



**U.S. SUPPLEMENT
TO**

**ABS RULES FOR STEEL VESSELS
CERTIFICATED FOR INTERNATIONAL
VOYAGES**

14 August 2017

AMERICAN BUREAU OF SHIPPING

USCG Approval: 14 August 2017 (16700/2017-821)

MISSION STATEMENT

The mission of ABS is to serve the public interest as well as the needs of our members and clients by promoting the security of life and property and preserving the natural environment.

HEALTH, SAFETY, QUALITY & ENVIRONMENTAL POLICY

We will respond to the needs of our members, clients and the public by delivering quality service in support of our mission that provides for the safety of life and property and the preservation of the marine environment.

We are committed to continually improving the effectiveness of our health, safety, quality and environmental (HSQE) performance and management system with the goal of preventing injury, ill health and pollution.

We will comply with all applicable legal requirements as well as any additional requirements ABS subscribes to which relate to HSQE aspects, objectives and targets.

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INTRODUCTION

Those who use this Supplement are asked to review the current ABS Rules for Building and Classing Steel Vessels, 2014 SOLAS and 2011 MARPOL or latest. Please be aware of the “Scope and Conditions of Classification.” This Supplement does not change the scope or conditions of ABS Classification. It is a reference document within the ABS Quality System.

Historically, as part of their regulatory reform initiative, the United States Coast Guard (USCG) established a task group consisting of USCG personnel and ABS Engineers to conduct a comparison of the applicable requirements contained within Title 46 of the Code of Federal Regulations (CFR) Subchapters “D” and “I” to the similar applicable regulations contained in 2014 SOLAS (as amended), the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) and the ABS Rules for Building and Classing Steel Vessels. The purpose of this effort was to identify redundancies and to determine if the International Conventions and ABS Class Rules would provide an equivalent level of safety to those regulations contained within 46 CFR Subchapters “D” and “I”. Over 370 separate regulations were examined, and it was determined that many of the CFR requirements were satisfied by either the ABS Rules alone, 2014 SOLAS (as amended) alone, MARPOL 73/78 alone, or a combination of all three of these regulations.

The results of the task group’s study were codified into a document, subsequently modified to include Subchapter “H”, titled “U.S. Supplement to ABS Rules for Steel Vessels for Vessels on International Voyages, dated 1 August 1997.” After review, the ABS U.S. Supplement was reissued in 1999 and again in 2003. This U.S. Supplement to ABS Rules for Steel Vessels for Vessels Certificated for International Voyages” (2017 ABS U.S. Supplement) identifies those USCG requirements which are to be applied in addition to the 2017 Rules for Building and Classing Steel Vessels, 2017 (2017 Rules) and requirements of the International Conventions in force as of 1 January 2017. This publication, is used in lieu of 46 CFR Subchapters “D”, “H”, “I” and “U” for plan review and inspections delegated to ABS by the USCG and, if used with a later edition of ABS Steel Vessels Rules, changes to this Supplement that result from changes between that later edition and the current edition of ABS Rules must also be applied. The use of this U.S. Supplement is restricted to those vessels which are enrolled in the USCG’s Alternate Compliance Program (ACP) and classed by ABS. The procedures for enrollment in the Alternate Compliance Program are addressed on Page 4 of this Introduction.

Applicability of this Supplement is limited to existing vessels that meet the following conditions and new vessels that are intended to meet the following conditions:

- A. A Cargo vessel over 500 gross tons ITC or a Passenger vessel carrying 12 or more passengers
- B. Greater than 90 meters (295 feet) in scantling length
- C. Certificated for international voyages
- D. Issued ICLL, SOLAS and MARPOL Certificates
- E. Issued and maintains a valid Certificate of Documentation (US Flag)
- F. Certified under 46 CFR Subchapter D, H, I, or U
- G. Classed under ABS Rules for Building and Classing Steel Vessels, 2017

The Supplement is divided into **nine** sections:

Section I contains supplemental requirements in areas where there exist ABS Rule cites for which the USCG has additional requirements. For ease of reference, each of these cites is identified by the corresponding ABS Rule number. If a Rule cite does not apply to the vessel under consideration, then the associated supplement requirement does not apply. This section will apply to vessels certified under 46 CFR Subchapters D, H, I, and U.

Section II contains the interpretations of 2014 SOLAS (as amended) from the U.S. Administration for those areas in which the USCG has amplifying or additional requirements. For ease of reference, each of these cites is identified by the corresponding SOLAS cite. If a SOLAS cite is not applicable to the vessel under consideration, then the associated interpretation does not apply. This section will apply to vessels certified under 46 CFR Subchapters D, H, I, and U.

Section III contains supplemental requirements in areas not contained in the ABS Rules, MARPOL or SOLAS for which the USCG has requirements. For ease of reference, each of these cites is identified by subject area title and an arbitrarily assigned paragraph identifier. This section will apply to vessels certified under 46 CFR Subchapters D, H, I, and U.

Section IV contains the U.S. Administration's interpretation of 2014 SOLAS (as amended) for the technical review of passenger vessels (certified under 46 CFR Subchapter H).

Section V contains the USCG interpretations for the implementation of the IBC Code.

Section VI contains the USCG interpretations for the implementation of the IGC Code.

Section VII contains additional requirements that apply to vessels certified under 46 CFR Subchapter U (Research Vessels). This is in addition to Section I through III.

Section VIII contains guidance and references.

Section IX contains the record of revisions commencing after 1 August 1997.

There are specific cites within this document where U.S. domestic standards are specified as mandatory for certain systems, equipment or components. U.S. Federal law is one of the reasons why many items are mandatory. It is recognized that there exist alternative standards developed by regulatory bodies and industry, both internal and external to the United States, which would define systems, equipment or components that are equivalent to those being specified herein. To the extent authorized by USCG Navigation and Vessel Inspection Circular No. 2-95, Change-2 (NVIC 2-95, Change-2), as amended and supplemented, ABS may evaluate alternatives built to these international/industry standards and forward comments and recommendations to the USCG Marine Safety Center (MSC) for final approval. Under no circumstances is ABS authorized to endorse or issue a Certificate of Inspection, exempt international convention requirements, or approve equivalencies to SOLAS or other international conventions.

In the normal course of technological advancement and application, it is entirely possible that new systems, equipment or components will be available for use onboard vessels covered by this program. In the event that existing design requirements are not applicable, it is incumbent on the owner, builder or his designer to seek from ABS as early as possible a determination by the MSC of the requirements which will be applied in such cases.

This document is the result of several years of review by ABS and the USCG. As noted above, the vision was to find common ground in their mutual missions of the protection of life and property at sea.

In August 1994 the USCG delegated authority to ABS under a Pilot Program, as defined in NVIC 2-95, to survey ABS-Classed vessels for compliance with the following statutory instruments:

- The International Convention for the Safety of Life at Sea, 1974 (as amended); and
- The International Convention for the Prevention of Pollution from Ships 73/78.

The Pilot Program was completed on 31 July 1997, and NVIC 2-95 was reissued on 1 August 1997 as NVIC 2-95, Change-1. Incorporated in Change 1 was the Coast Guard delegation of authority for ABS to review plans and conduct surveys on behalf of the USCG for vessels enrolled in the Alternate Compliance Program.

Under ACP, a voluntary program, the owner may elect to have ABS conduct surveys on existing vessels on behalf of the USCG. For new construction, a request is required from both the shipyard and the owner since enrollment in this program will influence both parties.

The controlling documents pertaining to vessels enrolled in ACP are 1974 SOLAS, as amended, MARPOL 73/78, as amended, NVIC 2-95, Change-2 (dated 5 May 2006), Volume II, Section B Chapter 9 of the USCG Marine Safety Manual, the ABS Steel Vessels Rules and this Supplement.

A vessel enrolled in the Alternate Compliance Program must satisfy all the requirements contained in the applicable sections of the International Conventions, ABS SVR and this U.S. Supplement, prior to the issuance of the COI. The vessel will remain subject to the requirements of the U.S. Supplement edition which corresponds with its date of construction and/or enrollment in the Alternative Compliance Program.

Each vessel enrolled in the MSP Select Program is subject to the guidance contained in Enclosure 4 of NVIC 1-13, CH-1, Inspection and Certification of vessels under the Maritime Security Program (MSP), which refers/invokes the standards contained in this supplement.

PROCEDURES FOR ENROLLMENT AND PARTICIPATION IN ACP

The process for enrollment in ACP is defined in the USCG Marine Safety Manual, Volume II, Section B, Chapter 9 and NVIC 2-95, Change-2 which is the guiding document for ACP administration and policy. The Marine Safety Manual, Volume II, and NVIC 2-95, Change-2 may be accessed, respectively, using the following links:

https://media.defense.gov/2017/Feb/27/2001704401/-1/-1/0/CCN_16000_2016_7_20.PDF
<https://www.uscg.mil/hq/cg5/nvic/pdf/1995/n2-95ch2.pdf>

NEW CONSTRUCTION

For new construction, since the design, fabrication sequences, and construction cost may be affected by the intended enrollment of a proposed new construction in ACP by the owner, it is imperative that the shipyard and owner consult with ABS as early in the design phase as possible. It is prudent to discuss the proposed enrollment in depth as soon as possible to establish the basic fundamentals and administrative clarifications. Upon the completion of such a meeting, both the shipyard and the owner are to forward a written request to ABS to confirm their intentions. For the shipyard, this could be accomplished in concert with the forwarding of the ABS Request for Classification Survey Details (Form A.B.122). For survey purposes, the owner is to forward a separate letter to the local ABS Office or Regional Office (Divisional Assistant Chief Surveyor, ABS Americas) to confirm their intention regarding the enrollment of the vessel. While this will assist in the proper processing within ABS, it is very important to note that the application for enrollment in ACP is to be forwarded to the USCG in accordance with NVIC 2-95, Change-2.

EXISTING VESSELS

With existing vessels, the owner or operator applies for enrollment by submitting an Application for Inspection of U.S. Vessel (Form CG-3752) to the OCMI, indicating their desire to have their vessel participate in the program. The USCG will subsequently authorize the ABS Program Manager (Divisional Assistant Chief Surveyor, ABS Americas) and the local ABS Survey Office to commence the process. A “Hand Over Survey,” discussed later in this text, will be scheduled at a mutually convenient time. Upon completion of this Survey, the owner/operator will receive official notification from the USCG indicating the enrollment status.

RE-FLAGGING

For vessels intending to re-flag to U.S. Flag, it is envisioned that:

- (1) For existing vessels intended to be certificated under the U.S. flag for the first time, the Supplement will apply in a similar manner to other vessels but with additional requirements or changes.
- (2) NVIC 10-81 (Current Version) is the guiding document for re-flagging.
- (3) The USCG accepted Vessel Deficiency Report or “Gap Analysis” augments the definition of the standards applied to the specific vessel.

HOW TO WITHDRAW

In order to withdraw from ACP, the owner is to advise the USCG in writing. If this is agreeable to the USCG, all data applicable to the vessel during the time period the vessel was enrolled in the program will be forwarded to the USCG for incorporation into the USCG computer files.

Upon accomplishment of the information transfer, the owner would then continue the required inspections directly under the jurisdiction of the USCG.

HAND OVER SURVEY

For all vessels, a “Hand Over Survey” must take place. The mandatory annual surveys for the SOLAS Cargo Ship Safety Construction Certificate, Safety Equipment Certificate and the MARPOL Certificates are conducted at this time, along with any surveys required for certificates due for renewal or annual classification surveys. The USCG will confirm that the history of the vessel has been properly entered into the ABS Status System. Then the Surveyors and Inspectors will agree on the resolution of any 835s and outstanding requirements. At this time, the USCG will also confirm to the Surveyors that the vessel is in compliance with all CFRs or will advise on those areas that must be corrected. The Surveyor and the Inspector will then complete the ABS Record of Safety Equipment. This record will ensure that the requirements of the USCG continue. The Record of Safety Equipment is to be a permanent part of the vessel’s documents.

WHAT HAPPENS WITH THE CERTIFICATE OF INSPECTION?

An ACP vessel will still have a Certificate of Inspection on board. However, it will be distinctively different in that it will not contain details of life-saving appliances and fire-extinguishing equipment. The ABS Status will contain the major details of the vessel.

WHAT HAPPENS IF THE VESSEL IS DAMAGED?

It is the responsibility of the vessel’s Master to report a marine casualty or accident, as defined in 46 CFR 4.03 to the cognizant USCG Officer in Charge of Marine Inspection (OCMI). ABS takes the lead in assessing the material condition of the affected vessel, proposing repairs and determining “Fitness to Proceed” and is obliged to share this with the local OCMI. If the vessel poses a pollution threat to the environment or poses a hazard to the safety of a U.S. navigable waterway such as a Class I structural failure, the local OCMI will have final authority to review and approve repairs. This decision must be coordinated with the Surveyor in Charge.

REPORTABLE CASUALTY

A marine casualty or accident means a casualty or accident involving any vessel within the navigable waters of the U.S., its territories or possessions, or any casualty or accident involving a US Flag vessel anywhere in the world. This definition of marine casualty or accident does not pertain to public vessels. The situations requiring reporting are contained in 46 CFR 4.05-1, **NOTICE OF MARINE CASUALTY**, as follows:

Immediately after addressing all resultant safety concerns, the owner, agent, master, operator, or person in charge, shall notify the nearest Marine Safety Office or USCG Group Office whenever a vessel is involved in a marine casualty consisting of:

- (1) An unintended grounding, or an unintended strike of (allision with) a bridge;
- (2) An intended grounding, or an intended strike of a bridge, that creates a hazard to navigation, the environment, or the safety of a vessel, or that meets any criterion of paragraphs 3 through 7;
- (3) A loss of main propulsion, primary steering, or any associated component or control that reduces the maneuverability of the vessel;
- (4) An occurrence materially and adversely affecting the vessel’s seaworthiness or fitness for service or route, including but not limited to fire, flooding, or failure of or damage

to fixed fire-extinguishing systems, life-saving appliances, auxiliary power generating equipment, or bilge pumping systems;

- (5) A loss of life;
- (6) An injury that requires professional medical treatment (treatment beyond first aid) and, if the person is engaged or employed on board a vessel in commercial service, that renders the individual unfit to perform his or her routine duties; or
- (7) An occurrence causing property damage in excess of \$25,000 including the cost of labor and materials to restore the property to its condition before the occurrence, but not including the cost of salvage, cleaning, gas-freeing, drydocking, or demurrage.

In addition to the above notification to the USCG, the owner, agent, master, operator or person in charge shall notify the nearest ABS office of any damages, failures, deterioration or repairs to hull, machinery or equipment, which affects or may affect classification or certification, and request an ABS Surveyor to attend the vessel at the first opportunity.

HOW TO HANDLE THE FORM CG 835

The Coast Guard may issue deficiencies on form CG-835 in conjunction with its inspections when there is no ABS surveyor onboard or available to attend in which case the Surveyor would normally issue the deficiency. When the CG inspector issues the CG-835, the original will be provided to the vessel's Master or authorized representative and the Coast Guard inspector will make a copy available to the local ABS office. The local ABS surveyor will enter the Coast Guard deficiency into the ABS vessel's survey status as an outstanding recommendation when it affects class and statutory certificates, or as a deficiency when it affects only the statutory certificates. The OCMI may accept a report of an ABS surveyor as proof of completion of an outstanding CG-835. The ABS Surveyor will specifically report on clearing of any CG-835 recommendations/deficiencies in a narrative report and forward one copy of the report to the local OCMI to allow USCG records to be updated. Without the written consent of the OCMI, ABS Surveyors cannot extend or modify recommendations/deficiencies that were initially reported on Form CG-835 by Coast Guard Inspectors.

NO SAIL ITEMS

This is a term normally used by the USCG when the condition of a vessel is suspect or has deteriorated or has sustained excessive damages such that there is a direct and immediate threat to the vessel's crew, the safety of navigation or the marine environment. ABS has the same concerns. However, the ABS terminology differs. ABS defines no sail items in various sections of the ABS Process Instructions. ABS does not use the term "Seaworthy." The term used in ABS is "Fitness to Proceed." A vessel is not considered Fit to Proceed if it has suffered structural damage that affects the longitudinal strength of the vessel or its watertight integrity. It also applies if the vessel has lost propulsion, steering or electrical generation capacity, including redundant systems.

Any of the foregoing would generate a report of noncompliance with the Rules and be listed as an "Outstanding Recommendation." Conversely, if the problem lies with SOLAS or MARPOL items, it would be listed as a "Deficiency." Deficiencies that would prevent a vessel from sailing would be: (1) Loss of life-saving appliances such as lifeboats; (2) Lack of life-saving appliances; (3) Failure of critical parts of the fire-extinguishing system. Examples of "No Sail" items are inoperable fire pumps or depleted fixed fire-extinguishing systems. On occasion an item that is a deficiency will also be an outstanding recommendation against Class. The emergency fire pump

is such an item. The emergency fire pump is required both for Class and for the Safety Equipment Certificate to be issued and/or remain valid.

OUTSTANDING RECOMMENDATIONS (OSR)

This is the term used by ABS to define areas of noncompliance with the Rules. Classification is maintained by a series of Annual Surveys and Periodical Surveys that allow the Class Society an opportunity to survey a vessel and maintain a record of its compliance with the Rules. It also allows ABS to confirm that the owner is maintaining the vessel in a satisfactory condition. A single Outstanding may not necessarily affect the Class of the vessel. Consideration is given to allow time to make corrections or to reach a more appropriate port. A number of Outstanding Recommendations or a major Outstanding Recommendation may be sufficient to question the “fitness of the vessel to proceed.”

WHAT HAPPENS IF THE SPECIAL SURVEYS MUST BE EXTENDED?

ACP survey extensions must be processed through the Survey Manager, ABS Americas. The maximum survey extension will be three months and shall not alter the baseline date for the survey concerned. Except for the Special Surveys, all other surveys have windows of time in which they are to be completed. A series of letters are sent to the owner advising of due dates and overdue dates. Provided there are no special circumstances to consider, the Class of the vessel is in jeopardy and will be canceled 90 days after the due date.

DRYDOCKING EXTENSIONS

Regardless of the circumstances, the USCG retains the ultimate authority for granting drydocking extensions of 90 days or more to ACP vessels. Under exceptional circumstances, ABS allows extensions of drydockings. The vessel must have no record of a grounding since the last drydocking, and a Survey must be conducted. For a 30-day extension, a general examination of the vessel is conducted. For extensions of 31 days up to 90 days, a modified Under Water Survey In Lieu of Drydocking (UWILD) is required. In the modified survey a record of the examination is made on photographs. The diver has a free swim of the bottom. Extensions of 90 days up to one year are normally done to allow the vessel’s surveys to be harmonized with IMO requirements, but must be approved by the USCG. A one-year extension requires a full Under Water Survey in Lieu of Drydocking, including two-way voice and video communications between the Surveyor and the diver. It would be considered unusual to do a one-year extension under any other circumstances.

UNDER WATER SURVEY IN LIEU OF DRYDOCKING

An ACP UWILD guide was developed for vessels enrolled in ACP. Guidance for Underwater Surveys In Lieu of Drydocking for vessels enrolled in the Alternate Compliance Program is included in NVIC 2-95, Change 2, Enclosure (3), which also refers to NVIC 01-89.

DRYDOCKING INSPECTION INTERVALS FOR PASSENGER VESSELS

For passenger vessels on international voyages, the CG has determined that the intervals for drydock inspections will be as specified under 46 CFR 71.50-3(a) which dictates drydocks and internal structural exams be conducted annually. Passenger vessels which have enrolled in the Coast Guard Underwater Survey in Lieu of Drydocking(UWILD) program may undergo drydocks on a twice in five year schedule with annual UWILDs in the intervening years.

For required internal structural exams, all tanks must be inspected annually; however, to accommodate vessel sailing schedules and surveyor availability, the class society may work with the attending Officer in Charge, Marine Inspection to develop a schedule to inspect a percentage of tanks at intervals throughout the year so that all tanks are inspected before the end of that period. At no time shall the period of internal inspection exceed twelve month.

OVERSIGHT

The USCG, in delegating surveys to ABS, still retains responsibility that vessels meet regulatory requirements. Crucial to fulfilling this responsibility is active and viable oversight by the USCG.

ABS' World Wide ISO 9001:2008 Certified Quality System can aid in this oversight. As with any successful quality system, it is a smoothly functioning in-service process verification scheme. It provides a source of continuous and timely opinion related to the effectiveness of the processes in place to meet customer requirements. An added benefit is the information it provides to both clients and management to prove that controlled work is being accomplished. In this respect it is very important in facilitating the delegation to ABS of USCG vessel inspection. It provides a framework that can be used in the USCG oversight program for delegated responsibilities.

Oversight will consist of internal and external audits of ABS by the USCG. It will also consist of annual boardings of the vessels to verify continued compliance with the issued certificates. The boardings will be similar to those done in Port State Inspections. A check sheet describing the considerations to expand the boardings is a part of the USCG Marine Safety Manual, Volume II, Section B Chapter 9. Coast Guard oversight activities also include periodic oversight reexaminations, attendance at dockings, new construction visits, attendance at UWILD surveys, evaluation of plan review activities and attendance at ISM Code safety management system audits.

SUPPLEMENTAL REPORTING

Certain supplemental information is required by the USCG to satisfy their requirements for the renewal and maintenance of the Certificate of Inspection. This survey checklist information is available in ABS Eagle Survey Manager. . These survey Check Sheets are available through ABS Eagle Survey Manager of which the USCG and Owner/Operator has or can obtain access. The survey checklists may also be obtained from the attending ABS Surveyor or ABS Surveyor-in-Charge.

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I. SUPPLEMENTAL REQUIREMENTS TO CURRENT ABS RULES

Cite: 1-1-5/1 Other Regulations – General

Cargo Gear is to be certified in accordance with the ABS the Guide for Lifting Appliances, 2015 as applicable for the type of cargo gear being provided.

As an alternative, evidence of approval by the International Cargo Gear Bureau may be submitted.

Cite: 3-3-1/3.1 Intact Stability

As required by SOLAS 1974, as amended and the 1988 Load Line Protocol, as amended, ships constructed on or after 1 July 2010 must, as a minimum, comply with the requirements of part A of the 2008 IS Code (IMO Resolution MSC.267(85)). The intact stability requirements of the 2008 IS Code have been determined to be equivalent to the intact stability requirements contained in 46 CFR Chapter I, Subchapter S and may be substituted for compliance with US requirements. Where applicable, the regulations contained in 46 CFR part 173, subpart B "Lifting", and 46 CFR part 173, subpart E "Towing", are to be satisfied. All recommendations that appear in the 2008 IS Code are required and considered mandatory.

Cite: 3-3-1/3.3 Damage Stability

Relative to damage stability, please note that all dry cargo vessels over 80 meters (262.5 ft) in length that change flag to US shall be considered to be new vessels for compliance with the probabilistic damage stability regulations in SOLAS, 1974, as amended, Chapter II-1, regardless of the actual build date.

Cite: 3-4-1/9 Fiber Reinforced Plastic (FRP) Gratings

Use of fiber reinforced plastic (FRP) gratings shall be in accordance with the guidance contained in NVIC 9-97, Change-1. All FRP grating of an approved level of structural fire integrity (L1, L2, L3) shall be type approved under USCG type approval series 164.040.

Cite: 3-6-1/1.1.4 Navigation Bridge Visibility – Remote Camera System

For ships of unconventional design, as a means for achieving the view of the ship's side from the bridge wing, use of a remote camera system may be permitted following an equivalency determination from the Marine Safety Center. The conditions of visibility available at the bridge wing are to be described, and use of remote camera systems to supplement may be accepted on a case-by-case basis in coordination with the Marine Safety Center.

Cite: 4-3-4/9.1.3 Steering Gear – Hydraulic Locks

This requirement applies to each vessel of 1600 gross tons and over that has power driven main or auxiliary steering gear. The steering failure alarm system must be independent of each steering gear control system, except for the input received from the steering wheel shaft.

Cite: 4-3-4/13 Steering Gear – Control Systems

The main steering gear is to be provided with full follow-up control in the pilothouse. Follow-up control means closed-loop (feedback) control that relates the position of the helm to a specific rudder angle by transmitting the helm-angle order to the power actuating system and, by means of feedback, automatically stopping the rudder when the angle selected by the helm is reached.

Cite: 4-3-5/1.3.3 Dynamic Positioning Systems

In addition to the requirements of the ABS Guide for Dynamic Positioning Systems, the DP-2 or DP-3 FMEA and Proving Trials should comply with the guidance provided in USCG MTN 2-11 to the greatest extent possible.

Cite: 4-4-1/1 Boilers and Pressure Vessels and Fired Equipment

Boilers, pressure vessels and heat exchangers are to comply with the requirements specified in 4-4-1 of the 2017 ABS Steel Vessels Rules or the ASME Code. Boilers, pressure vessels and heat exchangers manufactured to any other standard (other than recognized standards stated under 4-4-1/1.5) will be considered on a case-by-case basis in coordination with the Marine Safety Center.

Cite: 4-6-2/5.11 Piping Systems – Metallic Piping – Valves

A valve in which the closure is accomplished by resilient nonmetallic material instead of a metal to metal seat shall comply with the design, material and construction specified below. Valves employing resilient material shall be divided into three categories; Positive shutoff, Category A and Category B and shall be tested and used as follows:

- Positive Shutoff Valves – The closed valve must pass less than 10 ml/hr (0.34 fluid oz/hr) of liquid or 3 liters/hr (0.11 ft³/hr) of gas per inch nominal pipe size through the line after removal of all resilient material and testing at full rated pressure. Packing material must be fire resistant. Piping subject to internal head pressure from a tank containing oil (fuel, lube and cargo) must be fitted with a positive shutoff valve at the tank. See 4-6-4/13.5.3 of the Rules for additional requirements for such valves. Positive shutoff valves may also be used in any location in lieu of a required Category A or Category B valve.
- Category A Valves – The closed valve must pass less than the greater of 5% of its fully open flow rate or $15\% / \sqrt{(NPS)}$ of its fully open flow rate through the line after removal of all resilient material and testing at full rated pressure. Category A valves may be used in any piping system except where positive shutoff valves are required. Category A valves are required in the following locations:
 - Valves at vital piping (Fuel, Fire Main, CO₂, Halon, Bilge, Steering, Propulsion and its necessary auxiliaries, Ship's Service and Emergency Electrical Generation) system manifolds;

- Isolation valves in cross-connects between two piping systems, at least one of which is a vital system, where failure of the valve in a fire would prevent the vital system(s) from functioning as designed;
 - Valves providing closure for any opening in the shell of the vessel.
- Category B Valves – The closed valve will not provide effective closure of the line or will permit appreciable leakage from the valve after the resilient material is damaged or destroyed. Category B valves are not required to be tested and may be used in any location except where a Category A or Positive shutoff valve is required.

If a valve designer elects to use either calculations or actual fire testing in lieu of material removal and pressure testing, the proposed calculation method or test plan must be accepted by the Commandant.

General Acceptance Procedure. Valves are not issued a Certificate of Approval by the U.S. Coast Guard. Instead, the Marine Safety Center (MSC) determines if a valve is suitable for the intended purpose during engineering plan review for each vessel/system.

Cite: 4-6-3 Piping Systems – Plastic Piping

Pipes and piping components made of thermoplastic or thermosetting plastic materials, with or without reinforcement, are to conform to IMO Res. A.753(18). Piping required to meet flame, fire endurance, and/or smoke generation/toxicity requirements of A.753(18) must be USCG type approved. In lieu of meeting the smoke and toxicity requirements of A.753(18), plastic pipe located in concealed areas of an accommodation, control or service space must meet one of the following: (1) The trunk or duct containing the plastic pipe must be surrounded by an “A” class division; or (2) the concealed space containing the pipe must be fitted with approved smoke detection and penetrations of a bulkhead or deck and each draft stop installation shall maintain integrity of the fire divisions.

Marine Safety Center Note MTN 01-10 “MSC Review of Systems Containing Plastic Pipe” is considered an acceptable industry Guidance for the design and installation of plastic pipes onboard US Flag vessels

Cite: 4-6-4/7.7 Ballast Water Treatment Systems

A BWTS Type Approved by the USCG or an Alternate Management System (AMS) Unit in accordance with 33 CFR 151.2025 and 33 CFR 151.2026 is to be installed.

**Cite: 4-7-3/1 Fire Safety Systems – Fire-Extinguishing Systems and Equipment –
Fire Mains**

Fire mains may not be used for other than fire, deck wash or tank cleaning services unless specific provisions are included in the system design which ensure that system availability and performance requirements to fight shipboard fires are not compromised.

All distribution valves in the fire main system shall be distinctly marked to indicate the compartments or parts of the vessel to which they lead.

Material selection for piping and components shall be in accordance with 46 CFR 56.60 or ASTM F1155. Brass or bronze materials may be used in accordance with these standards.

Only USCG acceptable category “A” valves may be used in fire main system manifolds.

Cite: 4-7-3/3 Fire Safety Systems – Fire-Extinguishing Systems and Equipment – Fixed Gas Fire Extinguishing Systems

CO₂ systems, installed or altered after July 9, 2013, protecting spaces containing more than 6,000 cubic feet will require lockout valves. The lockout valves must be locked in the “off” position during maintenance or testing of a CO₂ system, to prevent accidental discharge during those times or heightened risk to personnel.

All new CO₂ systems, installed or altered after July 9, 2013 will need odorizers. In the event of a discharge, the odorizer will inject a wintergreen scent that will linger as long as harmful amounts of the discharged gas are present, to alert personnel to the presence of CO₂.

Cite: 4-8-2/3.11 Electrical Systems – System Design – System Arrangement

Time for starting and connection to the main switchboard must be both not more than 30 seconds and less than the time to start and connect the emergency generator to the emergency switchboard.

Cite: 4-8-2/5.9.1 Electrical Systems – System Design – Emergency Sources of Power – Power Supply – Generator

A stop control for an emergency generator must only be in the space that has the emergency generator, except a remote mechanical reach rod is permitted for the fuel oil shutoff valve to an independent fuel oil tank located in the space.

Cite: 4-8-2/5.13 Electrical Systems – System Design – Emergency Switchboard

Each bus-tie between a main switchboard and an emergency switchboard must be arranged to prevent parallel operation of the emergency power source with any other source of electric power, except for interlock systems for momentary transfer of loads.

If there is a reduction of potential of the normal source by 15% to 40%, the final emergency power source must start automatically without load. When the potential of the final emergency source reaches 85% to 95% of normal value, the emergency loads must transfer automatically to the final emergency power source. When the potential from the normal source has been restored, the emergency loads must be manually or automatically transferred to the normal source, and the final emergency power source must be manually or automatically stopped.

Cite: 4-8-2/5.17 Use of Emergency Generator in Port

The emergency generator may be used during lay time in port subject to the requirements of MSC.1 Circ 1464/Rev. 1 – Section 6 and all aspects of the emergency power system must be addressed in the Qualitative Failure Analysis, Design Verification Testing and Periodic Safety Test Procedure as required by ACP Cite 4-9-1/7. Final approval of the system is subject to plan approval by the MSC and acceptance of the installation by the cognizant OCMI.

Cite: 4-8-2/5.19 Electrical Systems – System Design – Alarms and Safeguards – Emergency Switchboard

Three means of shutdowns are required: low L.O. Pressure, Overspeed and upon release of the Fixed Fire-Extinguishing System in the Emergency generator room.

Cite: 4-8-2/7.1 Electrical Systems – System Design – Cable Sizing & 7.7

MCC and Lighting cables are not permitted a decrease in size if interlocks are employed.

Cite: 4-8-2/11.3 Electrical Systems – System Design – Navigation Light System

Each navigation light must meet the following:

- (a) Meet the technical details of the applicable navigation rules.
- (b) Be certified by an independent laboratory to the requirements of UL 1104 or an equivalent standard.
- (c) Be labeled with a label stating the following:
 - (1) “MEETS _____” (Insert the identification name or number of the standard under paragraph (b) above to which the light was tested.)
 - (2) “TESTED BY _____” (Insert the name or registered certification mark of the independent laboratory that tested the fixture to the standard under paragraph (b) above.)
 - (3) Manufacturer’s name.
 - (4) Model number.
 - (5) Visibility of the light in nautical miles.
 - (6) Date on which the fixture was Type Tested.
 - (7) Identification of the bulb used in the compliance test.

Cite: 4-8-2/11.5.2 Electrical Systems – System Design – Engine Order Telegraphs

On a vessel with more than one propulsion engine, each engine must have an engine order telegraph. On a double-ended vessel that has two navigating bridges, this system must be between the engine room and each navigating bridge.

On vessels equipped with pilothouse control, each local control station in the engine room must have an indicator if the local control station is not immediately adjacent to the engine room control station.

Engine order telegraph and remote propulsion control systems must be electrically separate and independent, except that a single mechanical operator control device with separate transmitters and connections for each system may be used.

Each vessel with navigating bridge throttle control must have a positive mechanical stop on each telegraph transmitter that prevents movement to the “Navigating Bridge Control” position without positive action by the operator.

Electric Engine Order Telegraph System

Where two or more transmitters, located on or on top of, or on the wings of, the navigating bridge operate a common indicator in the engine room, all transmitter handles and pointers must operate in synchronism or operate under the control of a transmitter transfer control as described below. Where the transmitters are mechanically interlocked to effect synchronous operation, a failure of a wire or chain at any transmitter must not interrupt or disable any other transmitter.

- Transmitter Transfer Control System: Except for a transmitter in an unattended navigating bridge on a double-ended vessel, each transmitter must operate under the control of a transmitter transfer control so that movement of any one transmitter handle automatically connects that transmitter electrically to the engine room indicator and simultaneously disconnects electrically all other transmitters. The reply pointers of all transmitters must operate in synchronism at all times.

On a double-ended vessel that has two navigating bridges, a manually operated transfer switch which will disconnect the system in the unattended navigating bridge must be provided.

Each electric engine order telegraph system must have transmitters and indicators that are electrically connected to each other.

Each engine room indicator must be capable of acknowledgment of orders.

Each system must have an alarm on the navigating bridge that automatically sounds and visually signals a loss of power to the system. The alarm is to be provided with means to reduce the audible signal from 100% to not less than 50%.

Mechanical Engine Order Telegraph System

Each mechanical engine order telegraph system must consist of transmitters and indicators mechanically connected to each other.

Each transmitter and each indicator must have an audible signal device to indicate, in the case of an indicator, the receipt of an order, and in the case of a transmitter, the acknowledgment of an order. The audible signal device must not be dependent upon any source of power for operation other than that of the movement of the transmitter or indicator handle.

If more than one transmitter operates a common indicator in the engine room, all transmitters must be mechanically interlocked and operate in synchronism. Where the transmitters are mechanically interlocked to effect synchronous operation, a failure of a wire or chain at any transmitter must not interrupt or disable any other transmitter.

Cite: 4-8-2/11.5.3 Electrical Systems – Interior Communication

A sound-powered telephone system or other reliable voice communication method must be installed that is independent of the vessel's electrical system (Ref: 46 CFR 113.30-3(b)).

Cite: 4-8-2/9.17.5 Electrical Systems – Electrical Design – Protection of Steering Gear Motor Circuits

(a) AC Steering Gear motors. The steering gear feeder must be provided with instantaneous trip protection (no overload protection allowed)

Cite: 4-8-3/5.5.4 Electrical Systems – Electrical Equipment – Emergency Switchboards – Instrumentation

Each AC switchboard must have a voltage regulator functional cut-out switch for transferring from automatic to manual control mode and a manual control rheostat for exciter field. This is not applicable if the excited current for the emergency generator is provided by attached rotating exciters or by static exciters deriving their source of power from the machines controlled.

A static exciter is prohibited by 46 CFR 111.12-3 for the emergency generator, unless the generator is provided with a permanent magnet or residual magnetism type exciter that has the capability of voltage build-up after two month of no operation.

Cite: 4-8-3/9.1 Electrical Systems – Electrical Equipment - Cables

IEC 60092-350, IEC 60092-352 and IEC 60072-353, 60092-354, 60092-360, 60092-370, 60092-376, IEEE Std-45 are acceptable cable constructions standards to be used.

**Cite: 4-8-3/13 Electrical Systems –Electrical Equipment – Certified Safe Equipment –
4-8-4/27.5 Certificated Safe Equipment in Hazardous Areas**

IEC certificated safe equipment must be tested or approved under the IECEx scheme and certification body must be recognized by the Commandant (i.e., certification under the ATEX scheme is not acceptable). See Section II/Cite: II-1/45.

Intrinsically safe systems or associated apparatus must meet the following “Ex ia” for Zones 0 and 1 (Class I, Division 1); and “Ex ib” for Zone 2 (Class I, Division 2).

Cite: 4-8-4/21.1.6 Electrical Systems – Shipboard Installation and Tests – Paint on Cables

Painting of cables is not permitted.

Cite: 4-8-5/3.10 High Voltage Shore Connection (HVSC)

Vessels equipped with a high voltage shore connection designed to power the vessel with the shore power alone, enabling the shipboard generators to be shut down while in port, are to comply with the requirements given in the ABS Guide for High Voltage Shore Connection.

**Cite: 4-9-1/5.1.10 Remote Propulsion Control and Automation – General –
4-9-2/9.1 Safety Systems**

Safety systems must not operate as a result of failure of the normal electric power source unless it is determined to be the failsafe state.

**Cite: 4-9-1/7 Remote Propulsion Control and Automation – General – Required
Plans and Data**

The degree of remote propulsion control and automation is to be based on the level of manning intended for the propulsion machinery space. Where it is intended to obtain USCG certification for a minimally attended machinery space, the ABS ACC requirements as well as the additional Cites contained in this Supplement are applicable.

Where it is intended to obtain USCG certification for an unattended machinery space, the ABS ACCU requirements as well as the additional Cites contained in this Supplement are applicable.

Note: It is the Owner’s responsibility to advise ABS as to the level of manning of the propulsion machinery space that will be requested from the USCG.

One copy of a qualitative failure analysis must be submitted for propulsion controls, microprocessor-based system hardware, safety controls, automated electric power management, automation required to be independent that is not physically separate and any other automation that in the judgment of the reviewing authority potentially constitutes a safety hazard to the vessel or personnel in case of failure. The QFA should enable the designer to eliminate single points of failure.

Note: The qualitative failure analysis is intended to assist in evaluating the safety and reliability of the design. It should be conducted to a level of detail necessary to demonstrate compliance with applicable requirements and should follow standard qualitative analysis procedures. Assumptions, operating conditions considered, failures considered, cause and effect relationships, how failures are detected by the crew, alternatives available to the crew, and necessary design verification tests should be included. Questions regarding failure analysis should be referred to the reviewing authority at an early stage of design.

A Design Verification test is to be performed once, immediately after the installation of the automated equipment or before issuance of the initial Certificate of Inspection (and thereafter whenever major changes are made to the system or its software), to verify that automated systems are designed, constructed and operate in accordance with the applicable ABS rules and requirements of this supplement. The purpose of design verification testing is to verify the conclusions of the QFA. The Design Verification Test Procedure (DVTP) is therefore an extension of the QFA and the two may be combined into one document. The DVTP should demonstrate that all system failures are alarmed and that all switchovers from a primary system component to a back-up component are also alarmed.

Periodic Safety tests must be conducted annually to demonstrate the proper operation of the primary and alternate controls, alarms, power sources, transfer override arrangements, interlocks and safety controls. Systems addressed must include fire detection and extinguishing, flooding safety, propulsion, maneuvering, electric power generation and distribution and emergency internal communications. Table 2 of Section 4-9-2 of ABS SVR, Table 1 of 4-9-5 and Tables 1 through 6 of 4-9-6, as applicable to the vessel's installed machinery and level of manning, should be used as a guide in developing the Periodic Safety Test Procedure (PSTP).

Design Verification and Periodic Safety test procedures are to be submitted for approval and retained aboard the vessel. Test procedure documents must be in a step-by-step or check off list format. Each test instruction must specify equipment status, apparatus necessary to perform the tests, safety precautions, safety control and alarm set points, the procedure to be followed, and the expected test result. Test techniques must not simulate monitored system conditions by maladjustment, artificial signals, improper wiring, tampering, or revision of the system unless the test would damage equipment or endanger personnel. Where a test meeting the restrictions on test techniques will damage equipment or endanger personnel, an alternative test method shall be proposed together with an explanation of why it is an equivalent test.

It is important to remember that the DVTP tests the response of the automation system to component failures within the system as predicted by the QFA and that the PSTP tests the performance of the automation system, its sensors, alarms, and actuators, and the interconnecting wiring. The design verification and periodic safety tests are to be witnessed by the surveyor. The OCMI must be notified prior to testing and may choose to attend these tests to verify that vital system automation is appropriate to the level of manning requested on the vessel's Certificate of Inspection.

Vessels with minimally attended or periodically unattended machinery plants must have a planned maintenance program to ensure continued safe operation of all vital systems. The

program must include maintenance and repair manuals for work to be accomplished by maintenance personnel and check off lists for routine inspection and maintenance procedures.

The planned maintenance program must be functioning prior to the completion of the evaluation period for reduced manning.

Maintenance and repair manuals must include details as to what, when and how to troubleshoot, repair and test the installed equipment and what parts are necessary to accomplish the procedures. Schematic and logic diagrams must be included in this documentation. Manuals must clearly delineate information that is not applicable to the installed equipment.

A set of Coast Guard approved automation testing procedures shall be maintained on board and made available upon request.

Cite: 4-9-2/1&3 Remote Propulsion Control and Automation – Remote Propulsion Control – Application – System Requirements

Sensors for the primary speed, pitch or direction of rotation control in closed loop propulsion control systems must be independent and physically separate from required safety, alarm or instrumentation sensors.

Cite: 4-9-2/13 Remote Propulsion Control and Automation – Remote Propulsion Control – Control on Navigation Bridge

An alarm to indicate starting capability of less than 50% of the requirement total starting capacity must be provided.

Cite: 4-9-5/1 Remote Propulsion Control and Automation – ACC – Application

Propulsion control from the Navigating Bridge is to be provided.

**Cite: 4-9-5/3 Remote Propulsion Control and Automation – ACC/ACCU –
4-9-6/3 System Requirements**

A personnel alarm must be provided and must annunciate on the Navigating Bridge if not routinely acknowledged at the centralized control station or in the machinery space.

**Cite: 4-9-5/9 Remote Propulsion Control and Automation – ACC/ACCU –
Monitoring in Centralized Control Station**

All required alarms must annunciate throughout the Centralized Control Station and the machinery space.

Cite: 4-9-5/15.5.1 Remote Propulsion Control and Automation – ACC/ACCU – Fire Detection and Alarm Systems

The fire detection and alarm system of approved type must activate all alarms at the Centralized Control Station, the Navigating Bridge, and throughout the machinery spaces and engineer's accommodations.

Cite: 4-9-5/15.5.2 Remote Propulsion Control and Automation – ACC/ACCU – Propulsion Machinery Space – Fire Safety – Fire Main System

The Centralized Control Station must include control of the main machinery space fire pumps. Where one or more fire pump is required to be independent of the main machinery space, at least one of such pumps must be controlled from the Navigating Bridge. See Section II/Cite II-2/7.2

All required fire pump control locations must include the controls necessary to charge the fire main and have (1) a fire main pressure indicator or (2) a fire main low pressure alarm.

Cite: 5C-1-7/1.9.1 Specific Vessel Types – Vessels Intended to Carry Oil in Bulk – Cargo Oil and Associated Systems - Cargo Oil Having Flash Point Exceeding 60° C (140° F)

See Section II/Cite: II-1/45 “The requirements of 5C-1-7/31.5.1(i) are applicable to cargo tanks.”

Cite: 5C-1-7/11.13 Specific Vessel Types – Vessels Intended to Carry Oil in Bulk – Position of Pressure/Vacuum Valves

Pressure vacuum relief valves and high velocity vent valves installed on tank vessels must be USCG approved equipment.

Cite: 5C-1-7/3.3 Specific Vessel Types – Vessels Intended to Carry Oil in Bulk – Cargo Oil System

The provisions in 5C-1-7/3.3.4(a) of the Rules, which permit the unrestricted routing of cargo piping through ballast tanks for vessels less than 5000 tons deadweight, is not acceptable on U.S. flagged vessels.

The requirements of 4-6-4/13.5.3 of the Rules for positive closing valves to be fitted on pipes emanating from fuel oil tanks which are subject to a static head of oil are also applicable to pipes from cargo oil tanks which are subject to a static head of oil.

Cite: 5C-1-7/5.3 Specific Vessel Types – Vessels Intended to Carry Oil in Bulk – Ballast System

The provisions in 5C-1-7/5.3.2(a) of the Rules, which permit the unrestricted routing of ballast piping through cargo tanks for vessels less than 5000 tons deadweight, is not acceptable on U.S. flagged vessels.

Cite: 5C-1-7/9 Specific Vessel Types – Vessels Intended to Carry Oil in Bulk – Cargo Heating Systems

A thermal fluid heater must be fitted with a control which prevents the heat transfer fluid from being heated above its flash point.

Cite: 5C-1-7/21 Specific Vessel Types – Vessels Intended to Carry Oil in Bulk – Cargo Vapor Emission Control Systems

In addition to meeting the requirements 5C-1-7/21 for Cargo Vapor Emission Control Systems :

- (a) Personnel training should be verified.
- (b) Connections on hoses and manifolds must be properly marked with a yellow band 0.8 m (2.64 ft) long between two red bands 0.1 m (.33 ft) long with the word “VAPOR” in black letters at least 50 mm (2 in) high on the yellow band.

Note: Oil Companies International Marine Forum Recommendation for Oil Tanker Manifolds and Associated Equipment, 4th Ed., has an alternative marking arrangement for vessel manifolds that is acceptable. The difference is that reducers on manifolds, where they are used, are lettered (at 2 and 10 o’clock) with the word “vapor”. That word does not need to be painted on the last meter of pipe that is before the flange.

- (c) Manifold flanges should have a stud and the hose/loading arm flange should have a hole.
- (d) Markings for overfill protection outside the control room should be in 50 mm (2 in) high black letters on a white background.
- (g) Each cargo tank shall have arrangements that allow oxygen measurements to be taken at a point 1m (3.3 ft) below the tank top and from a point at half the ullage prior to cargo transfer when cargo vapor is collected by a facility that requires the vapor from the vessel to be inerted, or when cargo vapor is transferred between vessels during lightering or topping off operations with vapor balancing.

**5C-1-7/11.11.2 Cargo Tank Venting/Protection for Tank Overpressurization/
PV Valve Setting**

Calculations are to be submitted to show that the cargo tanks will not be subjected to a pressure or vacuum in excess of their design pressure must also show that the P/V valve setting will not be exceeded.

5C-1-7/25.19 Non-return devices/ Deck Water Seal

Tankers engaged in U.S. trade require USCG approval of their Deck Water Seal Units in accordance with 46 CFR 32.53.10(b)(1). Inert gas systems employing “dry type” deck seals, are unacceptable.

Acceptable type of water seals include wet and semi-wet type. Other types of deck seals may be accepted on a case-by-case basis if approval is given by the Coast Guard Marine Safety Center.

**Cite: 5C-2 Specific Vessel Types – Vessels Intended to Carry Oil in Bulk
(Under 150 Meters in Length)**

The preceding cites of Section I of this Supplement associated with Chapter 5C-1 will also apply to vessels to which Chapter 5C-2 is applied.

**Cite: 5C-7-6/5.5 Vessels Intended to Carry Passengers – Automatic Sprinkler Systems
(Passenger Vessel Guide)**

Automatic sprinkler systems are to comply with National Fire Protection Association (NFPA) Standard 13-1996. Also see Section II, Cite II-2/10.6 and FSS Code Chapter 8 for additional requirements. Where SOLAS and NFPA 13 have similar requirements, the higher standard is to be satisfied. Note that the minimum design area required by SOLAS is 280m² (3,013 ft²).

**Cite: 5C-8-1/1 Vessels Intended to Carry Liquefied Gases in Bulk and Vessels
& 5C-9-1/1 Intended to Carry Chemicals in Bulk – General**

Refer to Sections V and VI for Interpretations and Guidance for IBC and IGC Code Authorization on behalf of the USCG for the issuance of an International Certificate of Fitness.

**Cite: 5C-8-5/1 & Specific Vessel Types – Vessels Intended to Carry Liquefied Gases
5C-8-9/1 in Bulk – Process Pressure Vessels and Liquid, Vapor, and Pressure
Piping Systems**

Cargo containment systems and piping systems carrying nitrogen, other than for deck tanks and their piping systems, must be USCG approved equipment.

Safety relief valves for liquefied compressed gas service must be USCG approved equipment.

**Cite: 5C-8-19 Specific Vessel Types – Vessels Intended to Carry Liquefied Gases
in Bulk – Summary of Minimum Requirements – Explanatory Notes
to the Summary of Minimum Requirements**

A liquefied gas not included in the table in 5C-8-19 of ABS Rules must have USCG approval in order to be carried in bulk in U.S. waters.

Cite: II-2/10.2.3.2.1	Fire Fighting – Fire Hoses and Nozzles – Number and Diameter of Fire Hoses	II-6
Cite: II-2/10.2.3.3	Fire Fighting– Fire Hoses and Nozzles – Sizes and Types of Nozzles	II-6
Cite: II-2/10.3 & FSS Code Chapter 4	Portable Fire Extinguishers	II-6
Cite: II-2/10.4 & FSS Code Chapter 5.2.2	Fixed Gas Fire-Extinguishing Systems – Carbon Dioxide Systems	II-6
Cite: II-2/10.4.1.1.3, 10.5 & FSS Code Chapter 7	Fixed Pressure Water Mist Fire-Extinguishing Systems in Machinery Spaces	II-7
Cite: II-2/10.5.4	Fire-Extinguishing Arrangements in Machinery Spaces – Other Machinery Spaces	II-7
Cite: II-2/10.5.6	Fixed Local Application fire-extinguishing systems	II-7
Cite: II-2/10.6	Automatic Sprinkler, Fire Detection and Fire Alarm Systems for Accommodation and Service Spaces	II-7
Cite: II-2/10.6.4	Fire-Extinguishing systems for the protection of Deep-Fat Cooking Equipment	II-8
Cite: II-2/10.8 & FSS Code Chapter 14	Fixed Deck Foam System	II-8
Cite: II-2/10.10.3	Storage of Fireman’s Outfits	II-9
Cite: II-2/13	Means of Escape	II-9
Cite: II-2/13	Miscellaneous Items	II-9
C. Life-Saving Appliances and Arrangements		
Cite: III/3	Definitions	II-9
Cite: III/4	Evaluation, Testing and Approval of Life-Saving Appliances and Arrangements	II-10
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Cite: III/33	Survival Craft Embarkation and Launching Arrangements	II-12
Cite: III/34 & LSA Code VI 6.1.2	Launching Appliances Using Falls and a Winch	II-13
Cite: III/34 & LSA Code VI 6.1.2.9	Launching Appliances Using Falls and a Winch	II-13
D. Radiocommunications		
Cite: IV/1.4	Radiocommunications – Application	II-13
E. Safety of Navigation		
Cite: V/22	Navigation Bridge Visibility	II-13

II. SOLAS INTERPRETATIONS NOT ADDRESSED BY ABS RULES

General

Equipment Approval by the USCG

The regulations in 46 CFR 2.75 address USCG authority over approvals of safety equipment, materials and installations. Neither these regulations, nor 46 CFR part 8, provide the regulatory authority to delegate type approval functions to a classification society. Therefore, the type approval certificates of the class society for the vessel enrolled in ACP cannot be used to meet type approval where required by U.S. regulations. For U.S. flag vessels, the USCG issues type approvals for a variety of equipment and materials including fire suppression equipment; structural fire protection materials; navigation equipment; pollution prevention equipment; and life-saving appliances, generally by independent laboratory testing, inspection, and/or oversight.

While the USCG recognizes some class societies to perform the role of independent lab, per 46 CFR 159.010, it is a separate and distinct regulatory program from the ACP. Class societies recognized by the USCG to perform functions under both the ACP and independent lab programs do not have unique authority to make decisions on behalf of the USCG in matters related to USCG type approval, or to make decisions regarding the modification to installed equipment holding USCG approval.

The USCG approves applicable “SOLAS” lifesaving equipment based on the IMO LSA Code incorporated by reference in the applicable subparts of Title 46 Subchapter Q. Likewise for fire protection items, the USCG approves “SOLAS” materials using the IMO Fire Test Procedures Code and the IMO Fire Safety Systems Code. All USCG approved equipment receives an approval number and must be permanently marked with that number. The first six digits of an approval number assigned by the Coast Guard are the approval series. Where approval is based on a subpart of 46 CFR Subchapter Q (i.e., parts 159 to 164), the approval series corresponds to the number of the subpart.

CGMIX (<http://cgmix.uscg.mil>) provides a listing of current and formerly approved equipment and materials. CGMIX is a US Coast Guard maintained publically available website providing maritime information to the public in the form of searchable databases.

Alternatives to USCG approval

Provisions within the 1996 USCG Authorization Act also allow the use of equipment approved by or on behalf of other governments under certain circumstances. In the case of life-saving appliances, there must be a reciprocal agreement in place to install equipment approved by/on behalf of that country on a U.S. vessel to meet carriage requirements. Documentation must be maintained on board to demonstrate Commandant (CG-ENG) accepted the life-saving appliance for installation in lieu of USCG approved equipment.

Additionally, a Mutual Recognition Agreement (MRA) exists between the U.S. and the European Community (EC), and the U.S. and the European Free Trade Association (EFTA), which address a limited number of items of fire protection, lifesaving, and navigation equipment. This US/EC MRA makes it possible for a manufacturer with a European Approval (MED/wheelmark) to obtain USCG

approval covered by the MRA. The US/EC MRA permits the “Notified Bodies” responsible for issuing approvals in Europe to issue USCG approval. Likewise, the USCG may issue the European Approval for manufacturers having a USCG approval if the item is included within the scope of the MRA. The US/EC MRA does not change the requirement of using USCG approved equipment and materials on U.S. Flag vessels, rather it allows an alternative means for obtaining USCG approval and still requires the issuance of a unique USCG approval number by the Notified Body, or European Marine Equipment Directive (MED) “wheelmark” by the USCG. The “wheelmark” on its own does not constitute USCG approval.

Further policy guidance is contained in NVIC 8-04, Change 1 and includes tables with the name and approval series for structural fire protection materials, navigation equipment, and lifesaving appliances eligible for approval through the US/EC MRA process. All other products requiring approval must have a USCG issued approval number. See CGMIX for a current list of approved equipment. CGMIX will not list those products approved under the US/EC MRA by a Notified Body, only products issued a wheelmark by the USCG.

If questions arise concerning the status of a piece of equipment or material, the classification society, preferably through their ACP point of contact, should send an e-mail to Commandant (CG-ENG) via typeapproval@uscg.mil.

A. Construction – Subdivision and Stability, Machinery and Electrical Installations

Cite: II-1/43 Emergency Source of Electrical Power in Cargo Ships

There must be visible indicators in the machinery space to show when the automatically controlled emergency power source is supplying the emergency loads.

Cite: II-1/45 Precautions Against Shock, Fire and Other Hazards of Electrical Origin

“Standards not inferior to those acceptable to the Organization” means standards contained in only one of the following sources:

- (a) Part 5C, Chapter 1, Section 7 “Cargo Oil and Associated Systems,” 31 “Electrical Installations” of the 2006 edition of ABS Rules for Building and Classing Steel Vessels. (Note: Reference II-2/9.2.4.2.5 shall be used in addition to II-2/4.5);
- (b) The requirements of 46 CFR 111.105; or
- (c) IEC 60092-502: 1999 “Electrical installations in ships – tankers” as supplemented by interpretations and additional requirements of IEC 60092-502: 1999 issued by the U.S. Coast Guard in April 2009.

B. Construction – Fire Protection, Fire Detection and Fire Extinction

Cite: II-2/3.1 Definitions – Accommodation Spaces

“A pantry containing no cooking appliances” is one which contains only low heat warming equipment, has steel furnishings and is not used as a storeroom for cleaning gear, linen supplies or any other combustible material. A dining room containing such appliances shall not be regarded as a pantry.

Cite: II-2/4.2.2.5.1 Fuel Oil Piping

The use of heat sensitive materials is prohibited in piping systems conveying flammable or combustible products. Heat sensitive materials are those having a solidus melting point below 1700° F.

Cite: II-2/7.2 Fixed Fire Detection and Fire Alarm Systems FSS Code Chapter 9

Fire protection systems must be USCG approved equipment.

A conductor must not be used as a common return from more than one zone.

Each connection box must be constructed in accordance with NEMA 250 Type 4 or 4X, or IEC IP56 requirements (46 CFR 113.10-7).

There must be at least two sources of power for the electrical equipment of each fire detecting and alarm system. The normal source must be the main power source. The other source must be the emergency power source or an automatically charged battery. If the other source is an automatically charged battery, the charger must be supplied from the emergency power source. Upon loss of power to the system from the normal source, the system must be automatically supplied from the other source.

The capacity of each branch circuit providing power to a fire detection or alarm system must not be less than 125 percent of the maximum load.

An alarm on one fire detection circuit shall not interfere with the normal operation of any other circuit (46 CFR Part 161.002).

Each fire detecting zone must not include spaces on more than one deck, except:

- (a) Adjacent and communicating spaces on different decks in the ends of the vessel having a combined ceiling area of not more than 279 m² (3000 ft²).
- (b) Isolated rooms or lockers in such spaces as mast houses, wheelhouse top, etc., which are easily communicable with the area of the fire-detecting circuit to which they are connected.
- (c) Systems with indicators for individual spaces.

The fire detecting zone must not contain more than 50 protected rooms or spaces.

The system must visually indicate the zone in which the alarm originated.

The detectors, control panel, manual call points and alarms must be listed in the approved component list for the USCG approved system.

The fire detecting system must be used for no other purpose, except it may be incorporated with the manual alarm system.

A framed chart or diagram must be installed in the wheelhouse or control station adjacent to the detecting cabinet indicating the location of the detecting zones and giving operating instructions.

Cite: II-2/7.4 Fixed Fire Detection and Fire Alarm Systems – Protection of Machinery Spaces

The fire control station must include an indicating unit or a fire alarm annunciator that indicates the machinery space that is on fire.

**Cite: II-2/7.2 & Fixed Fire Detection and Fire Alarm Systems – Installation
FSS Code Requirements
Chapter 9.2.4**

A sufficient number of call points must be employed such that a person escaping from any space would find an alarm box convenient on the normal route of escape.

The manual alarm system must be used for no other purpose, except it may be incorporated with the fire detecting system.

Manual fire alarm boxes shall be clearly and permanently marked “IN CASE OF FIRE BREAK GLASS” in at least 12.5 mm (½ in) letters.

Detector spacing shall be in accordance with the manufacturer’s recommendation. Detector spacing in spaces with ceilings greater than 3 m (10 ft) must be corrected in accordance with NFPA 72E.

Cite: II-2/9.2.3.1 Structural Fire Protection – Method of Protection in Accommodation Area

Only Method IC shall be used.

Cite: II-2/9.2.3.3 Fire Integrity of Bulkheads and Deck

In accordance with 46 CFR 112.05-5(e) or 127.220, no compartment that has an emergency power source or its vital components may adjoin a Category A machinery space or those spaces containing the main source of electrical power and its vital components.

Cite: II-2/9.3.1 “A” Class Divisions Penetrations

Non-ducted ventilation arrangements are to comply with the guidance provided in NVIC 9-97, CH 1.

Cite: II-2/9.7.3 Duct Penetrations

A large duct may not be subdivided into multiple smaller ducts when passing through a fire boundary to avoid the requirement to install automatic fire dampers.

Cite: II-2/10.2.1.1 Fire Main and Hydrants

Material Selection for piping and components shall be in accordance with 46 CFR 56.60 or ASTM F1155. Brass or bronze materials may be used in accordance with these standards.

Valves employing resilient material may be used in firemain systems provided they are USCG acceptable Category “A” or positive shutoff valves per 46 CFR 56.20-15.

Cite: II-2/10.2.1.5 Fire Fighting – Fire Mains and Hydrants – Number and Position of Hydrants

At each fire hose valve there shall be marked in not less than 50 mm (2 in) red letters and figure: “FIRE STATION.”

Cite: II-2/10.2.3.1.1 Fire Fighting – Fire Hoses and Nozzles – General Specifications

Each section of fire hose shall be lined commercial fire hose that conforms to Underwriters' Laboratories, Inc. Standard 19 or Federal Specification ZZ-H-451E.

Cite: II-2/10.2.3.2.1 Fire Fighting – Fire Hoses and Nozzles – Number and Diameter of Fire Hoses

The minimum hydrant and hose size shall be 40 mm (1.5 in.).

On passenger and cargo ships over 1500 gross tons, the minimum hydrant and hose size for interior and exterior locations is 65 mm (2.5 in.). For interior locations, where 65 mm (2.5 in) hydrants and hose are required, two 40 mm (1.5 in) outlets with two 40 mm, (1.5 in) hoses supplied through a siamese connection may be substituted.)

On tankships over 125 m (400 ft (L.O.A.)), the minimum hydrant and hose size for exterior locations is 65 mm (2.5 in.). Where 65 mm (2.5 in) hydrants and hose are required, two 40 mm (1.5 in) outlets with two 40 mm, (1.5 in) hoses supplied through a Siamese connection may be substituted. Please note that two hoses are required at exterior fire stations equipped with Siamese fittings.

Where two 40 mm (1.5 in) hydrants and hoses are permitted in lieu of one 65 mm (2.5 in) hydrant and hose, both of the outlets operating simultaneously are to be considered as a single outlet for the purpose of complying with the minimum number of jets criteria for fire pump capacity.

Cite: II-2/10.2.3.3 Fire Fighting – Fire Hoses and Nozzles – Size and Types of Nozzles

Nozzles must be USCG approved equipment.

**Cite: II-2/10.3 & Portable Fire Extinguishers
FSS Code
Chapter 4**

Fire extinguishers must be USCG type-approved equipment.

**Cite: II-2/10.4 & Fixed Fire-Extinguishing Systems – Fixed Gas Fire-Extinguishing
FSS Code Systems
Chapter 5.2.2**

Carbon dioxide and clean agent systems, such as FM200, NOVEC 1230, Halon or Halon substitutes, etc., are to be USCG Type Approved. The design and installation must be in accordance with the USCG Type Approved manufacturer's manual. Where SOLAS and the USCG Type Approved manufacturer's manual have dissimilar requirements (such as agent required calculations) the higher standard is to be satisfied.

Markings

CO₂ fire smothering apparatus shall be marked “CO₂ FIRE APPARATUS” in not less than 50 mm (2 in) red letters.

**Cite: II-2/10.4.1.1.3, Fixed Pressure Water Mist Fire-Extinguishing Systems
10.5 & in Machinery Spaces
FSS Code
Chapter 7**

Water mist system requirements are outlined in IMO MSC/Circ.1165 for machinery spaces and IMO Resolution A.800(19) as amended by Resolutions MSC.265(84) and MSC.284(86) for accommodation and service spaces. These guidelines are used in conjunction with USCG Type Approved Manuals. Water spray system requirements are in FSS Chapter 7.

**Cite: II-2/10.5.4 Fire-Extinguishing Arrangements in Machinery Spaces – Other
Machinery Spaces**

A fixed pressure water-spraying, fire extinguishing system is not acceptable by the USCG except for lamp lockers, paint lockers and pump rooms. Where installed in these spaces, it shall comply with Chapter 7 of the FSS Code and the following:

Water mist system requirements are outlined in IMO MSC/Circ.1165 for machinery spaces and IMO Resolution A.800(19) for accommodation and service spaces. These guidelines are used in conjunction with USCG Type Approved Manuals

Cite: II-2/10.5.6 Fixed Local Application fire-extinguishing systems

For Machinery of Category A above 500 m³ in volume, the system must be USCG approved equipment and must comply with manufacturer’s approved Design, Installation, Operation and Maintenance Manual that meets Chapter II-2, Regulation 10.5.6 and MSC/Circ. 913 as amended by MSC.1/Circ. 1387

**Cite: II-2/10.6 Automatic Sprinkler, Fire Detection and Fire Alarm Systems for
Accommodation and Service Spaces**

Automatic sprinkler systems are also to comply with National Fire Protection Association (NFPA) Standard 13-1996. Where SOLAS Reg. II-2/12 and NFPA Std. 13 have similar requirements, the higher standard is to be satisfied. The following supplemental requirements apply:

The sprinkler heads, alarms, dry pipe valves, and actuating mechanisms shall be listed or approved by a recognized independent testing lab.

The control the minimum design area required by SOLAS is (280 m²) 3,013 ft² cabinets or spaces containing valves or manifolds shall be distinctly marked in conspicuous red letters at least 50 mm (2 in) high “AUTOMATIC SPRINKLING SYSTEM.”

Cite: II-2/10.6.4 Fire-extinguishing systems for the protection of Deep-Fat Cooking Equipment

Fire-extinguishing systems for the protection of Deep-Fat Cooking Equipment UL listed (UL 300 Standard) or ISO15371 are considered acceptable for US Flag Vessels and are to follow the approved manufacturer's manual.

**Cite: II-2/10.8 & Fixed Deck Foam System
FSS Code
Chapter 14**

The foam concentrate, tank, monitors, proportioning device and other control components are to be USCG approved and must comply with manufacturer's approved Design, Installation, Operation and Maintenance Manual that meets Chapter II-2, Regulation 10.8.1 and FSS Code Chapter 14. of SOLAS and the following supplemental requirements: .

Controls

Complete, but simple instructions for the operation of the system shall be located in a conspicuous place at or near the controls.

The deck foam system must be capable of being actuated, including introduction of foam to the foam main, within three minutes of notification of a fire.

Piping

All piping, valves, and fittings of ferrous materials shall be protected inside and outside against corrosion unless specifically approved otherwise.

All piping, valves, and fittings shall be securely supported, and where necessary, protected against injury.

Drains and dirt traps shall be fitted where necessary to prevent the accumulation of dirt or moisture.

Piping shall not be used for any other purpose than firefighting, drills and testing.

Discharge Outlets

At least one mounted foam appliance shall be provided for each required foam station.

Markings

Foam apparatus, the control cabinets or spaces containing valves or manifolds for the various fire extinguishing systems shall be distinctly marked in conspicuous red letters at least 50 mm (2 in) high "FOAM FIRE APPARATUS".

Cite: II-2/10.10.3 Storage of Fireman's Outfits

Lockers or spaces where emergency equipment is stowed shall be marked: "EMERGENCY EQUIPMENT".

Cite: II-2/13 Means of Escape

The doors giving access to either of the two required means of escape shall not be lockable, except that crash doors or locking devices, capable of being easily forced in an emergency, may be employed provided that a permanent and conspicuous notice giving instructions on how to open the door or the lock is attached to both sides of the door. This paragraph shall not apply to outside doors to deckhouses where such doors are locked by key only, and such key is under control of one of the vessel's officers.

All public spaces having a deck area of over 28 m² (300 ft²) shall have at least two exits. Where practicable, the exits shall give egress to different corridors, spaces, or rooms to minimize the possibility of one incident blocking both means of escape.

All interior stairways, other than those within the Machinery Spaces or Cargo Holds, shall have a minimum width of 0.71 m (28 in.). The angle of inclination with the horizontal of such stairways shall not exceed 50°.

Cite: II-2/13 Miscellaneous Items

Small rooms or spaces having a secondary means of escape which is not obviously apparent shall have a suitable sign in red letters "EMERGENCY EXIT" directing attention to such escape.

C. Life-Saving Appliances and Arrangements (This supplement entry is intended to add clarity to the various terms used but not clearly defined in SOLAS.)

Cite: III/3 Definitions

"Accommodation" means a cabin or other covered or enclosed place intended to carry persons. Each place where passengers are carried is considered an accommodation, whether or not it is covered or enclosed. Accommodations include, but are not limited to halls, dining rooms, mess rooms, lounges, corridors, lavatories, cabins, offices, hospitals, cinemas, game and hobby rooms, and other similar spaces open to persons on board.

"Embarkation station" means the place where a survival craft is boarded.

"Fleet angle for a wire rope leading to a winch drum" means the angle included between an imaginary line from the lead sheave perpendicular to the axis of the drum and the line formed by the wire rope when led from the lead sheave to either extremity of the drum.

“Marine evacuation system” means an appliance designed to rapidly transfer large numbers of persons from an embarkation station by means of a passage to a floating platform for subsequent embarkation into associated survival craft, or directly into associated survival craft.

“Muster station” means the place where the crew and passengers assemble before boarding a survival craft.

“Seagoing condition” means the operating condition of the ship with the personnel, equipment, fluids and ballast necessary for safe operation on the waters where the ship operates. For bottom-bearing mobile offshore drilling units, the term also applies in the bottom-bearing mode, but the “lightest seagoing condition” is considered to be the highest anticipated operating condition.

“Survival craft” means a craft capable of sustaining the lives of persons in distress after abandoning the ship on which they were carried. The term includes lifeboats, liferafts, buoyant apparatus, and life floats, but does not include rescue boats.

“Toxic vapor or gas” means a product for which emergency escape respiratory protection is required under subchapter 17 of the International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk (IBC Code), and in subchapter 19 of the International Code for the Construction and Equipment of Ships carrying Liquefied Gases in Bulk (IGC Code).

Cite: III/4 Evaluation, Testing and Approval of Life-Saving Appliances and Arrangements

Life-saving appliances required by SOLAS Chapter III must be approved by the USCG. However, equipment marked with a CG approval number issued under the US-EC or US-EFTA Mutual Recognition Agreements per NVIC 8-04 Change 1, discussed above in the “General” section, are acceptable.

In addition, life-saving equipment accepted under the reciprocal acceptance agreement with certain Administrations, such as Norway, may also be used on a U.S. flag vessel. A copy of the USCG acceptance letter must be provided with each piece of equipment supplied to a U.S. flag ship, under these agreements.

Products marked with an approval number containing one of the following USCG approval series indicate compliance with SOLAS requirements:

- 160.017 Embarkation-Debarcation Ladders (only if marked “SOLAS 74/83”)
- 160.040 Line-throwing appliances
- 160.115 Winches
- 160.117 Embarkation-Debarcation Ladders
- 160.118 Rigid liferafts
- 160.121 Hand red flares
- 160.122 Floating orange smoke signals
- 160.132 Davits
- 160.133 Release Mechanisms (on-load/offload) for Lifeboats and Rescue Boats
- 160.135 Lifeboats

- 160.136 Rocket parachute flares
- 160.150 Ring life buoys
- 160.151 Inflatable liferafts
- 160.155 Lifejackets
- 160.156 Rescue boats
- 160.157 Self-activating smoke signals
- 160.162 Hydrostatic release units
- 160.163 Liferaft launching appliance
- 160.170 Liferaft automatic disengaging apparatus
- 160.171 Immersion suits
- 160.174 Thermal protective aids
- 160.175 Marine Evaluation Systems
- 160.176 Inflatable Lifejackets (SOLAS)
- 161.110 Floating electric water lights
- 161.112 Lifejacket lights
- 163.003 Pilot Ladders to comply with SOLAS V/17, IMO Res. A.889(21)
Accommodation ladders which are used in conjunction with a pilot ladder for pilot transfer need not be approved under USCG approval series 163.003. Such accommodation ladders may be approved by ABS under the Alternate Compliance Program to the requirements of SOLAS Ch.II-1/Reg. 3-9.

Where a particular life-saving appliance or arrangement is required, the Commandant, (CG-ENG), must accept any other appliance or arrangement that is at least as effective as that specified. This acceptance is not delegated to the class society under the ACP. If necessary, the Commandant, (CG-ENG), may require engineering evaluations and tests to demonstrate the equivalence of the substitute appliance or arrangement.

Life-saving appliances carried on board the ship in addition to equipment of the type required under this part must be approved equipment or be acceptable to the cognizant USCG Officer in Charge of Marine Inspection (OCMI) for use on the ship.

Cite: III/6 Communications

Each item of radio communications equipment must be type accepted by the Federal Communications Commission.

Cite: III/7 Personal Life-Saving Appliances

Each child-size lifejacket and immersion suit must be appropriately marked and stowed separately from adult or extended-size devices.

Each lifejacket and immersion suit must be marked with the vessel's name.

Inflatable lifejackets, if carried, must all be of the same or similar design.

Each lifejacket, immersion suit, and anti-exposure suit container must be marked in block capital letters and numbers with the quantity, identity, and size of the equipment stowed inside the

container. The equipment may be identified in words or with the appropriate symbol from IMO Resolution A.760(18).

Cite: III/8 Muster List and Emergency Instructions

Instructions for passengers must include illustrated instructions on the method of donning lifejackets.

Cite: III/11 Survival Craft Muster and Embarkation Arrangements

If a davit-launched survival craft is not intended to be moved to the stowed position with persons on board, the craft must be provided with a means for bringing it against the side of the vessel and holding it alongside the vessel to allow persons to safely disembark after a drill.

Cite: III/13 Stowage of Survival Craft

Each life-raft must be arranged to permit it to drop into the water from the deck on which it is stowed. The liferaft stowage arrangement meets this requirement if it

- (i) is outboard of the rail or bulwark,
- (ii) is on stanchions or on a platform adjacent to the rail or bulwark, or
- (iii) has a gate or other suitable opening large enough to allow the liferaft to be pushed directly overboard and, if the liferaft is intended to be available for use on either side of the vessel, such gate or opening is provided on each side of the vessel.

Cite: III/18 Line-Throwing Appliances

In addition to the equipment approved and carried as part of the appliance, each line throwing appliance must also have an auxiliary line that:

- (1) if other than manila, has a breaking strength of at least 40 kN (9,000 lb);
- (2) if other than manila, is of a dark color or of a type certified to be resistant to deterioration from ultraviolet light; and
- (3) is at least 450 m (1,500 ft) long.

The line throwing appliance and its equipment must be readily accessible for use, stowed in its container carried within the pilothouse or on the navigating bridge or stowed in a portable magazine chest.

Cite: III/33 Survival Craft Embarkation and Launching Arrangements

On a tank vessel certificated to carry cargoes that have a flashpoint less than 60°C (140°F) as determined under ASTM D93-94, each lifeboat or launching appliance of aluminum construction must be protected by a water spray system.

Cite: III/34 & Launching Appliances Using Falls and a Winch
LSA Code
VI 6.1.2

Each unguarded fall must not pass near any operating position of the winch, such as hand cranks, pay out wheels, and brake levers.

Cite: III/34 & Launching Appliances Using Falls and a Winch
LSA Code
VI 6.1.2.9

The lowering speed for a fully loaded survival craft must be not more than 1.3 m per second (256 ft per minute).

Each fall, where exposed to damage or fouling, must have guards or equivalent protection. Each fall that leads along a deck must be covered with a guard which is not more than 300 mm (12 inches) above the deck.

Each winch drum must be arranged so the fall wire winds onto the drum in a level wrap.

D. Radiocommunications

Cite: IV/1.4 Radiocommunications – Application

The required EPIRB must be marked with the vessel's name.

E. Safety of Navigation

Cite: V/22 Navigation Bridge Visibility

In addition to the SOLAS implementation schedule, this regulation applies to all cargo and passenger vessels of 100 m (328 ft) or more in length and contracted for on or after September 7, 1990.

III. ADDITIONAL REQUIREMENTS NOT CONTAINED IN ABS RULES, MARPOL OR SOLAS

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ANNEX VI

Cite: 46 CFR 63.25-9 Incinerators III-16

III. ADDITIONAL REQUIREMENTS NOT CONTAINED IN ABS RULES, MARPOL OR SOLAS

A. Accommodations for Officers and Crew

1. Application

- (a) The provisions of this section, with the exception of paragraph 13, shall apply to all vessels other than tankships of 100 gross tons and over contracted for on or after November 19, 1952. Vessels other than tankships of 100 gross tons and over contracted for prior to November 19, 1952, shall meet the requirements of paragraph 13.
- (b) Vessels other than tankships of less than 100 gross tons shall meet the applicable requirements of this section insofar as is reasonable and practicable.
- (c) The provisions of this section, with the exception of paragraphs 14 and 15, apply to all tankships of 100 gross tons and over constructed on or after June 15, 1987.
- (d) Tankships of less than 100 gross tons and manned tank barges must meet the requirements of paragraph 14.
- (e) Tankships of 100 gross tons and over constructed prior to June 15, 1987, must meet the requirements of paragraph 15.

2. Intent

- (a) It is the intent of this section that the accommodations provided for officers and crew on all vessels shall be securely constructed, properly lighted, heated, drained, ventilated, equipped, located, arranged, and, where practicable, shall be insulated from undue noise and effluvia.
- (b) The crew referred to herein includes all persons, except the licensed officers, regularly employed on board any vessel. Where the requirements for the accommodation of licensed officers are not otherwise specified, they shall be of at least equivalent to that indicated herein for the crew.
- (c) For the purpose of this subpart, the term “crew spaces” shall include sleeping rooms, messrooms, recreational rooms, toilet and shower spaces, etc., which are intended for the exclusive use of the crew.

3. Location of Crew Spaces

- (a) Crew spaces shall be located, where practicable, so that the maximum amount of fresh air and light are obtainable, having due regard to the service of the vessel and the requirements of other space users.

- (b) Crew quarters shall not be located farther forward in a vessel than a vertical plane located at 5% of the vessel's length abaft the forward side of the stem at the designed summer load waterline. However, for vessels in other than ocean or coastwise service, this distance need not exceed 28 ft (8.5m). For the purpose of this paragraph, the length shall be as defined in CFR 42.13-15 of subchapter E (Load Lines). No section of the deck of the crew spaces shall be below the deepest load line, except that in special cases, on vessels other than tankships, such an arrangement may be approved provided that in no case shall the deck head of the crew space be below the deepest load line.
- (c) Hawse pipes or chain pipes shall not pass through crew spaces.
- (d) There shall be no direct communication, except through solid, close fitted doors or hatches between crew spaces and chain lockers, cargo, stowage or machinery spaces.
- (e) There shall be no access, vents, or sounding tubes from fuel or cargo oil tanks opening into crew spaces, except that sounding tubes and access openings may be located in corridors.
- (f) Where practicable, crew spaces shall be located entirely separate and independent of spaces allotted to passengers or licensed officers.

4. Construction

- (a) All crew spaces are to be constructed in a manner suitable to the purpose for which they are intended. The bulkheads separating the crew space from cargo and machinery spaces, lamp and paint rooms, storerooms, drying rooms, washrooms, and toilet spaces shall be made odorproof.
- (b) Toilet spaces, except when provided as private or semiprivate facilities, shall be so built, fitted, and situated, that no odor from them will readily enter other crew spaces.
- (c) Where the shell or unsheathed weather decks form boundaries of crew spaces, suitable protective coverings shall be applied to prevent formation or accumulation of moisture.
- (d) Where crew spaces adjoin or are immediately above spaces such as galleys machinery spaces or casings, donkey boilerrooms, etc., they shall be suitably protected from the heat and noise.
- (e) The interior sides and deckheads of crew spaces shall be covered with enamel, paint, or other material light in color.
- (f) Crew spaces shall be properly drained where considered necessary.
- (g) All washrooms and toilet rooms shall be properly drained and so constructed and arranged that they can be kept in a clean, workable, and sanitary condition. The

scuppers shall be located in the lowest part of the space, due consideration being given to the average trim of the vessel.

5. Sleeping Accommodations

(a) Arrangements

- (1) Separate sleeping accommodations are to be provided for the deck, engine, and steward groups of the crew.
- (2) Each watch of seamen, firemen or similar ratings on duty in watches is to be provided with separate sleeping room or rooms, unless the total space for accommodations makes this impracticable.
- (3) Where practicable, each licensed officer shall be provided with a separate stateroom.

(b) Size

- (1) Sleeping accommodations for the crew shall be divided into rooms, no one of which shall berth more than four persons. Except on passenger ships requiring a large number of personnel in the steward's department, rooms may be arranged to accommodate not more than 10 such persons.
- (2) Each room shall be of such size that there are at least (2.79 m³) 30 ft² of deck area and a volume of at least (6 m³) 210 ft³ for each person accommodated. The clear headroom shall be not less than (1.9 m) 6 ft 3 in. In measuring sleeping quarters allocated to crews of vessels, any equipment contained therein for the use of the occupants is not to be deducted from the total volume or from the deck area.

(c) Equipment

- (1) Each person shall have a separate berth and not more than one berth shall be placed above another. The berths shall have a framework of metal or other hard, smooth material not likely to corrode or harbor vermin, and shall be so arranged that they provide ample room for easy occupancy. The overall size of a berth shall not be less than (762 mm) 30 in wide by (1930 mm) 76 in long, except by special permission of the Commandant, USCG. Where berths adjoin, they shall be divided by a partition not less than 457 mm (18 in) in height. Where two tiers of berths are fitted, the bottom of the lower must not be less than 305 mm (12 in) above the deck, and the bottom of the upper must not be less than 0.76 m (2 ft 6 in) both from the bottom of the lower and from the deck overhead. The berths shall not be obstructed by pipes, ventilating ducts, or other installations.
- (2) A locker of metal or other hard, smooth material shall be provided for each person accommodated in a room. Each locker shall be not less than 1935 cm² (300 in²) in cross section area and 1524 mm (60 in) high. It shall be so placed

as to be readily accessible. The interior of the locker shall be so arranged as to facilitate the proper stowage of clothes.

6. Wash Spaces; Toilet Spaces; and Shower Spaces

- (a) For the purposes of this section
 - (1) Private facility means a toilet, washing, or shower space that is accessible only from one single or double occupancy sleeping space;
 - (2) Semiprivate facility means a toilet, washing, or shower space that is accessible from one or two one-to-four person occupancy sleeping spaces; and
 - (3) Public facility means a toilet, washing, or shower space that is not private or semiprivate.
- (b) Each private facility must have one toilet, one shower, and one washbasin, all of which may be in a single space.
- (c) Each semiprivate facility must have at least one toilet and one shower, which may be in a single space.
- (d) Each room adjoining a semiprivate facility must have a washbasin if a washbasin is not installed in the semiprivate facility.
- (e) Each tankship must have enough public facilities to provide at least one toilet, one shower, and one washbasin for each eight persons without private facilities.
- (f) Urinals may be installed in toilet rooms, but no toilet required in this section may be replaced by a urinal.
- (g) Each public toilet space and washing space must be convenient to the sleeping space that it serves.
- (h) No public facility may open into any sleeping space.
- (i) Each washbasin, shower, and bathtub must have hot and cold running water.
- (j) Adjacent toilets must be separated by a partition that is open at the top and bottom for ventilation and cleaning.
- (k) Public toilet facilities and shower facilities must be separated.
- (l) Each public facility that is a toilet space must have at least one washbasin unless the only access to the toilet space is through a washing space.

- (m) Each washing space and toilet space must be so constructed and arranged that it can be kept in a clean and sanitary condition and the plumbing and mechanical appliances kept in good working order.
- (n) Washbasins may be located in sleeping spaces.

7. Messrooms

- (a) Messrooms shall be located as near to the galley or suitably equipped serving pantry as is practicable, except where messroom is equipped with a steam table. The messrooms shall be of such size as to seat the number of persons normally scheduled to be eating at one time.
- (b) Messrooms shall be properly equipped with tables, seats, and other necessary equipment and shall be so arranged as to permit access to each seat.

8. Hospital Space

- (a) Except as specifically modified by paragraph (f) of this section, each vessel, which in the ordinary course of its trade makes voyages of more than 3 days duration between ports and which carries a crew of 12 or more, shall be provided with a hospital space. This space shall be situated with due regard to the comfort of the sick so that they may receive proper attention in all weathers.
- (b) The hospital shall be suitably separated from other spaces and shall be used for the care of the sick and for no other purpose.
- (c) The entrance shall be of such width and in such a position as to admit a stretcher case readily. Berths shall be of metal and may be in double tier, provided the upper berth is hinged and arranged to be secured clear of the lower berth when not in use. At least one berth shall be so arranged that it can be made accessible from both sides when necessary.
- (d) The hospital shall be fitted with berths in the ratio of one berth to every twelve members of the crew or portion thereof who are not berthed in single occupancy rooms, but the number of berths need not exceed six.
- (e) The hospital shall have a toilet, washbasin, and bath tub or shower conveniently situated. Other necessary suitable equipment of such character as clothes locker, table, seat, etc., shall be provided.
- (f) On vessels in which the crew is berthed in single occupancy rooms a hospital space will not be required: provided that one room shall be designated and fitted for use as a treatment and/or isolation room. Such room shall meet the following standards:
 - (1) The room must be available for immediate medical use.
 - (2) The room must be accessible to stretcher cases.

- (3) The room must have a single berth or examination table so arranged that it can be made accessible from both sides when necessary.
- (4) A washbasin with hot and cold running water must be installed either in or immediately adjacent to the space and other required sanitary facilities must be conveniently located.

9. Other Spaces

- (a) Sufficient facilities, depending upon the number of the crew, shall be provided where the crew may wash their own clothes. There shall be at least one tub or sink fitted with the necessary plumbing, including hot and cold running water.
- (b) Clothes drying facilities or space shall be provided for the needs of the crew.
- (c) Recreation accommodations shall be provided. Where messrooms are used for this purpose, they shall be suitably planned.
- (d) A space or spaces of adequate size shall be available on an open deck to which the crew has access when off duty.

10. Lighting

- (a) All crew spaces shall be adequately lighted.
- (b) Berth lights shall be provided for each member of the crew.

11. Heating

- (a) All crew spaces shall be adequately heated in a manner suitable to the purpose of the space.
- (b) The heating system will be considered satisfactory if it is capable of maintaining a minimum temperature of 70°F (21°C). under normal operating conditions without undue curtailment of the ventilation.
- (c) Radiators and other heating apparatus shall be so placed, and where necessary shielded, as to avoid risk of fire, danger or discomfort to the occupants. Pipes leading to radiators or heating apparatus shall be insulated where those pipes create a hazard to persons occupying the space.

12. Insect Screens

- (a) Except in such areas as are considered to be insect free, provisions shall be made to protect the crew quarters against the admission of insects. This may be accomplished by the fitting of suitable screens to ventilating skylights, air ports, ventilators, and doors to unscreened spaces and the open deck or by other methods. Insect screens are

- not required in air conditioned crew quarters for windows, air ports, and doors that are normally kept closed.
13. For all vessels other than tankships contracted for prior to November 19, 1952.
- (a) Vessels of less than 100 gross tons, contracted for prior to November 19, 1952, shall meet the general intent of paragraph and in addition shall meet the following requirements:
- (1) Existing structure, arrangements, materials, and facilities, previously accepted or approved will be considered satisfactory so long as they are maintained in a suitable condition to the satisfaction of the Surveyor. Minor repairs and alterations may be made to the same standard as the original construction.
- (b) Vessels of 100 gross tons and over, contracted for prior to March 4, 1915, shall meet the requirements of this paragraph.
- (1) Existing structure, arrangements, materials, and facilities, previously approved will be considered satisfactory so long as they are maintained in good condition to the satisfaction of the Surveyor. Minor repairs and alterations may be made to the same standard as the original construction: Provided, that in no case will a greater departure from the standards of paragraphs 2 through 12 be permitted than presently exists.
- (c) Vessels of 100 gross tons and over, contracted for on or after March 4, 1915, but prior to January 1, 1941, shall meet the requirements of this paragraph.
- (1) Existing structure, arrangements, materials, and facilities, previously approved will be considered satisfactory so long as they are maintained in a suitable condition to the satisfaction of the Surveyor. Minor repairs and alterations may be made to the same standard as the original construction.
- (2) Where reasonable and practicable, a minimum of one toilet, shower, and washbasin shall be provided for each 10 members of the crew or fraction thereof.
- (3) Crew spaces shall have a volume of at least 3.4 m³ (120 ft)³ and a deck area of at least 1.1 m³ (16 ft)³ for each person accommodated.
- (4) Each crewmember shall have a separate berth, and berths may not be placed more than two high.
- (5) Each vessel, which in the ordinary course of its trade makes a voyage of more than three days' duration between ports and which carries a crew of 12 or more persons, shall be provided with a suitable hospital space for the exclusive use of the sick or injured. Berths shall be provided in the ratio of one berth for each twelve members of the crew or fraction thereof, but the number of berths need not exceed six.

- (6) The crew spaces shall be securely constructed, properly lighted, heated, drained, ventilated, equipped, located, and arranged, and where practicable, shall be insulated from undue noise and effluvia.
- (d) Vessels of 100 gross tons and over, contracted for on or after January 1, 1941, but prior to November 19, 1952, shall meet the requirements of this paragraph.
 - (1) Existing structure, arrangements, materials, and facilities, previously approved will be considered satisfactory so long as they are maintained in a suitable condition to the satisfaction of the Surveyor. Minor repairs and alterations may be made to the same standard as the original construction.
 - (2) Washrooms and Toilet Rooms:
 - (i) There shall be a minimum of one toilet, shower, and washbasin for each 8 members of the crew or fraction thereof who are not accommodated in rooms having attached private or semiprivate facilities.
 - (ii) Separate facilities shall be provided for the engine room, deck, or stewards department when the number of crew in that department, exclusive of officers, exceeds 8.
 - (iii) Toilet rooms shall be separate from the wash rooms. At least one washbasin shall be installed in each toilet room.
 - (iv) Toilets shall be provided with seats of the open front type. Urinals may be fitted in toilet rooms, if desired, but no reduction will be made in the required number of toilets.
 - (v) Washbasins, showers, and bath tubs if substituted for showers, shall be equipped with proper plumbing including hot and cold running water.
 - (3) Crew spaces shall have a volume of at least 3.4 m³ (120 ft)³ and a deck area of at least 1.1 m³ (16 ft)³ for each person accommodated.
 - (4) Each crewmember shall have a separate berth, and berths may not be placed more than two high.
 - (5) Each vessel, which in the ordinary course of its trade makes a voyage of more than three days duration between ports and which carries a crew of 12 or more persons, shall be provided with a suitable hospital space for the exclusive use of the sick or injured. Berths shall be provided in the ratio of one berth for each 12 members of the crew or fraction thereof, but the number of berths need not exceed six.

- (6) The crew spaces shall be securely constructed, properly lighted, heated, drained, ventilated, equipped, located, and arranged, and where practicable, shall be insulated from undue noise and effluvia.
14. Crew accommodations on tankships of less than 100 gross tons and manned tank barges
- (a) The crew accommodations on all tankships of less than 100 gross tons and all manned tank barges must have sufficient size and equipment, and be adequately constructed to provide for the protection of the crew in a manner practicable for the size, facilities, and service of the tank vessel.
- (b) The crew accommodations must be consistent with the principles underlying the requirements for crew accommodations on tankships of 100 gross tons or more.
15. Crew accommodations on tankships constructed before June 15, 1987

All tankships of 100 gross tons and over constructed before June 15, 1987 may retain previously accepted or approved installations and arrangements so long as they are maintained in good condition to the satisfaction of the Surveyor.

B. Passenger Spaces

1. Ventilation

Passenger spaces are to be provided with adequate ventilation.

C. Navigation Safety Requirements that Apply to All Vessels

This section applies to all self propelled vessels over 1600 gross tons when operating in the navigable waters of the United States, except the St. Lawrence Seaway.

Cite: 33 CFR 164.35(g) Navigational Equipment

1. Application

- (a) The provisions of this section apply to all self propelled vessels over 1600 gross tons when operating in the navigable waters of the United States, except the St. Lawrence Seaway.

2. Maneuvering Information

- (a) Maneuvering characteristics must be posted prominently on a fact sheet in the wheel house. The requirements for posting maneuvering information are found in 33 CFR 164.35. The maneuvering characteristics are to be representative of both normal load, normal ballast conditions, calm weather (wind 10 knots or less), no current, deep water (at least twice the vessel's draft), and clean hull. At the bottom of the fact sheet the following statement shall be provided:

“WARNING”

The response of the (name of vessel) may be different from that listed above if any of the following conditions, upon which the maneuvering information is based, are varied:

- (1) Calm weather – wind 10 knots or less, calm sea;
 - (2) No current;
 - (3) Water depth twice the vessel’s draft or greater;
 - (4) Clean hull; and
 - (5) Intermediate drafts or unusual trim.
- (b) The posted characteristics shall consist of the following maneuvers:
- (1) Turning Circle Diagram to both port and starboard.
 - Time, distance, advance, transfer to alter course 90° with maximum power settings for either full or half speeds, or full and slow speeds.
 - Vessels which have essentially the same turning characteristics to both port, and starboard may substitute a turning circle in one direction only, with a note stating the other direction to be essentially the same.
 - Time and Distance to Stop the vessel from either full and half speeds while maintaining initial heading, and minimum rudder application.
 - Table of Shaft RPM for a representative range of speeds should be provided for a vessel with a fixed pitch propeller.
 - Table of Control Settings for a representative range of speeds for a vessel with a controllable pitch propeller.
 - Table of Effective Speeds for auxiliary maneuvering devices such as bow thrusters. This table should show the range of speeds for which the unit can be used effectively.
 - (c) Navigation and Vessel Inspection Circular (NVIC) 7-89 calls attention to IMO Resolution A.601(15) “Provision and Display of Maneuvering Information Onboard Ships”, adopted 19 November 1987, and MSC/Circ. 389, “Interim Guidelines for Estimating Maneuvering Performance in Ship Design,” adopted 10 January 1985. These provide guidance to the owner and operator concerning maneuvering performance estimation and a standardized format for presentation of ship maneuvering information to operating personnel, including pilots.

**Cite: 33 CFR 164.33(2)(i) & Charts and Publications
33 CFR 164.33(3)(ii)**

1. Application

- (a) The provisions of this section apply to all self propelled vessels over 1600 gross tons when operating in the navigable waters of the United States, except the St. Lawrence Seaway.

2. Requirements

- (a) In addition to the requirements of SOLAS, a vessel must have a current copy of the “U.S. Coast Pilot”, and “Tidal Current Tables”, published by the National Oceanographic Service. Further detail is provided in 33 CFR 164.33.

Cite: 33 CFR 164.41 Electronic Position Fixing Devices

See Federal Register Vol. 59, No. 56, dated March 23, 1994, page 13757 for additional guidance.

1. Application

- (a) The provisions of this section apply to all self propelled vessels over 1600 gross tons and calling at a port in the United States, including Alaska south of Cape Prince of Wales. Each vessel operated, owned, or bareboat chartered by the United States, State, or Political Subdivision, by a foreign nation, and not engaged in commerce is exempt from this requirement. Requirements for electronic position fixing devices are found in 33 CFR 164.41.

2. Devices

- (a) A Type I or Type II Loran C Receiver meeting Part 2 (Minimum Performance Standards of the Radio Technical Commission for Marine Services (RTCM) Paper 12-78/DOD100. Each receiver installed on or after June 1, 1982 must have a label showing the name and address of the manufacturer, including the following statement: “This receiver was designed and manufactured to meet Part 2 (Minimum Performance Standards) of the RTCM MPS for Loran-C Receiving Equipment.”
- (b) A Satellite Navigation Receiver with automatic acquisition of satellite signals, and position updates derived from satellite information.
- (c) A system considered to meet the intent for availability, accuracy, and coverage for the U.S. Confluence Zone (CCZ) contained in U.S. “Federal Radio Navigation Plan” (Report No. DOD-No 4650.4-D or No. DOT-TSC-RSPA-80-16I).

D. Requirements in Addition to MARPOL Annexes

In order to facilitate reference, the applicable CFR cite is given for each entry.

ANNEX I

Cite: 33 CFR 151.27 Shipboard Oil Pollution Emergency Plan

For the issue of a Certificate of Inspection, the Shipboard Oil Pollution Emergency Plans (Reg. 37) outlined in IMO Res. MEPC.86(44) can only be approved by the U.S. Coast Guard (CG-533)

Cite: 33 CFR 155.205 Discharge Removal Equipment for Vessels 400 Feet (122 m) or Greater in Length

Oil carrying tank vessels with a length that is at least 122 m (400 ft) must carry discharge removal equipment for on-deck spills up to 12 bbl. The equipment must include: sorbents, non-sparking hand scoops, containers for the recovered spillage, emulsifiers for deck cleaning, protective clothing, one non-sparking portable pump with hoses, and scupper plugs.

Cite: 33 CFR 155.210 Discharge Removal Equipment for Vessels Less than 400 Feet (122 m) in Length

Oil carrying tank vessels with a length that is less than 122 m (400 ft) must carry discharge removal equipment for on-deck spills up to 7 bbl. The equipment must include: sorbents, non-sparking hand scoops, containers for the recovered spillage, emulsifiers for deck cleaning, protective clothing, one non-sparking portable pump with hoses, and scupper plugs.

Cite: 33 CFR 155.225 Internal Cargo Transfer Capability

Unless the vessel's cargo piping system can transfer cargo among all tanks within the cargo block, the vessel must be equipped with hoses and reducers which can enable the transfer of cargo from any tank to any other tank.

Cite: 33 CFR 155.230 Emergency Towing Capability for Oil Barges

Offshore barges must carry an emergency tow wire or a tow line that is rigged and ready for use, which has the same characteristics as the primary tow wire or tow line.

Cite: 33 CFR 155.310 Containment of Oil and Hazardous Material Cargo Discharge

Under hose connections there must be a fixed container or enclosed deck area with a mechanical means of closing the drain for that containment which has a capacity:

- 1/2 bbl for lines no more than 51 mm (2 in)
- 1 bbl for lines more than 51 mm (2 in) up to 102 mm (4 in)
- 2 bbl for lines no less than 102 mm (4 in) up to 152 mm (6 in)
- 3 bbl for lines no less than 152 mm (6 in) up to 304 mm (12 in)
- 4 bbl for lines 304 mm (12 in) or more

Cite: 33 CFR 155.320 Fuel Oil and Bulk Lubricating Oil Discharge Containment

Under fill connections and vents there must be a fixed container or enclosed deck area with a mechanical means of closing the drain for that containment which has a capacity:

- 1/2 bbl for vessels 300 gross ton or more but less than 1600 gross tons .
- 1 bbl for vessels 1600 gross ton or more

Cite: 33 CFR 155.380 Oily-water Separating Equipment, Bilge Alarm and Bilge Monitor Approval Standards

Oily-water separating equipment and oil content meters for bilge alarms are to be USCG approved equipment.

Cite: 33 CFR 155.450 Placard

Each machinery space must have a sign indicating that the discharge of oil is prohibited.

Cite: 33 CFR 155.780 Emergency Shutdown

Tank vessel must have an emergency means of stopping transfers within a vessel.

Cite: 33 CFR 155.790 Deck Lighting

Tank vessels must have a means of illuminating the deck in transfer operation work areas – 1.0 foot candle measured 0.91 m (3ft) above the deck – and at transfer connections – 5.0 foot candle measured 0.91 m (3ft) above the deck.

Cite: 33 CFR 155.800 Transfer Hoses

Transfer hoses must have burst pressure of at least 600 psi and four times the MAWP, which must be at least 10.3 bar (150 psi). Hose flanges must meet ANSI B16.5 or B16.24. The hoses must be marked with the MAWP, type of service, date of manufacture and the date of the last pressure test. The date of manufacture and the date of the last pressure test may be recorded in lieu of being marked on the hoses.

Cite: 33 CFR 155.1010 Response Plans – Purposes

Applies to tank vessels without regard to size. (Reg. 37 applies to tank vessels greater than 150 gross ton and all vessels greater than 400 gross ton applies to discharges of oil. (Reg. 37 applies to all discharges of oil.) Requires formal agreements for spill notification and cleanup. (Reg.37 requires only shipboard procedures and a shoreside contact.) Requires a geographic specific appendix for U.S. ports. (Reg. 37 requires a worldwide list.)

Cite: 33 CFR 157.03(n) Definition – Oil

Oil is not limited to petroleum and includes animal fats and other “oils.” (MARPOL regulates animal fats and vegetable oils under Annex II.)

Cite: 33 CFR 157.10b Segregated Ballast Tanks, Dedicated Clean Ballast Tanks, and Special Ballast Arrangements for Tank Vessels Transporting Outer Continental Shelf Oil

Tank vessels servicing the OCS are permitted to carry ballast water in cargo tanks. (MARPOL makes no special allowances for these sorts of vessels.)

Cite: 33 CFR 157.10d Double Hulls on Tank Vessels

U.S. dates for required double hull construction are three (3) years earlier than Reg. 19.

There is no minimum tonnage limit for applicability to vessels. (Reg. 19 applies for vessels greater than 5000 dwt.)

Cite: 33 CFR 157.12 Cargo Monitor and Control System

The oil discharge monitoring and control system is to be USCG approved equipment. The ODMC system manual is also required to be approved.

Cite: 33 CFR 157.15 Slop Tanks in Tank Vessels

The oily/water detectors installed on slop tanks are to be USCG approved equipment.

Cite: 33 CFR 157.21 Subdivision and Stability

For US Flag vessels, MARPOL damage stability requirements are applicable to the following vessels:

- (a) New vessels delivered after 31 December 1977
- (b) New vessels contracted after 31 December 1974, and
- (c) New vessels whose keels were laid (or similar stage of construction) after 30 June 1975

“New vessel” (defined in 157.03) applies to vessels as under contract, constructed, or completed between 1975/1976/1979. (Reg. 1.28.4) defines “new” as four (4) years later.)

Interpretation: MARPOL Reg. 18.5

Segregated ballast tanks, dedicated clean ballast tanks and crude oil washing. Vessels less than 150 m in (412 ft) length: The U.S. has not adopted the requirements in Appendix 1 to Annex I which addresses segregated ballast for vessels less than 150 m (412 ft) in length. Determination under this regulation must be made by the Commandant, USCG.

Interpretation: MARPOL Reg. 19.4

Prevention of oil pollution in the event of collision or stranding. Mid-deck tankers: The U.S. has not ratified that the mid-deck design is equivalent to a double hull.

Interpretation: MARPOL Reg. 20

Prevention of oil pollution in the event of collision or stranding. Determinations by the Administration: The Commandant, USCG, makes determinations on behalf of the U.S.

Interpretation: MARPOL Reg. 28.1.3

Subdivision and Stability. Stability for vessels under 100 m (328 ft): The Commandant, USCG, makes determinations concerning the relaxation requirements for vessels less than 100 m if the standards for a vessel 150 m (412 ft) or longer would impair the operational qualities of the ship.

ANNEX II

Navigation and Vessel Inspection Circular No. 03-06 provides “Guidance on implementation of revisions to MARPOL Annex II and the IBC Code,” which is considered to be U.S. Coast Guard policy.

Cite: 33 CFR 151.27 Shipboard Marine Pollution Emergency Plan for NLS

For the issue of a Certificate of Inspection, the Shipboard Marine Pollution Emergency Plans for Noxious Liquid Substances (NLS) (Reg. 16) outlined in IMO Res. MEPC.85(44) can only be approved by the U.S. Coast Guard (CG-533).

ANNEX III (no differences)

ANNEX IV (NOT ADOPTED) COMPARISON OF USCG RULES TO MARPOL

Cite: 33 CFR 159.53 Marine Sanitation Devices (MSDs)

All vessels must be installed with either an operable MSD which controls the discharged fecal coliform bacteria count to 200 per 100 ml (3.38 fl.oz) and the suspended solids to 150 mg/l, which is certified by the Commandant, USCG or with an operable MSD which retains the sewage on board.

ANNEX V

Cite: 33 CFR 151.51 Garbage Pollution – Applicability

The U.S. applies Annex V to U.S. public vessels after January 1, 1994. MARPOL does not generally apply to public vessels.

Cite: 33 CFR 151.55 Garbage Pollution – Record Keeping Requirements

U.S. ships over 12.2 m (40 ft) must keep records of garbage disposal.

Cite: 33 CFR 151.57 Garbage Pollution – Waste Management Plans

U.S. ships over 12.2 m (40 ft) with galleys must have a waste management plan.

Cite: 33 CFR 151.59 Garbage Pollution – Placards

U.S. ships over 7.9 m (26 ft) must have placards describing prohibited waste discharges.

ANNEX VI

U.S. Coast Guard policy with respect to the issue of MARPOL Annex VI certificates required to be carried aboard a vessel is contained in CG-543 Policy Letter 09-01.

Cite: 46 CFR 63.25-9 Incinerators

“Each incinerator installed on or after March 26, 1998 must meet the requirements of IMO Resolution MEPC.76(40) as amended by resolution MEPC.93(45). A Coast Guard Certificate of Approval is required for each incinerator. Incinerators in compliance with the following are considered to meet IMO Resolution MEPC.76(40) as amended by resolution MEPC.93(45):

- ISO 13617; or
- Both ASTM F 1323 and Annexes A1-A3 of IMO Resolution MEPC.76(40)

IV. PASSENGER VESSELS – SOLAS INTERPRETATIONS NOT ADDRESSED BY ABS RULES

(In addition to the Cites below, check all applicable Passenger Vessels Marine Safety Center (MSC) Plan Review Guidelines (PRG's) – Interpretations.

Go to <http://homeport.uscg.mil/mycg/portal/ep/home.do> use link to MSC – References to PRG)

Cite: II-1/13	Openings in Watertight Bulkheads Below the Bulkhead Deck in Passenger Ships	IV-1
Cite: II-1/17	Internal Watertight Integrity of Passenger Ships Above the Bulkhead Deck	IV-1
Cite: II-1/42	Emergency Source of Electrical Power in Passenger Ships	IV-1
Cite: II-2/13	Means of Escape	IV-1
Cite: II-2/20.6	Protection of Special Category Spaces	IV-2
Cite: II-2/20.6 & II-2/20.3.1.3	Protection of Special Category Spaces – Indication of Ventilation Systems	IV-3
Cite: III/22	Personal Life-Saving Appliances	IV-3
Cite: III/22.4.1.2	Personal Life-Saving Appliances – Immersion Suits and Thermal Protective Aids	IV-3

IV. PASSENGER VESSELS – SOLAS INTERPRETATIONS NOT ADDRESSED BY ABS RULES

**Cite: II-1/13 Openings in Watertight Bulkheads Below the Bulkhead Deck
in Passenger Ships**

All watertight doors in subdivision bulkheads shall be numbered conspicuously on both sides on an etched plate or equivalent in not less than 10 mm (3/8 in) letters and figures “W.T.D. 1,” “2,” “3,” etc. If stenciled or similar notice is used, the letters and figures shall be at least 25 mm (1 in) high. If the construction is such that the number cannot be seen with the door in the open position, a similar number shall be placed on the frame or other location immediately adjacent to the door. All watertight door remote control stations shall be marked in the same manner, and in addition, the direction of operation of the lever or wheel to open and close the door shall be conspicuously marked. Doors fitted in accordance with Subdivision and Stability requirements must be additionally marked “RECLOSE AFTER USE.”

**Cite: II-1/17 Internal Watertight Integrity of Passenger Ships Above the Bulkhead
Deck**

Arrangement to ensure the watertight integrity of the structure above the bulkhead deck must adhere to the guidance contained in MSC/Cir.541- Guidance Notes on the integrity of flooding boundaries above the bulkhead deck of passenger ships for proper application of SOLAS Chapter II-1. Coamings of ample height means at least 15.2 cm (5.98 inches.)

Cite: II-1/42 Emergency Source of Electrical Power in Passenger Ships

There must be visible indicators in the machinery space to show when the automatically controlled emergency power source is supplying the emergency loads.

Cite: II-2/13 Means of Escape

Stairways on passenger ships shall comply with the following:

The two means of escape required by Regulation 13, paragraphs 3.2.1 and 3.2.2 shall be as remote as possible to minimize the possibility of one incident blocking both escapes. Vertical ladders and deck scuttles shall not in general be considered as one of the required means of escape. However, where it is demonstrated that the installation of a stairway would be impracticable, a vertical ladder may be used as the second means of escape.

Doors giving access to either of the two required means of escape shall not be lockable, except that crash doors or locking devices, capable of being easily forced in an emergency, may be employed provided that a permanent and conspicuous notice giving instructions on how to open the door or lock is attached to both sides of the door.

Vertical communication shall be provided between weather decks by means of permanent inclined ladders. Where ladders are for the exclusive use of the crew, and do not form part of the escape route, vertical ladders may be employed.

Small rooms or spaces having a secondary means of escape which is not obviously apparent shall have a suitable sign in red letters “EMERGENCY EXIT” directing attention to such escape.

Readily accessible enclosed stairway as referred to in SOLAS II-2/13.3.2.4.1 is defined to mean it must either be in the MVZ or immediately adjacent to the zone such that entrance into the stairway does not require entering into the adjoining zone to gain access to the stairway.

In addition to the requirements of paragraph 3.2.1.2, the requirements of paragraph 7.3.1 apply to corridors which are 6 feet or more in width in all passenger vessels.

Cite: II-2/20.6 Protection of Special Category Spaces

Where a manual sprinkling system is installed for protection of vehicle decks, it shall comply with Regulation II-2/20.6.1.2, IMO Assembly Resolution A.123(V), and the following:

Capacity and Arrangement

The system shall be arranged to effectively distribute water into all spaces to be protected. The application rate shall be at least 3.5 liters/min/m² (0.07 gal/min/ft²) for spaces with a deck height not exceeding 2.5 m (8.2 ft) and a capacity of at least 5 liters/min/m² (0.1 gal/min/ft²) for spaces with a deck height of 2.5 m (8.2 ft) or more.

Controls

Complete, but simple instructions for the operation of the system shall be located in a conspicuous place at or near the controls.

Piping

All piping, valves, and fittings shall meet Part 4, Chapter 6 of the ABS Steel Vessels Rules for pipe material, pipe design, fabrication and testing, and piping general installation requirements as modified by this supplement

All piping, valves, and fittings of ferrous materials shall be protected inside and outside against corrosion unless specifically approved otherwise.

All piping, valves, and fittings shall be securely supported, and where necessary, protected against injury.

Drains, strainers and dirt traps shall be fitted where necessary to prevent the accumulation of dirt or moisture.

Distribution piping shall be used for no other purpose.

Markings

The control cabinets or spaces containing valves or manifolds shall be distinctly marked in conspicuous red letters at least 50 mm (2 in) high – “MANUAL SPRINKLING SYSTEM”.

Cite: II-2/20.6 & II-2/20.3.1.3 Protection of Special Category Spaces – Indication of Ventilation Systems

The alarm required to indicate loss of ventilation in spaces especially suitable for vehicles shall be marked with a conspicuous sign in at least 8 mm (1/4 in) letters “VENTILATION FAILURE IN VEHICULAR SPACE.”

Cite: III/22 Personal Life-Saving Appliances

Immersion suits and thermal protective aids are required to be provided for persons accommodated in totally or partially enclosed lifeboats, unless the vessel operates only on routes between 32 degrees north and 32 degrees south latitude.

Cite: III/22.4.1.2 Personal Life-Saving Appliances – Immersion Suits and Thermal Protective Aids

The warm climate exemption in Regulation 22.4.1.2 applies to ships operating only on routes between 32 degrees north and 32 degrees south latitude.

An immersion suit or anti-exposure suit of suitable size for each person is to be provided for each person assigned to a marine evacuation system crew.

V. IBC CODE SUPPLEMENTAL REQUIREMENTS

U.S. Interpretations and Guidance Related to the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code, 2016 Edition)

While this section of the supplement is based upon the IBC Code, 2016 Edition, Surveyors/Engineers should use the most appropriate version of the Code based on vessel the keel laid date or date of major conversion. In the case of a more recent edition of the Code, where the Code provides for the Administration to decide on a standard, equivalency, relaxation etc. that is not addressed in this section, ABS shall contact the Hazardous Materials Division (CG-ENG-5) at Hazmatstandards@uscg.mil for a determination.

Unless otherwise noted below, ABS is authorized to interpret the expressions “*left to the satisfaction of the Administration,*” or similar expressions in the IBC Code pertaining to the International Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk.

Navigation and Vessel Inspection Circular No. 03-06 provides “Guidance on implementation of revisions to MARPOL Annex II and the IBC Code,” which is considered to be U.S. Coast Guard policy.

Chapter 1 – General

- 1.1.3 USCG will handle matters relating to carriage conditions of cargoes not listed in the IBC Code.
- 1.3.16 The approved closed cup flashpoint test uses the Tagliabue apparatus.
- 1.3.2 USCG acts as the Administration for findings of equivalency.
- 1.5 Under this section, the Administration means the USCG.
- 1.5.4.1 The Certificate of Fitness issued by ABS on behalf of the USCG will not include an asterisk against the ship’s type notation

Chapter 2 – Ship Survival Capability and Location of Cargo Tanks

- 2.2.2 Intact Stability shall also meet the requirements for gas carriers contained in 46 CFR Subchapter S (or equivalent) for gas carriers 46 CFR 172.165, which states:
 - (a) Design calculations must show that 2 inches (50 mm) of positive metacentric height can be maintained by each tankship when it is being loaded and unloaded.
 - (b) For the purpose of demonstrating compliance with the requirements of paragraph (a) of this section, the effects of the addition of water ballast may be considered.

- 2.3.3 The valve shall be to ABS rules.
- 2.8.2 No dispensations for smaller ships will be allowed.
- 2.9.2.3 Residual stability should not be less than that allowed in 2.9.3.

Chapter 3 – Ship Arrangements

- 3.4.4 Smaller dimensions are not permitted unless authorized by the USCG.
- 3.7.2 Toxic cargoes cannot be unloaded bow or stern unless authorized by the USCG.
- 3.7.3 USCG must authorize relaxations.
- 3.7.3.5 Alternative arrangements must be authorized by the USCG.

Chapter 4 – Cargo Containment

- 4.1.3 ABS rules apply for tank testing.
- 4.1.4 ASME Code Section VIII, Division 1 or 2, applies for pressure vessel design.

Chapter 5 – Cargo Transfer

- 5.1.1 Piping classification standards are listed in 46 CFR 56.04 and piping design standards are listed in 46 CFR 56.07.
- 5.1.3 Flanges, valves, and fittings should meet applicable standards of the ASME.
- 5.2.1 Relaxations must be authorized by the USCG.
- 5.2.2 Exceptional cases should be authorized by the USCG.
- 5.2.3 Piping joint selection and limitations are listed in 46 CFR 56.30.
- 5.2.4 Bellows are not permitted.
- 5.2.5 Welding, post weld heat treatment and non-destructive testing standards are listed in 46 CFR 56.70, 56.85, and 56.95, respectively.
- 5.4.1 Relaxations must be authorized by USCG.
- 5.7 Hoses must have either full threaded connections; ANSI B16.2, 16.24, or B16.31 flanges; or Class 1 quick connect couplings that meet ASTM F1122 and marked “C1-1.” The hose should be marked with the date of manufacture and be in good condition (no loose covers, kinks, bulges, soft spots, or gouges/cuts which penetrate the hose reinforcement.) The hose should also be marked with the date of its last inspection,

which should be conducted with the hose in a straight, flat, horizontal position and include a static pressure test at the maximum operating pressure.

Chapter 6 – Materials of Construction

6.1.1 Materials must meet ABS rules 5C-9-6.

6.3 Prohibited materials. When one of the following paragraphs of this section is referenced in Table 1 of 46 CFR part 153, the materials listed in that paragraph may not be used in components that contact the cargo liquid or vapor:

- (a) Aluminum or aluminum alloys
- (b) Copper or copper alloys
- (c) Zinc, galvanized steel or alloys having more than 10 percent zinc by weight
- (d) Magnesium
- (e) Lead
- (f) Silver or silver alloys
- (g) Mercury

Required materials. When one of the following paragraphs of this section is referenced in Table 1 of 46 CFR part 153, only those materials listed in that paragraph may be used in components that contact the cargo liquid or vapor:

- (a) Aluminum, stainless steel, or steel covered with a protective lining or coating
- (b) With cargo concentrations of 98 percent or greater, aluminum or stainless steel
- (c) With cargo concentrations of less than 98 percent, 304L or 316 stainless steel
- (d) Solid austenitic stainless steel
- (e) Stainless steel or steel covered with a suitable protective lining or coating

Chapter 7 – Cargo Temperature Control

7.1.1 Construction, fitting and testing must comply with ABS rules 5C-9-7.

Chapter 8 – Cargo Tank Vent Systems

8.3.4 High velocity vents must be approved in accordance with 46 CFR Subchapter Q.

8.3.5 Flame arresters installed on tanks should meet ASTM F-1273.

Chapter 10 – Electrical Installations

10.1.4 No electric motors may be installed in chemical tanks. Pump motor arrangements must provide for an automatic shutdown if the pump loses suction. A pump motor shutdown must actuate audible and visual alarms and either a lockable circuit breaker or lockable switch that disconnects power to the motor must be provided.

10.1.5 All electrical installations in hazardous locations are to comply with the general requirements of IEC 60092-502: 1999 “Electrical installations in ships –tankers” and

must be supplemented by the interpretations and additional requirements of IEC 60092-502: 1999 issued by the U.S. Coast Guard in April 2009. The mentioned requirements are listed on the Coast Guard's Alternate compliance website as "USCG Supplemental Requirements for use of "IEC 60092-502:1999 for application of SOLAS regulation II-1/45.11 to U.S. flag vessels".

10.1.6 Electric motors are not permitted in the cargo area.

Chapter 11 – Fire Protection and Fire Extinction

11.2.2 Tankers carrying a restricted number of cargoes should not receive relaxations.

11.3.2 All foam concentrates shall be approved for the cargoes authorized to be carried.

11.3.7 Reduced monitor capacities for ships less than 4,000 DWT should be referred to USCG.

Chapter 12 – Mechanical Ventilation in the Cargo Area

12.2 No special requirements.

Chapter 13 – Instrumentation

13.2.3 Exemptions from toxic-vapor detection are only to be authorized by USCG.

Chapter 14 – Personnel Protection

14.1.2 Interpretation of the expression "adequate segregation" is left to the classification society, subject to USCG oversight.

Chapter 15 – Special Requirements

15.2.3 USCG only authorizes carriage of ammonium nitrate (93 percent or less) in tanks which have not contained other cargoes.

15.3.7 Cargo pump well shall extend to within 10 cm of tank bottom (46 CFR 153.520(a)).

15.5 Cooling systems, when fitted, should also be provided with leak detection systems.

15.6.3 USCG only authorizes entry into tanks which have not contained MFAK compounds.

15.7 Only the USCG can authorize carriage of molten phosphorous.

15.8.11 The materials listed are not acceptable under any circumstances.

15.8.22.2 The refrigeration requirements may not be waived.

15.8.25.2 Cargo handling plans are left to the classification society, subject to USCG oversight.

15.8.26.3 Cargo tank filling limits are left to the classification society, subject to USCG oversight.

15.8.29 The water spray shall operate automatically in a fire involving the cargo containment system, have at least two manual actuators, and have an application rate of 10.5 liters per square meter per minute.

15.12.1.4 High velocity vents must be approved in accordance with 46 CFR Subchapter Q.

15.14.3 No waivers will be granted for restricted operations.

15.19.7 ABS is authorized to act on behalf of the Administration.

Chapter 16 – Operational Requirements

16.2.2 USCG will review all cargoes which are mixtures.

16.5.1 Samples must be stored in the cargo area.

Chapter 16A – Additional Measures for the Protection of the Marine Environment

No special interpretations.

Chapter 17 – Summary of Minimum Requirements

For the purpose of material requirements, compliance with the special requirements in 46 CFR Part 153 of Table 1 of part 1 is required.

Chapter 18 – List of Chemicals to Which the Code Does Not Apply

No special interpretations.

Chapter 19 – Index of Products Carried in Bulk

No special requirements.

Chapter 20 – Transportation of Liquid Chemical Wastes

Transportation of liquid chemical wastes, although not generally permitted, require USCG authorization in concert with the US EPA.

VI. IGC CODE SUPPLEMENTAL REQUIREMENTS INCLUDING GUIDANCE RELATED TO 46 CFR SUBCHAPTER O- BULK DANGEROUS CARGOES

U.S. Interpretations and Guidance Related to the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code, 2016 Edition)

While this section of the supplement is based upon the IGC Code, 2016 Edition, Surveyors/Engineers should use the most appropriate version of the Code based on the vessel keel laid date or date of major conversion. In the case of a more recent edition of the Code, where the Code provides for the Administration to decide on a standard, equivalency, relaxation etc. that is not addressed in this section, ABS shall contact the Hazardous Materials Division (CG-ENG-5) at Hazmatstandards@uscg.mil for a determination.

Unless otherwise noted below, ABS is authorized to interpret the expressions “left to the satisfaction of the Administration” or similar terms given in the Code.

Chapter 1 – General

- 1.1.6.1 USCG acts only as a port administration for this requirement.
- 1.1.10 USCG acts only as a port administration for this requirement.
- 1.3 USCG acts as the Administration for this section.
- 1.4 USCG acts as the Administration for this section.

Chapter 2 – Ship Survival Capability and Location of Cargo Tanks

- 2.2.2 In addition to other intact stability requirements, design calculation must show that 50 mm of positive metacentric height can be maintained by each vessel when it is being loaded and unloaded in accordance with 46 CFR 172.165. The design calculations may consider the effects of the addition of water ballast.
- 2.2.3 The method for determining free surface effect is contained in the International Code on Intact Stability, 2008.
- 2.7.1.3 Residual stability should not be less than the requirement in 2.7.2.1.

Chapter 3 – Ship Arrangements

- 3.1.1 Machinery spaces forward of the cargo area are not normally permitted.
- 3.5.3.2. Relaxation of the access dimensions is not permitted (Refer to 46 CFR 154.340).
- 3.8.4.4 Relaxation of this section’s requirements is not permitted.

Chapter 4 – Cargo Containment

- 4.1 Cargo containment systems not previously accepted by the USCG will require USCG review and approval. A list of cargo containment systems currently accepted by the USCG may be obtained from Commandant (CG-ENG-5).
- 4.3.5 Corrosion allowances will be required for tanks that are not surrounded by inert gas or dry air or for corrosive cargoes. USCG will provide the values for these allowances upon request.
- 4.5 & 4.26.1.4 Semi-membrane tanks may have a partial secondary barrier approved by the Coast Guard. (Refer 46 CFR 154.459)
- 4.6.2.4 Either a pressure/vacuum test or a visual test shall be specified.
- 4.13.2.3 Higher vapor pressures in port are not allowed.
- 4.14.1.3 Calculations must show that a cargo tank and its fixtures are designed for transient or stationary thermal loads if the design temperature is colder than -55 deg C (-67 deg F) or causes thermal stresses in the cargo tank supports according to 46 CFR 154.406.
- 4.14.1.5 No special consideration shall be given for restricted service.
- 4.18.1.3.2 Special consideration of improved tensile and yield properties must be demonstrated to the USCG.
- 4.18.2.5 Simplified loading spectra shall not be used.
- 4.19.1.1.3 For vessels that intend to trade in Alaska, lower ambient temperatures are required, as given in 46 CFR 154.176.
- 4.19.1.2 Recognized standards are ABS Rules, but vessels trading to the U.S. should have crack arresting steels specified by USCG.
- 4.19.1.6.3 In general, hull heating systems are not accepted by the USCG.
- 4.20.1.2 Alternative edge penetrations are generally not permitted.
- 4.20.1.2.2 The ASME Code is the acceptable standard; other standards require USCG approval.
- 4.20.3.4 Tanks constructed to the ASME Code do not need stress level confirmation.
- 4.21.1.1 Recognized standards are ABS Rules.
- 4.21.2.2 ABS Rules will be used for recognized standards.

- 4.21.3.1 Acceptable stresses are those which agree with ABS Rules.
- 4.21.3.2 ABS Rules will be used for recognized standards.
- 4.22.3.1.1 The value of A shall be 4.0 for all materials.
- 4.22.3.1.2 Any amendments to the allowable stresses must be approved by USCG.
- 4.22.4.3 Model tests will normally be required.
- 4.23 ASME Boiler and Pressure Vessel Code will be used as the acceptable standard, except as required otherwise.
- 4.23.1.3 Type C tanks may only be allocated to Type B.
- 4.23.6.5 Higher stresses are not acceptable.
- 4.24.4.2/ 4.24.5.3 ABS SafeHull shall be used for structural analysis, and ABS Rules will be used for recognized standards.
- 4.25.2 Integral tanks must meet ABS Rules.
- 4.25.3.2 ABS Rules are recognized standards.
- 4.28.1.3 Equivalent calculation procedures must be submitted to USCG.

Chapter 5 – Process Pressure Vessels and Liquids, Vapor, and Pressure Piping Systems

- 5.1.2 Process pressure vessels shall meet the ASME Code.
- 5.8.2.3 Screwed couplings are also to comply with 46 CFR 56.30 – 20, as applicable.
- 5.8.3.2 Flanges must comply with ASME B16.5.
- 5.8.5 Alternative piping arrangements require USCG approval.
- 5.9.2 Thermal stress relieving may not be waived.
- 5.9.3.2 Radiography may not be reduced.
- 5.11.2.2 Piping standards shall be as required by 46 CFR Chapter I, Subchapter F.
- 5.11.5 Stress analysis is delegated to ABS subject to oversight by USCG.
- 5.11.6.1 No lower design pressure may be accepted.
- 5.11.6.2 Flanges must comply with ASME B16.5.

- 5.13.1 No higher or lower temperature may be specified.
- 5.13.2.2 Suitable fluids include water or liquids that have a flashpoint greater than 125°F.

Chapter 6 – Materials of Construction and quality control

- 6 USCG should be contacted concerning workmanship. In general, tolerances should be half of the ASME Code.
- 6.2.2 Recognized standards are ABS Rules.
- 6.3.2 Material properties must meet ABS Rules.
 - 6.3.2.1 A Charpy V-Notch test is required.
- 6.5.1 Testing may not be omitted.
- 6.5.2 Welding consumables shall meet ABS Rules for type A tanks. ABS approval of welding consumables may be applied for type B tanks. However, for type B tanks, welding consumables may be stipulated by the USCG as part of the USCG concept review for type B tanks. ASME Code requirements will be applied for type C tank welding consumables. Welding tests may not be waived.
 - 6.5.3.3 Radiography is required.
 - 6.5.3.4.3 Transverse bend tests are at the discretion of ABS.
 - 6.5.3.4.5 Requirements for these tests are left to the discretion of ABS.
 - 6.5.3.5.3 Recognized standards for this section will be individually reviewed.
 - 6.5.4 Test requirements should be in accordance with 6.5.3.
 - 6.5.5.1 A reduction in number of tests for secondary barrier is not acceptable. Production tests for contiguous hull structure are required to meet 46 CFR 154.182.
 - 6.5.5.5 Integral and membrane tests must be inspected according to USCG approved standards from the manufacturer.
 - 6.5.6.1 ABS Rules shall be the recognized standards, except that for membrane tanks, the USCG accepted manufacturer's procedures shall be used.
 - 6.5.6.4 Tank examination will be as approved by USCG for the tank designed.
- 6.6.2.1 ASME Code is the standard acceptable.
- 6.6.2.2 Soaking should be according to the ASME Code.

6.6.2.3 Stress relief shall comply with the ASME Code.

6.6.2.3.14 Mechanical stress relief methods must be approved beforehand by USCG.

Chapter 7 – Cargo Pressure/Temperature Control

7.1 Refrigeration systems shall meet 46 CFR 154.702. Stand-by unit is required. Unless refrigeration system is installed, cargoes with a vapor pressure exceeding the MARVS at 46°C are not authorized in US Waters

7.2 Design of cargo pressure and temperature control must contain cargo for 21 days, and cargo venting cannot be used to control tank pressure while in U.S. ports. Special design ambient temperatures apply for Alaskan waters, as given in 46 CFR 154.176.

Chapter 8 – Vent Systems for Cargo Containment

8.2.2 Pressure/vacuum relief is delegated to ABS, subject to USCG oversight.

8.2.8 Changing of relief valve settings will be overseen by an agent of ABS.

8.2.11.1 No relaxation of this requirement is accepted for ships less than 90 m.

8.4.1.2 Approval for F=0.5 is delegated to the ABS, subject to USCG oversight.

Chapter 9 – Cargo Containment System Atmosphere Control

No special requirements.

Chapter 10 – Electrical Installations

All electrical installations in hazardous locations are to comply with the general requirements of IEC 60092-502: 1999 “Electrical installations in ships –tankers” and must be supplemented by the interpretations and additional requirements of IEC 60092-502: 1999 issued by the U.S. Coast Guard in April 2009. The mentioned requirements are listed on the Coast Guard’s Alternate compliance website as “USCG Supplemental Requirements for use of “IEC 60092-502:1999 for application of SOLAS regulation II-1/45.11 to U.S. flag vessels”.

Chapter 11 – Fire Protection and Extinction

11.4.5 The coverage area maintained by hand hose lines for portions of the main deck which are inaccessible to personnel must not exceed one-half of the projected hose at its rated discharge or 10 m (32.8 ft), whichever is lesser.

Chapter 12 – Artificial Ventilation in the Cargo Area

No special requirements.

Chapter 13 – Instrumentation and Automation Systems

- 13.1.3 Testing intervals are delegated to ABS, subject to USCG oversight. Vessels in U.S. ports should be able to demonstrate that the instruments function, and in the case of gas detection, that they are properly calibrated.
- 13.3.3 Sensors required for automatic closing of the shut-off valve for overflow controls as specified by 13.2.1, must be independent of each other, however, the sensors may send signals to the same actuator. USCG should be contacted as needed.
- 13.6.19 Portable gas detectors should meet the thresholds specified by OSHA.
- 13.7.2.1 Temperature sensors should be at the bottom of the tank and near the top of the tank, below the maximum filling level.
- 13.9.1 This requirement is delegated to ABS, subject to USCG oversight.

Chapter 14 – Personnel Protection

No special requirements.

Chapter 15 – Filling Limits for Cargo Tanks

- 15.1.4 USCG will act as the Administration.

Chapter 16 – Use of Cargo as Fuel

- 16.6.1.2 This requirement is delegated to ABS, subject to USCG oversight.
- 16.6.2 This requirement is delegated to ABS, subject to USCG oversight.
- 16.9.1 Other cargo gases used as fuel must be accepted by the USCG.

Chapter 17 – Special Requirements

- 17.1 Carbon Dioxide is not permitted to be carried as cargo in U.S. Waters.
- 17.5.5 This requirement is delegated to ABS, subject to USCG oversight.
- 17.13 Chlorine may not be carried in U.S. waters.
- 17.16 Methyl acetylene propadiene mixtures (MAPP gas) shall be carried only in one of the two compositions specified in the applicable Gas Code.
- 17.16.3 Other compositions require USCG approval.
- 17.17 Nitrogen cargo carriage requires special USCG approval.

17.18 Propylene oxide may be authorized for carriage subject to the following special restrictions:

- (1) Classification society certification that the required cargo piping separation has been achieved must be on board the vessel and available to Coast Guard boarding personnel.

The following requirements apply to the carriage of ethylene oxide/propylene oxide mixtures (containing a maximum of 30% ethylene oxide):

- (1) When this cargo is carried without refrigeration the cargo tank relief valve setting shall not be less than 120 kPa gauge (17 psig).

17.18.8 Per 46 CFR 154.1725, steel, stainless steel, except types 416 and 442, or other material specially approved by the USCG are acceptable.

17.18.24 The approval of handling plans is delegated to ABS.

17.19 Operational requirements for the carriage of Vinyl Chloride:

Fixed or portable instruments shall be used to continuously monitor for vinyl chloride vapor leaks during vinyl chloride transfer operations. The method of monitoring and measurement shall have an accuracy (with a confidence level of 95 percent) of not less than $\pm 50\%$ from 0.25 through 0.5 ppm, $\pm 35\%$ from over 0.5 ppm through 1.0 ppm, and $\pm 25\%$ over 1.0 ppm;

Cargo transfer operation is discontinued or corrective action is initiated by the person in charge to minimize exposure to personnel whenever a vinyl chloride vapor concentration in excess of 1 ppm is detected. If the vinyl chloride vapor concentration exceeds 5 ppm for over 15 minutes, action to reduce the leak can be continued only if the respiratory protection requirements of 29 CFR 1910.1017 are met by all personnel in the area of the leak;

Those portions of cargo lines which will be open to the atmosphere after piping is disconnected are free of vinyl chloride liquid and the vinyl chloride vapor concentration in the area of the cargo piping disconnect points is not greater than 5 ppm;

Any restricted gauge fitted on a tank containing vinyl chloride is locked or sealed so that it cannot be used and a restricted gauge is not used as a check on the required closed gauge, nor as a means of sampling;

The words "CANCER-SUSPECT AGENT" are added to the warning signs required by 46 CFR 154.1830, and signs bearing the legend: "CANCER-SUSPECT AGENT IN THIS AREA, PROTECTIVE EQUIPMENT REQUIRED, AUTHORIZED PERSONNEL ONLY" are posted whenever hazardous operations, such as tank cleaning, are in progress;

A vessel undergoing cargo transfer operations be designated a “regulated area” having access limited to authorized persons and requiring a daily roster of authorized persons who may board, and;

Employees engaged in hazardous operations, such as tank cleaning, be required to wear and use respiratory protection in accordance with the provisions of 29 CFR 1910.1017 and protective garments, provided clean and dry for each use, to prevent skin contact with liquid vinyl chloride.

Chapter 18 – Operating Requirements

18.2.1 ABS acts as the Administration for the purpose of approving cargo operation manuals.

Chapter 19 – Summary of Minimum Requirements

No special requirements.

Appendix 4 – Non-Metallic Material

4.2.1.4 In the absence of standards, the test procedure proposed should be submitted to USCG for acceptance.

4.2.2.2 Testing should be performed to the satisfaction of the USCG for material properties not covered by the recognized standard.

Guidance related to 46 CFR Subchapter O – Bulk Dangerous Cargoes

Ships carrying liquefied gases

1. Allowable stress levels for independent tank types B and C

The stress factors for use in designing independent Type B tanks are shown in Table 2. Stress factors A and B also apply when designing Type C tanks. Certification of this item should be indicated in the Certificate of Fitness. (For a vessel to be accepted as Type II PG, the minimum design MARVS of 686 kPa (7kp/cm²) must be based on these stress factors).

Stress Factors	Nickel Steel and Carbon Manganese Steel Values	Austenitic Steel Values	Aluminum Alloy Values
A	4.0	4.0	4.0
B	2.0	1.6	1.5
C	3.0	3.0	3.0
D	1.5	1.5	1.5

Table 2: Values of Stress Factors

2. Crack arresting steels

The following grades of steel, or their equivalents, must be used along the length of the cargo area in the following locations as required by Section 46 CFR 154.70:

- Deck stringer: Grade E
- Sheer strake: Grade E
- Turn of the bilge: Grade D or E

Certification of this item may be made in the Certificate of Fitness or on a separate certificate issued by the classification society or administration.

3. Design ambient temperatures

Lower ambient temperatures for calculation of hull steel (see 446 CFR 154.174, 154.176, 154.466):

For continental U.S. and Hawaii:

- Air (at 5 knots): 18 degrees C (0 degrees F)
- Seawater: 0 degrees C (32 degrees F)

For Alaska:

- Air (at 5 knots): 29 degrees C (-20 degrees F)
- Seawater: 2 degrees C (28 degrees F)

Certification of this item should be indicated on the Certificate of Fitness. (For gas ships with independent tanks Type C, it is sufficient to use the design ambient temperatures from the IMO Gas Carrier Code and International Gas Carrier Code).

4. Cargo pressure/Temperature control

Except for the carriage of methane, the cargo containment system must be designed to maintain the cargo indefinitely without venting to the atmosphere at the upper design ambient temperature of 45 degrees C for air and 32 degrees C for seawater. For methane, the cargo containment system must be designed to maintain the cargo without venting to the atmosphere for a minimum period of 21 days while a vessel is in port and under ambient conditions of 45 degrees C for air and 32 degrees C for seawater. Certification of this item may be handled in the same manner as for item 2.

**VII. REQUIREMENTS FOR OCEANOGRAPHIC RESEARCH VESSELS
CERTIFICATED UNDER SUBCHAPTER U**

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**VII. REQUIREMENTS FOR OCEANOGRAPHIC RESEARCH VESSELS
CERTIFICATED UNDER SUBCHAPTER U**

Cite: B-1 Subdivision and Stability

- 1) Each oceanographic research vessel must meet the subdivision and damage stability requirements of 46 CFR Part 173, Subpart D (www.access.gpo.gov/nara/cfr/waisidx_08/46cfr173_08.html) and SOLAS Chapter II-1 cargo ship requirements.
- 2) In lieu of the requirement of paragraph 1), an oceanographic research vessel may comply with SOLAS chapter II-1 passenger ship requirements.

Cite: B-2 Lifesaving Appliances and Arrangements

- 1) Lifesaving appliances and arrangements on oceanographic research vessels are to meet the SOLAS/ACP Supplement requirements for passenger vessels as follows:
 - A. Vessels that carry more than 50 special personnel.
 - B. Vessels that carry not more than 50 special personnel that meet the structural fire protection regulations for passenger vessels of same size.
- 2) Lifesaving appliances and arrangements on oceanographic research vessels that carry not more than 50 special personnel that do not meet the structural fire protection regulations for passenger vessels of same size are to meet the SOLAS/ACP requirements for cargo vessels.

Cite: B-3 Means of Escape

There shall be two means of escape from all general areas where scientific personnel may be quartered or normally employed and from each public space with a deck area greater than 300 ft². At least one of these two means of escape shall be independent of watertight doors and hatches, except for quick acting watertight doors giving final access to weather decks.

Cite: B-4 Structural Fire Protection

Oceanographic research vessels that carry more than 150 persons must meet the structural fire protection requirements in SOLAS/ACP Supplement for Passenger vessels as applicable to passenger ships carrying more than 36 passengers.

Cite: B-5 Structural Fire Protection – General Laboratory Areas and Chemical Storerooms

- 1) Laboratories and chemical storerooms shall be considered as “service spaces” for the application of SOLAS chapter II-2.
- 2) Boundary bulkheads shall be of “A” class construction; however, if constructed in other than steel, shall be wholly lined with metal. Refer to 190.05-10 for similarity.
- 3) Divisional bulkheads that are permanently installed between laboratory spaces within a general laboratory may be of “B” or “C” class construction.

- 4) Divisional bulkheads temporarily installed between laboratory spaces within a general laboratory area may be constructed of combustible materials when they are necessary to facilitate a specific scientific mission.
- 5) Boundary bulkheads and decks separating general laboratory areas of 152 m² (500 ft²) or less from accommodations and control stations shall be of “A-15” class construction.
- 6) Boundary bulkheads and decks separating general laboratory areas of over 152 m² (500 ft²) from accommodations and control stations shall be of “A-30” class construction.
- 7) Furnishings and equipment which are permanently installed in laboratories, such as desks, file and storage cabinets, waste paper baskets, work benches, chair frames, etc. are to be constructed of noncombustible materials, in so far as reasonable and practicable. Working surfaces where chemical stores are used shall be of noncombustible material.
- 8) Furnishings and equipment temporarily installed to facilitate a specific scientific mission or used for working surfaces other than chemical stores may be of combustible materials.
- 9) Equipment installed in chemical storerooms, such as shelves and cabinets shall be constructed of noncombustible materials.
- 10) If the vessel is certificated to carry more than 150 persons, laboratories and chemical storerooms must be considered as type (14) spaces, and the boundary bulkheads must meet the requirements of SOLAS regulation II-2/9.2.2.3 in lieu of the requirements of items 1) through 6) of this cite.
- 11) Shelving must be constructed so as to provide a clear space of at least 102 mm (4 in) between the bottom shelf and the deck.

Cite: B-6 Structural Fire Protection- Integral Magazines

Bulkheads and decks of integral magazines that are common with storerooms or workshops shall be of “A-15” construction. Flush constructions shall be used where practicable.

Cite: B-7 Segregation of Chemical Laboratories and Chemical Storerooms

- 1) Chemical storerooms shall not be located in horizontal proximity to nor below accommodation or safety areas.
- 2) Chemical storerooms shall not be located adjacent to the collision bulkhead, nor boundary divisions of the boiler room, engine room, galley or other high fire hazard area.
- 3) Chemical laboratories shall not be located adjacent to nor immediately below safety areas. Whenever possible, they shall be similarly separated from accommodation spaces and high fire hazard areas such as the galley.
- 4) Access doors shall be labeled “Scientific Laboratory,” “Chemical Laboratory” or “Chemical Storeroom” in Red or White 3 inch Block type letters.

Cite: B-8 Construction and Location of Integral Magazines

- 1) Integral magazines shall be of permanent watertight construction located below the freeboard deck and where practicable below the waterline.
- 2) Magazines shall not be located in horizontal proximity to or below accommodation spaces.
- 3) Magazines shall not be located adjacent to the collision bulkhead, nor in bearing with the bulkhead forming the boiler room, engine room, galley, or other high fire hazard area boundary. If necessary to construct the magazine in proximity of these areas, a cofferdam

space of at least 0.61 m (2 ft) shall be provided between the bulkhead or deck involved and the magazine. Such a cofferdam shall be provided with suitable ventilation and shall not be used for storage purposes.

- 4) Access doors to magazines shall be of watertight construction, provided with means of locking and shall be labeled “Magazine” “Keep Open Lights and Fire Away” “Keep Door Closed” “Remove Matches and Lighters Prior to Entering” in Red or White 3 inch Block type letters.
- 5) Racks, stanchions, battens, and other devices must be installed in the magazine to provide rigid and safe stowage of explosives.

Cite: B-10 Deck Covering for Chemical Storerooms and Laboratories

In chemical storerooms and in laboratories where chemicals will be commonly used, the deck shall be of nonskid material suitably resistant to chemical spills with provisions to contain and remove chemical spills.

Cite: B-11 Deck/Shell Covering for Integral Magazines

- 1) Decks shall be covered with a permanent non-slip, non-spark covering.
- 2) Noncombustible thermal insulation shall be installed on shell and unsheathed weather decks that form boundaries of magazine spaces to prevent condensation of moisture.
- 3) Tank tops that form the magazine deck shall be insulated with an approved deck covering to prevent condensation of moisture. Tank top manholes shall not be installed in magazines.

Cite: B-12 Ventilation Systems for Chemical Storerooms and Chemical Laboratories

- 1) Exhaust type power ventilation system shall be installed which has a capacity sufficient to effect a complete change of air in not more than 4 minutes based on volume of compartment.
- 2) Power ventilation units shall have non-sparking impellers and shall not produce a source of vapor ignition in either the compartment or the ventilation system associated with the compartment.
- 3) System shall be independent of any other ventilation system, serve no other space in vessel and be of watertight construction.
- 4) Controls for the power ventilation shall be conveniently located and marked to clearly identify the purpose of control.
- 5) Ventilation exhaust outlets shall terminate more than 1.8 m (6 ft) from any opening to the interior part of the vessel and from any possible source of vapor ignition.
- 6) Chemical storerooms shall comply with the following additional requirements:
 - a. Vent inlets to exhaust ducts shall be provided and located at points where concentration of vapors may be expected.
 - b. Terminals of vents shall be fitted with flame screens.
 - c. Provisions shall be made so that the storeroom is ventilated prior to entry including an indicator outside the space to show that ventilation is being provided and, in addition, the storeroom shall be marked “Danger-Ventilate Before Entering”

- 7) Chemical laboratories shall comply with the following additional requirements:
 - a. Ventilation system must serve the entire laboratory so that same may be used in event of spills or other emergencies.
 - b. Power ventilation system shall be interlocked with any other ventilation or air conditioning system serving the laboratory to prevent circulation of vapors to other spaces.
 - c. Ventilation of air conditioning systems shall be designed so that air cannot be re-circulated into an accommodation space.
 - d. Suitably installed fume hood equipped with independent power exhaust ventilator shall be provided for any operations, reactions or experiments which produce toxic, noxious or corrosive vapors. Fume hood vent shall be compatible with laboratory ventilation to prevent fumes from backing-up within the fume hood system and shall terminate so as to prevent fumes from entering other portions of vessel. Terminals of vents shall be fitted with flame screens.

Cite: B-13 Ventilation Requirements for Integral Magazines

- 1) Natural or mechanical ventilation shall be provided with sufficient capacity to maintain the magazine temperature below 37.8° C (100° F) with 31.1° C (88° F) weather air. Mechanical cooling may be used where ventilation requirements exceed 1,500 cubic feet per minute.
- 2) Vent systems shall be of watertight construction, serve no other space and be provided with metal watertight closures for use when system is not in use.
- 3) Weather cowls shall be provided with a double layer of wire screen not less than 1/8" mesh.
- 4) To prevent pressure build up, a 2 inch IPS bypass with check valve shall be provided in parallel with at least one of the vent closures.

Cite: B-14 Piping and Electrical Requirements for Chemical Storerooms

- 1) Piping systems or similar arrangements are not permitted for the transfer of chemical stores between a storeroom and the area in which chemical stores are used.
- 2) Piping, electrical equipment and wiring shall not be installed within or pass through the storeroom except as required for storeroom itself.
- 3) Electrical installations must comply with requirements for hazardous areas – Class I, Division 1, Group C.

Cite: B-15 Electrical Requirements for Chemical Laboratory

Electrical installations located within 457 mm (18 in) of the deck of the laboratory must comply with the requirements for hazardous areas-Class I, Division 2.

Cite: B-16 Electrical Requirements for Integral Magazines

- 1) Light fixtures shall be of an approved type fitted with globes and guards.
- 2) Controls of the lighting system shall be from a location outside the magazine with an indicator light provided at the switch location to show when lighting circuits are energized.

- 3) Other electrical equipment and wiring must not be installed within or pass through the magazine.
- 4) Electrical cables enclosed in a watertight trunk are permitted.

Cite: B-17 Flushing System for Chemical Storerooms and Laboratories

- 1) Provisions shall be made for flushing away chemical spills.
- 2) Working spaces in which chemical stores are used shall be equipped with fresh water supply shower.
- 3) If a drainage system is installed, it shall be separate from any other drainage system.

Cite: B-18 Piping Systems for Integral Magazines

The only piping allowed, other than piping required for magazine itself, within or passing through magazine is as follows:

- 1) Fresh and salt water service piping and drainage system may be routed through magazines.
- 2) Other piping systems enclosed in watertight trunk.

Cite: B-19 Fire Extinguishing System for Magazines

Sprinkler system shall be installed in each magazine or magazine group.

- 1) System shall be manual control, hydraulic control or automatic and shall be remotely operable from a control station on the freeboard deck and manually operable at the control valve location. Control Valve shall be in general accordance with Spec. MIL-V-17501.
- 2) Automatic type systems shall have sprinkler head of the open head design to permit either manual or automatic operation.
- 3) System designs shall be based on minimum total system capacity of 0.8 gallons per minute per square foot of overhead area.
- 4) Vessel fire pump may be used if sprinkling system shall not interfere with simultaneous use of fire main.
- 5) Control locations for sprinkler system shall be labeled "MAGAZINE SPRINKLER CONTROL"

Cite: B-20 Firemain

Sufficient number of hose streams must be immediately available from the firemain at all times by either of the following methods:

- 1) Maintain water pressure on firemain by continuous operation of:
 - a. One fire pump, or
 - b. A suitable pump capable of supplying one hose stream at pitot tube pressure of not less than 3.45 bar (50 psi), or
 - c. Pressure tank capable of supplying one hose stream at pitot tube pressure of not less than 3.45 bar (50 psi) for five minutes.

- d. An audible alarm must be installed in continuously manned space to sound if pressure of firemain drops to less than necessary to maintain minimum pitot tube pressure.
- 2) Remote activation and control of one fire pump
 - a. If fire pump is in continuously manned space, remote controls for pump and all necessary valves must be located at manned operating platform.
 - b. If fire pump is in an unmanned machinery space, remote controls for pump and all necessary valves must be located in:
 1. Fire control station, if any
 2. Navigation bridge, or
 3. Readily accessible space acceptable to OCMI.

Cite: B-21 Fire Hydrants and Hose

If nozzles are provided that accept low velocity water spray applicators, a low-velocity water spray applicator must be installed in way of at least one length of fire hose on each fire hydrant outside and in the immediate vicinity of each laboratory.

Cite: B-22 Fixed Fire Suppression System

A USCG Type Approved Fixed Fire Suppression System (carbon dioxide or clean agent) shall be installed in all chemical storage areas. The system shall be capable of automatic activation.

Cite: B-23 Portable Fire Extinguishers

One dry chemical and one carbon dioxide C-II Type portable fire extinguisher must be installed in each chemistry laboratory, scientific laboratory and chemical storeroom for each 27.9 m² (300 ft²) or fraction thereof, as well as one of each kind located in vicinity of the exit of same.

Cite: B-24 Hazardous Materials and Explosives

Oceanographic research vessels shall comply with detailed requirements of 46 CFR Part 194 for stowage, labeling, handling, use, and control of explosives and other hazardous materials.
http://www.access.gpo.gov/nara/cfr/waisidx_08/46cfr194_08.html

Cite: B-25 Explosive Handling Plan

- a) It shall be the responsibility of the master to have prepared, signed, and prominently posted in conspicuous locations, operating procedures, plans, and safety precautions for all operations involving the use of explosives.
- b) The operating procedures referred to in paragraph (a) of this section shall include and set forth the special duties and stations of appropriate qualified persons for various operations involving the use of explosives. Assignment of such persons shall be commensurate with their experience and training.
- c) A copy of the operating procedures, plans and safety precautions required by paragraph (a) of this section and all subsequent changes or revisions shall be forwarded to the Officer in Charge, Marine Inspection, issuing the certificate of inspection for review.

Cite: B-26 Magazine Vans and Magazine Chests

- 1) Magazine vans and magazine chests carried on oceanographic research vessels shall meet the arrangement, construction, stowage, labeling, ventilation and fire protection system-sprinkler system requirements of 46 CFR Subpart 194.10
http://www.access.gpo.gov/nara/cfr/waisidx_08/46cfr194_08.html
- 2) Magazine vans are subject to normal plan submission procedures and initial construction inspection.

Cite: B-27 Portable Vans and Tanks

- 1) Portable vans and tanks, including temporary structures, which may be carried on oceanographic research vessels shall meet the design, construction, stowage and labeling requirements of 46 CFR Subpart 195.11:
http://www.access.gpo.gov/nara/cfr/waisidx_08/46cfr195_08.html
- 2) Accommodation, power and chemical stores vans are subject to normal plan submission procedures and initial and periodic inspection.

Cite: B-28 Weight Handling Gear

- 1) Weight handling gear installed on an oceanographic research vessel, with the exception of gear for lifesaving equipment, shall be certified in accordance with the ABS "Guide for the Certification of Lifting Appliances" as appropriate for the type of weight handling gear provided.
- 2) As an alternative, evidence of approval by the International Cargo Gear Bureau may be submitted.

Cite: B-29 Fire Axes

Each vessel must carry at least the number of fire axes as shown in the table below and these must be distributed throughout the spaces available to persons on board to be readily available in case of emergency.

Regulatory gross tons		Number of axes
Over	Not over	
	50	1
50	200	2
200	500	4
500	1,000	6
1,000		8

VIII GUIDANCE AND REFERENCES

USPHS (Application of PHS Publication No. 393)

Reference 1 (Note: For information only; USCG and Class have no requirements or involvement; see below how PHS 393 applies to U.S. Flag.)

- A. The ship must meet the definition of “vessel” in Section 1250.3(m) of Title 21 of the Code of Federal Regulations (21 CFR 1250.3(m)):

Any passenger-carrying, cargo, or towing vessel exclusive of:

- (1) fishing boats including those used for shell-fishing
- (2) tugs which operate only locally in specific harbors and adjacent waters
- (3) barges without means of self-propulsion
- (4) construction-equipment boats and dredges, and
- (5) sand and gravel dredging and handling boats”

The “PHS-393” USPHS/FDA Handbook on Sanitation of Vessel Construction applies to U.S. flagged conveyances that meet the “vessel” definition and operate in “interstate traffic” as defined in 21 CFR 1250.3(h) in B. below. Inspection and vessel blueprint review is done at the discretion of the FDA district office where the shipyard is located or the headquarters office of the vessel owner/operator is located depending on available resources.

Location of the appropriate FDA district office may be found at the following web address: http://www.fda.gov/ora/inspect_ref/iom/iomoradir.html#orafield.

- B. In order to fall under FDA jurisdiction the ship must operate in “interstate traffic” as defined in 21 CFR 1250.3(h): “ The movement of any conveyance or the transportation of persons or property, including any portion of such movement or transportation which is entirely within a state or possession (i) from a point of origin in any state or possession to a point of destination in any other state or possession, or (ii) between a point of origin and a point of destination in the same state or possession but through any other state, possession or contiguous foreign country.” There are certain exclusions that apply to this definition.

- C. USPHS Handbook on Sanitation apply to U.S. flagged vessels that meet the “vessel” and “interstate traffic” requirements and the following kind of documents are to be submitted to the appropriate FDA office:

Blueprints, sketches, and specifications of the following areas are usually needed:

- (1) General Plan – Inboard and Outboard Profiles
- (2) Deck by deck layout showing all spaces
- (3) Layouts of all food spaces includes galleys, pantries, bell boxes, dining areas, lounges, bars, dry provisions rooms, walk-in refrigerators and freezers, thaw

- rooms, all other food preparation, service and storage rooms, garbage handling room, trash incineration rooms, etc. showing location of food service equipment
- (4) Book of food service equipment specifications for all food spaces with model number, manufacturer's name and address, pictures, sketches
 - (5) Diagram and drawings of potable water system showing locations of sea chests, evaporators, RO devices, tanks, chlorinators, chlorine analyzers, service outlets, backflow preventers, etc.
 - (6) Lists of backflow preventers and where used in the potable water system as well as a specification sheet for each kind of backflow preventer.
 - (7) Operator's manuals and specification sheets for potable water evaporators and reverse osmosis equipment
 - (8) Diagrams and specifications for all pools and spas showing water supply, overflow scuppers, drains, drain piping, backflow preventers
 - (9) Specification sheets for marine sanitation devices and sewage holding tanks with IMO/USCG specification numbers
 - (10) Diagram showing location of all overboard discharges for the sewage system
 - (11) Black water system drawings
 - (12) Grey water and plumbing drains drawings
 - (13) Sketch of air handling units in AC/fan rooms showing inspection ports and access for cleaning (for passenger vessels)
- D. Contact the appropriate FDA district office to set up inspections.

IX. RECORD OF REVISIONS

<u>ABS Mission Statement and Quality Policy</u>		<u>Nov. 1, 1999</u>
	ABS Mission Statement and Quality Policy updated.	
<u>Introduction</u>		<u>Nov. 1, 1999</u>
	Updated to indicate inclusion of Subchapter H. Also added applicability criteria for Supplement.	
<u>Section I</u>		<u>Nov. 1, 1999</u>
1/1.7.1	New cite to clarify requirements for cargo gear.	
3/3.3.1	New cite to clarify intact stability requirements.	
4/5C7	Cite revised to update references to cable construction standards.	
4/6.15	Cite revised to update requirements for valves employing resilient material based on changes.	
4/6.71.1	New cite to clarify that arrangements permitted by this Rule are not acceptable on U.S. flag vessels. Clarification added regarding need for remote operation of cargo tank valves.	
4/6.72.3	New cite to clarify that arrangements permitted by this Rule are not acceptable on U.S. flag vessels.	
4/6.72.12	Item b revised to clarify the minimum sizing for the word "VAPOR." Item g also revised to clarify the requirement for oxygen measurements.	
4/8.9.6	New cite to clarify that full follow-up control is required for steering gear.	
4/9.7	Cite revised to clarify material requirements.	
4/11.1.4	Cite revised to clarify requirements for Design Verification and Periodic Safety tests.	
4/11.3.5b	Cite revised to clarify requirement for safety systems.	
4/11.5.1	Cite revised to clarify sensor requirements for closed loop propulsion control systems.	

- 4/11.7.6 Cite revised to indicate minimum restoration period for standby and 4/11.9.5 electric power for U.S. flag vessels.
- 5/2A.1.1.7 Updated cite to indicate USCG approval for high velocity vent valves. Additionally, required approval for pressure vacuum valves clarified.
- 5/4A.5.1 Updated cite to indicate that safety relief valves for liquefied compressed gas service are to be USCG approved. Additionally, required approval for cargo containment systems and piping systems carrying nitrogen clarified.
- 5/5.27 New cite addressing sprinkler systems for passenger vessels.

Section II

Nov. 1, 1999

- General Revised to reflect USCG policy for acceptance of fire suppression and detection equipment under ACP.
- II-2/4.7.2 Cite revised to clarify hydrant and hose arrangements.
- II-2/4.8.4 Cite revised to clarify required approval for nozzles.
- II-2/5 Cite revised to clarify required approval for fixed gas extinguishing systems.
- II-2/6 Cite revised to clarify required approval for fire extinguishers.
- II-2/7 Cite revised to clarify fire detection and fire-extinguishing requirements for incinerator spaces.
- II-2/12 Cite revised to indicate requirement for sprinkler systems to comply with NFPA 13.
- II-2/13 Cite revised to eliminate the battery capacity requirements as USCG requirements were harmonized with SOLAS. Additionally, cite was revised to clarify required approval for fixed fire detection and alarm systems.
- II-2/61 Cite revised to clarify required approval for fixed foam systems.

Section III

Nov. 1, 1999

C	New cite addressing requirement for ventilation of passenger spaces.	
33 CFR 155.380	New cite added to clarify approval requirement for pollution equipment.	
33 CFR 157.12	New cite added to clarify approval requirement for pollution equipment.	
33 CFR 157.15	New cite added to clarify approval requirement for pollution equipment.	
33 CFR 159	Cite revised to clarify requirements for MSDs.	
<u>Section IV</u>		<u>Nov. 1, 1999</u>
	Check Sheets for Surveys After Construction updated.	
<u>Section V</u>		<u>Nov. 1, 1999</u>
	New Construction Survey Check Sheet updated.	
<u>Introduction</u>		<u>Jan. 1, 2002</u>
	Revised applicability criteria for Supplement; i.e., Item F regarding Automation deleted – see Cite 4-9-1/1.	
<u>Section 1</u>		<u>Jan. 1, 2002</u>
General	Cite references in the Table of Contents revised to agree with the 2002 Edition of the Steel Vessels Rules.	
4-8-3/9	First paragraph following Demand Load Table revised to reflect USCG acceptance of IEC 92-350 series cables.	
4-8-4/27	First paragraph revised to clarify that either NEC or IEC standards for installations in hazardous areas may be followed; i.e., it is not necessary to comply with both.	
4-9-1/1	New cite to clarify automation requirements by basing the criteria on the level of manning intended for the propulsion machinery space.	
4-9-3/1, 4-9-3/3, 4-9-3/9 & 4-9-3/15.5.1	New cites providing additional USCG requirements which supplement ABS ACC requirements.	
4-9-3/15.5.2	Cite revised to include additional USCG requirements for fire pump control and pressure monitoring. Also made applicable for ACC.	

6/5.5 (PVG)	Cite revised to make reference to the ABS Passenger Vessel Guide.	
<u>Section II</u>		<u>Jan. 1, 2002</u>
II-2/4.7.2	Cite revised to clarify that for hydrants using a Siamese connection only one hose will be required for the station to agree with USCG requirements.	
II-2/5.2	Requirement addressing release time for CO2 system deleted as it is not applicable to cargo spaces and the machinery space requirement is covered by SOLAS.	
II-2/12	Cite revised to clarify that compliance with SOLAS and NFPA 13 required with the higher standard prevailing.	
VI 6.1 & VI 6.1.2.8 (LSA Code)	Cites III/48 and III/48.2 revised to reflect SOLAS Amendment creating the LSA Code.	
<u>Section III</u>		<u>Jan. 1, 2002</u>
B.6(m)	Deleted as the requirement for open front toilet seat is no longer in CFR.	
<u>Section VI</u>		<u>Jan. 1, 2002</u>
III/21	Regulation number of Cite III/20 changed to III/21 per SOLAS Amendments.	
III/22	Regulation number of Cite III/21 changed to III/22 per SOLAS Amendments.	
III/22.3	Regulation number of Cite III/21.3 changed to III/22.3 per SOLAS Amendments.	
III/22.4.1.2	Regulation number of Cite III/21.4.2.2 changed to III/22.4.1.2 per SOLAS Amendments.	
III/23	Regulation number of Cite III/22 changed to III/23 per SOLAS Amendments.	
<u>Section II</u>		<u>Nov. 1, 2002</u>
II/44	Added Regulation 44 to agree with the USCG "A60" Construction for space around the emergency source of power.	
<u>Sections IV and V</u>		<u>Nov. 1, 2002</u>
	Revised Check Sheets ACP CS, SS, ES and NCS.	

Introduction Mar. 10, 2003

Introduction-1 Revised Title to reflect applicability to include vessels certificated for international voyages.

Introduction-2 Revised applicability of Supplement.

Introduction-3 Expanded guidance regarding equivalency evaluation. Correction of Chapter 32 to 9.

Introduction-4 Re-Flagging wording revised to reflect requirements.

Introduction-5 Reportable Casualty re-paragraphed.

Section I Mar. 10, 2003

Cite 3-3-1/3.1 Revised intact stability to include vessels for re-flagging.

Cite 3-3-1/3.3 Cargo vessels over 80 meters are considered new and must meet the probabilistic damage stability regulation when changing to U.S. flag.

Section II Mar. 10, 2003

II-2/4.7.2 Revised from one hose to two hoses.

Section III Mar. 10, 2003

33 CFR 151.27 Added Pages III-ii, III-12, III-15 Shipboard oil pollution Emergency Plan requirements.

Section I Apr. 22, 2003

Deleted cites 4-8-2/7, 9, 7.13, 11.5; 4-8-3/5.3.2, 5.5.1, 5.3.6, 9, 9.1; 4-8-4/27; 5-1-7/31.

Revised cite 4-8-3/5.5.4 reference to Main AC Switchboard deleted.

Section II Apr. 22, 2003

Entire section "General, Equipment Approvals" replaced.

New section added "Fire Equipment and Arrangements."

Added approval series 160.175, 160.176, 161.110, deleted ****.

Deleted 161.010; II-2/5.2 revised last to paragraphs relative to the SOLAS Reg. 10.4.1.1.1 and 20.6.1.1.

Under “Carbon Dioxide Storage” deleted last sentence; under “Fire Extinguishers” replaced approved with type-approved.

Cite II-2/10 First sentence rewritten for clarity.

Revised Cite II-2/28 to 13 and changed cites in wording.

Cite II-2/37.1.3 to 20.6, Cite II-2/37.1.3 and II-2/37.1.6.3 to 20.6 and 20.3.1.3 as per SOLAS 2000 Amendments.

II-2/45 changed .087 radius to 50 degrees.

Cite II-2/56.6 deleted since part of SOLAS.

Section III

Apr. 22, 2003

Cite III-4 original wording replaced with new paragraphs.

Revised Cite III-17 to 18, cite III-27.3 to 32.3 added /inserted for each person and regardless if it has totally enclosed lifeboats.

Revised Cite III/41 to 33; revised cite III/34 LSA Code 6.1.2.9, 6.1.2.

Revised, corrected and clarified as per USCG letter dated May 14, 2003.

General Equipment Approval changed Union to Community, MarED to MED.

Cite: III/4 160.115 added “if winches for Rescue Boats***.”

Cite: III/4 160.132 added “if davits for Rescue Boats***.”

General

May 20, 2003

Changed date on Front Page from January 1 to June 1. Added USCG approval date June 9, 2003.

Section II

May 20, 2003

Made site corrections II-2/44 to 9.2.3.3, II-2/45 to 13, II-2/61 to 10.4 and FSS Code C Chapter 14.

General	Revised applicable to the latest Rules, Standards, Special Decisions, Reporting.	Jan. 3, 2007
Introduction	Revised how to handle Form 835, revised authorization relative to SOLAS exemptions, drydock inspection for passenger vessels, editorial and clarifications, USPHS application requirements, supplemental reporting, added gas/chemical carrier details. New added Subchapter L cargo vessels, oil recovery vessels, oceanography research vessels.	Jan. 3, 2007
Section I	Revised 4-3-4/1, 4-8-3/5.5.4, 4-6-2/5.9; added cite 5-8-1/1 and 5-9-1/1, 4-8-2/5.19, 7.4 7.7, 4-8-4/21.1.6.	Jan. 3, 2007
Section II	Deleted cite III/32.3 covered by the Rules, added new "Table Navigating Equipment"; revised cite II/10.3, II-2/10.5.4, II/10.5.4, II/10.6; added cite II-2/9.2.3.1, revised Table concerning SOLAS Equipment, added Pilot Ladder.	Jan. 3, 2007
Section III	Added Annex VI, Incinerator. Added reference to USPHS.	Jan. 3, 2007
Section VI	Revised Survey Check Sheets; revised Cite II-1/8, added 46 CFR 63.25-9.	Jan. 3, 2007
Section VIII	New references added for information only.	Jan. 3, 2007
Section VIII to X	Renumbered sections: VII is IBC Code, VIII is IGC Code, IX is References and X is Records. Incorporated editorial comments.	Aug. 22, 2008
Sections All	Incorporated USCG comments 23 March 2008. Revised all headers to match SOLAS Regulations and the FSS code.	Aug. 22, 2008
Introduction		Aug. 22, 2008

Added Offshore Supply Vessels (OSV's) over 90 meters in length.

Introduction Mar. 10, 2009

New and revised headings: Introduction, Procedures, Form 835 CG, Dry Docking, Supplemental Reporting, Renumbering, etc., Incorporated USCG comments dated 23 February 2009.

Sections I, II, III, IV, VI, VII, VIII, IX, X, XI Mar. 10, 2009

Section I Editorial, Index, 3-3-1/3.1, 4-4-1/1, 4-6-3, 4-8-2/3.1, 4-8-2/5.13, 4-8-2/9.17.5, 4-8-3/9.1, 4-8-3/13, 4-9-2/5, 4-8-2/3.11, 5C-1-7/31

Section II Editorial, Index, II-1/45.11, II-2/7.4, II-2/10.4.1.1.3, II-2/10.6

Section III Editorial, ANNEX II, VI

Section VI II-1/8 deleted, II-2/13

Section VII Editorial, Chapters 3, 5, 10, 19

Section VIII Editorial, Chapters 4, 10, 17

Section IX New Chapter "Offshore Supply Vessels (OSV's) > 90 Meters in Length.

Section X Guidance and References (USPHS)

Sections I to XI Apr. 4, 2009

Sections I to XI Incorporated USCG comments dated 23 February, 1, 2 and 6 April 2009

Sections I, III, IX, XI Apr. 13, 2009

Section IX Deleted Cites A13, A14 and A15 in lieu of A11, Editorial.

Mar. 28, 2011

General Revised, incorporating USCG Comments dated 03/01/2011.

Section I-3 Last paragraph to 4-6-2/5.11 deleted. Last sentence to 4-6-3 replaced. Last paragraph to 4-7-3/1 replaced.

Section I-14 Added note to 6/6.5 relative to the highest standard to be used.

Section VI-2	Wording in II-2/20.6 replaced with IMO wording. Removed last sentence from Cite II-2/13 removed “new”, removed second sentence and added SOLAS reference. II-2/17 Complete wording replaced.
Section X-7	B-22 Wording replaced with that of USCG.
Section II-6	Editorial, added Chapter 1 to Cite II-2/9.3.1.
Section II-9	Editorial to II-2/19 conversion to SI Units.
Section VI	Added MSC PRG reference.
Section I	Replaced wording from 2003 ACP.
Section VI	II-2/7.2 Added wording relative to interference.
Section VI-3	Replaced wording of first sentence under piping in II-2/20.6.
Section VI-5	Deleted Cite III/21, updated reference to latitude.
Section VI-6	Deleted Cites III/22.3 and III/23, added to III/22.4.1.2 on exposure suit.

Aug. 2, 2011

Contents	Removed section titled “Requirements for Offshore Supply Vessels (OSV’s) certificated under Subchapter L.” Renumbered sections to reflect changes.
Introduction	Revised sections listing to reflect removal of OSV requirements.
Section I	Editorial, revised headings for Cites 4-8-2/11.5.1 & 11.5.5 and 4-8-4/21.1.6. Editorial, reordered citations. Added to 5C-1-7/11.11.2 to reflect Rule revisions.
Section II	Editorial, revised headings for Cites II-2/10.2.1.5, II-2/10.2.3.1.1, II-2/10.2.3.2.1 and II-2/10.3 & FSS Code Chapter 4.
Section III	Removed information about “Diving Support Systems.” Renumbered sections to reflect change. Editorial, revised heading for Cite 33 CFR 157.10b. Revised page numbering to reflect changes.
Section IV	Removed section called “Advice for Lifeboat Weight Tests.”
Section VI	Editorial, revised headings for Cite II-2/20.6 & II-2/20.3.1.3

ABS Mission Statement and Health, Safety, Quality & Environmental Policy August 1, 2017

ABS Mission Statement and Health, Safety, Quality & Environmental Policy updated.

Introduction August 1, 2017

Updated reference section to reflect most current consolidated editions of SOLAS and MARPOL as references.

Deleted Previously Sections IV, V and IX and in the current revision subsequent Sections are renumbered in the order.

Removed language regarding the survey checksheet sections (Previously Section IV and V).

Updated various section explanations and applicabilities.

Updated the referenced websites for the MSM Vol II cites and the ACP NVIC

OSV references deleted

Sections I August 1, 2017

3-3-1/3.1

Clarifications added

Added the cite for Fiber Reinforced Plastic Gratings 3-4-1/9

Added the cite for Navigation Bridge Visibility – remote Camera System 3-6-1/1.1.4

Added the cite for Steering Gear – Hydraulic Locks 4-3-4/9.1.3 which is similar to 4-3-4/15 from the previous revision.

Added the cite for Dynamic Positioning Systems 4-3-5/1.3.3

4-4-1/1

Clarification added to the “other standard”

4-6-2/5.11

General Acceptance Procedure has been added

4-6-3

MTN 01-10 reference as acceptable industry guidance is added.

Added the cite for Ballast Water treatment Systems 4-6-4/7.7

Added the cite for Fire Safety Systems – Fire Extinguishing Systems and Equipment – Fixed Gas Fire Extinguishing Systems 4-7-3/3

	Added the cite for Use of Emergency Generator in Port 4-8-2/5.17
	Deleted cite 4-8-2/11.5.1 & 11.5.5
4-8-3/9.1	Acceptable cable construction standards added and cite clarified.
	Added the cite for High Voltage Shore Connection 4-8-5/3.10
4-9-1/5.1.10 & 4-9-2/9.1	Cite renumbered and rearranged. Old cite 4-9-1/9.9
4-9-2/13	Cite renumbered, old cite 4-9-2/5
4-9-5/1	Cite renumbered, old cite 4-9-3/1
4-9-5/3 & 4-9-6/3	Cite renumbered, old cite 4-9-3/3
4-9-5/9	Cite renumbered, old cite 4-9-3/9
	Deleted cite 4-9-3/13.9.1, 4-9-4/3.7, 15.1 & 4-8-2/3.11
4-9-5/15.5.1	Cite renumbered, old cite 4-9-3/15.5.1
4-9-5/15.5.2	Cite renumbered, old cite 4-9-3/15.5.2
	Deleted cite 5C-1-7, 5C-1-7/31, 5C-8-10, 5C-9-10 & 5C-10-2
	Added the cite for Non-return devices/ Deck Water Seal 5C-1-7/25.19
5C-2	Clarifications added for applicability
5C-7-6/5.5	Cite renumbered, old cite 6/5.5
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Sections II	August 1, 2017
General	Updates to Equipment Approvals.
II-1/45	Clarifications due to Rule revisions & OSV removed.
II-2/10.4.1.1.3, 10.5 & FSS Code Chapter 7	MSC Resolutions 265(84) & 284(86) added.
	Added the cite for Fixed Local Application fire-extinguishing systems II-2/10.5.6

Added the cite for Fire-extinguishing systems for the protection of Deep-Fat Cooking Equipment II-2/10.6.4

Added the cite for Fixed Deck Foam System II-2/10.8 & FSS Code Chapter 14

III/4 Further clarifications to reflect the policy. Added 160.133 Release Mechanisms to the USCG Approval series.

Sections III August 1, 2017

Deleted the subsection on Diving Support Systems

Sections V August 1, 2017

Basis of Section clarified.

10.1.5 Electrical Installation requirements clarified.

Sections VI August 1, 2017

Basis of Section clarified.

Major revamp to the section reflecting the changes to the IGC Code 2016. 46 CFR Subchapter O- Bulk Dangerous Cargo requirements added.