155 in the NPRM. On the same date that the NPRM was published, April 19, 1990, a separate notice of proposed rulemaking concerning EPIRB carriage on uninspected vessels, including commercial fishing industry vessels, was published (56 FR 14922) under CGD 87-016, RIN 2115-AC69. That NPRM was in response to the mandate of the EPIRBs on Uninspected Vessels Requirements Act, Public Law 100-540. All comments concerning EPIRBs on commercial fishing industry vessels submitted in response to the NPRM on this rulemaking were considered in developing the final EPIRB regulations for uninspected vessels. Those final regulations are expected to be published in the Federal Register soon under CGD 87-016a, RIN 2115-AC69. In order to prevent redundancy, § 28.150 has been amended to merely refer to the requirements for EPIRBs on all uninspected vessels, including commercial fishing industry vessels, in 46 CFR 25.26-1.

There has also been a provision added to this section that calls attention to the Federal Communication Commission requirements for a Ship Radio Station License in 47 CFR part 80.

Section 28.155 Excess Fire Detection and Protection Equipment

This was § 28.160 in the NPRM. This section allows fire fighting and fire detection equipment which is not required, provided it does not endanger the vessel or the personnel on board and is listed and labeled by an independent nationally recognized testing laboratory. Provisions have been added to clarify that excess equipment installations must be in accordance with appropriate industry standards for design, installation, and maintenance.

The terminology used to describe the laboratory that lists and labels the excess equipment has been changed to "an independent, nationally recognized testing laboratory" for clarification. This same wording is now also used for fixed gas fire extinguishing system components in § 28.320.

Section 28.160 Portable Fire Extinguishers

This was § 28.165 in the NPRM. This section requires portable fire extinguishers for all vessels. Vessels of not more than 65 feet in length, including sail powered commercial fishing industry vessels such as "skipjacks", are required to meet the existing regulations for portable fire extinguishers in 46 CFR part 25, subpart 25.30. In addition to the requirements of 46 CFR part 25, subpart 25.30, vessels over 65 feet in length are required, as a minimum, to carry the portable fire extinguishers specified in table 28.160 (Table 28.165 in the NPRM). The requirements in this section are similar to those for inspected vessels and have not been changed from the NPRM.

Section 28.165 Injury Placard

This was § 28.170 in the NPRM. This section requires specific wording on and construction of an injury placard required by the Act in 46 U.S.C. 4502(a)(8) and 10603, to be aboard all commercial fishing industry vessels. The NPRM (§ 28.170) would have required the placard to be at least 8½ inches by 11 inches and be posted in a prominent place accessible to the crew. A number of comments objected to this requirement. The Coast Guard must keep the regulation because it is specifically required by the Act in 46 U.S.C. 4502(a)(8) and 10603. Other comments stated that an 8½ inch by 11 inch placard was too large. The Coast Guard agrees. The size has been reduced to 5 inches by 7 inches.

The format of the placard as originally published in the NPRM has also been changed. The Coast Guard has published NVIC 4-89 "Introduction to

Human Factors Engineering." The NVIC contains a labeling overview section, a synopsis of techniques, and examples of effective labeling. Use of this NVIC will increase the readability and effectiveness of labels. The NVIC addresses reader familiarity, brevity, format, characters, and numbers and location. Anyone responsible for providing the injury placard, the emergency instructions, or any other type of label or marking should use the NVIC 4-89 as a reference. The revised placard format applies human factors engineering labeling techniques to increase the readability and effectiveness of the placard. Specifics such as letter size are subject to human variables, such as how far away from the placard the reader will be, and will not be made a part of the regulation.

Subpart C—Requirements for Documented Vessels That Operate Beyond the Boundary Line or With More than 16 Individuals On Board**Section 28.200 Applicability**

This section describes the applicability of this subpart. This subpart implements the mandate of 46 U.S.C. 4502(b). The requirements of this subpart are in addition to the requirements of subparts A and B. This subpart applies to all documented vessels that operate with more than 16 individuals on board and all documented vessels that operate beyond the Boundary Lines. The Boundary Lines are described in 46 CFR part 7, and the rules for documenting vessels are contained in 46 CFR part 67. An individual is any individual on board for any reason.

During the public hearing, several speakers requested that the Coast Guard modify the locations of the Boundary Lines to make application of the regulations more consistent geographically and to bring the level of risk into closer agreement with the area of operation. For instance, it was pointed out that the waters of Cook Inlet, Alaska, are some of the most treacherous fishing grounds contiguous to the United States. However, these waters are inside the defined Boundary Line, and thus, vessels operating in Cook Inlet would be subject to survival craft requirements that are not appropriate. The Coast Guard agrees that the location of the Boundary Lines may seem inconsistent, if viewed from the perspective of any one set of regulations. There are many regulations in which the location of the Boundary Lines plays a part and these must also be considered in determining the location of Boundary Lines. While there

are instances besides Cook Inlet where using the appropriate Boundary Line as a means of assessing risk seems inappropriate, modifying the location of a Boundary Line for the purposes of these regulations could be considered as an attempt to circumvent certain mandates of the Act. That is not the Coast Guard's intention and modifying the location of a Boundary Line in any locality is beyond the scope of this rulemaking.

The Coast Guard evaluates requests for modification of a Boundary Line on merit. If there are compelling reasons for modifying the location of a Boundary Line, considering all factors, a rulemaking project is initiated.

Section 28.205 Fireman's Outfit and Self-Contained Breathing Apparatus

This section contains requirements for the carriage of at least two fireman's outfits on vessels with more than 49 individuals on board. A fireman's outfit was proposed in the NPRM as an aid for rescuing trapped individuals in the event of a fire. Vessels with more than 49 individuals on board are likely to be relatively large with many accommodation spaces and large, more complicated work spaces than the typical commercial fishing industry vessel. The likelihood of fire increases as the number of work spaces and the size of the work spaces increases. Fireman's outfits are considered necessary to allow for the rescue of individuals liable to be trapped during a fire and to aid in fighting a fire. Several comments pointed out that it was poor practice to have only one fireman's outfit and recommended that at a minimum two should be required; one to accompany the other. The Coast Guard agrees and this section has been modified to require at least two fireman's outfits. NVIC 4-68, "Protective Equipment Required for Fireman's Outfits," provides useful guidance for selection of equipment for these outfits.

Some comments pointed out that ammonia is used as a refrigerant on some large vessels. The health hazards of ammonia are well known, and these comments recommended that such vessels should be required to be equipped with Coast Guard approved self-contained breathing apparatuses (SCBAs).

The Coast Guard agrees that there should be protection from this potential health threat and has modified this section to include a requirement for SCBAs for vessels which use ammonia as a refrigerant. For the same reason as fireman's outfits, two SCBAs are the required minimum. Additionally, at least

one spare air bottle is required for each SCBA. The Coast Guard encourages the carriage of extra air bottles to provide an opportunity to participate in "hands on" drills with individuals actually wearing the SCBAs.

In an effort to facilitate obtaining the required equipment and reduce the burden on the industry, the Coast Guard is moving toward accepting readily available equipment which is designed and used for purposes similar to that for which the Coast Guard has developed specific requirements. Consequently, paragraph (e) of this section requires each self-contained breathing apparatus to be approved by the Mine Safety and Health Administration (MSHA) and by the National Institute for Occupational Safety and Health (NIOSH) rather than be approved under Coast Guard specifications in 46 CFR part 160, subpart 160.011 as proposed in the NPRM. This equipment is further required to have as a minimum a 30 minute air supply, and a full facepiece. This paragraph should make it easier to obtain the required self-contained breathing apparatus.

Section 28.210 First Aid Equipment and Training

A number of comments expressed a desire to have the rules include a list of contents for the medicine chests and first aid kits. The Coast Guard does not wish to develop detailed regulations for the first aid equipment for the many different categories of commercial fishing industry vessels. The Coast Guard prefers performance type requirements instead of a detailed list of equipment. Consequently, no change has been made.

The Coast Guard considers it to be the owner's responsibility to ensure that each vessel is properly equipped. This includes determining the equipment that is necessary for the first aid kit. It is expected that many organizations, including the American National Red Cross, can provide recommendations on the equipment that is appropriate for each vessel. Many industry organizations such as the North Pacific Fishing Vessel Owners Association publish guidance for their members on minimum first aid equipment considered appropriate. It is the responsibility of the master or individual in charge of the vessel to ensure that the owner's first aid kit and medicine chest are properly maintained on board the vessel.

Some comments expressed concern for the proposed wording dealing with medicine chests " * * * stowed in a location accessible to all individuals on board." This wording was interpreted to require that any individual on board

have ready access to the medicine chest. This was not the intent of the proposed regulation and this portion of the rule has been reworded to require the first aid manual and medicine chest to be in a readily accessible location.

Several comments expressed concern that the remote location of some crewmen would make obtaining the required training burdensome and that the number of individuals required to obtain the training would also add to the burden. The Coast Guard recognizes this concern. However, as explained in the preamble to the NPRM, without proper training, the required first aid equipment is not as useful. The NPRM proposed an effective date two years after the effective date of the regulations before the training is actually required. This provision has been retained in the final rule to allow time to plan and attend the training, although the Coast Guard encourages pursuit of earlier training.

One comment addressed the difficulty in meeting the training requirement with transient crews. The Coast Guard is aware that some segments of the commercial fishing industry is transient, but is of the opinion that there is a core that comprises the majority of the industry that is not transient.

The proposed requirements concerning acceptable training courses are similar to those found in 46 CFR 10.205 for licensed individuals and, in fact, individuals in possession of a valid license will meet the requirements of this part. Section 28.210 contains no provisions for maintaining training certificates, such as periodic refresher courses, such as is commonly required to remain certified in CPR. While the Coast Guard supports periodic refresher training, such a requirement would be too burdensome on the industry and on the Coast Guard, which must enforce and administer these rules. It is hoped that conscientious owners and operators will voluntarily see that individuals periodically take refresher courses.

Section 28.215 Guards for Exposed Hazards

This section requires guards for exposed hazards. Running machinery is required to have hand covers, guards, or railings to reduce the chance of personnel being injured while working around the moving gears, belts, and chains. These guards are required to be retro-fitted on existing vessels after the effective date of the regulations, if not already so equipped. The economic impact of retrofitting guards is expected to be small. Because it is considered good marine practice to have machinery guards and rails, the larger vessels likely

to be subject to this section probably have guards installed already.

This section has been slightly modified to clarify the intent of the regulation. "All hot exhaust pipes" has been replaced with "each exhaust pipe from an internal combustion engine which is * * *." Paragraph (a) has been added to make it clear that the requirements of this section apply to every space on board a vessel. This clarification is meant to alleviate questions concerning protection of individuals working on fish processing equipment in particular.

Section 28.225 Navigational Information

This section requires each vessel to have on board adequate up-to-date charts necessary to safely navigate on each voyage. Other navigational information appropriate for an intended voyage is also required. Vessels of 39.4 feet in length or over would be required to maintain a copy of the Inland Navigation Rules when operating inside the COLREG demarcation line.

Requiring nautical charts and compasses (see § 28.230) is intended to help vessel operating personnel navigate without grounding. Operating personnel should always know the correct position of the vessel and be able to use a chart to determine a safe course to steer using the compass. Charts are also being required to help operating personnel determine their position when assistance is needed.

A number of comments suggested that the proposed regulation was too general and that provisions should be made to specify what nautical charts or appropriate information is required. The Coast Guard agrees and is amending the rules to better describe what type of charts are required, and specify the other appropriate information considered minimally acceptable for safe navigation.

A number of comments objected to the proposed requirement to keep charts up-to-date and recommended that this requirement be deleted. The Coast Guard disagrees and has not changed this requirement. As revised in this final rule the regulations specify that each chart used in navigation must be currently corrected. The Coast Guard must require this standard of care as a part of meeting the intent of the Act. It is generally recognized as good seamanship for all charts to be maintained in an up-to-date condition. Corrections are made to point out factors affecting safe navigation including changes in navigational hazards. The mechanism to ensure that

the latest navigational information is available is procurement of the monthly Notice to Mariners, published by the Defense Mapping Agency, available at no cost to vessel owners.

There were several comments regarding the requirement for carriage of the Inland Navigation Rules. This regulation is based on the Pilot Rules of Annex V of the Inland Navigation Rules. The Inland Navigation Rules are required on vessels of more than 39.4 feet in length when operating on U.S. inland waters. The proposed rule was reworded to clarify when a vessel is in U.S. inland waters. Since there is no collision regulations (COLREG) demarcation line in Alaska, that State contains no U.S. inland waters. Therefore, vessels operating in Alaskan waters are not required to carry the Inland Navigation Rules.

Section 28.230 Compasses

This section requires each vessel subject to this section to be equipped with an operable magnetic steering compass with a compass deviation table at the operating station. More sophisticated equipment such as a gyrocompass could also be fitted at the steering station for primary use; but a magnetic compass would still be required due to its reliability.

Section 28.235 Anchors and Radar Reflectors

This section combines §§ 28.235 and 28.240 of the NPRM. This section requires that each vessel be fitted with anchor(s) and chain(s), cable, or rope appropriate for the vessel and the waters of the intended voyage. There are many nautical books and classification society rules available for use as a guide in determining the appropriate size for an anchor as well as the appropriate size and length of cable, rope, or chain which is suitable for use with it.

Several comments asked that the Coast Guard provide a table with specific anchor and chain requirements. The Coast Guard prefers to keep the proposed performance standard rather than to list required anchor and chain sizes. The size of anchors, chain/cable as well as the length of the chain/cable is better left to the determination of the vessel owner. The owner's determination should be based upon manufacturer's information, nautical books, and classification society information.

Several comments asked that trawl doors be permitted to be used as substitutes for anchors. While the Coast Guard agrees that such large, heavy items could be adequate for holding the

vessel in place in many circumstances, they are not as effective as properly designed anchors. Consequently, these other devices will not be permitted as a substitute for anchors.

This section also requires each nonmetallic hull vessel, such as wooden or fiber reinforced plastic hull vessels, to have a radar reflector if the rigging of the vessel does not provide a radar signature from a distance of 6 nautical miles. Many small nonmetallic hull vessels have been struck while fishing, especially in inclement weather, because their radar signatures were inadequate to allow them to be detected.

No specific standards are being published for radar reflectors. Vessel owners should satisfy themselves that the radar reflector installed will allow their vessel to be detected by radar in all expected conditions of operation, including, but not limited to, situations where other vessels may be close at hand.

Section 28.240 General Alarm System

The NPRM did not propose requirements for a general alarm system, but several comment letters recommended requiring one. The Act at section 4502(b)(7) permits the Coast Guard to develop regulations for " . . . other equipment required to reduce the risk of injury to the crew during vessel operations" if it is determined that a risk of serious injury exists that can be eliminated or mitigated by that equipment. The Coast Guard believes that a general alarm system is such a system. The sinking of the Aleutian Enterprise highlighted the importance of the ability to notify all individuals on board a vessel in a timely and effective manner in the event of an emergency.

This section requires a general alarm system on each documented vessel that has an accommodation space or a work space which is not adjacent to the operating station and which operates outside of the Boundary Lines or that operates with more than 16 individuals on board. The general alarm system must be capable of notifying individuals on board in any accommodation space or work space where they may normally be employed. If a space has high ambient background noise level, a flashing red light must also be provided. As an alternative to a general alarm system, a public address system or other means of alerting all individuals on board may be substituted if it can meet the same performance criteria.

This section will require retro-fitting of the required alarm system on many vessels. As a consequence, the rule does not take effect until 1 year after the effective date of the regulations,

although the Coast Guard's position is that safety is better served by earlier installation.

This section also requires standard wording to appear on each general alarm bell and red flashing light. This wording is to inform each individual that when the general alarm bell sounds, or the red light flashes, that they should proceed to their station. This labeling is exempt from the Office of Management and Budget guidelines for collection and posting of information since exact wording is provided.

Section 28.280 of the NPRM would have applied to vessels which underwent a major modification or were built after the effective date of the regulations and would have required a fire alarm system. The requirements of § 28.240 replace that proposed requirement.

Section 28.245 Communication Equipment

This section requires each vessel to be equipped with a VHF radiotelephone capable of transmitting and receiving on the frequency or frequencies within the 156-162 MHz band necessary to communicate with a public coast station or a U.S. Coast Guard station serving the area in which the vessel operates.

A vessel that operates more than 20 nautical miles from the coastline is also required to have a radio transceiver capable of transmitting and receiving frequencies in the 2-4 MHz bands necessary to communicate with a public coast station or a U.S. Coast Guard station serving the area in which the vessel operates.

A vessel that operates more than 100 nautical miles from the coastline is also required to have a radio transceiver capable of transmitting and receiving frequencies in the 4-27.5 MHz bands necessary to communicate with a public coast station or U.S. Coast Guard station serving the area in which the vessel operates.

A vessel that operates in the waters contiguous to Alaska, regardless of the distance from the coastline, where communication with a public coast station or U.S. Coast Guard VHF station is not possible on the 156-162 MHz or 2-4 MHz bands is required to be equipped with a radio transceiver capable of transmitting and receiving frequencies in the 4-27.5 MHz bands necessary to communicate with a public coast station or U.S. Coast Guard station serving the area in which the vessel operates.

Satellite communication capability with a system servicing the vessel's operating area or a cellular telephone capable of communicating with a public

coast station or U.S. Coast Guard station is permitted as a substitute for the radiotelephones required.

Communication equipment is required to be located at the operating station and connected to an emergency power source. Communication equipment is considered to be of primary importance. There are numerous cases where communication by radio has been responsible for the timely rescue of individuals on disabled vessels.

Several comments pointed to instances where waves had impacted and broken windows at the operating station resulting in communication equipment getting wet and unusable. These comments recommended that a requirement be included to prevent this. The Coast Guard agrees and a provision has been added that requires communication equipment to be located so that water intrusion into the equipment from windows broken by heavy seas is minimized. Additionally, this section requires communication equipment to be installed to ensure safe operation and to protect the equipment from vibration, moisture, extreme temperature, and excessive voltage or currents.

Many comments objected to the proposed upper limit of the high frequency band of the single side band radio transceiver required on board a vessel operating more than 100 miles from the coastline. The comments stated that most fishing vessels currently have radios with frequencies no higher than 20 MHz and that this allowed them to converse with others at great distances. They argued that they should not be required to replace radios that had proven to be effective and adequate.

The Coast Guard selected 27.5 MHz as the upper frequency limit in these rules because it is the upper frequency range used for maritime communications. The higher frequency band increases communication reliability. A full range of maritime frequencies is required to allow a vessel to communicate during propagation anomalies such as ionospheric disturbances and sun spot cycles. During such disturbances vessels far from the coastline in distress and other vessels that could render assistance may only be able to communicate in the higher frequency band. It is important that all vessels, including those far from the coastline be able to communicate effectively for distress and safety purposes.

These communication rules are intended to address the difficulty associated with transmitting and receiving in the high frequency bands and for the purpose of developing a

standard ensuring that a vessel far from the coastline will be able to communicate distress and safety messages to coastal stations and other vessels. The requirements in these rules are based on implementation of the Global Maritime Distress and Safety System (GMDSS).

The GMDSS has been under development by the IMO since the 1970s. It was adopted at an International Conference on Maritime Safety held in November 1988. It will formally enter into force on February 1, 1992, under provisions of SOLAS 74/83. Implementation of GMDSS will require high frequency radios capable of operating in the 4-27.5 MHz bands to be carried on all vessels which are subject to SOLAS 74/83.

The concept of the GMDSS is that search and rescue authorities ashore, as well as shipping in the immediate vicinity of the ship in distress, will be rapidly alerted to a distress incident so that they can assist in a coordinated search and rescue operation with a minimum of delay. While commercial fishing industry vessels are exempt from the requirements of SOLAS 74/83, they sail in the same waters, face the same dangers, and have the same need for emergency communications as do those ships operating under SOLAS 74/83 requirements. The GMDSS will also provide for urgency and safety communications and the dissemination of meteorological warnings and meteorological forecasts. Every ship outfitted with a suite of GMDSS rapid communications equipment prescribed for its operating areas will be able to perform those communication functions essential for the safety of the ship itself and of other ships operating in the same area.

The Federal Communications Commission published a proposed rule to implement the GMDSS in the Federal Register on October 31, 1990 (55 FR 45816). The new rules would apply to U.S. flag vessels subject to SOLAS 74/83. These will include cargo ships of 300 gross tons and over and passenger ships that carry more than 12 passengers regardless of size, that sail on international voyages.

Despite the effectiveness of SSB transceivers operating up to only 20 MHz in the past, the maritime bands now extend to 27.5 MHz for the reasons explained above. In recognition of the expense involved with replacing an existing SSB transceiver with one capable of transmitting and receiving the higher frequency bands, the Coast Guard has included provisions in § 28.245(e) that will permit existing SSB transceivers capable of transmitting and

receiving on frequencies in the 4-20 MHz bands to meet the requirement for a transceiver capable of transmitting and receiving on frequencies in the 4-27.5 MHz bands, provided that it was installed prior to September 15, 1991. Should one of these transceivers require replacement, it must be replaced with a transceiver that is capable of transmitting and receiving on frequencies in the 4-27.5 MHz bands.

Section 28.250 High Water Alarms

This section requires an audible and visual alarm at the operating station of each vessel of more than 36 feet in length to indicate high water in a normally unmanned space subject to flooding. Such a space includes a space with a through hull fitting below the deepest waterline; a machinery space bilge, bilge well, shaft alley bilge, or other space subject to flooding from sea water piping within the space; or a space with a nonwatertight closure on the main deck if the space is unmanned. For a commercial fishing industry vessel, this includes nearly all spaces below the main deck except cargo holds. This could require some existing vessels to be retro-fitted with bilge alarms.

Section 4502(b) of the Act which applies to documented vessels which operate beyond the Boundary Lines or which operate with more than 16 individuals on board does not specifically address high water alarms. However, the Committee felt strongly that any space below deck which was not under the direct observation of the master or individual in charge of the vessel should be fitted with both a high water alarm and a bilge system to dewater that space. Section 4502(b)(7) of the Act authorizes the Secretary of Transportation to require equipment not specifically identified, if that equipment will minimize the risk of serious injury. The Committee felt that high water alarms and a bilge pumping system is equipment of this type. The Coast Guard agrees and has included requirements in this and the following section for high water alarms and a bilge pumping system.

Section 28.255 Bilge Pumps, Bilge Piping, and Dewatering Systems

This section requires each vessel to be equipped with a pump capable of draining any watertight compartment other than small buoyancy compartments, such as buoyancy air tanks. A portable bilge pump would be required to be provided with a suitable suction hose capable of reaching the bilge of each space it must serve and the

discharge hose must be able to discharge overboard.

A vessel of more than 79 feet in length would be required to be equipped with a fixed, powered, self-priming bilge pump. This pump could be used for other purposes, except as a required fire pump, and would have to be fixed to a bilge manifold. Each bilge suction line is required to be led to a manifold and be fitted with a stop valve and a check valve. The stop valve and the check valve would aid in preventing unintentional back-flooding of spaces while using the bilge piping system.

Several comments pointed out that the bilge pump should not be connected to tanks which are used for consumable fluids such as fuel oil and potable water. As proposed this section would have required such bilge suction. The Coast Guard agrees with these comments and tanks used for consumable liquids have been excluded from those spaces required to have a bilge suction.

Several comments suggested that bilge suction lines should be fitted with strainers to prevent debris from being sucked into the bilge lines, possibly blocking suction lines or manifold valves. The Coast Guard agrees and has added a requirement for bilge suction lines to be fitted with a strainer with an open area three times the open area of the bilge suction line. This requirement is similar to a requirement for inspected vessels.

The investigation of the sinking of the *Alentian Enterprise* pointed out a problem not explicitly addressed in the NPRM. That problem concerns spaces where seawater is introduced into the spaces used in the processing of fish. It is not uncommon on fish processing vessels to use seawater in a largely uncontained manner to help move, clean, and preserve fish. A method commonly used to discharge a portion of the water is chutes on the side of the vessel at deck level. On the *Alentian Enterprise* just such an operation was used. This type of arrangement points out two concerns; one, removing the processing water from the processing space and two, preventing water from entering the vessel through the chutes.

The Coast Guard's position is that large amounts of water on deck in the processing space is an unacceptable risk to the individuals working in the space and can lead to stability problems.

The intent of this section is to ensure that an enclosed space in which water might accumulate is fitted with equipment to enable that water to be removed. On most vessels the only spaces of concern are below the waterline. The bottom of these spaces are known as "bilges." On processing

vessels water is introduced into enclosed spaces to move fish and fish waste within the space. Many processing spaces are located above the waterline and, therefore, do not have a "bilge."

As a consequence, this section has been modified to require a "dewatering" system capable of removing water at least at the same rate as it is introduced into the space in the processing operations. This addition is considered a clarification of the intent of the proposed requirement and is expected to have a negligible impact on existing fish processing vessels. The dewatering system must also be interlocked with the water supply system so that failure of the dewatering system will prohibit introduction of processing water into the processing space.

In normal processing space arrangements, this section will require a suction in each corner of the processing space so that regardless of the trim or list water can be rapidly removed. A typically arranged bilge pump serving more than one corner of the space would not be able to remove water if any one of its suction lines was not immersed. It is typical in these processing spaces that a submersible pump is installed in a sump in each corner of the processing space. This allows for removing water in one corner of the room, while there is no water in the other corners.

Section 28.260 Electronic Position Fixing Devices

This section contains requirements for each documented vessel of more than 79 feet in length that operates beyond the Boundary Lines or with more than 15 individuals on board to be equipped with an appropriate electronic position fixing device. There is presently no such requirement in 46 CFR Subchapter C—Uninspected Vessels, although many commercial fishing industry vessels are so equipped. Acceptable devices include a Loran receiver, a satellite navigation receiver, or another electronic device which provides accurate fixes in the area in which the vessel operates. Many cases of vessels going around result from operating personnel not being aware of their position. Having this electronic position fixing equipment in conjunction with the navigational information required in § 28.225 should help minimize these incidents.

Section 28.265 Emergency Instructions

This section requires emergency instructions on board each documented vessel which operates beyond the Boundary Lines or with more than 16

individuals on board. The emergency instructions must address at least:

1. Identification of survival craft embarkation stations;
2. Fire and emergency signals;
3. Location and donning instructions for immersion suits, if they are carried;
4. Procedures for making a distress call;
5. Essential action that must be taken in an emergency by each individual;
6. Procedures for rough weather;
7. Procedures for anchoring;
8. Procedures to be used in the event an individual falls overboard; and
9. Procedures for fighting a fire.

Each documented vessel must post these instructions, except for procedures for rough weather, anchoring, man overboard, and fighting a fire; these instructions may be kept readily available as an alternative to posting. A vessel which operates with less than 4 individuals on board is permitted to keep the emergency instructions in a location readily accessible to all individuals on board in lieu of posting.

The emergency instructions are considered necessary to ensure that the master or individual in charge of the vessel formally assigns crewmembers to specific emergency duties and provides for the contingencies involved in dealing with an emergency situation, including abandoning the vessel. The emergency instructions should result in better organization and less confusion during an emergency.

The requirements of this section are not intended to limit an owner in developing emergency instructions. Rather, they should be viewed as a minimum framework in tailoring emergency instructions for a particular vessel. Many examples of emergency instructions have been included as a starting point for the owner to develop more specific and, if necessary, more elaborate instructions. The Coast Guard encourages owners to work with other owners, safety training professionals, and other knowledgeable individuals in developing emergency instructions in order to maximize the usefulness and availability of the instructions.

A contributing factor in a majority of casualties involves the human element. Many fatalities can be directly attributed to individuals not knowing the proper procedures to take in an emergency situation. Such things as individuals not knowing how to don an immersion suit have contributed to fatalities.

The Coast Guard's position is that improving the general awareness of individuals in the procedures to be followed in an emergency situation and

improving their competence and self assurance in these situations will have the largest safety benefit. While the Act gives limited authority to require training, exposing individuals to proper emergency procedures combined with instruction and drill on emergency procedures can make a dramatic difference in ensuring the survival of individuals in emergencies. The Act gives authority at § 4502(b) for regulations dealing with the use of equipment addressed in that section of the Act. It is the Coast Guard's opinion that this authority has been used to its fullest practicable extent in these regulations.

Several comments suggested that these instructions were too important to be limited to only those vessels with 16 or more individuals on board as proposed in the NPRM. The Coast Guard agrees. The proposed rule has been revised to apply to all documented vessels which operate beyond the Boundary Lines. These requirements also apply to documented vessels which operate inside the Boundary Lines if more than 16 individuals are on board.

The step-by-step instructions are for accomplishing specific emergency tasks and are considered important to all vessels. However, most small documented vessels do not have the room to post such a large number of instructions. Therefore, they are only required to maintain the instructions in a location readily accessible to all individuals on board. Guidance on preparing posted material may be found in NVIC 4-89, "Introduction to Human Factors Engineering".

Several comments suggested that a placard explaining emergency broadcast procedures should be required to be posted at all communications equipment installations. This placard would explain to an individual unfamiliar with radio procedures the proper use of the equipment in an emergency. The Coast Guard agrees in principle with these comments. An individual unfamiliar with proper radio procedures would have difficulty effectively making a distress call during an actual emergency. That individual is also unlikely to be able to follow the procedures on a placard in an actual emergency. For that reason, the Coast Guard will require that procedures for distress calls be made a part of the emergency instructions. In this way individuals on board will have an opportunity to become familiar with those procedures in a less stressful environment. This topic must also be part of the drills and instruction required by § 28.270. It is felt that these two methods will be more

effective in ensuring an individual on board is capable of making a distress call.

Section 28.270 Instruction, Drills, and Safety Orientation

This section requires the master or individual in charge of a vessel to ensure that drills are conducted at least once each month. Instruction may be combined with the drills or may be at a separate location and at a separate time as long as each individual on board is familiar with their assigned duties and the proper responses to at least the following contingencies:

1. Abandoning the vessel;
2. Fighting a fire in different locations on board the vessel;
3. Recovering an individual from the water;
4. Minimizing the affects of unintentional flooding;
5. Launching survival craft and recovering lifeboats and rescue boats;
6. Donning immersion suits and other wearable personal flotation devices;
7. Donning a fireman's outfit and a self-contained breathing apparatus, if the vessel is so equipped;
8. Making a distress call;
9. Sounding the general alarm; and
10. Reporting inoperative alarm systems and fire detection systems.

The master or individual in charge is not required to conduct the instruction or drills, but is responsible for making sure that it is done. If the master, or individual in charge does not conduct the instruction and drills, a professional trainer, licensed officer, or other individual specially trained for this purpose may conduct the required instruction on the vessel or aid in conducting the drills.

Specific comments were requested on the usefulness of instruction carried out at locations other than on the vessel and on the use of prepared training materials such as video tape presentations. The comments submitted by safety training professionals indicated that the most useful training is that which most closely approximates an actual situation, i.e., on board training using the vessel's emergency equipment. These comments did point out that prepared training aids used either on the vessel or at an alternate location were useful in familiarization and as a refresher, if each individual was directly involved in a discussion of the material led by an individual familiar with the evolution. As a result of these comments, the final rules require that drills be conducted on board the vessel using the vessel's emergency equipment to approximate actual situations as they may happen. Instruction need not be

conducted on board the vessel but can be at an alternate site. Currently, there are several commercial sources of such training. It is expected that other sources will be established with publication of these rules.

The master or individual in charge of a vessel must ensure that a safety orientation is given to any individual on board the vessel that has not received instruction and not participated in drills. As with instruction and drills, the master or individual in charge of the vessel is responsible to see that the safety orientation is given, but need not give the orientation. This safety orientation must cover the emergency instructions required by § 28.265 and the evolutions covered in paragraph (a) of this section prior to operating with that individual on board. This would provide a minimum level of understanding of emergency procedures for each individual on-board regardless of how long they had been on board.

Coast Guard investigation of casualties on commercial fishing industry vessels has shown repeatedly that being unfamiliar with immersion suits, liferaft launching procedures, and the proper procedures for abandoning the vessel have needlessly resulted in deaths and injuries. This section is meant to ensure that crew members know the proper procedures for the use of the required lifesaving equipment and are familiar with and practiced in the use of equipment needed during an emergency.

Many comments on the ANPRM pointed out the need for licensed individuals on board commercial fishing industry vessels, especially those carrying large numbers of individuals or those that operate on exposed waters. Section 3 of the Act required the Coast Guard to submit a plan for licensing operators of documented fishing industry vessels. That plan, developed in consultation with the Committee, has been submitted to Congress, but there is currently no statutory authority that would require such a license for an operator of a vessel less than 200 gross tons. The requirements in this section for instruction and drills are independent of that study and independent of any requirement for licensing.

The Committee was concerned with the quality of the instruction and drills required by this section. Discussions with the Committee centered around the inability of an individual to conduct effective training without themselves having a thorough knowledge of proper procedures. Therefore, the Committee recommended that the individual

providing the training be required to be trained prior to instructing others.

Section 4502(b) of the Act requires regulations for installation, maintenance, and use of specific equipment. This authority permits the requirements for training, instruction, and drills in the use of emergency and lifesaving equipment recommended by the Committee. Consequently, this section contains a requirement that an individual conducting drills or instruction must have been trained in the proper procedures. A three year period is provided to allow individuals needing this training to obtain it.

One comment from an owner/operator of a commercial fishing industry vessel stated that the proposed requirements for this section for instruction and drills should be removed because his crew was too busy for instruction and drills. The Coast Guard disagrees. The message from Congress is that safety in the commercial fishing industry can no longer be left to voluntary actions. It is the Coast Guard's position that safety is not something that should be dealt with only if time permits, but rather that safety must be considered in every action. Consequently, this recommendation was not adopted and the requirements for instruction and drills have been retained.

The NPRM requested specific comments concerning the qualifications of the individual required by 28.270(b) (now 28.270(c)) to conduct drills. There were no suggestions concerning these qualifications. However, several commenters questioned whether a licensed individual would be considered qualified to conduct the instruction and drills without further training. Individuals licensed to operate inspected vessels of 100 gross tons or more are considered qualified to conduct the instruction and drills without further training and paragraph (c) has been modified to indicate this.

The requirement for training by the individual conducting the instruction and drills is intended to be a performance standard that training institutions can meet in a manner they decided is appropriate for their students. However, the Coast Guard recognizes that there are individuals in the industry who want to attend Coast Guard accepted courses and institutions which want to have formal recognition of their courses. In order for the Coast Guard to be able to formally accept a course of instruction there must be clearly defined requirements. The Coast Guard can not "accept" courses of instruction without going through the rulemaking process.

The Coast Guard intends to propose standards for qualification of instructors, acceptance of curriculum, and procedures by which institutions can obtain acceptance of their courses and instructors. These standards would not be mandatory, but, those institutions which demonstrate that they meet the standards would be authorized to state that their courses met Coast Guard standards.

The intent is to publish these standards as proposals in the SNPRM previously mentioned. It is anticipated that these standards will be drawn from title 46 Code of Federal Regulations for Licensed individuals and the Document for Guidance on Fishermen's Training and Certification, 1988, published jointly by IMO, the International Labor Organization, and the Food and Agriculture Organization of the United Nations.

To provide assistance now, the Coast Guard will provide guidance on instructor qualification and curriculum selection after consultation with the Committee and individuals within the safety training profession. The intent is to publish this guidance in the form of a Navigation and Vessel Inspection Circular (NVIC). NVICs may be obtained by calling (202) 366-6430. The Coast Guard will not review courses of instruction or instructor qualification for compliance with the NVIC. As explained above, prior to any acceptance, regulations must exist. Institutions or individuals would however be able to compare curriculum to that in the NVIC on their own.

This may appear to create a dilemma for those individuals required by this section to have training by September 1, 1994, since the standards have not been published. The Coast Guard does not intend to require certification in training or specific courses of study. It is the Coast Guard's position that Congress never intended for there to be a complicated system for training approvals and certification of individuals.

Compliance with the training requirements of this section can be met in a number of ways. There are a number of institutions which offer Coast Guard approved courses of instruction for individuals expecting to take a Coast Guard licensing examination. The satisfactory completion of pertinent courses by these institutions would meet the requirements of this section. There are other institutions that specialize in safety training in the commercial fishing industry and which offer courses meeting the requirements of this section.

There are still other ways of satisfying the requirements of this section. While professional trainers offer many advantages for those desiring training, this section does not require training from professional trainers. For instance: Training by a local fire department in fire fighting would meet the requirements of this section for training in fighting a fire in different locations on board a vessel; training by local servicing facilities for inflatable liferafts dealing with abandoning the vessel would meet the requirements of this section; and training by local electronics suppliers on voice distress calls would meet the requirements of this section.

Subpart D—Requirements for Vessels Which Have Their Keel Laid or Are at a Similar Stage of Construction on or After or Which Undergo a Major Conversion Completed After September 15, 1991, and That Operate With More Than 16 Individuals On Board

This subpart contains requirements for commercial fishing industry vessels which have their keel laid or are at a similar stage of construction on or after or which undergoes a major conversion completed on or after September 15, 1991, and that operate with more than 16 individuals on board. These requirements are in addition to the requirements of subparts A, B, and C. This means that applicable portions of subparts A, B, and C apply in addition to the requirements of this subpart. For instance, a vessel which has its keel laid on or after September 15, 1991, which does not operate with more than 16 individuals on board and does not operate beyond the Boundary Lines is not subject to the requirements of subparts C and D, but is subject to the requirements of subparts A and B. If that same vessel were to operate beyond the Boundary Lines, the requirements of subpart A, B, and C would apply; and if the vessel operated with more than 16 individuals on board, the requirements of subparts A, B, C, and D would apply.

Section 28.300 Applicability

The requirements in this subpart are in response to 46 U.S.C. 4502(c). In many cases, these rules are more detailed than those of the other subparts and are targeted at safety improvements that can only be accomplished by building in the safety features during original vessel construction or during a major conversion. Modifications made as part of a major conversion will have to incorporate the requirements of this subpart. However, modifications to an existing vessel solely to incorporate the requirements of this section are not

expected, except in especially hazardous cases. The Coast Guard encourages owners, designers, and shipyard supervisors to approach a major conversion as an opportunity to economically improve safety on a vessel.

Section 28.305 Lifesaving and Signaling Equipment

This section requires that each vessel which has its keel laid or is at a similar stage of construction on or after or which undergoes a major conversion completed on or after September 15, 1991, must be equipped with the lifesaving appliances, survival craft, and distress signals required by §§ 28.110, 28.115, 28.145 and table 28.120 (a), (b), or (c), as appropriate, on the date that construction or conversion is completed. Sections 28.110, 28.115, 28.120, and 28.145 each have a provision for delayed implementation, as previously mentioned in the discussion of those sections. The delayed implementation provisions do not apply to a vessel which has its keel laid or is at a similar stage of construction on or after or which undergoes a major conversion completed after September 15, 1991.

Section 28.310 Launching of Survival Craft

This section requires that a gate or other opening be provided in bulwarks, deck rails, or lifelines to facilitate the manual launching of survival craft which weigh more than 110 pounds.

Section 28.315 Fire Pumps, Fire Main, Fire Hydrants, and Fire Hoses

This section specifies the fire fighting equipment required to provide what is considered to be the minimum acceptable level of safety on commercial fishing industry vessels.

Each vessel of more than 36 feet in length would be required to be equipped with a fixed, powered, self-priming fire pump connected to a fixed piping system. The pump and the piping system are not required to be for the exclusive use of fire fighting, but could not be connected to serve as a bilge pump, as previously discussed in § 28.255. In addition, a fire pump on a vessel over 79 feet in length must meet performance standards applicable to the fire pump and piping system similar to the performance standards for inspected vessels.

Since it is uncommon to have a manned engineroom on most commercial fishing industry vessels, the powered fire pumps must be capable of being started from the fire pump itself and from the operating station, including remotely controlling any necessary

valves. This same performance standard was proposed for small passenger vessels (CGD 85-080, RIN 2115-AC22, published January 30, 1989, 54 FR 4412.)

Each fire hose on a vessel of more than 79 feet in length is required to be of commercial grade with a corrosion resistant nozzle capable of producing a solid stream and a spray pattern. These requirements, while less specific, are similar to those for inspected vessels. Vessels 79 feet in length or less are permitted to use good commercial grade hose, if that hose is at least $\frac{3}{4}$ inch nominal diameter and fitted with an appropriate corrosion resistant nozzle capable of both a solid stream and a spray pattern. Good commercial grade hose of any size would be fitted with corrosion resistant fittings.

Fire hydrants on a vessel of more than 79 feet in length are required to be so located and in sufficient number that any location on the vessel can be reached with a charged fire hose. Each fire hydrant is also required to be fitted with a fire hose at all times while the vessel is operating.

Section 28.320 Fixed Gas Fire Extinguishing Systems

Each vessel over 79 feet in length is required to be equipped with a fixed gas fire extinguishing system in each space containing an internal combustion engine of more than 50 horsepower, an oil fired boiler, an incinerator, or a gasoline fuel storage tank. The fixed gas fire extinguishing system must be approved by the Coast Guard and custom engineered, unless it is an approved pre-engineered system. "Pre-engineered" and "custom engineered" are industry terms and are defined in § 28.050.

Fixed gas fire extinguishing system components are required to be listed by an independent laboratory. The terminology used to describe the laboratory that lists and labels the fixed gas fire extinguishing system components has been changed to "an independent, nationally recognized testing laboratory" for clarification. This same wording is now also used for excess equipment in § 28.155.

The fire extinguishing system design and installation are required to be in accordance with the Coast Guard approved "Manufacturer's Marine Design, Installation, Operation, and Maintenance Manual." Guidance on design and installation of fixed fire extinguishing systems is contained in NVIC 6-72, Ch-1, "Guide to Fixed Fire Fighting Equipment Aboard Merchant Vessels," dated February 28, 1977. The provisions of this circular are well known to manufacturers of fixed gas fire

extinguishing systems. A listing of approved fire extinguishing systems is contained in Commandant Instruction M16714.3C, "Equipment Lists" and is available from the Government Printing Office. This information is also available on the Coast Guard's Marine Safety Information System and is available from any Coast Guard Marine Safety or Marine Inspection Office.

Several types of fixed gas fire extinguishing system arrangements are available in choosing a system, depending upon the size of the space protected. A space with a gross volume exceeding 6,000 cubic feet is required to be fitted with a manually actuated and alarmed system; a smaller space could also be so fitted. A system capable of automatic discharge upon heat detection is only permitted in a normally unoccupied space with a gross volume of 6,000 cubic feet or less. A pre-engineered system is permitted only in a normally unoccupied machinery space, paint locker, or a space containing flammable liquid stores with a gross volume of not more than 1,200 cubic feet. A fixed gas fire extinguishing system is permitted to protect more than one space, provided the amount of extinguishing agent is sufficient to protect the largest space.

A pre-engineered fixed gas fire extinguishing system is required to be fitted so that the system can be manually actuated from outside the space protected in addition to any automatic actuation. The system is also required to be equipped with a visual and audible alarm at the operating station to indicate discharge, an automatic device to shut down ventilation in the protected space, and a means to reset these ventilation systems after discharge of the extinguishing agent.

In developing these requirements for fixed gas fire extinguishing systems, the following requirements and recommendations for other vessels were considered: 46 CFR Subchapter H (Passenger Vessels); SOLAS 74/83; NVIC 6-72, Ch-1 "Guide to Fixed Fire-Fighting Equipment Aboard Merchant Vessels"; NVIC 5-86 "Voluntary Standards for U.S. Uninspected Commercial Fishing Vessels"; National Fire Protection Association Standard 101 "Life Safety Code"; Canadian regulations for small passenger vessels; and the proposed rules for small passenger vessels (CGD) 85-080, RIN 2115-AC22, published January 30, 1989, 54 FR 4412.)

Section 28.325 Fire Detection Systems

This section requires independent smoke detectors in accommodation spaces of vessels subject to this subpart. The NPRM proposed the applicability as only those vessels operating with more than 49 individuals on board. Several comments pointed to the relatively low cost of fire detectors compared to the safety benefits offered and urged that the applicability be broadened to include all vessels subject to this subpart. The Coast Guard agrees that the safety improvement offered by having a smoke detector in each accommodation space more than offsets the small cost increase for a new vessel or a vessel which undergoes a major conversion. As an alternative to independent, modular smoke detectors, a Coast Guard approved smoke actuated detection system could be installed.

Independent modular smoke detectors are required to comply with Underwriters Laboratories (UL) Standard UL 217, "Standard for Single and Multiple Station Smoke Detectors," and to be listed as a "Single Station Smoke Detector—Also Suitable For Use in Recreational Vehicles." Protection of accommodation spaces on vessels with a relatively large number of individuals is considered necessary, especially in staterooms.

Section 28.330 Galley Hood and Other Fire Protection Equipment

This section requires that each vessel subject to this subpart be fitted with a grease extraction hood and a pre-engineered dry or wet chemical fire extinguishing system over each grill, broiler, and deep fat fryer. The grease extraction hood is required to comply with UL 710, "Exhaust Hoods for Commercial Equipment," and the extinguishing system must comply with National Fire Protection Association (NFPA) Standard 17, "Dry Chemical Extinguishing Systems," or 17a, "Wet Chemical Extinguishing Systems." A large portion of vessel fires originate in the galley; this equipment would help prevent fires and quickly control those that start.

Several comments pointed out that the fire hazard posed by a galley, especially one large enough to accommodate more than 16 individuals, should be required to meet the proposed standards, which originally would have applied to only those vessels operating with more than 49 individuals on board. The Coast Guard agrees and the requirements of this section now apply to all vessels subject to this subpart.

Section 28.335 Fuel Systems

This section contains requirements for fuel systems on board commercial fishing industry vessels, except fuel systems on outboard engines. Portable fuel tanks would be required to meet the requirements of ABYC Project H-25, "Portable Fuel Systems and Portable Containers for Flammable Liquids."

Alternatives to the requirements of this section would be permitted for vessels of 79 feet in length or less. The standards of ABYC Project H-33—"Diesel Fuel Systems", Chapter 5 of NFPA Standard 302—"Pleasure and Commercial Motor Craft," or 33 CFR subchapter S—Boating Safety, are permitted as substitutes.

The Committee felt that this class of vessel (those that operate with more than 16 individuals on board) should be prohibited from having main propulsion engines or generator prime movers powered by gasoline, because of the explosion hazard of gasoline. The Committee also recommended that bunker C be permitted as a fuel. The Coast Guard agrees with the Committee. Gasoline is prohibited as a fuel, except for use in outboard engines; and bunker C fuel is permitted. Because of the viscosity of bunker C; it is frequently heated to permit easier pumping and transfer on board the vessel. This heating can cause safety problems if not done properly. Therefore, bunker C installations are required to comply with the requirements for fuel systems for inspected vessels, in 46 CFR subchapter F—Marine Engineering.

Vents for integral fuel oil tanks are required to be fitted to the highest point in the tank, terminate in a 180 degree bend on the weather deck, and be fitted with a flame screen. These requirements reflect common practice in the marine industry. Also, tanks that can be filled under pressure must have a venting area at least equal to the area of the fill line. This aids in preventing tank overpressurization. A tank that is not filled under pressure would be required to have a venting area of not less than 0.484 square inch (312.3 square millimeters). This value corresponds to the area of 3/4 inch nominal type L copper tubing with 0.035 inch wall thickness. This area has been corrected from 0.022 square inch (14.2 square millimeters), incorrectly stated in the NPRM.

Fuel piping is required by this section to be at least 0.035 inch in thickness. It is also required to be seamless and, with two exceptions, made of steel, annealed copper, copper-nickel, or nickel-copper. Aluminum piping is permitted on aluminum hulled vessels in spaces

outside a machinery space. Aluminum, with its relatively low melting point, is considered to be unsuitable for fuel oil transfer in machinery spaces. Nonmetallic flexible hose is permitted in lengths not exceeding 30 inches. Nonmetallic flexible hose is commonly used to provide flexibility in fuel lines, especially at connection points to internal combustion engines where vibration can cause fuel line cracking.

Nonmetallic flexible hose is not permitted to penetrate a watertight bulkhead. It also must be in an accessible location so that leaks can be easily detected and repaired.

Fuel piping subject to head pressure from fuel in a tank requires a positive shutoff valve. This shutoff valve is required to be operable from outside the space in which the valve is located. Many engineroom fires could have been quickly brought under control if the supply of fuel oil to the fire was stopped. The fuel shutoff valve will provide that capability.

Section 28.340 Ventilation of Enclosed Engine and Fuel Tank Spaces

This section lists requirements for vessels which store gasoline engines or gasoline storage tanks in spaces that could entrap gasoline vapors. These spaces must be fitted with mechanical ventilation systems with nonsparking fans. The fan motors for such spaces must comply with the requirements for fan motors in hazardous locations on inspected vessels in 46 CFR 111.105-23. The requirement for fan motors is added for clarification of what is considered good marine practice and crucial to preventing explosions.

As an alternative, vessels of not more than 65 feet in length may meet the standards of NFPA 302, chapter 2, section 2-2 or ABYC Project H-2 "Ventilation of Engine and Fuel Compartments" and 33 CFR part 183, subpart K. The NPRM proposed ABYC Project H-32, "Ventilation of Boats Using Diesel Fuel" instead of H-2. Project H-2 is considered to be more appropriate for spaces dealing with storage of gasoline and has replaced Project H-32 as an optional industry standard. Project H-2 will add ventilation requirements not included in Project H-32. Project H-32 did not address the need to ventilate spaces which could contain gasoline vapors, a known explosion hazard.

Section 28.345 Electrical Standards for Vessels Less Than 79 Feet in Length

This section prescribes the requirements and alternative standards for electrical systems on vessels less

than 79 feet in length. Such vessels can comply with the same electrical standards for vessels of more than 79 feet in length or alternative standards. The alternative standards that could be met are ABYC Projects E-8, "AC Electrical Systems on Boats" or E-1, "Bonding of Direct Current Systems" and E-9 "DC Electrical Systems on Boats," as appropriate, for the vessel's electrical system, combined with either NFPA 302 chapter 7, "Electrical Systems Under 50 Volts" and chapter 8, "Alternating Current (AC) Electrical Systems on Boats" or 33 CFR part 183, subpart I, and § 28.375.

This section has been redrafted in this rule for clarity. There have been no other changes from the requirements proposed in the NPRM.

Section 28.350 General Requirements for Electrical Systems

This section requires electrical equipment exposed to the weather or in a location exposed to seas to be waterproof, watertight, or enclosed in a watertight housing. Aluminum is prohibited as a current carrying part of electrical equipment or as wiring. Metallic enclosures and frames of electrical equipment are required to be grounded.

This section requires the amount of electrical equipment to be kept to a practicable level in a space likely to contain vapors from flammable or combustible liquids. Electrical equipment required in such spaces must be explosion-proof or intrinsically safe. Guidance on explosion-proof and intrinsically safe installations is contained in 46 CFR subchapter J—Electrical Engineering Regulations and NVIC 2-89, "Guide for Electrical Installations on Merchant Vessels and Mobile Offshore Drilling Units," dated August 14, 1989.

This section also requires a continuous, non-current carrying grounding conductor on each nonmetallic hull vessel. This grounding conductor is required to connect the enclosures and frames of electrical equipment and other metallic items such as engines, fuel tanks, and electrical equipment enclosures to a common ground point. This grounding conductor must meet the requirements of section 250-95 of the National Electrical Code, NFPA 70.

Section 28.355 Main Source of Electrical Power

This section requires at least 2 electrical generators if any of the essential loads rely on electrical power. Essential loads include interior lighting, steering systems, communication

systems, general alarm system, navigation equipment, navigation lights, fire protection equipment, bilge pumps, and the propulsion system and its auxiliaries and controls. Each generator must be attached to an independent prime mover.

The NPRM would have required 2 electrical sources of power. Several comments pointed out that a vessel large enough to carry 16 individuals engaged in commercial fishing would be so large that generators would be necessary to supply the listed essential loads. The Coast Guard agrees and this section has been modified to specify generators for supplying the essential loads rather than simply sources of electrical power.

Section 28.360 Electrical Distribution Systems

This was § 28.365 in the NPRM. This section requires that a distribution system which has a neutral bus or conductor have the neutral bus or conductor grounded. It also requires a grounded distribution system to have only one connection to ground. The one connection to ground must be at the switchboard or, on a nonmetallic vessel, the common ground point.

Section 28.365 Overcurrent Protection and Switched Circuits

This was § 28.370 in the NPRM. This section requires that each source of power be protected against overcurrent and that overcurrent protection for generators not exceed 115 percent of the full load rating. Steering systems would be required to be protected from short circuits only. These requirements are similar to the requirements for inspected vessels contained in 46 CFR subchapter J—Electrical Engineering Regulations.

An ungrounded current carrying conductor must be protected against overcurrent in accordance with its current rating by a circuit breaker or a fuse at the switchboard or distribution box from which it leads. Circuit breakers and switches are required to open all ungrounded conductors.

Further, all devices that disconnect a grounded conductor must disconnect ungrounded conductors as well. These measures ensure that all conductors on the load side of the switch or circuit breaker are electrically neutral.

Navigation light circuits are required to have the necessary circuits switched so that only the appropriate circuit can be energized. If the vessel is engaged in fishing operations, the appropriate fishing navigation lights can be energized.

A separate circuit is required for each installed radio transceiver or

radiotelephone. This is intended to improve the reliability of power to the communications equipment.

Section 28.370 Wiring Methods and Materials

This was § 28.375 in the NPRM. This section requires all cable and wire to be insulated, copper, stranded, and appropriately sized. Solid wire conductors, such as are common in household applications, have proven to adversely affect the reliability of connections on board ships. The lack of flexibility offered by solid wire conductors is not compatible with the vibrations in the marine environment. However, stranded wire is not affected by the vibrations to the same degree.

Conductors are required to be sized so that the voltage drop caused by the conductors does not exceed 10 percent. Conductors must meet one of several recognized industry standards for material and construction. Metallic cable armor is required to be electrically continuous and grounded to the metal hull or the common ground point for a nonmetallic hull. Connections for conductors are required to be made only in fire retardant enclosures, such as junction boxes.

Section 28.375 Emergency Source of Electric Power

This was § 28.360 in the NPRM. This section requires vessels of more than 36 feet in length to have an emergency source of electrical power which is capable of supplying connected loads for at least 3 hours and which is physically separated from the main machinery space. This separation would help ensure that one casualty did not disable all sources of power.

Vessels of 79 feet (24 meters) in length or less are only required to have emergency lighting, navigation equipment, general alarm system, and communication equipment connected to the emergency source of power, provided the propulsion system, including control systems, and steering systems do not rely upon electrical power. Vessels of 36 feet (11 meters) in length or less are only required to provide an emergency source of power for communication equipment if flashlights are provided. The prime mover of a generator used as an emergency source of power must have a separate fuel supply.

Several comments noted that there was no description of which loads were required to be connected to the emergency source of power. The Coast Guard agrees that for the sake of consistency a list of the loads that are

considered to be necessary in an emergency should be specified. This section has been modified to require as a minimum the following loads to be connected to the emergency source of power:

- (1) Navigation lights;
- (2) Steering systems;
- (3) Bilge pumps;
- (4) Fire protection and detection systems, including fire pumps;
- (5) Communication equipment;
- (6) General alarm system; and
- (7) Emergency lighting.

Several comments stated confusion concerning the requirements for an emergency source of power on vessels less than 36 feet in length, paragraph (c) of the NPRM. The intent was to have an emergency source of power for communication equipment in all cases, but not to require any other loads to be connected to the emergency source of power if flashlights are provided. This paragraph, now paragraph (d), has been redrafted for clarification.

Section 28.390 General Structural Fire Protection

To a large extent, fire protection can only be designed and built into a vessel. The requirements in this section are consistent with the Coast Guard's fire protection philosophy of limiting combustibles and containing a fire in the space of origin.

The requirement to insulate heated surfaces is a restatement of good marine practice from the standpoint of personnel safety and fire protection. ABYC P-1 is considered an appropriate standard for dry exhaust systems on vessels with combustible hulls, where special care must be taken to prevent ignition of the hull material.

Machinery and fuel tank spaces must be separated from accommodation spaces by a vapor tight boundary. Fires often originate in accommodation spaces. A fire in an accommodation space could easily spread to a fuel tank space or a machinery space with catastrophic results, unless vapor tight boundaries separate them. Another consideration is that flammable vapors could accumulate in accommodation spaces from adjoining machinery or fuel tank spaces and be accidentally ignited in the accommodation space.

Paint and flammable liquid stores present an obvious fire/explosion hazard since there is a concentrated fire load in the possible presence of flammable vapors. Lockers of steel or with a steel lining are required for the purpose of containing a fire within a paint or flammable liquid storage space. Several comments recommended relaxing this requirement to permit these

liquids to be stored in a space lined in a metal other than steel. The Coast Guard disagrees since steel has excellent fire resistance properties, therefore this requirement remains unchanged.

Insulation in spaces where flammable vapors are present will absorb the vapors and in time become combustible regardless of the original fire resistance of the insulation. A vapor barrier is required as a covering for insulation in spaces containing flammable vapors, such as enginerooms and paint lockers, to prevent absorption of those vapors.

Nitrocellulose or noxious fume producing paints or lacquers are prohibited. There is a similar requirement on all inspected vessels.

Mattresses are required to meet the flammability standards applicable to all mattresses sold commercially in the U.S. and polyurethane mattresses are prohibited because of the toxic fumes generated if ignited.

Fiber reinforced plastic vessels are required to be constructed using fire retardant resin. This requirement permits the flexibility of using plastic hulls but still requires a minimum measure of fire protection for the highly combustible hull material.

A fire alarm system was proposed. This requirement has been removed since it would be redundant with the new requirements for a general alarm system contained in § 28.240.

Noncombustible surfaces are required within 3 feet of cooking appliances. Many comments expressed confusion by this requirement. Combustible material is allowed within 3 feet of cooking appliances so long as it is covered with a noncombustible material. The NPRM would have required combustible material to be sheathed in metal. However, this final rule has relaxed that proposal to accept sheathing in any noncombustible material. Some examples of this arrangement are wooden counters covered by tile or stainless steel sheathing. A similar requirement was proposed for small passenger vessels (CGD 85-080, RIN 2115-AC22, published January 30, 1989, 54 FR 4412.)

Section 28.385 Structural Fire Protection for Vessels That Operate with More Than 49 Individuals on Board

This section contains additional structural fire protection requirements based upon the Coast Guard's concern for the increased risk additional personnel on board a vessel present. Additional protection of accommodation spaces is provided by requiring bulkheads and decks of accommodation spaces which separate them from control stations, machinery spaces,

cargo spaces, or service spaces to be constructed of noncombustible material. With more individuals on board there is greater likelihood of fire, and a greater degree of protection is required for accommodation spaces. This requirement will prevent major bulkheads from being constructed of wood. Additionally, major structural components, such as the hull, decks, and columns are required to be of steel.

The Committee pointed out the need for lightweight deck houses and superstructures. The additional weight of steel used to construct deckhouses and superstructures, as might be required from a fire protection standpoint, adversely affects stability (relatively high weight in a relatively high location) and thereby limits the cargo capacity. As a consequence, aluminum or other noncombustible material is permitted for the construction of deckhouses and superstructures. This provides a reasonable balance between fire protection and stability, and the economy issues raised by the Committee.

Section 28.390 Means of Escape

Escape from interior spaces, whether accommodation spaces or work spaces, is a key safety item and an integral facet of structural fire protection. There are numerous cases of individuals being trapped in interior spaces during fires or sudden capsizing. Noncombustible bulkheads play a key role in protecting escape routes, just as the arrangement of the escape routes does. This section contains requirements for means of escape. These requirements are intended to minimize the possibility of individuals being isolated in interior spaces in the event of an emergency.

Each space used on a regular basis and which is generally accessible to individuals is required to have two means of escape, one of which must provide a satisfactory route to weather. These means of escape may take the form of passageways, stairways, ladders, deck scuttles, or windows. A door, hatch, or scuttle used as a means of escape must be capable of being opened by one individual from either side in light or dark conditions and is required to open in the direction of expected escape. A deck scuttle used as a means of escape must be quick acting and arranged with a holdback to prevent it from closing unexpectedly while being used for egress. A provision has been added to require that watertight doors used as a means of escape must be of the quick acting type; this will help ensure rapid egress in an

emergency. Ladders, footholds, and handholds must be of rigid construction and suitable for emergency use. A window or windshield, suitably located and of sufficient size is permitted to serve as an emergency means of escape. This will provide a convenient means of ensuring a second means of escape at the operating station of small vessels.

Section 28.395 Embarkation Stations

This section requires each vessel to have at least one survival craft embarkation station to allow all individuals to board survival craft in the event the vessel must be abandoned. If work spaces or accommodation spaces are widely separated, an additional survival craft embarkation station must be provided. Since survival craft are the last resort for safe refuge in an emergency, adequate arrangements must be provided to allow crew and workers to quickly and safely board the survival craft.

Section 28.400 Radar and Depth Sounding Devices

This section was entitled "Navigation equipment" in the NPRM. Each vessel is required to be fitted with a radar and an echo depth sounding device. It is believed that nearly all of the existing vessels in this class are presently equipped with radar.

Many groundings can be prevented by the proper use of an echo sounding device. Commercial fishing industry vessels suffer from groundings more frequently than other classes of vessels, due in part to the areas in which they operate and the continual activity involved with fishing which can distract those responsible for navigation of the vessel. A grounding frequently leads to capsizing of the vessel with resultant peril to the individuals on board.

Section 28.405 Hydraulic Equipment

Coast Guard investigation of deaths and injuries on commercial fishing industry vessels show that hydraulic equipment is frequently involved. The Coast Guard and the Committee are concerned for the dangers presented by improper construction and operation of hydraulic equipment. This section contains design requirements for hydraulic systems to help ensure safe installations and operation. The requirements in this section are considered to address the type of risk contemplated in section 4502(b)(7) of the Act.

Piping systems are required to be designed with a burst pressure of 4 times the relief pressure of the required pressure relieving device. Several comments stated that this factor of

safety was too conservative. The Coast Guard disagrees. A safety factor of 4 is commonly used in marine engineering piping systems and unfired pressure vessels.

Suitability of all materials in a piping system in relation to the fluid used and the operating temperature is also required.

Except for steering systems, controls for hydraulic equipment must be located where the equipment operator is able to have an unobstructed view of the work area. There have been many injuries and fatalities which could have been prevented if the operator knew that an individual was entangled or being crushed by hydraulically operated equipment. Controls for hydraulic equipment are required to be arranged so that equipment can be disengaged in an emergency, such as when an individual is caught in a line which is controlled hydraulically. This requirement also applies to automatically controlled hydraulic equipment. Further, hydraulic equipment is required to be equipped so that uncontrolled movement of the equipment is prevented upon loss of hydraulic pressure, such as in the case of a ruptured line. These requirements are intended to reduce the likelihood of injuries associated with operation of hydraulic equipment. These requirements are similar to recommendations in the Vessel Safety Manual published by the North Pacific Fishing Vessel Owners' Association. The manual also contains other valuable recommendations concerning hydraulic equipment.

Several comments objected to the limitations on the use of nonmetallic flexible hose in hydraulic systems. There is a great tendency to rely on such hoses as they are much easier to install, thereby reducing costs. However, nonmetallic flexible hose is subject to physical damage, rapid deterioration, and damage from fire exposure to a much greater extent than metallic pipe. The Coast Guard recognizes the desirability of installing nonmetallic flexible hoses in locations subject to vibration and other relative motion. Nonmetallic flexible hose in these locations should be limited to a length necessary to accomplish the isolation but should not be used as a means to simplify installation of hydraulic equipment. Consequently, "reasonable length" has been clarified to be not more than 30 inches (0.76 meters) in this final rule.

Section 28.410 Deck Rails, Lifeline, Storm Rails, and Hand Grabs

Deck rails and grab rails can reduce the chance of workers slipping or being washed overboard. The requirements in this section are similar to the requirements for inspected vessels.

This section specifies the minimum height and construction of deck rails, hand grabs, and bulwarks. Many comments expressed concern that rails would interfere with normal fishing operations. This is not the intent of this section. This section includes provisions to permit portable stanchions and lifelines as a substitute for fixed rails where fixed rails would impede fishing operations.

Subpart E—Stability

Approximately 70 percent of deaths involving commercial fishing industry vessels are related to stability. The Act recognized the hazards of improper design or operation as they relate to stability by requiring stability regulations for vessels which are built, or the physical characteristics of which are substantially altered in a manner that affects the vessel's stability, after December 31, 1989.

An examination of search and rescue and casualty data for 1987 and 1988 reveals that the majority of stability related cases can be attributed to watertight hull integrity problems or operational errors. The data clearly shows that unintentional flooding is involved in many major casualties. A one compartment flooding standard would prevent capsizing or sinking in most of these cases.

Casualty data for the years 1982 to 1987 shows that stability related casualty rates are independent of vessel length or vessel hull material. The data also shows that stability related casualties are independent of the geographic area of operation.

Section 28.500 Applicability

This subpart applies to all vessels built after the effective date of the regulations which are more than 79 feet (24 meters) in length. The Act specifies that each vessel built after or which is substantially altered after December 31, 1989, be subject to regulations for operational stability. Since regulations were not finalized by December 31, 1989, there have been no stability evaluations required by regulations prior to the effective date of these regulations.

Fifteen comments stated that the standards proposed in the NPRM, which were derived from the IMO criteria, were not appropriate for vessels less than 79 feet (24 meters) in length and

that more time was needed to evaluate and/or develop appropriate criteria. As explained previously, an SNPRM is under development which will address the stability criteria applicable to commercial fishing industry vessels which are less than 79 feet (24 meters) in length. Therefore, these rules will only apply to vessels more than 79 feet (24 meters) in length.

There is an exclusion in this section for a vessel that is issued a Load Line Certificate under 46 CFR subchapter E since the stability of a vessel is reviewed prior to issuance of a Load Line Certificate. The Coast Guard is considering formalizing the stability criteria for commercial fishing industry vessels which receive a Load Line Certificate. Currently, only certain fish tender vessels and fish processing vessels more than 79 feet in length are required to obtain a Load Line Certificate. The load line regulations require a stability analysis prior to issuance of a Load Line Certificate, but do not specify the stability criteria which must be satisfied. The Coast Guard has by policy established stability criteria for such vessels. However, the Coast Guard decided that the criteria imposed should be addressed in regulations. The SNPRM previously addressed may address the stability criteria that must be met by commercial fishing industry vessels prior to obtaining a Load Line Certificate.

Six comments suggested that the definition of the "built date" in paragraph (a) be more clearly defined. The Coast Guard agrees and has replaced "is built after" with "has its keel laid or is at a similar stage of construction on or after" throughout these rules.

Several comments pointed out that the Act was not intended to restrict the use of any fishing gear. They pointed out that the definition of "substantially altered" did not account for a vessel which changed fishing equipment to engage in different fisheries during different times of the year. This is a misinterpretation of the definition. This subject was discussed with the Committee and the definition in § 28.050 of the NPRM included the wording "Alterations to the fishing or processing

equipment for the purpose of catching, landing, or processing fish in a manner different than has previously been accomplished on the vessel" (emphasis added). The intent of this wording was to allow routine changing of fishing gear to accommodate different fisheries, if that gear had been used on the vessel previously, i.e. before the effective date of the regulations. However, gear being used on a vessel for the first time would have been considered a substantial alteration.

The definition of "substantially altered" has been slightly modified to remove the reference to changes in fishing gear. To clarify the intent, the definition of "substantially altered" has been deleted from § 28.050 and the wording " * * * alterations to the fishing or processing equipment for the purpose of catching, landing, or processing fish in a manner different than has previously been accomplished on the vessel" has been added to this section to determine applicability. The intent is still to permit changes in equipment on a vessel if those changes have been made to the vessel before the effective date of these regulations without imposing any requirements for a stability analysis. However, changes to the vessel's equipment which have not been accomplished previously would trigger the requirements of this subpart.

Eleven comments suggested that paragraph (b) be reworded or that the definition of "substantially altered" be modified to indicate that the alteration would have to adversely affect the vessel's operating stability before stability criteria would have to be met. They argued that many vessel owners voluntarily modify their vessels to improve stability. If the modified vessel were required to comply with the stability criteria proposed, the voluntary modifications may not be made. It was felt that this would have a more detrimental effect overall than if only those vessels which were adversely affected were required to meet the proposed stability criteria.

The Coast Guard agrees in principle and has added § 28.501 to differentiate between changes which adversely affect a vessel's stability and those which do not adversely affect the vessel's stability.

If a substantial alteration does not adversely affect a vessel's stability the owner need only provide the operating personnel with revised stability instructions meeting the requirements of § 28.530(c) through (e).

If a substantial alteration does adversely affect the vessel's stability, a determination can be made by a qualified individual whether the vessel can be operated with the same level of safety after the alteration as before the alteration, i.e., the adverse effects can be compensated for by operational restrictions. If the adverse effects of alterations can be compensated for by operational restrictions, the owner need only provide the operating personnel with revised stability instructions which meet § 28.530(c) through (e).

In those instances where the adverse effects of alterations cannot be compensated for by operational restrictions in the stability instructions, the stability criteria in this part must be met.

The intent of these options is to permit alterations to a vessel which improve the stability or which have only slightly adverse effects on a vessel which can be compensated for by judicious operation of the vessel, as reflected in the stability instructions. The Coast Guard's position is that a large portion of small vessel stability related casualties can be avoided if the master or individual in charge of the vessel adheres to simple stability instructions which are developed by a qualified individual. This section will, therefore, require stability instructions for each substantial alteration. It is not the Coast Guard's intent or expectation that all substantial alterations will be compensated for by revised stability instructions without regard to the stability evaluations required by this subpart. The Coast Guard's position is that qualified individuals will recognize instances when the stability of a vessel has been so markedly changed by one large or many small alterations that simple changes in the stability instructions are not appropriate. The decision tree which follows as Figure 1 is intended to pictorially explain the requirements of §§ 28.500 and 28.501.

SUMMARY OF SUBPART E APPLICABILITY

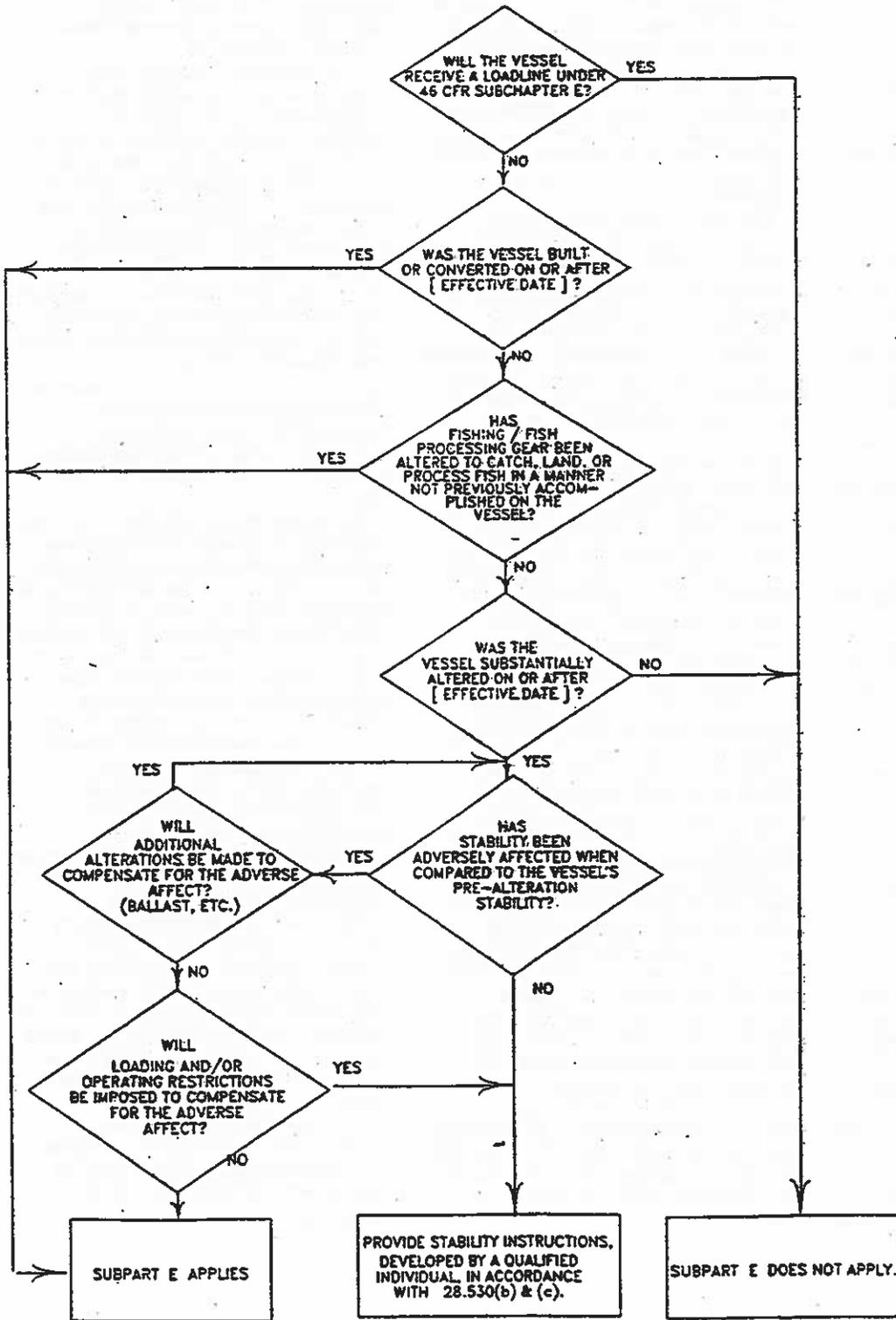


FIGURE 1

110a

Section 28.505 Vessel Owner's Responsibility

This section places on the owner of a commercial fishing industry vessel the burden of selecting a qualified individual to evaluate stability under this subpart. The owner would be responsible for maintaining calculations and test results from the stability evaluation in the event a vessel's compliance with the requirements of this subpart are questioned. It is expected that when selling a commercial fishing industry vessel an owner would transfer the calculations and test results to the purchaser, but such a requirement is beyond the scope of this rulemaking.

The Coast Guard proposed third party review of stability calculations to the Committee. After long discussions of the benefits and disadvantages of such an arrangement, the Committee recommended that no third party review of calculations be required, arguing that the cost of such verification did not justify the benefits. As a consequence of that recommendation, no third party verification of stability evaluations was proposed in the NPRM.

Several comments stated that such an arrangement should be made mandatory. The Coast Guard does not agree that such a requirement should be mandatory. An owner is free to retain a third party, such as the American Bureau of Shipping, to evaluate stability initially or to review the work of another qualified individual. Whether a third party is retained or not, the burden is on the owner to ensure that stability is evaluated in accordance with this subpart by a qualified individual.

Comments on this arrangement were specifically requested from vessel owners, designers, naval architects, and underwriters of primary insurance. Only four comments addressed this issue. Three comments stated that mandatory third party review was necessary and that without such a requirement, the regulations would be worthless. Their primary concern is that there will be no consistency in the interpretation of the regulations, thus, interpretation will be subject to the judgment of the "qualified individual." This in turn may lead to an undermining of the system. Additionally, the comments stated that the argument that the cost of a mandatory third party review would not justify the benefits was hollow and that the Coast Guard was sending a mixed message about the importance of the stability evaluations. On one hand the Coast Guard is requiring a stability evaluation, but on the other hand no one is required to review it for accuracy or methodology. One comment agreed with the concept

of no third party review, but did not elaborate upon the reason.

After reviewing the comments and the arguments concerning mandatory third party review of stability evaluations, the Coast Guard has decided that no change to the proposal is warranted and that third party review will not be required.

Section 28.510 Definitions of Stability Terms

Ten comments addressed problems and questions dealing with use of the term "qualified individual." Some went so far as to recommend that the Coast Guard develop a system of certifying or licensing qualified individuals. A plan for such action is beyond the scope of this rulemaking and the Coast Guard disagrees that such a plan is needed. A definition of "qualified individual" has been added to clarify the Coast Guard's intent. A qualified individual is defined as an individual or organization with formal training and experience in matters dealing with naval architecture calculations. This would include an individual licensed as a Professional Engineer in Naval Architecture (available only in the states of Washington and Oregon) but would not be limited to such individuals. Classification societies such as the American Bureau of Shipping would meet the definition as an organization considered to be a qualified individual, as would many reputable naval architecture design firms throughout the country.

One comment suggested that instead of referring to § 170.050 and § 171.010 for the applicable stability related definitions, that the definitions be transferred into this section for clarity. The Coast Guard agrees and the applicable definitions, including those in proposed § 28.050 dealing with stability have been placed in this section.

A definition of "freeboard deck" has been added to clarify several rules which refer to the location of this deck.

Section 28.515 Submergence Test as an Alternative to Stability Calculations

This section contains a submergence test that would be accepted in lieu of the more complicated and possibly more expensive stability calculations. The submergence test is similar to the submergence test required for some recreational boats under 33 CFR part 183. Alternatively, a plate affixed to a vessel by the manufacturer under 33 CFR part 183 is also acceptable in lieu of calculations or the submergence test described in this section.

In the opinion of the Committee, a simple stability assessment is necessary so as not to place an economic hardship

on the owners of small commercial fishing industry vessels.

Specific provisions are included for the weight expected from the loading of fish since this cargo can weigh more than the vessel itself on a small vessel. The Coast Guard believes that owners of many vessels under 25 feet (7.6 meters) in length will find the submergence test more suitable than stability calculations. The owner of a decked vessel may find calculations more suitable than this submergence test because of inability of the vessel to survive simultaneous flooding of the two largest compartments or because of the effort and expense necessary to protect the vessel to withstand submergence.

Nine comments stated that this test was impractical except for vessels which are produced in mass. Several of the comments suggested that the test should be limited to vessels less than 40 feet (12.2 meters), while several other of the comments stated that it would be economically infeasible to conduct this test. This test is merely an alternative to required calculations and tests and not the required method to evaluate the stability of a vessel. It is the owner's responsibility to decide which method of complying with these regulations is best suited to their vessel. The Coast Guard's position is that practical alternatives to conducting the normal inclining test should be offered. The submergence test has been successfully used in the past, therefore, the option to use the submergence test has been retained.

Sections 28.520 and 28.525

These sections are being reserved at this time.

Section 28.530 Stability Instructions for Operating Personnel

This section requires stability instructions for personnel who operate commercial fishing industry vessels to ensure that they can maintain loading so that the applicable stability criteria are met or to maintain the stability of a vessel which has been substantially altered. These stability instructions must be in a form readily usable by the master or the individual in charge of the vessel. For inspected vessels, the Coast Guard reviews stability information to ensure that the information provided to operating personnel is suitable and accurate. With no regulatory body or other third party examination of stability evaluations or stability instructions for commercial fishing industry vessels, the responsibility for determining the accuracy and detail of stability instructions rests with the vessel owner.

The necessary instructions will vary with vessel design, outfitting, fishing methods, and operating personnel experience and training. A list of items that must be considered for inclusion in the stability instructions is offered to help ensure needed information is provided. Much of the information in this list would not be necessary on many vessels.

The Committee recommended that the Coast Guard require pictorial guidance and a one page summary for each vessel. This could be appropriate for some vessels, but not for other vessels. Therefore, determining the best form for presenting the required information is left to the owner and the qualified individual working with the owner. The Coast Guard expects that for most vessels, the qualified individual and the owner will jointly decide on the content and form of the stability instructions necessary so that the operating personnel have the information necessary to properly load the vessel in the simplest format.

Seven comments suggested that in lieu of the operating instructions described in the regulations, short one or two page instructions describing load limits in simple terms be mounted under glass in the pilot house. They argued that when the vessel is at sea, the operating personnel are busiest and do not have time to do calculations, read/study loading curves or other applicable data. Additionally, the comments stated that many of these operating personnel are not comfortable with nor have they had the training to do these calculations. The comments argue that it is not feasible or reasonable to expect owners to do detailed calculations. The Coast Guard partially agrees with these arguments. The Coast Guard's position is that the owners must provide the required information in a format determined to be suitable for their operation, whether this is in the form of a Trim and Stability Booklet, Simplified Loading Diagram, Loading Instructions or any other appropriate and applicable format. Therefore, paragraphs (c) and (d) (paragraphs (a) and (b) in the NPRM) have been modified to clarify this.

Four comments suggested eliminating the words "intact and damage" from paragraph (a) (now paragraph (c)). The comments pointed out that the IMO stability criteria do not require vessels to meet damage stability unless they are over 100 meters (300 feet) in length and carrying 100 or more individuals.

The Coast Guard agrees with eliminating the words "intact and damage" but in their place inserting the word "applicable." This is because all vessels must meet intact stability

requirements, but all vessels do not have to meet damage stability requirements. The Coast Guard has provided the option of obtaining and maintaining a Load Line Certificate in lieu of meeting damage stability design criteria. The reasoning for this is explained in the discussion of § 28.710.

Additional changes to this section include paragraph (b) which emphasizes that only a qualified individual may develop stability instructions. Stability is a complex topic and the expertise of a qualified individual is needed for development of the stability instructions, although the qualified individual is expected to work closely with the owner in these matters.

Paragraph (a) has been added to make the Coast Guard's intentions relating to stability instructions known to all individuals dealing with them. The Coast Guard's position is that major improvements in safety can be achieved by proper attention to the human element as they relate to stability. If masters or individuals in charge of vessels have a better appreciation for and understanding of the stability limits of their vessels as reflected in the stability instructions then there should be fewer stability related casualties. For this reason the Coast Guard has placed emphasis in these rules with promoting stability instructions on vessels.

The Marine Board of Investigation (Board) dealing with the sinking of the Aleutian Enterprise recommended that all vessels, including existing vessels, be required to have a stability placard detailing the vessels loading and operating limitations. This placard would be developed by a naval architect (qualified individual) after the vessel was tested and evaluated for watertight integrity and intact stability. The Board argued that section 4502(b)(7) of the Act, which reads "other equipment required to minimize the risk of injury to the crew during vessel operations, if the Secretary (of Transportation) determines that a risk of serious injury exists that can be eliminated or mitigated by such equipment" is adequate authority for the stability placard. The Coast Guard disagrees with this interpretation of the authority for issuing such a requirement but strongly supports the concept of providing the master or individual in charge of the vessel with stability information and strongly encourages vessel owners to have the stability of their vessels evaluated by a qualified individual voluntarily.

Section 28.535 Inclining Test

This section requires an inclining test when accurate determination of a

vessel's weight and locations of the centers of gravity is necessary to determine compliance with the applicable stability requirements. Provision is made for using less accurate procedures, such as a deadweight survey, when the stability of a vessel is sufficient to assume margins of safety in the stability criteria, and for using the stability test results for a vessel of the same arrangement, outfitting, and loading. NVIC 15-81, "Guidelines for Conducting Stability Tests," provides valuable information for those conducting inclining experiments.

Several comments expressed confusion concerning the criteria for a sister vessel. The Coast Guard feels that the term "undocumented weight change," as it applies to the "sister vessel" issue may have caused some confusion. An undocumented weight change is a result of a change in the design, outfitting, or equipment to a vessel that differs from one vessel to another without specific identification or quantization. The changes could be physical changes to the vessel structure or additions, deletions, or substitutions of material or equipment which would alter the displacement of the vessel and a vessel's vertical center of gravity (VCG) or longitudinal center of gravity (LCG). An example of a "documented weight change" is the addition of a known amount of permanent ballast added to a known location on one vessel that was not present on another vessel.

Four comments stated that the criteria which determines a "sister vessel" (undocumented weight difference between the two vessels is less than 3 percent of the lightweight displacement of the original vessel and the location of the Longitudinal Center of Gravity (LCG) differs less than 1 percent of the vessel's length) is too restrictive. They suggest that the Coast Guard change the 3 percent and 1 percent to 5 percent and 2 percent, respectively. The Coast Guard disagrees. The figures used are from long standing Coast Guard policy which has satisfactorily withstood the test of time, and is considered an applicable and an appropriate standard for all vessels.

Two comments stated that paragraph (d) was misleading. The comments expressed the opinion that by stating that the inclining test had to be done in accordance with § 170.185, that Coast Guard participation was inferred. This was not the Coast Guard's intent. The reference to § 170.185 was intended to provide guidance on inclining test preparations. Coast Guard presence is

not required at inclining tests or other stability tests.

Paragraph (d) has been modified to point out that an inclining test may be conducted using recently published ASTM F-1321-90, "Standard Guide for Conducting a Stability Test (Inclining and Lightweight Survey) to determine the Lightship Displacement and Centers of Gravity of a Vessel." It is expected that this standard will be proposed by the SNPRM for incorporation by reference in § 28.040. Additionally, reference to § 170.185 has been deleted.

Section 28.540 Free Surface

This section requires that consideration be given to the effects of liquids that shift within or between tanks as a vessel heels. These liquids have the virtual effect of raising the vertical center of gravity, thus reducing intact stability. The minimum number of slack tanks (tanks which are not full) to be considered and the method of selecting tanks to be considered is described in paragraph (a). Consideration of the effect of shifting liquids is necessary for all vessels as the liquids on board are continually changing and can have a detrimental effect, if not given proper attention. Methods of calculating the effect of shifting liquids vary in ease of use and accuracy. The normally used surface inertia method is relatively conservative but is easy to use. More accurate methods can be used by the owner or the qualified individual.

The effects on intact stability of shifting fluids are required to be addressed in stability evaluations reviewed by the Coast Guard for inspected vessels. Those who develop stability instructions for operating personnel on uninspected commercial fishing industry vessels are expected to limit the adverse effects of shifting liquids by including appropriate instructions in the stability instructions for operating personnel.

The Board investigating the Aleutian Enterprise casualty recommended that the weight and free surface effect of processing water and fish on the deck of fish processing vessels be included in the free surface calculation whenever a continuous uncontained flow is used inside the vessel during its normal operation. The Coast Guard agrees and has modified paragraph (a) to include such water in considering free surface effects.

The wording in this section has been further modified editorially to better convey the intent and incorporate current practice for inspected vessels.

Section 28.545 Intact Stability When Using Fishing Gear

This section requires an evaluation of heeling moments imposed on a vessel by fishing gear or lifting a weight over the side. A vessel with a certain lifting moment, as specified by a formula, would require further evaluation. This standard is similar to the lifting criterion of 46 CFR subchapter S and applies to only a small number of vessels due to the threshold for further evaluation. The requirements of this section are considered necessary since lifting weights adversely affects stability and can result in sudden capsizing, if done improperly.

Six comments suggested deleting this section entirely until a study was conducted, because they found it to be untested and too restrictive. The Coast Guard disagrees. This criteria is not untested, it is the basic lifting criteria found in 46 CFR subchapter S and NVIC 5-86. While this criteria will not apply to many vessels due to the limitation on the relative heeling moment for applicability, lifting weights can adversely affect stability and can result in capsizings, if not accounted for or if done improperly. Therefore, the Coast Guard feels that keeping this criteria is important and it has not been removed.

One comment stated that the proposed requirement was redundant for vessels which comply with the righting energy criteria of § 28.570 and therefore, suggested that this section be deleted and reserved for towing and lifting in trawling operations. The Coast Guard disagrees. The Coast Guard's position is that this section is appropriate in addition to the righting energy criteria.

One comment letter asked for clarification of the applicability of this section to drift fishermen. The comment noted that drift fishermen do not lift fish or fish products and nets over the side but instead over the stern. The criteria is generally for vessels that lift over the side, therefore, this section does not apply to drift fishermen which do not impose a transverse heeling moment when lifting.

One comment suggested changing paragraph (e) to take into account a vessel's ability to restrict the transverse movement via the use of sideboards, thus minimizing the heeling moment. This is particularly important on stern trawlers. The Coast Guard agrees and has modified paragraph (e) to include consideration of methods used to restrict the transverse movement of a suspended load.

Section 28.550 Icing

This section requires that the effects of ice on a vessel's structure be considered during the stability evaluation, if a vessel operates in the specified regions during the specified times. Icing of a vessel results in a topside weight addition and a consequent rise in the vertical center of gravity. This method of evaluation is recommended in NVIC 5-86 and is similar to the recognized international standard for commercial fishing industry vessels. Those concerned with the stability instructions for operating personnel must consider providing guidance on the meteorological conditions which favor icing and the best methods to minimize icing and the effects of icing in accordance with § 28.530(b)(9).

Two comments noted that the criteria used in the NPRM for ice loading differed from the criteria in NVIC 5-86 and suggested that the criteria in NVIC 5-86 be used. Four comments suggested that the criteria be consistent with the IMO standards. The Coast Guard partially agrees and has clarified paragraphs (b) and (c) and has changed paragraph (d) to more closely agree with the criteria in NVIC 5-86 and the IMO standards with the following exceptions: "Projected lateral area" will be changed to "projected horizontal and vertical areas" to make the intent clearer. Additionally, the calculation of the projected horizontal and vertical areas of rails, spars, and rigging with no sails, which is currently accounted for in NVIC 5-86 by increasing the calculated area by 5 percent and the static moments of the area by 10 percent; will be changed to " * * * increasing the calculated area by 15 percent." The Coast Guard's position is that this is a simpler calculation to make and the result will not be substantially different from that proposed.

Several comments, including those presented at the public hearings, recommended changes to the dates to shorten the time when icing should be considered a concern. The dates in the NPRM are the same dates that appear in NVIC 5-86. The Coast Guard's position is that if the slightest possibility exists for vessel icing to occur, the stability calculations should take that into consideration. Consequently, the dates in the final rule are unchanged from those proposed.

Section 28.555 Freeing Ports

This section contains requirements for the drainage of weather decks, to minimize the added weight and free

surface effect of boarding seas. Few vessels can meet the stability criteria unless boarding seas are assumed to be rapidly removed. This standard for freeing ports was suggested in NVIC 5-86 and is similar to that required by the American Bureau of Shipping for small vessels and to that of recognized international standards for commercial fishing industry vessels. A reduction in the required freeing port area is provided for vessels that operate exclusively on protected waters, where boarding seas are not expected.

Eight comments objected to the 50 percent increase of freeing port area for vessels with no shear. They suggested that the increase be reduced from 50 percent to between 10 and 20 percent. The Coast Guard disagrees. The standards used are similar to those of 46 CFR 42.15-70 of the load line regulations and are considered appropriate for all vessel types.

Two comments noted that there were errors in the formulas when bulwarks are greater than 48 inches and less than 36 inches when compared to similar requirements in NVIC 5-86. This has been clarified by including units in the description of the variables. Additionally, the "m" in the formulas has been changed to "q" to avoid possible confusion with metric units.

Section 28.560 Watertight and Weather-tight Integrity

This section requires watertight coamings and weather-tight closures to prevent the inadvertent entry of sea water into the interior of a vessel. Coamings help ensure that water on deck will not normally enter openings in decks and bulkheads during normal operation.

Four comments suggested that all openings on the freeboard deck should be required to be fitted with watertight closures, and only those openings above the freeboard deck should be allowed to have the less tight weather-tight enclosures. The Coast Guard disagrees. Weather-tight closures are satisfactory on the freeboard deck because together with the required coaming heights, they should keep water from entering the spaces to which they are fitted and thus prevent downflooding. Required use of watertight closures in these locations is considered too costly and unnecessary.

Four comments suggested that the minimum coaming heights on the freeboard deck should be reduced to 18 inches in height and that on the first deck above the freeboard deck they should be reduced to 9 inches in height. The Coast Guard disagrees that these coaming heights offer adequate

protection and these suggestions have not been adopted.

Two other comments suggested that the coaming requirements be changed to coincide with the current load line regulations and ABS Rules for Vessels Less Than 200 feet (61 meters) in Length. The Coast Guard agrees with these comments and has incorporated this criteria into these rules.

One comment suggested that the coaming height for a fish hold under constant attention when closure is not in place is 18 inches (0.46 meters) vice the recommended 6 inches (0.15 meters). The Coast Guard disagrees. While an 18 inch (0.46 meters) coaming would be less likely to permit water on deck to enter below deck spaces, normal fishing operations necessitate better access to holds than would be permitted by 18 inch (0.46 meters) coamings. A coaming 6 inches (0.15 meters) in height will provide an acceptable level of protection from downflooding when the hatch is under constant attention and will still allow access to holds below deck.

Several comments noted that the coaming height for vessels less than 79 feet (24 meters) in length would normally be expected to be less than for a vessel more than 79 feet (24 meters) in length. The Coast Guard agrees and notes that the coaming heights in the NPRM at § 28.560(b) (1) and (2) were inadvertently switched in drafting. These values have been corrected to show that for a vessel more than 79 feet (24 meters) in length, a minimum coaming height of 24 inches (0.61 meters) is required and for a vessel less than 79 feet (24 meters) in length, a minimum coaming height of 12 inches (0.30 meters) is required.

As previously discussed (§ 28.255), the sinking of the Aleutian Enterprise brought to light problems with the ability of vessels to keep water from entering processing spaces. On the Aleutian Enterprise the processing deck was fitted with several large chutes for discharge of processing water and fish debris. The chutes were fitted with flaps arranged similar to those found on freeing ports to keep water off of the deck. These type of flaps allow water to flow relatively unimpeded when flowing off of the vessel, and swing shut as water is forced onto the deck. However, these flaps were not effective in keeping water out of the processing space since they were not watertight or weather-tight. When the vessel took on a list large enough to submerge these chutes water entered the processing space, contributing to the list. These type arrangements are not accepted by the load line regulations, 46 CFR

subchapter E, for protecting the watertight integrity of the hull envelope. As a consequence, paragraph (g) has been added to require these type openings to be fitted with a means of closure that is at least weather-tight. This means of closure must be operable from a location outside the space containing the opening. If such closures were fitted on the Aleutian Enterprise, the sinking may have been delayed or even prevented.

Section 28.565 Water on Deck

The requirements of this section are intended to guard against vessel capsizing due to water trapped on deck by bulwarks. This section is not applicable to a vessel that does not have bulwarks, since water cannot be trapped on deck. This standard was originally presented in NVIC 5-86 and is similar to recognized international standards for commercial fishing industry vessels.

Specific comments from designers were requested on alternative methods of analyzing the effect of large quantities on trapped water on deck.

Eight comments suggested that this section be deleted. They argued that the IMO criteria requires adequate stability to cope with water on deck and therefore, these proposed regulations are redundant and unnecessary. The Coast Guard disagrees. This technical standard is from NVIC 5-86 and is equivalent to the recognized international standards for fishing industry vessels.

One comment noted that the proposed regulation differs from the criteria in NVIC 5-86 which corresponds with the IMO standard and recommended that the proposed regulations be changed to agree with NVIC 5-86 and the IMO standard. The Coast Guard agrees, and has changed paragraph (c)(1) accordingly.

Two comments noted discrepancies in Figure 28.565. One comment noted that area "b" extends out to 60° (1.05 radians) when it should only extend out to 45° (0.79 radians) or the angle of downflooding, whichever is least. The other comment noted that the curve of heeling energy in this figure was confusing or misleading. The comment noted that a normal boat with approximately vertical bulwarks would have a curve of heeling energy that would remain positive out to roughly 90° (1.57 radians). The Coast Guard agrees and has modified this figure to better reflect the points made in these comments.

Section 28.570 Intact Righting Energy

This section contains the basic stability criteria for commercial fishing industry vessels and were developed internationally 20 years ago. They have been successfully applied in the United States to many different vessel types for many years. However, the range of positive stability proposed here, 60° (1.05 radians), is greater than that for other vessel types, which is 50° (0.87 radians). The larger range of positive stability is critical to the ability of a small vessel, such as many commercial fishing industry vessels, to remain upright in relatively large or breaking waves.

Twelve comments stated that the intact righting energy criteria was suitable for vessels more than 79 feet (24 meters) in length except for the requirement that the maximum righting arm must occur at an angle of heel not less than 25° (0.44 radians). They suggested that this requirement be deleted. Their reasoning was that when IMO established the requirement that the area under each righting arm curve be at least 5.6 foot-degrees (0.030 meter-radians) between 30° (0.52 radians) and 40° (0.70 radians) or the downflooding angle, whichever is less, this assured adequate stability at higher angles of heel. Therefore, requiring the maximum righting arm to occur at an angle of heel not less than 25° (0.44 radians) is unnecessary and restrictive. The Coast Guard disagrees. IMO Resolution 168, dated November, 1968, established the criteria for intact stability of fishing vessels, and the criteria of maximum righting arm occurring at an angle of heel not less than 25° (0.44 radians) was not eliminated with the establishment of the requirement to have 5.6 foot-degrees (0.030 meter-radians) under the righting arm curve between 30° (0.52 radians) and 40° (0.70 radians) or the angle of downflooding. It was not IMO's intent to remove this requirement but, instead, to enhance the safety of the fishing vessels with the additional requirement.

The IMO standard encourages that the hydrostatic and stability curves be prepared on a design trim basis and that where the operating trim or the form and the arrangement of the ship are such that the change in trim has an appreciable effect on the righting arms, the change should be taken into account. The Coast Guard agrees that this is a good practice to establish, one which will enhance the safety of the fishing vessels. Therefore, paragraph (c) has been added, which requires that the vessel's hydrostatic properties be evaluated in the worst anticipated conditions of trim and be used when

showing compliance with the stability criteria. Additionally, the righting arm values used in the stability criteria should be calculated using "free trim" instead of "fixed trim." This is required for inspected vessels required to meet the stability requirements of 46 CFR subchapter S.

Section 28.575 Severe Wind and Roll

This section requires evaluation of an intact stability criterion for fishing industry vessels to ensure that the wind area is not mismatched to the vessel's intact stability. It was recommended in NVIC 5-86, in a slightly different form, and is similar to a recognized international standard. This criterion evaluates the possibility of a vessel capsizing in a beam wind.

Ten comments suggested that this section be deleted and reserved for future study. The comments stated that the criteria was too complex and too cumbersome and felt that there was not enough experience with the applicability of this criterion to make a proper evaluation.

Three comments endorsed the proposed rule. They agreed that the criterion may be too complicated to accurately calculate, but they felt it to be necessary. The Coast Guard agrees. This rule represents the state of the art technical criteria for use in evaluating intact stability for commercial fishing industry vessels and is taken from NVIC 5-86. This rule incorporates minor changes to the recognized international standard. While the criterion may be complicated to calculate for a lay person, a "qualified individual" should have little problem performing the required calculations.

Four comments noted that there were errors in the formulas for the angle of roll to windward (A1 and C), when compared to the IMO requirements. The Coast Guard agrees and has corrected the formulas.

Section 28.580 Unintentional Flooding

This section contains requirements for evaluation of unintentional flooding from leaking hull penetrations or collision damage. Calculations are necessary for vessels more than 79 feet in length. The transverse extent of damage, 30 inches, is similar to the standards proposed in 46 CFR subchapter L—Offshore Supply Vessels Including Lifboats (CGD 82-004, RIN 2115-AA77, published on May 9, 1989, 54 FR 20066) and international standards for Offshore Support Vessels, and was recommended in NVIC 5-86.

As an alternative to meeting the requirements of this section, a vessel which is not required by 46 CFR

subchapter E—Load Line Regulations to obtain a Load Line Certificate may obtain and maintain a Load Line Certificate. A vessel assigned a load line is subject to the load line regulations until the Load Line Certificate is surrendered and the load line marks removed from the vessel, even if the load line is not required.

An examination of the hull is a prerequisite to obtaining a Load Line Certificate. This examination is for the purpose of determining the condition of the hull's watertightness and the material and arrangements which may affect that watertightness. A vessel must also be examined annually to ensure continued compliance with the conditions of assignment. Many cases of unintentional flooding are the result of leaking through-hull penetrations caused by poor maintenance or inappropriate material selection. Annual load line examinations should help alleviate these problems.

The NPRM proposed an annual examination by a surveyor of the American Bureau of Shipping, a similarly qualified organization, or an accepted organization in lieu of meeting paragraphs (c) through (g) of this section. While there were few comments either for or against the proposal, the Coast Guard's position is that this alternative may be impractical and may even be construed as an attempt to require fishing industry vessels to be "inspected." The Coast Guard has no authority to require inspection on most commercial fishing industry vessels. Only fish processing vessels 5000 gross tons or more and fish tender vessels 500 gross tons or more are required to be inspected.

Additionally, the question of whether commercial fishing industry vessels may voluntarily receive a Load Line Certificate has been raised by some individuals in the commercial fishing industry. Section 5102(c) of title 46 U.S. Code permits assignment of a load line to a vessel which is not required to obtain a load line.

Consequently, paragraph (f) of this section has been modified so that a Load Line Certificate may be substituted for the design requirements of this section for vessels not required to obtain a Load Line Certificate. The Coast Guard considers this to be a more realistic and practical alternative to the damage stability provisions of this section than contained in the NPRM.

Definitions of a "similarly qualified organization" and an "accepted organization" are contained in § 28.050.

Sixteen comments objected to the provisions in this section. Generally, the

comments stated the standards were not practical, were too restrictive, and were nearly impossible to meet. Additionally, they suggested that since these criteria are reserved by IMO for vessels over 100 meters (300 feet) and carrying 100 individuals, they should not be imposed on commercial fishing industry vessels. The Coast Guard disagrees. Casualty statistics for 1987 and 1988 reveal that the majority of stability related casualties can be attributed to problems with hull watertight integrity and that the one compartment flooding standard is necessary to prevent similar capsizings or sinkings. The Coast Guard has provided a reasonable alternative to the design criteria, an annual physical examination of the vessel.

Six comment letters requested clarification of the required location of a collision bulkhead on vessels with a bulbous bow. The Coast Guard has modified paragraph (b)(4) and added Figure 28.580 to clarify this.

One comment suggested that the minimum distance of the collision bulkhead from the forward perpendicular be specified. The Coast Guard disagrees. There is already a limiting factor for the maximum location of the collision bulkhead aft of the forward perpendicular, the vessel's ability to survive flooding of the space forward of the collision bulkhead.

Subpart F—Fish Processing Vessels

This subpart applies to all fish processing vessels in addition to the requirements of subparts A through E. The requirements in this subpart are in response to Sections 4502(f) and 4503 of the Act.

Section 28.600 Applicability

Fish processing vessels of over 5,000 gross tons are subject to inspection under the provisions of 46 U.S.C. 3301(11) and are not subject to this subchapter. All other fish processing vessels, as defined in § 28.050, are subject to this subpart.

Section 28.610 Examination and Certification of Compliance

This section requires each fish processing vessel to be examined for compliance with title 46 Code of Federal Regulations at least once every two years. Most of the requirements applicable to fish processing vessels less than 5000 gross tons are contained in these rules.

The examination must be performed by the American Bureau of Shipping, a similarly qualified organization, or an accepted organization. The organization performing the examination is required to provide the owner and the cognizant

Coast Guard District Commander a copy of the signed certification letter, if the examination determines that the vessel is in compliance with title 46 Code of Federal Regulations. A copy of a certification letter is also required to be maintained on board the vessel.

Several comments expressed concern over the qualifications of marine surveyors and the lack of requirements for designation as a marine surveyor. While this is outside the scope of this rulemaking, examination of the definition of "accepted organization" in § 28.050 revealed that the intent of the proposed definition was not as clear. Consequently, this definition has been modified by specifically referring to surveyors of the organization as well as other members of the organization. An organization with members who are not surveyors may also be "accepted." The proposed definition could have been misconstrued to mean that all members of the accepted organization were required to be surveyors.

Section 28.620 Survey and Classification

This section requires each fish processing vessel built after or which undergoes a major conversion completed after July 27, 1990, to be classed by the American Bureau of Shipping or another organization determined by the Commandant to be similarly qualified. Fish processing vessels subject to this section must satisfactorily complete all required surveys and maintain certificates required by the classification society.

Incorporation by Reference

The Director of the Federal Register has approved the material in § 28.040 for incorporation by reference under 5 U.S.C. 552 and 1 CFR part 51. The material is available as indicated in § 28.040.

Regulatory Evaluation

These regulations are considered to be non-major under Executive Order 12291 on Federal Regulation and significant under DOT regulatory policies and procedures (44 FR 11034, February 26, 1979). A regulatory evaluation has been prepared and placed in the rulemaking docket. It may be inspected and copied at the address listed under ADDRESSES. The projected capital costs estimated for the 110,000 existing commercial fishing industry vessels to comply with these regulations is \$94 million dollars. The annualized capital costs are estimated to be \$16.4 million, with an additional \$7.1 million annual operating and maintenance costs

for a total annualized cost to the industry of \$23.5 million.

The highest costs associated with these rule are for primary and secondary lifesaving equipment, e.g. survival craft and immersion suits. This equipment is expected to play the largest role in reducing the number of fatalities associated with casualties in the commercial fishing industry. Additionally, largely unquantifiable benefits are expected to accrue from the requirements for instruction and drills, while the costs are considered to be negligible.

The economic benefits of these regulations consist of vessel casualties prevented and a reduction in the number of injuries and fatalities that could be expected to occur without these regulations. The commercial fishing industry has a fatality rate estimated to be nearly 7 times the national industry average. The annual number of fatalities that may be prevented in response to the provisions of this proposal as they relate to existing commercial fishing industry vessels is estimated to be 29 per annum. These regulations could prevent up to 27 existing commercial fishing industry vessels from sinking annually. In addition, over 100 serious injuries could be avoided. The Coast Guard estimates the benefits of these regulations to be in excess of \$50 million annually, or over two times the annualized cost to the industry.

Environment

The Coast Guard has considered the environmental impact of these final rules and it has been determined to be categorically excluded from further environmental documentation in accordance with section 2.B.2. Commandant Instruction (COMDTINST) M16475.1B due to the inconsequential affects these rules are expected to have on the environment. A categorical Exclusion Determination statement has been prepared and placed in the rulemaking docket.

Federalism

This rulemaking has been analyzed in accordance with the principles and criteria contained in Executive Order 12612, and it has been determined that this rulemaking does not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

Small Entities

In accordance with the Regulatory Flexibility Act, a regulatory flexibility analysis which describes the impact of these regulations on small entities is

included in the regulatory evaluation available for inspection. An estimated 90-95 percent of the total number of commercial fishing industry vessels are independently owned. Even investor and company owned vessels are predominately associated with small businesses. Therefore, virtually the entire industry can be said to be composed of small businesses. Although the cost of the regulations is estimated to be minor when compared to the total annual revenues of the domestic industry of over \$2.5 billion, compliance costs fall disproportionately on a number of individual classes of vessels.

The cost of these regulations is estimated to be minor with respect to virtually all small and large vessels operating in waters inside the Boundary Lines. The cost is estimated to be moderate for larger vessels operating outside of the Boundary Lines. Relative to the revenues of these vessels, the costs are considered to be negligible.

The economic impact of these regulations on smaller vessels that operate beyond the Boundary Lines may be significant. Examples of smaller vessels that operate beyond the Boundary Lines include New England lobster boats, swordfish vessels, bottom long-line vessels, offshore gillnetters, and virtually all of the small vessels that operate on the West Coast of the United States. The economic impact on smaller vessels will depend upon the safety, equipment already on board these vessels, the area of operation, and whether the vessels are employed part time or full time in commercial fishing.

A 26 foot boat operating far offshore would incur capital costs of over \$1,500. This is a significant amount to invest in a vessel worth \$10,000 to \$20,000. The largest impact would be to vessels that operate in the Northern waters. A small salmon gillnet boat in Alaska could have capital costs as high as \$4,300 with annualized costs of \$1,100 per boat. This is a relatively high economic burden for a vessel that may earn less than \$10,000 annually from commercial fishing.

Part-time and seasonal operators represent a significant proportion of many fisheries. The cost of complying with the regulations is the same for part-time and seasonal operators as it is for full-time operators. Therefore, these regulations may lead some part-time and seasonal operators to discontinue commercial fishing activities.

Collection of Information

This rulemaking contains information collection requirements in the following sections of 46 CFR:

§ 28.080, § 28.090, § 28.135, § 28.165,
§ 28.530, § 28.560, § 28.710, § 28.720.

The information collection requirements have been approved by the Office of Management and Budget (OMB) under the provisions of the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 *et seq.*) and approved under approval number 2115-0582.

List of Subjects in 46 CFR Part 28

Fire prevention, Fishing vessels, Incorporation by reference, Lifesaving equipment, Main and auxiliary machinery, Marine safety, Navigation (water), Reporting and recordkeeping requirements, Seamen, and Stability.

In consideration of the foregoing, chapter I of title 46, Code of Federal Regulations subchapter C, is amended by adding part 28 to read as follows:

PART 28—REQUIREMENTS FOR COMMERCIAL FISHING INDUSTRY VESSELS

Subpart A—General Provisions

- Sec.
- 28.10 Authority.
 - 28.20 OMB control numbers.
 - 28.30 Applicability.
 - 28.40 Incorporation by reference.
 - 28.50 Definition of terms used in this part.
 - 28.70 Approved equipment and material.
 - 28.73 Accepted organizations.
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 - 28.80 Report of casualty.
 - 28.90 Report of injury.
 - 28.95 Right of appeal.

Subpart B—Requirements for All Vessels

- 28.100 Applicability.
- 28.105 Lifesaving equipment—general requirements.
- 28.110 Life preservers or other personal flotation devices.
- 28.115 Ring life buoys.
- 28.120 Survival craft.
- 28.125 Stowage of survival craft.
- 28.130 Survival craft equipment.
- 28.135 Lifesaving equipment markings.
- 28.140 Operational readiness, maintenance, and inspection of lifesaving equipment.
- 28.145 Distress signals.
- 28.150 Emergency Position Indicating Radio Beacons (EPIRBs).
- 28.155 Excess fire detection and protection equipment.
- 28.160 Portable fire extinguishers.
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Subpart C—Requirements for Documented Vessels That Operate Beyond the Boundary Line or with More Than 16 Individuals On Board

- 28.200 Applicability.
- 28.205 Fireman's outfit and self-contained breathing apparatus.
- 28.210 First aid equipment and training.
- 28.215 Guards for exposed hazards.
- 28.225 Navigational information.
- 28.230 Compasses.
- 28.235 Anchors and radar reflectors.

- Sec.
- 28.240 General alarm system.
 - 28.245 Communication equipment.
 - 28.250 High water alarms.
 - 28.255 Bilge pumps, bilge piping, and dewatering systems.
 - 28.260 Electronic position fixing devices.
 - 28.265 Emergency instructions.
 - 28.270 Instruction, drills, and safety orientation.
- Subpart D—Requirements for Vessels Which Have Their Keel Laid or Are at a Similar Stage of Construction on or After or Which Undergo a Major Conversion Completed on or After September 15, 1991, and That Operate With More Than 16 Individuals on Board**
- 28.300 Applicability and general requirements.
 - 28.305 Lifesaving and signaling equipment.
 - 28.310 Launching of survival craft.
 - 28.315 Fire pumps, fire mains, fire hydrants, and fire hoses.
 - 28.320 Fixed gas fire extinguishing systems.
 - 28.325 Fire detection systems.
 - 28.330 Galley hood and other fire protection equipment.
 - 28.335 Fuel systems.
 - 28.340 Ventilation of enclosed engine and fuel tank spaces.
 - 28.345 Electrical standards for vessels less than 79 feet (24 meters) in length.
 - 28.350 General requirements for electrical systems.
 - 28.355 Main source of electrical power.
 - 28.360 Electrical distribution systems.
 - 28.365 Overcurrent protection and switched circuits.
 - 28.370 Wiring methods and materials.
 - 28.375 Emergency source of electrical power.
 - 28.380 General structural fire protection.
 - 28.385 Structural fire protection for vessels that operate with more than 49 individuals on board.
 - 28.390 Means of escape.
 - 28.395 Embarkation stations.
 - 28.400 Radar and depth sounding devices.
 - 28.405 Hydraulic equipment.
 - 28.410 Deck rails, lifelines, storm rails, and hand grabs.
- Subpart E—Stability**
- 28.500 Applicability.
 - 28.501 Substantial alterations.
 - 28.505 Vessel owner's responsibility.
 - 28.510 Definitions of stability terms.
 - 28.515 Submergence test as an alternative to stability calculations.
 - 28.520 Reserved.
 - 28.525 Reserved.
 - 28.530 Stability instructions.
 - 28.535 Inclining test.
 - 28.540 Free surface.
 - 28.545 Intact stability when using lifting gear.
 - 28.550 Icing.
 - 28.555 Freeing ports.
 - 28.560 Watertight and weathertight integrity.
 - 28.565 Water on deck.
 - 28.570 Intact righting energy.
 - 28.575 Severe wind and roll.
 - 28.590 Reserved.
 - 28.580 Unintentional flooding.
 - 28.600 Reserved.

- Sec.
- 28.610 Reserved.
- 28.620 Reserved.
- 28.630 Reserved.

Subpart F—Fish Processing Vessels

- 28.700 Applicability.
- 28.710 Examination and certification of compliance.
- 28.720 Survey and classification.

Authority: 46 U.S.C. 3316, 4502, 4506, 6104, 10603; 49 U.S.C. App. 1804; 49 CFR 1.46.

Subpart A—General Provisions

§ 28.10 Authority.

The regulations in this part are prescribed by the Commandant of the Coast Guard, pursuant to a delegation of authority by the Secretary of Transportation set forth in 49 CFR 1.46(b), to carry out the intent and purpose of 46 U.S.C. 3316 which authorizes the Secretary to rely on reports, documents, and certificates issued by the American Bureau of Shipping (ABS) or a similar United States classification society, or an agent of the ABS or similar society; sections 4502 and 4506 which require safety equipment and operational stability for certain vessels in the commercial fishing industry; section 6104 which requires the Secretary of Transportation to compile statistics concerning marine casualties compiled from vessel insurers and to delegate that authority to compile statistics from insurers to a qualified person; and section 10603 which requires seamen on commercial fishing

industry vessels to give notice of illness, injury, or disability to their employer.

§ 28.20 OMB control numbers.

(a) This section collects and displays the control numbers assigned to information collection and recordkeeping requirements in this part by the Office of Management and Budget (OMB) pursuant to the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 *et seq.*). This section complies with the requirements of 44 U.S.C. 3507(f) which requires that agencies display a current control number assigned by the Director of the OMB for each approved agency information collection requirement.

(b) Display.

46 CFR part or section where identified or described	Current OMB control No.
§ 28.80	2115-0582
§ 28.90	2115-0582
§ 28.135	2115-0582
§ 28.165	2115-0582
§ 28.530	2115-0582
§ 28.710	2115-0582
§ 28.720	2115-0582

§ 28.30 Applicability.

(a) Except as provided in paragraph (b) of this section, this part is applicable to all United States flag vessels not inspected under this chapter that are commercial fishing, fish processing, or fish tender vessels. This includes

vessels documented under the provisions of subchapter G of this chapter and vessels numbered by a State or the Coast Guard under the provisions of subchapter S of this chapter. Certain regulations in this part apply only to limited categories of vessels. Specific applicability statements are provided at the beginning of those regulations.

(b) This part does not apply to a small boat or auxiliary craft that is deployed from a fishing industry vessel for the purpose of handling fishing gear.

§ 28.40 Incorporation by reference.

(a) Certain material is incorporated by reference into this part with the approval of the Director of the Federal Register in accordance with 5 U.S.C. 552(a). To enforce any edition other than that specified in paragraph (b) of this section, the Coast Guard must publish notice of change in the *Federal Register* and make the material available to the public. All approved material is on file at the Office of the Federal Register, 1100 L Street NW., Washington, DC and at the U.S. Coast Guard, Marine Technical and Hazardous Materials Division, 2100 Second Street SW., Washington, DC 20593-0001 and is available from the sources indicated in paragraph (b) of this section.

(b) The material approved for incorporation by reference in this part and the sections affected are:

American Boat and Yacht Council (ABYC)	
P.O. Box 747, 405 Headquarters Dr., Suite 3 Millersville, MD 21108-0747	
E-1-1972—Bonding of Direct Current Systems	28.345
E-8-1985—Alternating Current (AC) Electrical Systems on Boats	28.345
E-9-1981—Recommended Practices and Standards Covering Direct Current (DC) Electrical Systems on Boats	28.345
H-2-1989—Ventilation of Boats Using Gasoline	28.340
H-25-1986—Portable Fuel Systems for Flammable Liquids	28.335
H-33-1989—Diesel Fuel Systems	28.335
P-1-1986—Installation of Exhaust Systems for Propulsion and Auxiliary Engines	28.380
International Maritime Organization (IMO)	
Publications Section, 4 Albert Embankment, London SE17SR, England	
Resolution A.658(16) "Use and Fitting of Retro-Reflective Materials on Life-Saving Appliances", dated November 1989	28.135
National Fire Protection Association (NFPA)	
60 Batterymarch Park, Quincy, MA 02269	
70-1990—National Electrical Code (also known as ANSI/NFPA 70-1990)	28.350; 28.370
302-1989—Pleasure and Commercial Motor Craft	26.335; 28.340;
	28.345
17-1985—Dry Chemical Extinguishing Systems	28.330
17A-1986—Wet Chemical Extinguishing Systems	28.330
Society of Automotive Engineers (SAE)	
400 Commonwealth Drive, Warrendale, PA 15096	
SAE J 1942-1989—Hose and Hose Assemblies for Marine Applications	28.405
Underwriters Laboratories, Inc. (UL)	
333 Pfingsten Rd., Northbrook, IL 60062	
UL 217-1985—Single and Multiple Station Smoke Detectors	28.325
UL 710-1990—Exhaust Hoods for Commercial Cooking Equipment	28.330

§ 28.50 Definition of terms used in this part.

Accepted organization means an organization which has been designated by the Commandant for the purpose of

examining commercial fishing industry vessels under the provisions of § 28.073.

Accommodations include:

- (1) A messroom.
- (2) A lounge.

- (3) A sitting area.
- (4) A recreation room.
- (5) Quarters.
- (6) A toilet space.
- (7) A shower room.

(8) A galley.

(9) Berthing facilities.

(10) A clothing changing room.

Approved means approved by the Commandant unless otherwise stated.

Boundary Lines means the lines set forth in 46 CFR part 7. In general, they follow the trend of the seaward high water shorelines and cross entrances to small bays, inlets and rivers. In some areas, they are along the 12 mile line which marks the seaward limits of the contiguous zone and in other areas they come ashore.

Coastal waters means coastal waters as defined in 33 CFR 175.105.

Cold Water means water where the monthly mean low water temperature is normally 59 °F (15 °C) or less.

Commandant means the Commandant of the Coast Guard or an authorized representative of the Commandant of the Coast Guard.

Commercial fishing industry vessel means a fishing vessel, fish tender vessel, or a fish processing vessel.

Currently corrected means corrected with changes contained in all Notice to Mariners published by the Defense Mapping Agency Hydrographic/Topographic Center.

Custom engineered means, when referring to a fixed gas fire extinguishing system, a system that is designed for a specific space requiring individual calculations for the extinguishing agent volume, flow rate, and piping, among other factors, for the space.

Documented vessel means a vessel for which a Certificate of Documentation has been issued under the provisions of 46 CFR part 67.

Fish means finfish, mollusks, crustaceans, and all other forms of marine animal and plant life, except marine mammals and birds.

Fish processing vessel means a vessel that commercially prepares fish or fish products other than by gutting, decapitating, gilling, skinning, shucking, icing, freezing, or brine chilling.

Fish tender vessel means a vessel that commercially supplies, stores, refrigerates, or transports fish, fish products, or materials directly related to fishing or the preparation of fish to or from a fishing, fish processing or fish tender vessel or a fish processing facility.

Fishing vessel means a vessel that commercially engages in the catching, taking, or harvesting of fish or an activity that can reasonably be expected to result in the catching, taking, or harvesting of fish.

Gasoline as used in this part includes gasoline-alcohol blends and any other fuel having a flash point of 110 °F (43.3 °C) or lower.

Length means the length listed on the vessel's Certificate of Documentation or Certificate of Number.

Major conversion means a conversion of a vessel that—

(1) Substantially changes the dimensions or carrying capacity of the vessel;

(2) Changes the type of the vessel;

(3) Substantially prolongs the life of the vessel; or

(4) Otherwise so changes the vessel that it is essentially a new vessel, as determined by the Commandant.

Mile means a nautical mile.

North Pacific Area means all waters of the North Pacific Ocean and Bering Sea north of 48°30' north latitude including waters in contiguous bays, inlets, rivers, and sounds.

Officer in Charge, Marine Inspection (OCMI) means an officer of the Coast Guard who commands a Marine Inspection Zone described in 33 CFR part 3 or an authorized representative of that officer.

Open to the atmosphere means a space that has at least 15 square inches (9686 square millimeters) of open area directly exposed to the atmosphere for each cubic foot (0.0283 cubic meters) of net volume of the space.

Operating station means the principal steering station on the vessel from which the vessel is normally navigated.

Pre-engineered means, when referring to a fixed gas fire extinguishing system, a system that is designed and tested to be suitable for installation as a complete unit in a space of a set volume, without modification, regardless of the vessel on which installed.

Similarly qualified organization means an organization which has been designated by the Commandant for the purpose of classing or examining commercial fishing industry vessels under the provisions of § 28.76.

Switchboard means an electrical panel which receives power from a generator, battery, or other electrical power source and distributes power directly or indirectly to all equipment supplied by the power source.

Warm water means water where the monthly mean low water temperature is normally more than 59° F. (15° C.).

Watertight means designed and constructed to withstand a static head of water without any leakage, except that "watertight" for the purposes of electrical equipment means enclosed so that equipment does not leak when a stream of water from a hose with a nozzle one inch (25.4 millimeters) in diameter that delivers at least 65 gallons (246 liters) per minute is played on the enclosure from any direction from a

distance of 10 feet (3 meters) for five minutes.

Weather deck means the uppermost deck exposed to the weather to which a weathertight sideshell extends.

Weathertight means that water will not penetrate into the unit in any sea condition.

§ 28.70 Approved equipment and material.

(a) Equipment and material that is required by this subchapter to be approved or of an approved type, must have been manufactured and approved in accordance with the design and testing requirements in Subchapter Q of this chapter or as otherwise specified by the Commandant.

(b) Notice regarding equipment approvals is published in the Federal Register. Coast Guard publication COMDTINST M16714.3, "Equipment Lists, Items Approved, Certificated or Accepted under Marine Inspection and Navigation Laws," lists approved equipment by type and manufacturer. COMDTINST M16714.3 may be obtained from the Superintendent of Documents U.S. Government Printing Office, Washington, DC 20462. Each OCMI may be contacted for information concerning approved equipment.

§ 28.73 Accepted organizations.

An organization desiring to be designated by the Commandant as an accepted organization must request such designation in writing. As a minimum the organization must verify that it is an organization—

- (a) With a Code of Ethics;
- (b) Whose surveyors are familiar with the requirements of this chapter related to commercial fishing industry vessels;
- (c) Whose surveyors are familiar with the operations and equipment on board commercial fishing industry vessels;
- (d) Whose only interest in the fishing industry is in ensuring the safety of commercial fishing industry vessels and surveying commercial fishing industry vessels;
- (e) That has grievance procedures;
- (f) That has procedures for accepting and terminating membership of an individual, including minimum professional qualifications for surveyors;
- (g) That maintains a roster of present and past accepted members and surveyors; and
- (h) That has an Apprentice/Associate program for surveyors.

§ 28.76 Similarly qualified organizations.

An organization desiring to be designated by the Commandant as a similarly qualified organization must

request such designation in writing. As a minimum the organization must verify that it—

(a) Publishes standards for vessel design and construction which are as widely available as and which are of similar content to the standards published by the ABS;

(b) Performs periodic surveys in a wide range of localities during and after construction to ensure compliance with published standards, including drydock examinations, in a manner similar to the ABS;

(c) Issues certificates testifying to compliance with the published standards;

(d) Has as its primary concern the survey and classification of vessels;

(e) Has no interest in owning or operating fishing, fish processing, or fish tender vessels; and

(f) Maintains records of surveys and makes such records available to the Coast Guard upon request in a manner similar to the ABS.

§ 28.80 Report of casualty.

(a) Except for a casualty which is required to be reported to the Coast Guard on Form CG 2692 in accordance with part 4 of this chapter, the owner, agent, operator, master, or individual in charge of a vessel involved in a casualty must submit a report in accordance with paragraph (c) of this section, as soon as possible after the casualty, to the underwriter of primary insurance for the vessel or to an organization listed in paragraph (d) of this section whenever the casualty involves any of the following.

(1) Loss of life.

(2) An injury to an individual that causes that individual to remain incapacitated for a period in excess of 72 hours.

(3) Loss of a vessel.

(4) 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 \$2,500.00 or more.

(b) Each underwriter of primary insurance for a commercial fishing industry vessel must submit a report of each casualty involving that vessel to an organization listed in paragraph (d) of this section within 90 days of receiving notice of the casualty and whenever it pays a claim resulting from the casualty. Initial reports must be in accordance with paragraph (c) of this section. Subsequent reports must contain sufficient information to identify the casualty and any new or corrected casualty data.

(c) Each report of casualty must include the following information:

(1) The name and address of the vessel owner and vessel operator, if different than the vessel owner;

(2) The name and address of the underwriter of primary insurance for the vessel;

(3) The name, registry number, call sign, gross tonnage, year of build, length, and hull material of the vessel;

(4) The date, location, primary cause, and nature of the casualty;

(5) The specific fishery, intended catch, and length of fishery opening when applicable;

(6) The date that the casualty was reported to the underwriter of primary insurance for the vessel, or to an organization acceptable to the Commandant;

(7) The activity of the vessel at the time of the casualty;

(8) The weather conditions at the time of the casualty, if the weather caused or contributed to the cause of the casualty;

(9) The damages to or by the vessel, its apparel, gear, or cargo;

(10) The monetary amounts paid for damages;

(11) The name, birth date, social security number, address, job title, length of disability, activity at the time of injury, type of injury, and medical treatment required for each individual incapacitated for more than 72 hours, or deceased as a result of the casualty;

(12) The name, registry number, and call sign of every other vessel involved in the casualty; and

(13) The monetary amount paid for an injury or a death.

(d) A casualty to a commercial fishing industry vessel must be reported to an organization that has knowledge and experience in the collection and processing of statistical insurance data and that has been accepted by the Commandant to receive and process casualty data under this part. The Commandant has accepted for this purpose:

(1) Marine Index Bureau, Inc., P.O. Box 1964, New York, NY 10156-0612.

(2) Reserved.

Note: The Coast Guard intends to treat information collected under this section from underwriters of primary insurance as exempt from disclosure under the Freedom of Information Act because it is commercial and financial information which, if disclosed, would be likely to cause substantial harm to the competitive position of the underwriter.

§ 28.90 Report of injury.

Each individual employed on a commercial fishing industry vessel must notify the master, individual in charge of

the vessel, or other agent of the employer of each illness, disability, or injury suffered while in service to the vessel not later than seven days after the date on which the illness, disability, or injury arose.

§ 28.95 Right of appeal.

Any person directly affected by a decision or action taken under this part, by or on behalf of the Coast Guard, may appeal therefrom in accordance with part 1, subpart 1.03 of this chapter.

Subpart B—Requirements For All Vessels

§ 28.100 Applicability.

Each commercial fishing industry vessel must meet the requirements of this subpart, in addition to the requirements of parts 24, 25, and 26 of this chapter.

§ 28.105 Lifesaving equipment—general requirements.

(a) In addition to the requirements of this subpart, each commercial fishing industry vessel must comply with the requirements of part 25 subpart 25.25 of this chapter.

(b) Except as provided in § 28.120(d), each item of lifesaving equipment carried on board a vessel to meet the requirements of this part must be approved by the Commandant. Equipment for personal use which is not required by this part need not be approved by the Commandant.

§ 28.110 Life preservers or other personal flotation devices.

(a) Except as provided by § 28.305 of this chapter, after November 15, 1991, each vessel must be equipped with at least one immersion suit, exposure suit, or wearable personal flotation device of the proper size for each individual on board as specified in table 28.110 and part 25, subpart 25.25 of this chapter. Notwithstanding the provisions of paragraphs (c) and (d) of § 25.25-1 of this chapter, each commercial fishing industry vessel propelled by sail or a manned barge employed in commercial fishing activities must meet the requirements of this paragraph.

(b) Each wearable personal flotation device must be stowed so that it is readily accessible to the individual for whom it is intended, from both the individual's normal work station and berthing area. If there is no location accessible to both the work station and the berthing area, an appropriate device must be stowed in both locations.

TABLE 28.110.—PERSONAL FLOTATION DEVICES AND IMMERSION SUITS

Applicable waters	Vessel type	Devices required	Other regulations
Seaward of the Boundary Line and North of 32° N; or South of 32° S; or Great Lakes.	Documented vessels	Immersion suit or exposure suit ¹	28.135; 25.25-5(a); 25.25-13; 25.25-15.
Coastal waters or beyond cold waters (includes Great Lakes).	All vesselsdo ¹	Do.
All other waters	40 feet (12.2 meters) or more in length	Type I, Type V commercial hybrid, immersion suit, or exposure suit ² .	28.135; 25.25-5(a); 25.25-5(b); 25.25-9(a); 25.25-13; 25.25-15.
Do.	Less than 40 feet (12.2 meters) in length.	Type I, Type II, Type III, Type V commercial hybrid immersion suit, or exposure suit ² .	Do.

¹ Until September 1, 1995, individuals weighing less than 44 pounds (196 Newtons) may substitute an approved personal flotation device of the appropriate size for a required immersion suit or exposure suit.

² Certain Type V personal flotation devices are approved for substitution for Type I, II, or III personal flotation devices when used in accordance with the conditions stated in the Coast Guard approval label.

§ 28.115 Ring life buoys.

(a) Except as provided in paragraph (b) of this section and § 28.305, after November 15, 1991, each vessel must be equipped with a throwable flotation device or a ring life buoy as specified in table 28.115. If the vessel is equipped with a ring life buoy, at least one ring life buoy must be equipped with a line which is at least:

(1) 60 feet (18.3 meters) in length for a vessel less than 65 feet (19.8 meters) in length; or

(2) 90 feet (27.4 meters) in length for a vessel 65 feet (19.8 meters) or more in length.

(b) For each vessel less than 65 feet (19.8 meters) in length, an approved 20 inch (0.51 meters) or larger ring life buoy which is in serviceable condition and which was installed on board before September 15, 1991, may be used to meet the requirements of paragraph (a) of this section.

TABLE 28.115.—THROWABLE FLOTATION DEVICES

Vessel length	Devices required
Less than 16 feet (4.9 meters).	None.
16 feet (4.9 meters) or more, but less than 26 feet (7.9 meters).	1 buoyant cushion, or ring life buoy (Type IV PFD) meters).
26 feet (7.9 meters) or more, but less than 65 feet (19.8 meters).	1 ring life buoy approval number starting with 160.009 or 160.050; orange; at least 24 inch (0.61 meters) size.
65 feet (19.8 meters) or more.	3 ring life buoys, approval number 160.50; orange; at least 24 inch (0.61 meters) size.

Note: Certain Type V PFDs are approved for use in substitution for Type IV PFDs, when used in accordance with the conditions stated in the Coast Guard approval label.

§ 28.120 Survival craft.

(a) Except as provided in paragraphs (b) and (d) through (h) of this section, each vessel must carry the survival craft specified in table 28.120(a), table 28.120(b), or table 28.120(c), as appropriate for the vessel, in an aggregate capacity to accommodate the total number of individuals on board.

(b) The requirements of this section do not apply to a vessel with less than 4 individuals on board which operates within 12 miles of the coastline.

(c) Except as provided by § 28.305, compliance dates for the requirements for the number and type of survival craft in tables 28.120(a), 28.120(b), and 28.120(c) are:

(1) For a documented vessel that operates in the North Pacific Area, September 1, 1992;

(2) For a documented vessel that operates in the Great Lakes or in the Atlantic Ocean north and east of a line drawn at a bearing 159° true from Watch Hill Light, Rhode Island, September 1, 1993;

(3) For each other documented vessel, September 1, 1994; and

(4) For each other vessel, September 1, 1995.

(d) Each survival craft installed on board a vessel before September 15, 1991, may continue to be used to meet the requirements of this section provided the survival craft is:

(1) Of the same type as required in tables 28.120(a), 28.120(b), or 28.120(c), as appropriate for the vessel type; and

(2) Maintained in good and serviceable condition.

(e) Each inflatable liferaft installed on board a vessel before September 15, 1991, may continue to be used to meet the requirements for an approved inflatable liferaft, provided the existing liferaft is maintained in good and serviceable condition as required by table 28.140, and it is equipped with the equipment pack required by tables 28.120(a), 28.120(b), or 28.120(c), as appropriate for the vessel type. Where no equipment pack is specified in tables 28.120(a), 28.120(b), or 28.120(c), a coastal service pack is required.

(f) An approved lifeboat may be substituted for any survival craft required by this section, provided it is arranged and equipped in accordance with part 94 of this chapter.

(g) The capacity of an auxiliary craft carried on board a vessel which is integral to and necessary for normal fishing operations will satisfy the requirements of this section for survival craft, except for an inflatable liferaft, provided the craft is readily accessible during an emergency and is capable of safely holding all individuals on board the vessel. If the auxiliary craft is equipped with a Coast Guard required capacity plate, the boat must not be loaded so as to exceed the rated capacity.

(h) A vessel less than 36 feet in length which meets the positive flotation provisions of 33 CFR part 183 is exempt from the requirement for survival craft in paragraph (a) of this section for operation on the following waters:

(1) Within 12 miles of the coastline, any waters; and
 (2) Rivers

TABLE 28.120 (a).—SURVIVAL CRAFT FOR DOCUMENTED VESSELS

Area	Vessel type	Survival craft required
Beyond 50 miles of coastline	All	Inflatable liferaft with SOLAS A pack.
Between 20-50 miles of coastline, cold waters	All	Inflatable liferaft with SOLAS B pack.

TABLE 28.120 (a).—SURVIVAL CRAFT FOR DOCUMENTED VESSELS—Continued

Area	Vessel type	Survival craft required
Between 20-50 miles, of coastline, warm waters	All	Inflatable liferaft
Beyond Boundary Line, within 20 miles of coastline, cold waters	All	Inflatable liferaft
Beyond Boundary Line within 20 miles of coastline, warm waters	All	Life float
Inside Boundary Line, cold waters; or Lakes, bays, sounds, cold waters; or Rivers, cold waters	36 feet (11 meters) or more in length	Inflatable buoyant apparatus
Do	Less than 36 feet (11 meters) in length	None
Inside Boundary Line, warm waters; or Lakes, bays, sounds, warm waters; or Rivers, warm waters	All	None
Great Lakes, cold waters	36 feet (11 meters) or more in length	Inflatable buoyant apparatus
Do	Less than 36 feet (11 meters) in length	Buoyant apparatus
Great Lakes, beyond 3 miles of coastline, warm waters	All	Buoyant apparatus
Great Lakes, within 3 miles of coastline, warm waters	All	None

Note: The hierarchy of survival craft in descending order is lifeboat, inflatable liferaft with SOLAS A pack, inflatable liferaft with

SOLAS B pack, inflatable liferaft with coastal service pack, inflatable buoyant apparatus, life float, buoyant apparatus. A survival craft

higher in the hierarchy may be substituted for any survival craft required in this table.

TABLE 28.120(b).—SURVIVAL CRAFT FOR UNDOCUMENTED VESSELS WITH NOT MORE THAN 16 INDIVIDUALS ON BOARD

Area	Vessel type	Survival craft required
Beyond 20 miles of coastline	All	Inflatable buoyant apparatus
Beyond Boundary Line, within 20 miles of coastline, cold waters	All	Inflatable buoyant apparatus
Beyond Boundary Line, within 20 miles of coastline, warm waters	All	Life float
Inside Boundary Line, cold waters; or Lakes, bays, sounds, cold waters; or Rivers, cold waters	36 feet (11 meters) or more in length	Buoyant apparatus
Do	Less than 36 feet (11 meters) in length	None
Inside Boundary Line, warm waters; or Lakes, bays, sounds, warm waters; or Rivers, warm waters	All	None
Great Lakes, cold waters	All	Buoyant apparatus
Great Lakes, beyond 3 miles of coastline, warm waters	All	Buoyant apparatus
Great Lakes, within 3 miles of coastline, warm waters	All	None

Note: The hierarchy of survival craft in descending order is lifeboat, inflatable liferaft with SOLAS A pack, inflatable liferaft with

SOLAS B pack, inflatable liferaft with coastal service pack, inflatable buoyant apparatus, life float, buoyant apparatus. A survival craft

higher in the hierarchy may be substituted for any survival craft required in this table.

TABLE 28.120(c).—SURVIVAL CRAFT FOR UNDOCUMENTED VESSELS WITH MORE THAN 16 INDIVIDUALS ON BOARD

Area	Vessel type	Survival craft required
Beyond 50 miles of coastline	All	Inflatable liferaft with SOLAS A pack
Between 20-50 miles of coastline, cold waters	All	Inflatable liferaft with SOLAS B pack
Between 20-50 miles of coastline, warm waters	All	Inflatable liferaft
Beyond Boundary Line, within 20 miles of coastline, cold water	All	Inflatable liferaft
Beyond Boundary Line within 20 miles of coastline, warm waters	All	Life float
Inside Boundary Line, cold waters; or Lakes, bays, sounds, cold waters; or Rivers, cold waters	36 feet 11 (meters) or more in length	Inflatable buoyant apparatus
Do	Less than 36 feet (11 meters) in length	None
Inside Boundary Line, warm waters; or Lakes, bays, sounds, warm waters; or Rivers, warm waters	All	None
Great Lakes, cold waters	36 feet (11 meters) or more in length	Inflatable buoyant apparatus
Do	Less than 36 feet (11 meters) in length	Buoyant apparatus
Great Lakes, beyond 3 miles of coastline, warm waters	All	Buoyant apparatus
Great Lakes, within 3 miles of coastline, warm waters	All	None

Note: The hierarchy of survival craft in descending order is lifeboat, inflatable liferaft with SOLAS A pack, inflatable liferaft with SOLAS B pack, inflatable liferaft with coastal service pack, inflatable buoyant apparatus, life float, buoyant apparatus. A survival craft higher in the hierarchy may be substituted for any survival craft required in this table.

§ 28.125 Stowage of survival craft.

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

(b) Each inflatable liferaft, inflatable buoyant apparatus, and any auxiliary craft used in their place, must be kept readily accessible for launching or be stowed so as to float free in the event the vessel sinks.

(c) Each hydrostatic release unit used in a float-free arrangement must be

approved under part 160, subpart 160.062 of this chapter.

(d) Each float-free link used with a buoyant apparatus or with a life float must be certified to meet part 160, subpart 160.073 of this chapter.

§ 28.130 Survival craft equipment.

(a) *General.* Each item of survival craft equipment must be of good quality, effective for the purpose it is intended to serve, and secured to the craft.

(b) *Inflatable liferafts.* Each inflatable liferaft must have one of the following equipment packs as shown by the markings on its container:

- (1) Coastal Service;
- (2) SOLAS B Pack (formerly "Limited Service"); or
- (3) SOLAS A Pack (formerly "Ocean Service").

(c) Each life float and buoyant apparatus must be fitted with a lifeline, pendants, a painter, and a floating electric water light approved under part 161 subpart 161.010 of this chapter.

(d) *Other survival craft.* A vessel must not carry survival craft other than inflatable liferafts, life floats, inflatable buoyant apparatus, or buoyant apparatus, such as lifeboats or rigid liferafts, unless the survival craft and launching equipment comply with the requirements for installation, arrangement, equipment, and maintenance contained in 46 CFR part 94.

§ 28.135 Lifesaving equipment markings.

(a) Except as provided in paragraph (d) of this section, after September 1, 1992, lifesaving equipment carried

aboard a vessel pursuant to the requirements of this subpart of part 25, subpart 25.25 of this chapter must be marked as specified in table 28.135.

(b) Lettering used in lifesaving equipment markings must be in block capital letters.

(c) Retroreflective markings required by this section must be with material approved under part 164, subpart 164.018 of this chapter. The arrangement of the retroreflective material must meet IMO Resolution A.658(16).

(d) A wearable personal flotation device must be marked with the name of either the vessel, the owner of the device, or the individual to whom it is assigned.

TABLE 28.135.—LIFESAVING EQUIPMENT MARKINGS

Item	Markings required, name of vessel	Retroreflective material
Wearable personal flotation device (Type I, II, III, or wearable Type V); Immersion suit or exposure suit	See § 28.135(d)	Type I or Type II.
Ring life buoy	X	Type II.
Inflatable liferaft	See note	See note.
Inflatable buoyant apparatus	See note	See note.
Life float	X	Type II.
Buoyant apparatus	X	Type II.
Auxiliary craft	X	Type II.
EPIRB	X	Type II.

Note: No marking other than that provided by the manufacturer and the servicing facility is required.

§ 28.140 Operational readiness, maintenance, and inspection of lifesaving equipment.

(a) The master or individual in charge of a vessel must ensure that each item of lifesaving equipment must be in good working order, ready for immediate use, and readily accessible before the vessel

leaves port and at all times when the vessel is operated.

(b) Except for an inflatable liferaft or an inflatable buoyant apparatus less than two years of age, each item of lifesaving equipment, including unapproved equipment, must be maintained and inspected in accordance with:

- (1) Table 28.140;

(2) The servicing procedure under the subpart of this chapter applicable to the item's approval; and

(3) The manufacturer's guidelines.

(c) An inflatable liferaft or inflatable buoyant apparatus must be serviced at a facility specifically approved by the Commandant.

(d) An escape route from a space where an individual may be employed or an accommodation space must not be obstructed.

TABLE 28.140.—SCHEDULED MAINTENANCE AND INSPECTION OF LIFESAVING EQUIPMENT

Item	Interval		Regulation
	Monthly	Annually	
Inflatable wearable personal flotation device (Type V commercial hybrid)		Servicing	28.140
Personal flotation devices, exposure suits and immersion suits		Inspect, clean and repair as necessary	28.140
Buoyant apparatus and life floats		Inspect, clean and repair as necessary	28.140
Inflatable liferaft		Servicing	28.140
Inflatable buoyant apparatus		Servicing	28.140
Hydrostatic release		Servicing	28.140
Disposable hydrostatic release		Replace on or before expiration date	28.140
Undated batteries		Replace	28.140
Dated batteries ¹ and other items		Replace on or before expiration date	25.26-5, 28.140
EPIRB	Test		25.26-5

¹ Water activated batteries must be replaced whenever they are used.

§ 28.145 Distress signals.

Except as provided by 28.305, after November 15, 1991, each vessel must be equipped with the distress signals specified in table 28.145.

TABLE 28.145.—DISTRESS SIGNALS

Area	Devices required
Ocean, more than 50 miles from coastline.	3 parachute flares, approval series 46 CFR 160.136; plus 6 hand flares, approval series 46 CFR 160.121; plus 3 smoke signals, approval series 46 CFR 160.122.
Ocean, 3-50 miles from the coastline; or more than 3 miles from the coastline on the Great Lakes.	3 parachute flares, approval series 46 CFR 160.136, or 160.036; plus 6 hand flares, approval series 46 CFR 160.121 or 160.021; plus 3 smoke signals, approval series 46 CFR 160.122, 160.022, or 160.037.

TABLE 28.145.—DISTRESS SIGNALS—Continued

Area	Devices required
Coastal waters, excluding the Great Lakes; or within 3 miles of the coastline on the Great Lakes.	Night visual distress signals consisting of one electric distress light, approval series 46 CFR 161.013 or 3 approved flares; plus Day visual distress signals consisting of one distress flag, approval series 46 CFR 160.072, or 3 approved flares, or 3 approved smoke signals. ¹

¹ If flares are carried, the same 3 flares may be counted toward meeting both the day and night requirement.

§ 28.150 Emergency position indicating radio beacons (EPIRBs).

Each vessel must be equipped with an emergency position indicating radio beacon (EPIRB) as required by 46 CFR part 25, subpart 25.28.

Note: Each vessel which uses radio communication equipment must have a Ship

Radio Station License issued by the Federal Communications Commission, as set forth in 47 CFR part 80.

§ 28.155 Excess fire detection and protection equipment.

Installation of fire detection and protection equipment in excess of that required by the regulations in this subchapter is permitted provided that the excess equipment does not endanger the vessel or individuals on board in any way. The excess equipment must, at a minimum, be listed and labeled by an independent, nationally recognized testing laboratory and be in accordance with an appropriate industry standard for design, installation, testing, and maintenance.

§ 28.160 Portable fire extinguishers.

(a) Each vessel must meet the requirements of part 25, subpart 25.30 of this chapter.

(b) Each vessel 65 feet (19.8 meters) or more in length must be equipped with the minimum number, location, and type of portable fire extinguishers specified in table 28.160.

TABLE 28.160.—PORTABLE FIRE EXTINGUISHERS FOR VESSELS 65 FEET (19.8 METERS) OR MORE IN LENGTH

Space	Classification	Quantity and location
Safety areas, communicating corridors	A-II	1 in each main corridor not more than 150 feet (45.7 meters) apart. (May be located in stairways.)
Pilothouse	C-I	2 in vicinity of exit.
Service spaces, galleys	B-II or C-II	1 for each 2,500 square feet (269.1 sq. meters) or fraction thereof suitable for hazards involved.
Paint lockers	B-II	1 outside space in vicinity of exit.
Accessible baggage and storerooms	A-II	1 for each 2,500 square feet (269.1 sq. meters) or fraction thereof located in the vicinity of exits, either inside or outside the spaces.
Work shops and similar spaces	A-II	1 outside the space in vicinity of exit.
Machinery spaces; internal combustion propelling machinery.	B-II	1 for each 1,000 brake horsepower or fraction thereof but not less than 2 nor more than 6.
Electric propulsion motors or generator unit of open type.	C-II	1 for each propulsion motor generator unit.
Auxiliary spaces	B-II	1 outside the space in the vicinity of exit.
Internal combustion machinery	B-II	1 outside the space in the vicinity of exit.
Electric emergency motors or generators	C-II	1 outside the space in the vicinity of exit.

§ 28.165 Injury placard.

Each vessel must have posted in a highly visible location accessible to the crew a placard measuring at least 5 inches by 7 inches (127 millimeters by 178 millimeters) which reads:

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.

Subpart C—Requirements for Documented Vessels That Operate Beyond the Boundary Lines or With More Than 16 Individuals On Board

§ 28.200 Applicability.

Each documented commercial fishing industry vessel that operates beyond the Boundary Lines or that operates with more than 16 individuals on board must meet the requirements of this subpart in addition to the requirements of subparts A and B of this part.

§ 28.205 Fireman's outfits and self-contained breathing apparatus.

(a) Each vessel that operates with more than 49 individuals on board must be equipped with at least two fireman's

outfits stowed in widely separated locations.

(b) Each vessel that uses ammonia as a refrigerant must be equipped with at least two self-contained breathing apparatuses.

(c) A fireman's outfit must consist of one self-contained breathing apparatus with lifeline attached, one flashlight, a rigid helmet, boots, gloves, protective clothing, and one fire axe.

(d) At least one spare air bottle must be provided for each self-contained breathing apparatus.

(e) Each self-contained breathing apparatus must be approved by the Mine Safety and Health Administration (MSHA) and by the National Institute for Occupational Safety and Health

(NIOSH), have as a minimum a 30 minute air supply, and a full facepiece.

§ 28.210 First aid equipment and training.

(a) Each vessel must have on board a complete first aid manual and medicine chest of a size suitable for the number of individuals on board in a readily accessible location.

(b) *First aid and cardiopulmonary resuscitation (CPR) course certification.* Certification in first aid and CPR must be as described in this paragraph.

(1) First aid—a certificate indicating completion of a first aid course from:

(i) The American National Red Cross "Standard first Aid and Emergency Care" or "Multi-media Standard First Aid" course; or

(ii) A course approved by the Coast Guard under § 10.205(h)(1)(ii) of this chapter.

(2) CPR—A certificate indicating completion of course from:

(i) The American National Red Cross;

(ii) The American Heart Association;

or

(iii) A course approved by the Coast guard under § 10.205(h)(2)(iii) of this chapter.

(c) After September 1, 1993, each vessel that operates with more than 2 individuals on board must have at least 1 individual certified in first aid and at least 1 individual certified in CPR. An individual certified in both first aid and CPR will satisfy both of these requirements.

(d) After September 1, 1993, each vessel that operates with more than 16 individuals on board must have at least 2 individuals certified in first aid and at least 2 individuals certified in CPR. An individual certified in both first aid and CPR may be counted against both requirements.

(e) After September 1, 1993, each vessel that operates with more than 49 individuals on board must have at least 4 individuals certified in first aid and at least 4 individuals certified in CPR. An individual certified in both first aid and CPR may be counted against both requirements.

§ 28.215 Guards for exposed hazards.

(a) Each space on board a vessel must meet the requirements of this section.

(b) Suitable hand covers, guards, or railing must be installed in way of machinery which can cause injury to personnel, such as gearing, chain or belt drives, and rotating shafting. This is not meant to restrict necessary access to fishing equipment such as winches, drums, or gurdies.

(c) Each exhaust pipe from an internal combustion engine which is within

reach of personnel must be insulated or otherwise guarded to prevent burns.

§ 28.225 Navigational information.

(a) Each vessel must have at least the following navigational information on board:

(1) Marine charts of the area to be transited, published by the National Ocean Service, Defense Mapping Agency Hydrographic/Topographic Center, U.S. Army Corps of Engineers, or a river authority that—

(i) Are of a large enough scale and have enough detail to make safe navigation of the area possible; and

(ii) Are currently corrected.

(2) For the area to be transited, a currently corrected copy of, or applicable currently corrected extract from, each of the following publications:

(i) U.S. Coast Pilot; and

(ii) Coast Guard Light List.

(3) For the area to be transited, the current edition of, or applicable current extract from, each of the following publications:

(i) Tide tables published by the National Ocean Service; and

(ii) Tidal current tables published by the National Ocean Service, or river current publication issued by the U.S. Army Corps of Engineers or a river authority.

(b) Each vessel of 39.4 feet (12 meters) or more in length that operates shoreward of the COLREG Demarcation Lines, as set forth in 33 CFR part 80, must carry on board and maintain for ready reference a copy of the Inland Navigation Rules, as set forth in 33 CFR chapter I, subchapter E.

§ 28.230 Compasses.

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

§ 28.235 Anchors and radar reflectors.

(a) Each vessel must be fitted with an anchor(s) and chain(s), cable, or rope appropriate for the vessel and the waters of the intended voyage.

(b) Except for a vessel rigged with gear that provides a radar signature from a distance of 6 miles, each nonmetallic hull vessel must have a radar reflector.

§ 28.240 General alarm system.

(a) Except as provided in paragraph (f) of this section, after September 1, 1992, each vessel with an accommodation space or a work space which is not adjacent to the operating station, must have an audible general alarm system with a contact-maker at the operating station suitable for

notifying individuals on board in the event of an emergency.

(b) The general alarm system must be capable of notifying an individual in any accommodation space or work space where they may normally be employed.

(c) In a work space where background noise makes a general alarm system difficult to hear, a flashing red light must also be installed.

(d) Each general alarm bell and flashing red light must be identified with red lettering at least ½ inch (13 millimeters) high as follows:

Attention

General Alarm—When Alarm Sounds Go to Your Station.

(e) A general alarm system must be tested prior to operation of the vessel and at least once each week thereafter.

(f) A public address system or other means of alerting all individuals on board may be used in lieu of a general alarm system provided it complies with paragraphs (b), (c), and (e) of this section and can be activated from the operating station.

§ 28.245 Communication equipment.

(a) Except as provided in paragraphs (b) through (e) of this section, each vessel must be equipped as follows.

(1) Each vessel must be equipped with a VHF radiotelephone capable of transmitting and receiving on the frequency or frequencies within the 156–162 MHz band necessary to communicate with a public coast station or U.S. Coast Guard station serving the area in which the vessel is operating.

(2) Each vessel that operates more than 20 miles from the coastline, in addition to the VHF radiotelephone required by paragraph (a)(1) of this section, must be equipped with a radiotelephone transceiver capable of transmitting and receiving on frequencies in the 2–4 MHz band necessary to communicate with a public coast station or U.S. Coast Guard station serving the area in which the vessel is operating.

(3) Each vessel that operates more than 100 miles from the coastline, in addition to the communication equipment required by paragraph (a)(1) of this section must be equipped with a radiotelephone transceiver capable of transmitting and receiving on frequencies in the 2–27.5 MHz band necessary to communicate with a public coast station or U.S. Coast Guard station serving the area in which the vessel is operating.

(4) Each vessel that operates in waters contiguous to Alaska where no public coast station or U.S. Coast Guard

station is within communications range of a VHF radio transceiver operating on the 156-162 MHz band or the 2-4 MHz band, in addition to the VHF radio communication equipment required by paragraph (a)(1) of this section, must be equipped with a radiotelephone transceiver capable of transmitting and receiving on frequencies in the 2-27.5 MHz band necessary to communicate with a public coast station or a U.S. Coast Guard station serving the area in which the vessel is operating.

(b) A single radio transceiver capable of meeting the requirements of paragraphs (a) (2) and (3), or paragraphs (a) (2), (3), and (4) of this section, is acceptable.

(c) Satellite communication capability with the system servicing the area in which the vessel is operating is acceptable as an alternative to the requirements of paragraphs (a)(2), (a)(3), or (a)(4) of this section.

(d) A cellular telephone capable of communicating with a public coast station or a U.S. Coast Guard station serving the area in which the vessel is operating is acceptable as an alternative to the requirements of paragraphs (a)(2), (a)(3), or (a)(4) of this section.

(e) A radiotelephone transceiver installed on board a vessel before September 15, 1991, capable of transmitting and receiving on frequencies on the 4-20 MHz band may continue to be used to satisfy the requirements of paragraphs (a)(3) and (a)(4) of this section.

(f) The principle operating position of the communication equipment must be at the operating station.

(g) Communication equipment must be installed to ensure safe operation of the equipment and to facilitate repair. It must be protected against vibration, moisture, temperature, and excessive currents and voltages. It must be located so as to minimize the possibility of water intrusion from windows broken by heavy seas.

(h) Communication equipment must comply with the technical standards and operating requirements issued by the Federal Communications Commission, as set forth in 47 CFR part 80.

Note: Each vessel which uses radio equipment to meet the communication requirements of this section must have a Ship Radio Station License issued by the Federal Communications Commission, as set forth in 47 CFR part 80.

(i) All communication equipment must be provided with an emergency source of power that complies with § 28.375.

§ 28.250 High water alarms.

On a vessel 36 feet (11.8 meters) or more in length, a visual and audible

alarm must be provided at the operating station to indicate high water level in each of the following normally unmanned spaces:

(a) A space with a through-hull fitting below the deepest load waterline, such as the lazarette;

(b) A machinery space bilge, bilge well, shaft alley bilge, or other space subject to flooding from sea water piping within the space; and

(c) A space with a non-watertight closure, such as a space with a non-watertight hatch on the main deck.

§ 28.255 Bilge pumps, bilge piping, and dewatering systems.

(a) Each vessel must be equipped with a bilge pump and bilge piping capable of draining any watertight compartment, other than tanks and small buoyancy compartments, under all service conditions. Large spaces, such as engine rooms must be fitted with more than one suction line.

(b) In addition to the requirements of paragraph (a) of this section, a space used in the sorting or processing of fish in which water is used must be fitted with dewatering system capable of dewatering the space under normal conditions of list and trim at the same rate as water is introduced. Pumps used as part of the processing of fish do not count for meeting this requirement. The dewatering system must be interlocked with the pump(s) supplying water to the space, so that in the event of failure of the dewatering system, the water supply is inactivated.

(c) Except as provided by paragraph (f) of this section, each vessel 79 feet (24 meters) or more in length must be equipped with a fixed, self-priming, powered, bilge pump connected to a bilge manifold.

(d) If a bilge pump required by paragraph (a) of this section is portable, it must be provided with a suitable suction hose of adequate length to reach the bilges of each watertight compartment it must serve and with a discharge hose of adequate length to ensure overboard discharge. A portable pump must be capable of dewatering each space it serves at a rate of at least 2 inches (51 millimeters) of water depth per minute.

(e) Except for a fire pump required by § 28.315, a bilge pump may be used for other purposes.

(f) Except where an individual pump is provided for a separate space or for a portable pump, each individual bilge suction line must be led to a manifold. Each bilge suction line must be provided with a stop valve at the manifold and a check valve at some accessible point in

the bilge line to prevent unintended flooding of a space.

(g) Each bilge suction line and dewatering system suction must be fitted with a suitable strainer to prevent clogging of the suction line. Strainers must have an open area of not less than three times the open area of the suction line.

(h) Each vessel must comply with the oil pollution prevention requirements of 33 CFR parts 151 and 155.

§ 28.260 Electronic position fixing devices.

Each vessel 79 feet (24 meters) or more in length must be equipped with an electronic position fixing device capable of providing accurate fixes for the area in which the vessel operates.

§ 28.265 Emergency instruction.

(a) Except as provided in paragraphs (b) and (c) of this section, each vessel must have emergency instructions posted in conspicuous locations accessible to the crew.

(b) The instructions identified in paragraphs (d)(6), (d)(7), (d)(8), and (d)(9) of this section, may be kept readily available as an alternative to posting.

(c) On a vessel which operates with less than 4 individuals on board, the emergency instructions may be kept readily available as an alternative to posting.

(d) The emergency instructions required by this section must identify at least the following information, as appropriate for the vessel:

(1) The survival craft embarkation stations aboard the vessel and the survival craft to which each individual is assigned;

(2) The fire and emergency signal and the abandon ship signal;

(3) If immersion suits are provided, the location of the suits and illustrated instructions on the method for donning the suits;

(4) Procedures for making a distress call, such as:

(i) Make sure your communication equipment is on.

(ii) Select 156.8 MHz (VHF channel 16), 2182 kHz, or other distress frequency used in your area of operation. Note: VHF channel 16 and 2182 kHz on SSB are for emergency and calling purposes only.

(iii) Press microphone button and speaking slowly—clearly—calmly say: "Mayday—Mayday—Mayday"

(iv) Say: "This is the M/V (Insert name of your vessel), (Insert name of your vessel), (Insert name of your vessel). Over."

(v) Release the microphone button briefly and listen for acknowledgment. If no one answers, repeat steps in paragraphs (d)(4) (iii) and (iv) of this section.

(vi) If there is still no answer, or if the Coast Guard or another vessel responds, say: "Mayday—This is the M/V (Insert Name of Your Vessel)."

(vii) Describe your position using latitude and longitude coordinates, LORAN coordinate, or range and bearing from a known point.

(viii) State the nature of the distress.

(ix) Give number of individuals aboard and the nature of any injuries.

(x) Estimate the present seaworthiness of your vessel.

(xi) Describe your vessel: (Insert length, color, hull type, trim, masts, power, and any additional distinguishing features).

(xii) Say: "I will be listening on Channel 16/2182 (or other channel monitored)."

(xiii) End message by saying: "This is (insert vessel's name and call sign)."

(xiv) If your situation permits, stand by the radio to await further communication with the Coast Guard or another vessel. If no answer, repeat, then try another channel.

(5) Essential action that must be taken in an emergency by each individual, such as:

(i) Making a distress call.

(ii) Closing of hatches, airports, watertight doors, vents, scuppers, and valves for intake and discharge lines which penetrate the hull, stopping of fans and ventilation systems, and operation of all safety equipment.

(iii) Preparing and launching of survival craft and rescue boats.

(iv) Fighting a fire.

(v) Mustering of personnel including—

(A) Seeing that they are properly dressed and have put on their lifejackets or immersion suits; and

(B) Assembling personnel and directing them to their appointed stations.

(vi) Manning of fire parties assigned to deal with fires.

(vii) Special duties required for the operation of fire fighting equipment.

(6) The procedures for rough weather at sea, crossing hazardous bars, flooding, and anchoring of the vessel, such as:

(i) Close all watertight and weathertight doors, hatches and airports to prevent taking water aboard or further flooding in the vessel.

(ii) Keep bilges dry to prevent loss of stability due to water in bilges. Use power driven bilge pump, hand pump, and buckets to dewater.

(iii) Align fire pumps to use as bilge pumps, if possible.

(iv) Check all intake and discharge lines which penetrate the hull for leakage.

(v) Personnel should remain stationary and evenly distributed.

(vi) Personnel should don lifejackets and immersion suits if the going becomes very rough, the vessel is about to cross a hazardous bar, or when otherwise instructed by the master or individual in charge of the vessel.

(7) The procedures for anchoring the vessel.

(8) The procedures to be used in the event an individual falls overboard, such as:

(i) Throw a ring life buoy as close to the individual as possible;

(ii) Post a lookout to keep the individual in the water in sight;

(iii) Launch the rescue boat and maneuver it to pick up the individual in the water;

(iv) Have a crewmember put on a lifejacket or immersion suit, attach a safety line to the crewmember, and have the crewmember standby to jump into the water to assist in recovering the individual in the water if necessary;

(v) If the individual overboard is not immediately located, notify the Coast Guard and other vessels in the vicinity; and

(vi) Continue searching until released by the Coast Guard.

(9) Procedures for fighting a fire, such as:

(i) Shut off air supply to the fire—close hatches, ports, doors, ventilators, and similar openings.

(ii) Deenergize the electrical systems supplying the affected space, if possible.

(iii) Immediately use a portable fire extinguisher or use water for fires in ordinary combustible materials. Do not use water on electrical fires.

(iv) If the fire is in a machinery space, shut off the fuel supply and ventilation system and activate the fixed extinguishing system, if installed.

(v) Maneuver the vessel to minimize the effect of wind on the fire.

(vi) If unable to control the fire, immediately notify the Coast Guard and other vessels in the vicinity.

(vii) Move personnel away from the fire, have them put on lifejackets, and if necessary, prepare to abandon the vessel.

§ 28.270 Instruction, drills, and safety orientation.

(a) *Drills and instruction.* The master or individual in charge of each vessel must ensure that drills are conducted and instruction is given to each individual on board at least once each

month. Instruction may be provided in conjunction with drills or at other times and places provided it ensures that each individual is familiar with their duties and their responses to at least the following contingencies:

(1) Abandoning the vessel;

(2) Fighting a fire in different locations on board the vessel;

(3) Recovering an individual from the water;

(4) Minimizing the effects of unintentional flooding;

(5) Launching survival craft and recovering lifeboats and rescue boats;

(6) Donning immersion suits and other wearable personal flotation devices;

(7) Donning a fireman's outfit and a self-contained breathing apparatus, if the vessel is so equipped;

(8) Making a voice radio distress call and using visual distress signals;

(9) Activating the general alarm; and

(10) Reporting inoperative alarm systems and fire detection systems.

(b) *Participation in drills.* Drills must be conducted on board the vessel as if there were an actual emergency and must include participation by all individuals on board, breaking out and using emergency equipment, testing of all alarm and detection systems, donning protective clothing, and donning immersion suits, if the vessel is so equipped.

(c) *Training.* After September 1, 1994, no individual may conduct the drills or provide the instructions required by this section unless that individual has been trained in the proper procedures for conducting the activity. An individual licensed for operation of inspected vessels of 100 gross tons or more need not have additional training to comply with this requirement.

(d) The viewing of videotapes concerning at least the contingencies listed in paragraph (a) of this section, whether on board the vessel or not, followed by a discussion led by an individual familiar with these contingencies will satisfy the requirement for instruction but not the requirement for drills in paragraph (b) of this section or for the safety orientation in paragraph (e) of this section.

(e) *Safety orientation.* The master or individual in charge of a vessel must ensure that a safety orientation is given to each individual on board that has not received the instruction and has not participated in the drills required by paragraph (a) of this section before the vessel may be operated.

(f) The safety orientation must explain the emergency instructions required by § 28.265 and cover the specific

evolutions listed in paragraph (a) of this section.

Note: The individual conducting the drills and instruction need not be the master, individual in charge of the vessel, or a member of the crew.

Subpart D—Requirements for Vessels Which Have Their Keel Laid or Are at a Similar Stage of Construction on or After or Which Undergo a Major Conversion Completed on or After September 15, 1991, and That Operate With More Than 16 Individuals on Board

§ 28.300 Applicability and general requirements.

Each commercial fishing industry vessel which has its keel laid or is at a similar stage of construction on or after or which undergoes a major conversion completed on or after September 15, 1991, and that operates with more than 16 individuals on board must comply with the requirements of this subpart in addition to the requirements of subparts A, B, and C of this part.

§ 28.305 Lifesaving and signaling equipment.

Each vessel to which this subpart applies must meet the requirements for life preservers, immersion suits, ring life buoys, distress signals, and survival craft in §§ 28.110, 28.115, 28.145 and table 28.120 (a), (b), or (c), as appropriate for the vessel type, on the date that its construction or major conversion is completed.

§ 28.310 Launching of survival craft.

A gate or other opening must be provided in the deck rails, lifelines, or bulwarks adjacent to the stowage location of each survival craft which weighs more than 110 pounds (489 Newtons), to allow the survival craft to be manually launched.

§ 28.315 Fire pumps, fire mains, fire hydrants, and fire hoses.

(a) Each vessel 36 feet (11.8 meters) or more in length must be equipped with a self-priming, power driven fire pump connected to a fixed piping system.

(1) A fire pump on a vessel 79 feet (24 meters) or more in length must be capable of delivering water simultaneously from the two highest hydrants, or from both branches of the fitting if the highest hydrant has a siamese fitting, at a pitot tube pressure of at least 50 psi (0.345 Newtons per square millimeter) and a flow rate of at least 80 gpm (303 liters per minute).

(2) Each vessel with a power driven fire pump must be equipped to permit energizing the fire main from the operating station and from the pump.

(b) Fire main, hydrants, hoses and nozzles.

(1) A vessel required to have a fixed fire main system must have a sufficient number of fire hydrants to reach any part of the vessel using a single length of fire hose.

(2) A fire hose must be connected to each fire hydrant at all times the vessel is operating.

(3) A fire hose on a vessel less than 79 feet (24 meters) in length must be at least 5/8 inch (16 millimeters) nominal diameter, be of good commercial grade and be fitted with a nozzle of corrosion resistant material capable of providing a solid stream and a spray pattern.

(4) A fire hose on a vessel 79 feet (24 meters) or more in length must be lined commercial fire hose and be fitted with a nozzle made of corrosion resistant material capable of providing a solid stream and a spray pattern.

§ 28.320 Fixed gas fire extinguishing systems.

(a) *Requirements for vessels 79 feet (24 meters) or more in length.* A vessel 79 feet (24 meters) or more in length must be fitted with a fixed gas fire extinguishing system in the following enclosed spaces:

- (1) A space containing an internal combustion engine of more than 50 horsepower;
- (2) A space containing an oil fired boiler;
- (3) An incinerator and;
- (4) A space containing a gasoline storage tank.

(b) System types and alternatives.

(1) A pre-engineered fixed gas fire extinguishing system may only be installed in a normally unoccupied machinery space, a paint locker, or a space containing flammable liquid stores, which has a gross volume of not more than 1200 cubic feet (42.4 cubic meters).

(2) A fixed gas fire extinguishing system, which is capable of automatic discharge upon heat detection, may only be installed in a normally unoccupied space with a gross volume of not more than 6000 cubic feet (21.2 cubic meters).

(3) A space with a gross volume exceeding 6000 cubic feet (21.2 cubic meters) must be fitted with a manually actuated and alarmed, fixed gas fire extinguishing system.

(c) General requirements.

(1) A fixed gas fire extinguishing system aboard a vessel must be approved by the Commandant and be custom engineered, unless the system meets the requirements for a pre-engineered fixed gas fire extinguishing system in paragraph (d) of this section.

(2) System components must be listed and labeled by an independent, nationally recognized testing laboratory for the system being installed.

(3) System design and installation must be in accordance with the Manufacturer's Marine Design, Installation, Operation, and Maintenance Manual approved for the system by the Commandant.

(4) A fixed gas fire extinguishing system may protect more than one space. The quantity of extinguishing agent must be at least sufficient for the largest space protected by the system.

(d) Pre-engineered fixed gas fire extinguishing systems.

(1) A pre-engineered fixed gas fire extinguishing system must:

- (i) Be approved by the Commandant;
- (ii) Be capable of manual actuation from outside the space in addition to any automatic actuation devices; and
- (iii) Automatically shut down all power ventilation systems serving the protected space and all engines that draw intake air from within the protected space.

(2) A vessel on which a pre-engineered fixed gas fire extinguishing system is installed must have the following equipment at the operating station:

- (i) A visual alarm to indicate the discharge of the extinguishing agent;
- (ii) An audible alarm to sound upon discharge of the extinguishing agent; and
- (iii) A means to reset devices used to automatically shut down ventilation systems and engines as required by paragraph (d)(1)(iii) of this section.

§ 28.325 Fire detection systems.

(a) Each accommodation space must be equipped with an independent modular smoke detector or a smoke actuated fire detecting unit installed in accordance with 46 CFR part 76, subpart 76.33.

(b) An independent modular smoke detector must meet UL 217 and be listed as a "Single Station Smoke Detector—Also suitable for use in Recreational Vehicles."

§ 28.330 Galley hood and other fire protection equipment.

(a) Each vessel must be fitted with a grease extraction hood complying with UL 710 above each grill, broiler, and deep fat fryer.

(b) Each grease extraction hood must be equipped with a pre-engineered dry or wet chemical fire extinguishing system meeting the applicable sections of NFPA 17 or 17A and must be listed by an independent laboratory.

(c) A vessel 79 feet (24 meters) or more in length must have at least one fire axe located in or adjacent to the operating station.

§ 28.335 Fuel systems.

(a) *Applicability.* Except for the components of an outboard engine or portable bilge pump, each vessel must meet the requirements of this section.

(b) *Portable fuel systems.* Portable fuel systems including portable tanks and related fuel lines and accessories are prohibited except where used for outboard engines or portable bilge pumps. The design, construction, and stowage of portable tanks and related fuel lines and accessories must meet the requirements of ABYC H-25.

(c) *Fuel restrictions.* Except for outboard engines, the use of fuel other than bunker C or diesel is prohibited. An installation using bunker C must comply with the requirements of subchapter F of this chapter.

(d) *Vent pipes for integral fuel tanks.* Each integral fuel tank must meet the requirements of this paragraph.

(1) Each fuel tank must be fitted with a vent pipe connected to the highest point of the tank terminating in a 180 degree (3.14 radians) bend on a weather deck and fitted with a flame screen.

(2) Except where provision is made to fill a tank under pressure, the net cross-sectional area of the vent pipe for a fuel tank must not be less than 0.484 square inches (312.3 square millimeters).

(3) Where provision is made to fill a tank under pressure, the net cross-sectional area of the vent pipe must not be less than that of the fill pipe.

(e) *Fuel piping.* Except as permitted in paragraph (e)(1) and (e)(2) of this section, each fuel line must be seamless and must be of steel, annealed copper, nickel-copper, or copper-nickel. Each fuel line must have a wall thickness of not less than that of 0.035 inch (0.9 millimeters) except that:

(1) Aluminum piping is acceptable on an aluminum hull vessel provided it is installed outside the machinery space and is at least Schedule 80 in thickness; and

(2) Nonmetallic flexible hose is acceptable but must—

(i) Not be used in lengths of more than 30 inches (0.82 meters);

(ii) Be visible, easily accessible, and must not penetrate a watertight bulkhead;

(iii) Be fabricated with an inner tube and a cover of synthetic rubber or other suitable material reinforced with wire braid.

(iv) Be fitted with suitable, corrosion resistant, compression fittings; and

(v) Be installed with two clamps at each end of the hose, if designed for use with clamps. Clamps must not rely on spring tension and must be installed beyond the bead or flare or over the serrations of the mating spud, pipe, or hose fitting.

(f) A fuel line subject to internal head pressure from fuel in the tank must be fitted with a positive shutoff valve located at the tank which is operable from a safe location outside the space in which the valve is located.

(g) A vessel less than 79 feet (24 meters) in length may comply with one of the following standards in lieu of the requirements of paragraphs (e) and (f) of this section.

(1) ABYC H-33.

(2) Chapter 5 of NFPA 302.

(3) 33 CFR Chapter I, subchapter S (Boating Safety).

§ 28.340 Ventilation of enclosed engine and fuel tank spaces.

(a) *Applicability.* Each vessel with a gasoline outboard engine or gasoline storage tank must comply with the requirements of this section.

(b) *Ventilation of spaces containing gasoline.* Each space that contains a gasoline engine, a gasoline storage tank, or gasoline piping connected to an integral gasoline tank must be open to the atmosphere and so arranged as to prevent the entrapment of vapors or be ventilated by a mechanical exhaust system with a nonsparking fan. The fan motor must comply with 46 CFR 111.105-23.

(c) *Alternative standards.* A vessel less than 65 feet in length with ventilation installations in accordance with NFPA 302, chapter 2, section 2-2, or ABYC H-2 and 33 CFR part 183, subpart K, will be considered as meeting the requirements of this section.

§ 28.345 Electrical standards for vessels less than 79 feet (24 meters) in length.

(a) A vessel less than 79 feet (24 meters) in length with an alternating current electrical distribution system may comply with the requirements of ABYC E-8 and either paragraph (c) or (d) of this section, as applicable, in lieu of meeting the requirements of §§ 28.350 through 28.370.

(b) A vessel less than 79 feet (24 meters) in length with a direct current system may comply with the requirements of ABYC E-1, ABYC E-9, and either paragraph (c) or (d) of this section, as applicable, in lieu of meeting the requirements of §§ 28.350 through 28.370.

(c) In addition to paragraph (a) or (b) of this section, the vessel may comply

with the requirements of NFPA 302, chapters 7 and 8.

(d) In addition to paragraph (a) or (b) of this section, the vessel may comply with the requirements of 33 CFR part 183, subpart I and § 28.370.

§ 28.350 General requirements for electrical systems.

(a) Electrical equipment exposed to the weather or in a location exposed to seas must be waterproof, watertight, or enclosed in a watertight housing.

(b) Aluminum must not be used for current carrying parts of electrical equipment or wiring.

(c) As far as practicable, electrical equipment must not be installed in lockers used to store paint, oil, turpentine, or other flammable or combustible liquid. If electrical equipment, such as lighting, is necessary in these spaces, it must be explosion-proof or intrinsically safe.

(d) Explosion-proof and intrinsically safe equipment must meet the requirements of 46 CFR part 111, subpart 111.105.

(e) Metallic enclosures and frames of electrical equipment must be grounded.

(f) Each vessel with a nonmetallic hull must have a continuous, non-current carrying grounding conductor which connects together the enclosures and frames of electrical equipment and which connects metallic items such as engines, fuel tanks, and equipment enclosures to a common ground point.

(g) The equipment grounding conductor must be sized in accordance with section 250-95 of NFPA Standard 70.

§ 28.355 Main source of electrical power.

(a) *Applicability.* Each vessel that relies on electricity to power any of the following essential loads must have at least two electrical generators to supply these loads:

(1) The propulsion system and its necessary auxiliaries and controls;

(2) Interior lighting;

(3) Steering systems;

(4) Communication systems;

(5) Navigation equipment and navigation lights;

(6) Fire protection or detection equipment;

(7) Bilge pumps; or

(8) General alarm system.

(b) Each generator must be attached to an independent prime mover.

§ 28.360 Electrical distribution systems.

(a) Each electrical distribution system which has a neutral bus or conductor must have the neutral bus or conductor grounded.

(b) A grounded electrical distribution system must have only one connection to ground. This ground connection must be at the switchboard or, on a nonmetallic vessel, at the common ground point.

§ 28.365 Overcurrent protection and switched circuits.

(a) Each power source must be protected against overcurrent. Overcurrent devices for generators must be set at a value not exceeding 115 percent of the generator full load rating.

(b) Except for a steering circuit, each circuit must be protected against both overload and short circuit. Each overcurrent device in a steering system power and control circuit must provide short circuit protection only.

(c) Each ungrounded current carrying conductor must be protected in accordance with its current carrying capacity by a circuit breaker or fuse at the connection to the switchboard or distribution panel bus.

(d) Each circuit breaker and each switch must simultaneously open all ungrounded conductors.

(e) The grounded conductor of a circuit must not be disconnected by a switch or an overcurrent device unless all ungrounded conductors of the circuit are simultaneously disconnected.

(f) Navigation light circuits must be separate, switched circuits having fused disconnect switches or circuit breakers so that only the appropriate navigation lights can be switched on.

(g) A separate circuit with overcurrent protection at the main distribution panel or switchboard must be provided for each radio installation.

§ 28.370 Wiring methods and materials.

(a) All cable and wire must have insulated, stranded copper conductors of the appropriate size and voltage rating for the circuit.

(b) Each conductor must be No. 22 AWG or larger. Conductors in power and lighting circuits must be No. 14 AWG or larger. Conductors must be sized so that the voltage drop at the load terminals is not more than 10 percent.

(c) Cable and wiring not serving equipment in a high risk fire area such as a galley, laundry, or machinery space must be routed as far as practicable from these spaces. As far as practicable, cables serving duplicated essential equipment must be separated so that a casualty that affects one cable does not affect the other.

(d) Cable and wire for power and lighting circuits must:

- (1) For circuits of less than 50 volts, meet 33 CFR 183.425 and 183.430; and
- (2) For circuits of 50 volts or greater:

(i) Meet section 310-13 and 310-15 of NFPA 70, except that asbestos insulated cable and dry location cable must not be used;

(ii) Be listed by Underwriters Laboratories Inc. as UL Boat or UL Marine Shipboard cable; or

(iii) Meet 46 CFR part 111, subpart 111.60.

(e) All metallic cable armor must be electrically continuous and grounded to the metal hull or the common ground point at each end of the cable run, except that final sub-circuits (those supplying loads) may be grounded at the supply end only.

(f) A wiring termination and connection must be made in a fire retardant enclosure such as a junction box, fixture enclosure, or panel enclosure. A fire retardant plastic enclosure is acceptable.

§ 28.375 Emergency source of electrical power.

(a) Each vessel must have an emergency source of electrical power which is independent of the main sources of electrical power and which is located outside the main machinery space.

(b) The emergency source of electrical power must be capable of supplying all connected loads continuously for at least 3 hours.

(c) Except as provided in paragraphs (d) and (e) of this section, the following electrical loads must be connected to the emergency source of power:

- (1) Navigation lights;
- (2) Steering systems;
- (3) Bilge pumps;
- (4) Fire protection and detection systems, including fire pumps;
- (5) Communication equipment;
- (6) General alarm system; and;
- (7) Emergency lighting.

(d) A vessel less than 36 feet (11.0 meters) in length need only supply communication equipment by an emergency source of electrical power if flashlights are provided.

(e) A vessel less than 79 feet (24 meters) in length which is not dependent upon electrical power for propulsion, including propulsion control systems or steering, need only supply emergency lighting, navigation equipment, general alarm system, and communication systems by the emergency source of power.

(f) Where the emergency source of power is a generator, the generator prime mover must have a fuel supply which is independent of other prime movers.

§ 28.380 General structural fire protection.

(a) *Fire hazards to be minimized.* Each vessel must be constructed so as to minimize fire hazards insofar as is reasonable and practicable.

(b) *Combustibles insulated from heated surfaces.* An internal combustion engine exhaust, galley uptake; or similar source of ignition must be kept clear of an suitably insulated from combustible material. A dry exhaust system for an internal combustion engine on a wooden or fiber reinforced plastic vessel must be installed in accordance with ABYC P-1.

(c) *Separation of machinery and fuel tank spaces from accommodation spaces.*

(1) Each accommodation space must be separated from machinery and fuel tank spaces by a fire resistant boundary which will prevent the passage of vapors.

(2) Each pipe and cable penetration between an accommodation space and a machinery or a fuel tank storage space must be sealed.

(d) *Paint and flammable liquid lockers.* Each vessel carrying paint and flammable liquids must be equipped with a steel or a steel lined storage locker.

(e) *Insulation.* Except as provided in paragraphs (e)(1) and (e)(2) of this section, insulation must be noncombustible.

(1) In machinery spaces, combustible insulation may be used for pipe and machinery lagging.

(2) In cargo spaces and refrigerated compartments of service spaces, combustible insulation may be used.

(f) *Vapor barrier.* Where insulation of any type is used in spaces where flammable and combustible liquids or vapors are present, e.g., machinery spaces and paint lockers, a vapor barrier which covers the insulation must be provided.

(g) *Paint.* Nitrocellulose or other highly flammable or noxious fume producing paints or lacquers must not be used on the vessel.

(h) *Mattresses.* Polyurethane foam mattresses are prohibited.

Note: The U.S. Department of Commerce Standard for Mattress Flammability (FF4-72.16) in 16 CFR part 1632, subpart A, applies to each mattress.

(i) *Fiber reinforced plastic.* When the hull, a deck, deckhouse, or superstructure of a vessel is partially or completely constructed of fiber reinforced plastic, the resin used must be fire retardant.

(j) *Cooking areas.* Vertical or horizontal surfaces within 3 feet (0.91 meters) of cooking appliances must be

composed of noncombustible material or covered by noncombustible material. Curtains, draperies, or free hanging fabrics are not permitted within 3 feet (1 meter) of cooking appliances.

§ 28.385 Structural fire protection for vessels that operate with more than 49 individuals on board.

(a) *Applicability.* Each vessel that operates with more than 49 individuals on board must comply with the requirements of this section in addition to the requirements of § 28.380.

(b) *Construction.* The hull, structural bulkheads, columns and stanchions must be composed of steel. Superstructure and deckhouses must be constructed of noncombustible material.

(c) *Protection of accommodation spaces.* A bulkhead or deck separating an accommodation space from a control station, machinery space, cargo space, or service space must be constructed of noncombustible material.

§ 28.390 Means of escape.

(a) Each space which is used by an individual on a regular basis or which is generally accessible to an individual must have at least two widely separated means of escape. At least one of the means of escape must be independent of watertight doors. Subject to the restrictions of this section, means of escape include normal exits and emergency exits, passageways, stairways, ladders, deck scuttles, and windows.

(b) At least one of the means of escape from each space must provide a satisfactory route to weather.

(c) Each door, hatch or scuttle used as a means of escape must be capable of being opened by one individual, from either side, in both light and dark conditions, must open towards the expected direction of escape from the space served, and if a watertight door be of the quick acting type.

(d) Each deck scuttle which serves as a means of escape, must be fitted with a quick-acting release and a device to hold the scuttle in an open position.

(e) Each foothold, handhold, ladder, or similar structure, provided to aid escape, must be suitable for use in emergency conditions and must be of rigid construction.

(f) A window or windshield of sufficient size and proper accessibility may be used as one of the required means of escape from an enclosed space.

§ 28.395 Embarkation stations.

Each vessel must have at least one designated survival craft embarkation station and any additional embarkation

stations necessary so that an embarkation station is readily accessible from each accommodation space and work space. Each embarkation station must be arranged to allow the safe boarding of survival craft.

§ 28.400 Radar and depth sounding devices.

(a) Each vessel must be fitted with a general marine radar system for surface navigation with a radar screen mounted at the operating station.

(b) Each vessel must be fitted with a suitable echo depth sounding device.

§ 28.405 Hydraulic equipment.

(a) Each hydraulic system must be so designed and installed that proper operation of the system is not affected by back pressure in the system.

(b) Piping and piping components must be designed with a burst pressure of not less than four times the system maximum operating pressure.

(c) Each hydraulic system must be equipped with at least one pressure relieving device set to relieve at the system's maximum operating pressure.

(d) All material in a hydraulic system must be suitable for use with the hydraulic fluid used and must be of such chemical and physical properties as to remain ductile at the lowest operating temperature likely to be encountered by the vessel.

(e) Except for hydraulic steering equipment, controls for hydraulic equipment must be located where the operator has an unobstructed view of the hydraulic equipment and the adjacent working area.

(f) Controls for hydraulic equipment must be so arranged that the operator is able to quickly disengage the equipment in an emergency.

(g) Hydraulically operated machinery must be equipped with a holding device to prevent uncontrolled movement due to loss of hydraulic system pressure.

(h) A nonmetallic flexible hose must only be used between two points of relative motion, including a pump and piping system, and must meet SAE J 1942.

(i) Each nonmetallic flexible hose and hose assembly must be installed in accordance with the manufacturer's rating and guidelines and must be limited to a length of not more than 30 inches (0.76 meters) in an application not subject to torsional loading.

§ 28.410 Deck rails, lifelines, storm rails and hand grabs.

(a) Except as otherwise provided in paragraph (d) of this section, deck rails, lifelines, grab rails, or equivalent protection must be installed near the

periphery of all weather decks accessible to individuals. Where space limitations make deck rails impractical, hand grabs may be substituted.

(b) The height of deck rail, lifelines, or bulwarks must be at least 39½ inches (1 meter) from the deck, except, where this height would interfere with the normal operation of the vessel, a lesser height may be substituted.

(c) All deck rails or lifelines must be permanently supported by stanchions at intervals of not more than 7 feet (2.3 meters). Stanchions must be through bolted or welded to the deck.

(d) Portable stanchions and lifelines may be installed in locations where permanently installed deck rails would impede normal fishing operations or emergency recovery operations.

(e) Deck rails or lifelines must consist of evenly spaced courses. The spacing between courses must not be greater than 15 inches (0.38 meters). The opening below the lowest course must not be more than 9 inches (0.23 meters). Lower courses are not required where all or part of the space below the upper rail is fitted with a bulwark, chain link fencing, wire mesh, or an equivalent.

(f) A suitable storm rail or hand grab must be installed where necessary in a passageway, at a deckhouse side, at a ladder, and a hatch where an individual might have normal access.

(g) A stern trawler must have doors, gates, or other protective arrangements at the top of the stern ramp at least as high as adjacent bulwarks or 39½ inches (1 meter), whichever is less.

Subpart E—Stability

§ 28.500 Applicability.

This subpart applies to each commercial fishing industry vessel which is 79 feet (24 meters) or more in length that is not required to be issued a load line under subchapter E of this chapter and that—

(a) Has its keel laid or is at a similar stage of construction or undergoes a major conversion on or after September 15, 1991;

(b) Undergoes alterations to the fishing or processing equipment for the purpose of catching, landing, or processing fish in a manner different than has previously been accomplished on the vessel; or

(c) Has been substantially altered on or after September 15, 1991.

§ 28.501 Substantial alterations.

(a) Except as provided in paragraph (b) of this section, a vessel that is substantially altered, including the cumulative effects of all alterations,

need not comply with the remainder of this subpart, provided that it has stability instructions developed by a qualified individual which comply with § 28.530 (c) through (e).

(b) A vessel that is substantially altered in a manner which adversely affects its stability, including the cumulative effects of all alterations, need not comply with the remainder of this subpart, provided the stability instructions required by paragraph (a) of this section are based on loading conditions or operating restrictions, or both, which compensate for the adverse effects of the alterations.

(c) The following changes to a vessel's lightweight characteristics are considered to adversely affect vessel stability:

(1) An increase in the vertical center of gravity at lightweight by more than 2 inches (51 millimeters) compared to the original lightweight value.

(2) An increase or decrease of lightweight displacement by more than 3 percent of the original lightweight displacement.

(3) A shift of the longitudinal center of gravity of more than 1 percent of the vessel's length.

(d) In determining whether or not a vessel's stability has been adversely affected, a qualified individual must, at a minimum, consider the net effects on stability of any:

(1) Reduction of the downflooding angle;

(2) Increase in the maximum heeling moment caused by fishing gear or weight lifted over the side due to changes in lifting arrangement or capacity;

(3) Reduction in freeing port area;

(4) Increase in free surface effects, including increased free surface effects due to water on deck associated with any increase in length or height of bulwarks;

(5) Increase in projected wind area;

(6) Decrease in the angle of maximum righting arm;

(7) Decrease in the area under the righting arm curve; and

(8) Increase in the surface area on which ice can reasonably be expected to accumulate.

§ 28.505 Vessel Owner's responsibility.

(a) Where a test or calculations are necessary to evaluate stability, it is the owner's responsibility to select a qualified individual to perform the test or calculations.

(b) Test results and calculations developed in evaluating stability must be maintained by the owner.

§ 28.510 Definition of stability terms.

Downflooding means the entry of seawater through any opening into the hull or superstructure of an undamaged vessel due to heel, trim, or submergence of the vessel.

Downflooding angle means the static angle from the intersection of the vessel's centerline and the waterline in calm water to the first opening that cannot be closed weathertight and through which downflooding can occur.

Flush deck means a continuous weather deck located at the uppermost sheer line of the hull.

Forward perpendicular means a vertical line corresponding to the intersection of the forward side of the vessel's stem and the vessel's waterline at the vessel's deepest operating draft.

Open boat means a vessel not protected from entry of water by means of a complete deck, or by a combination of partial weather deck and superstructure which is seaworthy for the waters upon which the vessel operates.

Protected waters means sheltered waters presenting no special hazards such as most rivers, harbors, lakes, and similar waters as determined by the OCMI.

Qualified individual means an individual or an organization with formal training in and experience in matters dealing with naval architecture calculations.

Substantially altered means the vessel is physically altered in a manner that affects the vessel's stability and includes:

(1) Alterations that result in a change of the vessel's lightweight vertical center of gravity of more than 2 inches (51 millimeters), a change in the vessel's lightweight displacement of more than 3 percent, or an increase of more than 5 percent in the vessel's projected lateral area, as determined by tests or calculations;

(2) Alterations which change the vessel's underwater shape;

(3) Alterations which change a vessel's angle of downflooding; and

(4) Alterations which change a vessel's buoyant volume.

Well deck means a weather deck fitted with solid bulwarks that impede the drainage of water over the sides or an exposed recess in the weather deck extending one-half or more of the length of the vessel.

§ 28.515 Submergence test as an alternative to stability calculations.

(a) A vessel may comply with this section in lieu of the remainder of the requirements in this subpart. A certification plate installed under 33

CFR part 183, subpart B, is acceptable evidence of compliance with this section.

(b) A vessel which is fitted with inboard engines and loaded as described in paragraph (e) of this section must float in calm water, after being submerged for 18 hours, so that—

(1) For an open vessel, any portion of the vessel's gunwale is above the water's surface; or

(2) For a decked vessel, any portion of the main deck is above the water's surface.

(c) A vessel which is fitted with an outboard engine must be loaded as described in paragraph (e) of this section and must float in calm water after being submerged for 18 hours so that—

(1) The vessel has an equilibrium heel angle of less than 10°;

(2) Any portion of the vessel's hull is above the water's surface; and

(3) Any portion of the lowest 3 feet (0.91 meters) of the vessel's hull is not more than 6 inches (152 millimeters) below the water's surface as measured at the lowest point on the following—

(i) The gunwale, for an open boat; or
(ii) The main deck, for a decked vessel.

(d) A vessel which is fitted with an outboard engine must be loaded as described in paragraph (f) of this section and must survive the submergence described in paragraph (c) of this section, except that the equilibrium heel angle must not exceed 30° and the vessel must float with the lower end of the vessel not more than 12 inches (0.31 meters) below the water's surface in calm water.

(e) For the tests described in paragraph (b) and (c) of this section, a vessel must be complete in all respects, except that machinery which would be damaged by water may be replaced with equivalent fixed weight in the same location as the machinery it replaces. The vessel must be loaded with weight to represent the most adverse loading condition. The most adverse loading condition normally includes the maximum weight of fish in its highest possible location. Weights must be substituted for operating personnel at 165 pounds (734 Newtons) per individual and may be substituted for fishing gear. The substitute weights may be located transversely so that the vessel floats level prior to being submerged. The two largest air chambers, or compartments of a decked vessel not used as fuel tanks, that contribute buoyancy to the vessel must be flooded.

(f) For the test described in paragraph (d) of this section, a vessel must be

complete and loaded as described in paragraph (e) of this section, except that the center of gravity of the equivalent maximum fish load must be located to one side of the vessel's centerline by a distance equal to one-fifth of the maximum transverse dimension of the fish storage space.

§ 28.520 [Reserved]

§ 28.525 [Reserved]

§ 28.530 Stability instructions.

(a) *Intent.* The intent of this section is to ensure that vessel masters and individuals in charge of vessels are provided with enough stability information to allow them to maintain their vessel in a satisfactory stability condition. The rules provide maximum flexibility for owners and qualified individuals to determine how this information is conveyed, taking into consideration decisions by operating personnel must be made quickly and that few operating personnel in the commercial fishing industry have had specialized training in stability. Therefore, stability instructions should take into account the conditions a vessel may reasonably be expected to encounter and provide simple guidance for the operating personnel to deal with these situations.

(b) Each vessel must be provided with stability instructions which provide the master or individual in charge of the vessel with loading constraints and operating restrictions which maintain the vessel in a condition which meets the applicable stability requirements of this subpart.

(c) Stability instructions must be developed by a qualified individual.

(d) Stability instructions must be in a format easily understood by the master or individual in charge of the vessel. Units of measure, language, and rigor of calculations in the stability instructions must be consistent with the ability of the master or the individual in charge of the vessel. The format of the stability instructions may include, at the owner's discretion, any of the following:

- (1) Simple loading instructions;
- (2) A simple loading diagram with instructions;
- (3) A stability booklet with sample calculations; or
- (4) Any other appropriate format for providing stability instructions.

(e) Stability instructions must be developed based on the vessel's individual characteristics and may include the following, as appropriate for the format chosen for presentation:

(1) A general description of the vessel, including lightweight data;

(2) Instructions on the use of the information;

(3) General arrangement plans showing watertight compartments, closures, vents, downflooding angles, and allowable weights;

(4) Loading restrictions, such as diagrams, tables, descriptions or maximum KG curves;

(5) Sample loading conditions;

(6) General precautions for preventing unintentional flooding;

(7) Capacity plan or tank sounding tables showing tank and hold capacities, centers of gravity, and free surface effects;

(8) A rapid and simple means for evaluating any specific loading condition;

(9) The amount and location of fixed ballast;

(10) Any other necessary guidance for maintaining adequate stability under normal and emergency conditions;

(11) A general description of the stability criteria that are used in developing the instructions;

(12) Guidance on the use of roll limitation devices such as stabilizers; and

(13) Any other information the owner feels is important to the stability and operation of the vessel.

§ 28.535 Inclining test.

(a) Except as provided in paragraphs (b) and (c) of this section, each vessel for which the lightweight displacement and centers of gravity must be determined in order to do the calculations required in this subpart must have an inclining test performed.

(b) A deadweight survey may be substituted for the inclining test, if there is a record of an inclining test of a sister vessel. A vessel qualifies as a sister vessel if it is built to the same basic drawings and the undocumented weight difference between the two vessels is less than 3 percent of the lightweight displacement of the vessel which was inclined and the location of the longitudinal center of gravity differs less than 1 percent of the vessel's length.

(c) A deadweight survey may be substituted for the inclining test, or the inclining test may be dispensed with, if an accurate estimate of the vessel's lightweight characteristics can be made and the precise location of the position of the vessel's vertical center of gravity is not necessary to ensure that the vessel has adequate stability in all probable loading conditions.

(d) ASTM Standard F 1321-90, with the exception of Annexes A and B, may be used as guidance for any inclining test or deadweight survey conducted under this section.

§ 28.540 Free surface.

(a) When doing the stability calculations required by this subpart, the virtual rise in the vessel's vertical center of gravity due to liquids in tanks must be considered by calculating the following—

(1) For each type of consumable liquid, the maximum free surface effect of a tank, or a transverse pair of tanks, having the greatest free surface effect, in addition to a correction for service tanks; and

(2) The free surface effect of each partially filled tank and hold containing a liquid that is not a consumable or containing fish or a fish product that can shift as the vessel heels. This should include correction for any loose water within the vessel's hull associated with the processing of fish.

(b) The free surface effect of tanks fitted with cross-connection piping must be calculated assuming the tanks are one common tank, unless valves that will be kept closed to prevent the transfer of liquids as the vessel heels are installed in the piping.

(c) The moment of transference method may be used in lieu of the inertia method when calculating free surface effects.

§ 28.545 Intact stability when using lifting gear.

(a) Each vessel which lifts a weight over the side, or that uses fishing gear that can impose an overturning moment on the vessel, such as trawls and seines, must meet the requirements of this section if that maximum heeling moment exceeds $0.67(W)(GM)(F/B)$, in foot-long tons (meter-metric tons), where:

W = displacement of the vessel with the lifted weight or the force on the fishing gear included, in long tons (metric tons);

GM = metacentric height with the lifted weight or force on the fishing gear included, in feet (meters);

F = freeboard to the lowest weather deck, measured at amidships in feet (meters); and

B = maximum beam, in feet (meters).

(b) Except as provided in paragraph (f) of this section, each vessel must meet the requirements of § 28.570 or have at least 15 foot-degrees (0.080 meter-radians) of area under the righting arm curve, after correcting the righting arms for the heeling arm caused by lifting or fishing gear, from the angle of equilibrium to the least of the following:

- (1) The angle corresponding to the maximum righting arm;
- (2) The angle of downflooding; or
- (3) 40° (0.7 radians).

(c) The angle of intersection of the heeling arm curve resulting from the lifting moment or the moment of fishing gear and the righting arm curve must not be at an angle of more than 10° (0.17 radians).

(d) The heeling arm curve resulting from lifting must be calculated as the resultant of the upright heeling moment divided by the vessel's displacement multiplied by the cosine of the angle of heel.

(e) For the purposes of this section, the weight of suspended loads must be assumed to act at the tip of the boom unless the suspended load's transverse movement is restricted, such as by the use of sideboards.

(f) A vessel that operates on protected waters, as defined in § 170.050 of this chapter, must comply with the requirements of this section, except that the area described in paragraph (b) of this section must be at least 10 foot-degrees (0.053 meter-radians).

§ 28.550 Icing.

(a) *Applicability.* Each vessel that operates north of 42° North latitude between November 15 and April 15 or south of 42° South latitude between April 15 and November 15 must meet the requirements of this section.

(b) Except as provided in paragraph (d) of this section, the weight of assumed ice on each surface above the waterline of a vessel which operates north of 66°30' North latitude or south of 66° South latitude must be assumed to be at least:

(1) 6.14 pounds per square foot (0.423 Newtons per square millimeter) of horizontal projected area which corresponds to a thickness of 1.3 inches (33 millimeters); and

(2) 3.07 pounds per square foot (0.021 Newtons per square millimeter) of vertical projected area which corresponds to a thickness of 0.65 inches (16.5 millimeters).

(c) Except as provided in paragraph (d) of this section, the weight of assumed ice on a vessel that operates north of 42° North but south of 66°30' North latitude or south of 42° South but north of 66° South latitude must be assumed to be at least one-half of the values required by paragraphs (b)(1) and (b)(2) of this section.

(d) The height of the center of gravity of the accumulated ice should be calculated according to the position of each corresponding horizontal surface (deck and gangway) and each other continuous surface on which ice can reasonably be expected to accumulate. The projected horizontal and vertical area of each small discontinuous surface such as a rail, a spar, and rigging with

no sail can be accounted for by increasing the calculated area by 15 percent.

(e) The weight and location of ice must be included in the vessel's weight and centers of gravity in each condition of loading when performing the stability calculations required by this subpart.

§ 28.555 Freeing ports.

(a) Except as provided in paragraph (i) of this section, each decked vessel fitted with bulwarks must be fitted with freeing ports.

(b) Freeing ports must be located to allow the rapid clearing of water in all probable conditions of list and trim.

(c) Except as provided by paragraphs (d) through (h) of this section, the aggregate clear area of freeing ports on each side of the vessel must not be less than 7.6 plus 0.115 times the length of bulwark, in feet, for area in square feet (0.7 plus 0.035 times the length of the bulwark, in meters, for area in square meters).

(d) Except as provided in paragraphs (e) through (h) of this section, for bulwarks which exceed 66 feet (20 meters) in length, the aggregate clear area of freeing ports on each side of the vessel must not be less than 0.23 times the length of the bulwark in feet (0.07 times the length of the bulwark in meters, for area in square meters).

(e) For a bulwark more than 4 feet (1.22 meters) in height, the freeing port area required by paragraphs (c) or (d) of this section must be increased in accordance with the following formula:

$i = [h - 4]0.04q$, ($i = [h - 1.722]0.04q$, for metric units), where:

i = increase in freeing port area, in square feet (square meters);

h = bulwark height, in feet (meters);

and q = length of bulwark exceeding 4 feet (1.22 meters) in height, in feet (meters).

(f) For a bulwark less than 3 feet (0.91 meters) in height, the required freeing port area, required by paragraph (c) or (d) of this section, may be decreased in accordance with the following formula:

$r = [3 - h]0.04q$, ($r = [h - 0.91 - h]0.04q$), where:

r = permitted reduction in freeing port area, in square feet (square meters).

h = bulwark height, in feet (meters).

q = length of bulwark which is less than 3 feet (0.914 meters) in height, in feet (meters).

(g) For a vessel without sheer, the freeing port area must be increased by 50 percent.

(h) The area of the freeing ports on a vessel that operates on protected waters need only be 50 percent of the area required by paragraphs (c) or (d) of this section.

(i) Freeing port covers are permitted provided that the freeing port area required by this section is not diminished and the covers are constructed and fitted so that water will readily flow outboard but not inboard.

§ 28.560 Watertight and weathertight integrity.

(a) Each opening in a deck or a bulkhead that is exposed to weather must be fitted with a weathertight or a watertight closure device.

(b) Except as provided in paragraphs (c) through (f) of this section, each opening in a deck or a bulkhead that is exposed to weather must be fitted with a watertight coaming as follows:

(1) For a vessel 79 feet (24 meters) or more in length, the coaming must be at least 24 inches (0.61 meters) in height; or

(2) For a vessel less than 79 feet (24 meters) in length, the coaming must be at least 12 inches (0.30 meters) in height.

(c) A coaming to a fish hold that is under constant attention when the closure is not in place need only be 6 inches (0.15 meters) in height.

(d) The coaming of an opening fitted with a quick-acting watertight closure device need only be of sufficient height to accommodate the device.

(e) Except on an exposed forecastle deck, a coaming is not required on a deck above the lowest weather deck.

(f) Each window and portlight located below the first deck above the lowest weather deck must be provided with an inside deadlight. Each deadlight must be efficient, hinged, and arranged so that it can be effectively closed watertight.

(g) An opening in a vessel below the weather deck which is used for discharging water or debris resulting from processing or sorting operations must be fitted with a means to ensure the opening can be closed weathertight. This means of closing must be operable from a location which is outside the space containing the opening.

§ 28.565 Water on deck.

(a) Each vessel with bulwarks must comply with the requirements of this section.

(b) Except for a vessel that operates on protected waters, the residual righting energy, "b" in Figure 28.565, must not be less than the water on deck heeling energy, "a" in Figure 28.565.

(c) The water on deck heeling energy must be determined assuming the following:

(1) The deck well is filled to the top of the bulwark at its lowest point and the vessel heeled to the angle at which this point is immersed;

(2) Water does not run off through the freeing ports;

(3) Vessel trim and displacement are constant and equal to the values of the vessel without the water on deck; and

(4) Water in the well is free to run-off over the top of the bulwark.

(d) The residual righting energy is the righting energy from the value where the righting arm equals the water on deck heeling arm up to the lesser of the values of 40° (0.70 radians) of heel or the downflooding angle.

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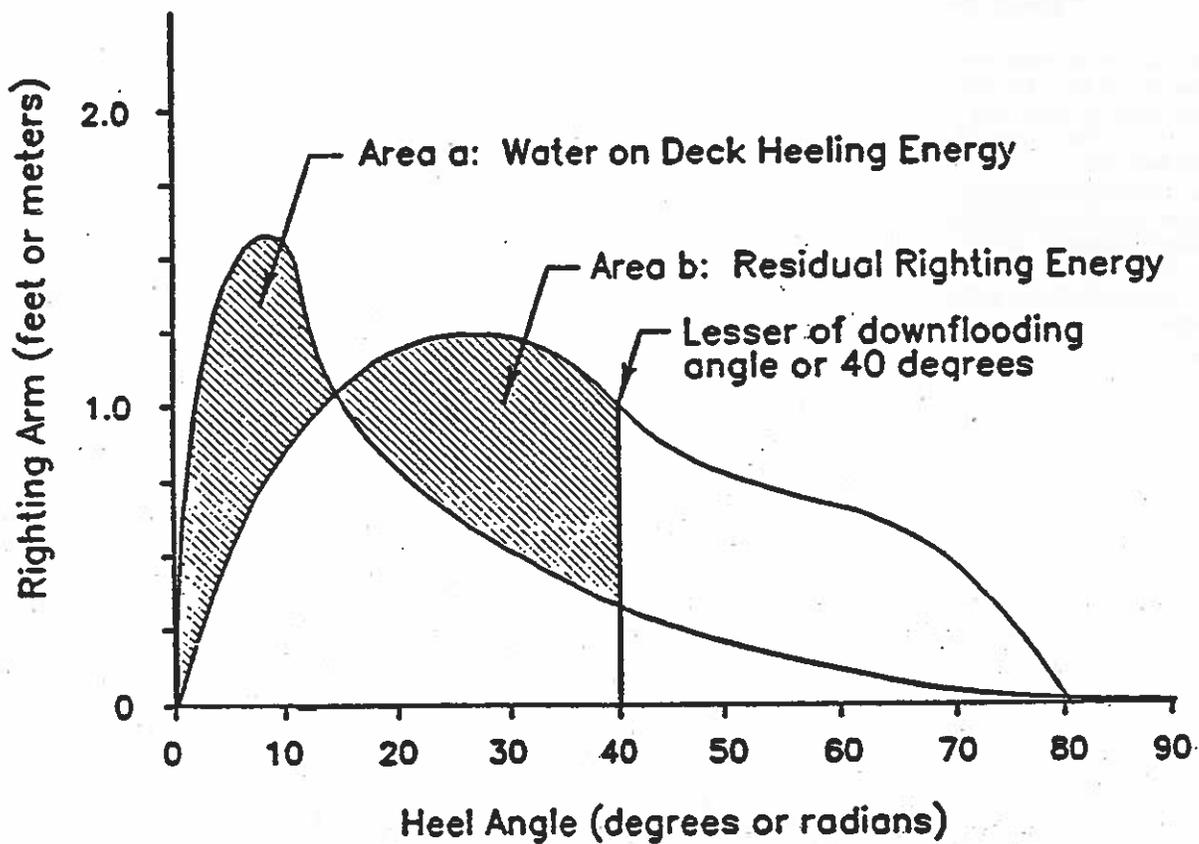


Figure 28.565

240a

§ 28.570 Intact righting energy.

(a) Except as provided in paragraph (c) of this section, each vessel must have the following properties in each condition of loading:

(1) An initial metacentric height (GM) of at least 1.15 feet (0.35 meters);

(2) A righting arm (GZ) of at least 0.66 feet (0.2 meters) at an angle of heel not less than 30° (0.52 radians);

(3) A maximum righting arm that occurs at an angle of heel not less than 25° (0.44 radians);

(4) An area under each righting arm curve of at least 16.9 foot-degrees (0.090 meter-radians) up to the lesser of 40° (0.70 radians) or the angle of downflooding;

(5) An area under each righting arm curve of at least 10.3 foot-degrees (0.055 meter-radians) up to an angle of heel of 30° (0.52 radians);

(6) An area under each righting arm curve of at least 5.6 foot-degrees (0.030 meter-radians) between 30° (0.52 radians) and the lesser of 40° (0.70 radians) or the angle of downflooding; and

(7) Except as provided by paragraph (b) of this section, positive righting arms through an angle of heel of 60° (1.05 radians).

(b) In lieu of meeting the requirements of paragraph (a)(7) of this section, a vessel may comply with the following provisions:

(i) Hatches in the watertight/weathertight envelope must be normally kept closed at sea (e.g., the live tank hatch is only opened intermittently, under controlled conditions); or

(ii) Unintentional flooding through these hatches must not result in progressive flooding to other spaces; and

(iii) In all cases, a vessel must have positive righting arms through an angle of heel of at least 50° (0.87 radians) and the intact stability analysis must consider that spaces accessed by such hatches to be flooded full or flooded to the level having the most detrimental effect on stability when free surface effects are considered.

(c) In lieu of meeting the requirements of paragraph (a) of this section, a vessel may comply with the provisions of § 170.173(c) of this chapter, provided that righting arms are positive to an angle of heel of not less than 50° (0.87 radians).

(d) For the purpose of paragraphs (a) and (c) of this section, at each angle of heel a vessel's righting arm must be calculated assuming the vessel is permitted to trim free until the trimming moment is zero.

§ 28.575 Severe wind and roll.

(a) Each vessel must meet paragraphs (f) and (g) of this section when subjected to the gust wind heeling arm and the angle of roll to windward as specified in this section.

(b) The gust wind heeling arm, L_w in figure 28.575 of this chapter, must be calculated by the following formula:

$$0.00216E_n(V_n^2A_nZ_n)/W,$$

where:

E_n = series summation notation where n varies from 1 to the number of elements in the series;

$V_n = S[0.124LN(0.3048h_n) + 0.772]$, in feet per second $S[0.127LN(h_n) + 0.772]$, in meters per second and is the wind speed for profile element "n" on a vessel;

$S = 64$ (19.5, if metric units are used) for a vessel that operates on protected waters; or 85.3 (26, if metric units are used) for a vessel that operates on waters other than protected waters;

LN = natural logarithm;

h_n = the vertical distance from the centroid of area A_n to the waterline for profile element n , in feet (meters);

A_n = projected lateral area for profile element n , in square feet (square meters);

Z_n = the vertical distance between the centroid of A_n and a point at the center of the underwater lateral area or a point at approximately one-half of the draft, for profile element n , in feet; and

W = displacement of the loaded vessel, in pounds (Newtons).

(c) The angle of roll to windward, A_1 , is measured from the equilibrium angle, A_{e1} , and is calculated by the following formula:

$$A_1 = 109kXY[\text{Square root of } (rs)], \text{ in degrees,}$$

where:

s, X, Y = factors from table 28.575;

$r = 0.73 + 0.6 Z_e/d$;

Z_e = distance between the center of gravity and the waterline (+ above, - below), in feet (meters);

$k = 1.0$ for round bilged vessels with no bilge keels or bar keels; 0.7 for vessels with sharp bilges, or the value from table 28.575 for vessels with a bar keel, bilge keels, or both;

B = molded breadth of the vessel, in feet (meters);

d = mean molded draft of the vessel, in feet (meters);

C_b = block coefficient;

A_x = aggregate area of bilge keels, the area of the lateral projection of a bar keel, or the sum of these areas, in square feet (square meters);

L = length, in feet (meters);

$T = 1.108 BC/\text{square root of } GM$, in seconds; $2.0 BC/\text{square root of } GM$, if metric units are used;

GM = metacentric height corrected for free surface effects, as explained in § 28.540, in feet (meters);

$C = 0.373 + 0.023(B/d) - 0.000131L$ or $0.373 + 0.023(B/D) - 0.00043L$, if metric units are used.

(d) The angle of equilibrium, A_{e1} in figure 28.575, is calculated by determining the lowest angle at which the gust wind heeling arm, L_w , is equal to the righting arm.

(e) The area "b" in figure 28.575 must be measured to the least of the following:

(1) The angle of downflooding, A_d ;

(2) The angle of the second intercept, A_{e2} in figure 28.575, of the wind heeling arm curve, L_w in figure 28.575, and the righting arm curve; or

(3) A heel angle of 50° (0.87 radians).

(f) The angle of equilibrium, A_{e1} in figure 28.575, must not exceed 14° (0.24 radians).

(g) Area "b" in figure 28.575 must not be less than area "a" in figure 28.575.

TABLES 28.575.—Roll Factors

B/d	X
2.4	1.0
2.5	0.98
2.6	0.96
2.7	0.95
2.8	0.93
2.9	0.91
3.0	0.90
3.1	0.88
3.2	0.86
3.3	0.84
3.4	0.82
3.5	0.80

Note. Intermediate values must be obtained by interpolation.

C_b	Y
0.45	0.75
0.50	0.82
0.55	0.89
0.60	0.95
0.93	0.65
0.70	1.0

Note. Intermediate values must be obtained by interpolation.

$100A_x/(LB)$	k
0	1.0
1.0	0.98
1.5	0.95
2.0	0.88
2.5	0.79
3.0	0.74
3.5	0.72
4.0	0.70

Note. Intermediate values must be obtained by interpolation.

T	S
6	0.100
7	0.098
8	0.093
12	0.065
14	0.053
16	0.044
18	0.038

T	S
20	0.035

Note: Intermediate values must be obtained by interpolation.

§ 28.580 Unintentional flooding.

(a) *Applicability.* Except for an open boat that operates on protected waters and as provided by paragraph (i) of this section, each vessel must comply with the requirements of this section.

(b) *Collision bulkhead.* A watertight collision bulkhead must be fitted and must meet the following:

(1) Openings in the collision bulkhead must be kept to a minimum, and each must be fitted with a watertight closure device;

(2) A collision bulkhead must not be fitted with a door below the bulkhead deck;

(3) A penetration or opening in a collision bulkhead must be—

(i) Located as high and as far inboard as practicable; and

(ii) Fitted with a means to rapidly make it watertight which is operable from a location aft of the collision bulkhead;

(4) The collision bulkhead must be located at least 5 percent of the length from the forward perpendicular unless the vessel has a bulbous bow, in which case the forward reference point will be extended by half the distance between the vessel's forward perpendicular and the forwardmost point of the bulbous bow as shown in figure 28.580; and

(5) The collision bulkhead must not be stepped below the bulkhead deck.

(c) Each vessel must meet the survival conditions in paragraph (f) of this section in each condition of loading and operation with the extent and character

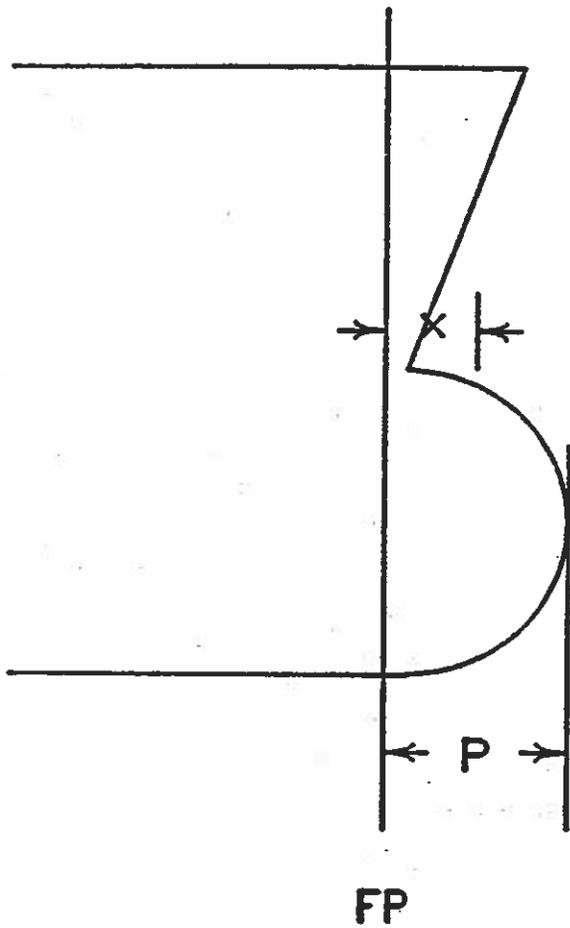
of damage specified in paragraphs (d) and (e) of this section.

(d) *Extent and character of damage.* Except where a lesser extent of damage or a smaller penetration would be more disabling, in evaluating the damage stability of a vessel the following penetration must be assumed:

(1) Longitudinal extent— $L/10$, or 10 feet (3.05 meters) plus $0.63L$, whichever is less. Transverse watertight bulkheads that are separated by at least this distance may be assumed to remain effective;

(2) Transverse extent—30 inches (0.76 meters) from the side measured at right angles to the centerline at the level of the deepest operating waterline; and

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$$x = P/2$$

Figure 28.580

(3) Vertical extent—from the baseline upward without limit.

(e) Each space containing a through hull fitting, such as the lazarette and the engine room, must be assumed to be flooded.

(f) *Survival conditions.* A vessel is presumed to survive the assumed damage and unintentional flooding described in paragraphs (d) and (e) of this section if:

(1) The angle of equilibrium after flooding does not exceed 25° (0.44 radians); and

(2) Through an angle of 20° (0.35 radians) beyond the angle of equilibrium after flooding, the following are met—

- (i) The righting arm curve is positive;
- (ii) The maximum righting arm is at least 4 inches (102 millimeters);
- (iii) Each submerged opening is capable of being made weathertight; and
- (iv) The heeling arm caused by deploying all fully loaded davit-launched survival craft on one side of a vessel does not exceed the righting arm at any angle of heel beyond the equilibrium angle when launching is assumed on the damaged side.

(g) *Permeability.* The permeability of each space must not be less than the following:

- (1) For an accommodations space—95 percent;
- (2) For a propulsion machinery space—85 percent;
- (3) For a tightly packed storage space—60 percent;
- (4) For a void or an auxiliary machinery space—95 percent;
- (5) For an empty fish hold—95 percent;
- (6) For a full fish hold—50 percent; and
- (7) For tanks—95 percent (less if a tank must be full to attain the draft under consideration.)

(h) *Buoyancy of superstructure.* A deckhouse or a superstructure may be

included in the buoyant volume of a vessel provided it is:

- (1) Sufficiently strong to withstand the impact of waves;
- (2) Fitted with a weathertight or watertight closure device for each opening;
- (3) Equipped with an efficient, hinged, inside deadlight, for each window and each portlight, arranged so that it can be effectively closed watertight; and
- (4) Fitted with interior access from the spaces below.

(i) A vessel may obtain and maintain a Load Line Certificate under Subchapter E of this chapter in lieu of meeting the requirements of paragraphs (c) through (g) of this section.

§ 28.590 [Reserved]

§ 28.600 [Reserved]

§ 28.610 [Reserved]

§ 28.620 [Reserved]

§ 28.630 [Reserved]

Subpart F—Fish Processing Vessel

§ 28.700 Applicability.

Each fish processing vessel which is not subject to inspection under the provisions of another subchapter of this chapter must meet the requirements of this subpart.

§ 28.710 Examination and certification of compliance.

(a) At least once in every two years each vessel must be examined for compliance with the regulations of this subchapter by the ABS, a similarly qualified organization, or a surveyor of an accepted organization.

(b) Each individual performing an examination under paragraph (a) of this section, upon finding the vessel to be in compliance with the requirements of this chapter, must provide a written

certification of compliance to the owner or operator of the vessel.

(c) Each certification of compliance issued under paragraph (b) of this section must:

- (1) Be signed by the individual that performed the examination;
- (2) Include the name of the organization the individual performing the examination represents or the name of the accepted organization the individual belongs to; and
- (3) State that the vessel has been examined and found to meet the specific requirements of this chapter.

(d) A certification of compliance issued under paragraph (b) of this section must be retained on board the vessel until superseded.

(e) A copy of the certification of compliance issued under paragraph (b) of this section must be forwarded by the organization under whose authority the examination was performed to the Coast Guard District Commander (Attention: Fishing Vessel Safety Coordinator) in charge of the district in which the examination took place.

§ 28.720 Survey and classification.

(a) Each vessel which is built after or which undergoes a major conversion completed after July 27, 1990, must be classed by the ABS, or a similarly qualified organization.

(b) Each vessel which is classed under paragraph (a) of this section must:

- (1) Have on board a certificate of class issued by the organization that classed the vessel.

(2) Meet all survey and classification requirements prescribed by the organization that classed the vessel.

Dated: July 31, 1991.

J.W. Kime,

Admiral, U.S. Coast Guard, Commandant.

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