



**U.S. SUPPLEMENT
TO**

**ABS RULES FOR BUILDING AND CLASSING
OFFSHORE SUPPORT VESSELS**

1 January 2013

AMERICAN BUREAU OF SHIPPING

USCG Approval: 11 January 2013

MISSION STATEMENT

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

QUALITY & ENVIRONMENTAL POLICY

It is the policy of the American Bureau of Shipping to be responsive to the individual and collective needs of our clients as well as those of the public at large, to provide quality services in support of our mission, and to provide our services consistent with international standards developed to avoid, reduce or control pollution to the environment.

All of our client commitments, supporting actions, and services delivered must be recognized as expressions of Quality. We pledge to monitor our performance as an on-going activity and to strive for continuous improvement.

We commit to operate consistent with applicable environmental legislation and regulations and to provide a framework for establishing and reviewing environmental 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 Offshore Support Vessels, 2009 SOLAS and 2006 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. The Check Sheets contained in this Supplement are also for reference only and are not to be used in the performance of a Survey. The controlled Check Sheets are available through the normal distribution of controlled documents. The most recent revisions may be obtained from the ABS Surveyor-in-Charge.

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 1974 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, 1974 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.” This supplement has been periodically updated; the most recent version was issued 01 April 2011.

In August 1994 the USCG delegated authority to ABS under a Pilot Program, as defined in USCG Navigation and Vessel Inspection Circular No. 2-95 (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 USCG delegation of authority for ABS to review plans and conduct surveys on behalf of the USCG for vessels enrolled in the Alternate Compliance Program (ACP).

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 affect both parties.

The success of the ACP for steel vessel led to industry requests to expand the program to vessels classed under the ABS Rules for Building and Classing Offshore Support Vessels (OSVs). To meet this demand, ABS issued and obtained USCG Approval for this supplement applicable to OSVs enrolled in the USCG's ACP and classed by ABS. The procedures for enrollment in the ACP are addressed on Page 4 of this Introduction.

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 Rules for Building and Classing Offshore Support Vessels and this Supplement.

A vessel enrolled in the ACP must satisfy all the requirements contained in the applicable sections of the International Conventions, ABS Rules and the U.S. Supplement, prior to the issuance of the Certificate of Inspection (COI).

The Supplement is divided into **nine** (9) sections.

Section I is applicable to offshore supply vessels that either have a USCG COI listing as a Multi-Certificated vessel inspected under subchapters 46 CFR I and L, or have submitted an application for inspection to the USCG to obtain one, and are classed by ABS under the Rules for Building and Classing Offshore Support Vessels.

Sections II contains USCG SOLAS interpretations not addressed by ABS rules.

Section III conditions additional U.S. requirements not contained in ABS Rules, MARPOL or SOLAS.

Section IV is applicable to offshore supply vessels that either have a USCG COI listing "Subchapter L" or have submitted an application for inspection to the USCG to obtain one, and are classed by ABS under the Rules for Building and Classing Offshore Support Vessels.

Section V is applicable to vessels that either have a USCG COI listing "Subchapter U" or have submitted an application for inspection to the USCG to obtain one, and are classed by ABS under the Rules for Building and Classing Offshore Support Vessels.

Sections VI – IX are supplementary and may be used for any vessel to which Sections I-V apply.

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 alternative standards developed by regulatory bodies and industry, both internal and external to the United States, exist which would define systems, equipment or components that are equivalent to those being specified herein. To the extent authorized by NVIC 2-95, Change-2, as amended and supplemented, ABS may evaluate alternatives built to such 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 USCG COI, 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 the requirements that will be applied.

PROCEDURES FOR ENROLLMENT AND PARTICIPATION IN ACP

The USCG Marine Safety Manual, Volume II, Section B, Chapter 9 and NVIC 2-95, Change-2 describes the process for enrollment in ACP. The Marine Safety Manual, Volume II, and NVIC 2-95, Change-2 may be accessed using the following links:

http://www.uscg.mil/directives/cim/16000-16999/CIM_16000_7A.pdf

<http://www.uscg.mil/hq/cg5/nvic/pdf/1995/NVIC%2002-95ch2.pdf>

NEW CONSTRUCTION

During new construction the design, fabrication sequences, and construction cost may be affected by the intended enrollment of a proposed new construction in ACP by the owner. Therefore, it is imperative that the shipyard and owner consult with ABS as early in the design phase as possible to discuss the proposed enrollment in depth 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 should 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 Officer in Charge, Marine Inspections (OCMI), indicating their desire to have their vessel participate in the ACP. 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 Change-1 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 completion 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 ABS Surveyors and USCG Marine Inspectors will agree on the resolution of any CG-835s and outstanding requirements. At this time, the USCG will confirm to ABS that the vessel is in compliance with applicable federal regulations or advise on those areas that must be corrected. The ABS Surveyor and the USCG Marine 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 COI. 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 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 ABS 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 U.S. 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. Immediately after addressing all resultant safety concerns, the owner, agent, master, operator, or person in charge, shall notify the nearest OCMI whenever a vessel is involved in a marine casualty as described in 46 CFR 4.05-1.

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 FORM CG-835

The USCG 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 ABS Surveyor would normally issue the deficiency. When the USCG Marine Inspector issues the CG-835, the original will be provided to the vessel’s Master or authorized representative and the USCG Marine Inspector will make a copy available to the local ABS office. The local ABS surveyor will enter

the USCG 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 USCG Marine Inspectors.

NO SAIL ITEMS

This is a term normally used by the USCG when the condition of a vessel is suspect, 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 ABS 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." Examples of deficiencies that would prevent a vessel from sailing are: (1) Loss of life-saving appliances such as lifeboats; (2) Lack of life-saving appliances; or (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. A suitable emergency fire pump is required for both the Class and SOLAS Safety Equipment Certificates 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 Recommendation 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 UWILD, 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.

OVERSIGHT

The USCG retains responsibility to ensure vessels meet regulatory requirements and maintains an active and viable oversight of ABS. ABS's World Wide ISO 9001:2000 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. 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. USCG 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 audits.

I. SUPPLEMENTAL REQUIREMENTS TO 2013 ABS RULES FOR BUILDING AND CLASSING OSVS

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I. SUPPLEMENTAL REQUIREMENTS TO 2013 ABS RULES FOR BUILDING AND CLASSING OSVS

**Cite: 1-1-5/1 Other Regulations – General
(SVR)**

Cargo Gear is to be certified in accordance with the ABS Guide for Certification of Lifting Appliances, 2007 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

Intact stability for OSVs and Oceanographic research vessels is to comply with the applicable parts of Subchapter S. It has been determined that IMO Resolution MSC.267 (85), “International Code on Intact Stability, 2008” (2008 IS Code) is equivalent to the intact stability requirements of Subchapter S. The alternative criteria in 3-3-A1/3.5 is not to be applied for Oceanographic research vessels. Where the intact stability requirements contained in IMO Resolution MSC.267 (85) are used, the Regulations contained in 46 CFR 173 Subpart B, Lifting, Subpart D, Oceanographic Research, and Subpart E, Towing, of Subchapter S are also to be satisfied, where applicable. All recommendations that appear in the 2008 IS Code on Intact Stability are required and considered mandatory.

Cite: 3-3-1/3.3 Subdivision and 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 U.S. 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: 4-3-4/13 Steering Gears – 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: 4-3-4/15 Steering Gears – Instrumentation

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.

The steering failure alarm system must have audible and visible alarms in the pilothouse when the actual position of the rudder differs by more than 5° from the rudder position ordered by the follow-up control systems for more than:

- (a) 30 seconds for ordered rudder position changes of 70°,
- (b) 6.5 seconds for ordered rudder position changes of 5°, and
- (c) The time period calculated by the following formula for ordered rudder position changes between 5° and 70°:

$$t = (R/2.76) + 4.64$$

Where:

t = maximum time delay in seconds

R = ordered rudder change in degrees (°)

Each steering failure alarm system must be supplied by a circuit that is independent of other steering gear systems and steering alarm circuits.

Cite: 4-3-5/15 Dynamic Positioning Systems

- (a) The vital system automation review should be completed in accordance with Cite 4-9-1/7 of this Supplement.
- (b) Regardless of vessel tonnage, dynamic positioning systems on vessels of more than 500 gross tons must complete the Failure Mode and Effects Analysis (FMEA) in 4-3-5/15.1.4 and the schedule of tests to demonstrate the level of redundancy established in the FMEA must comply with the criteria for Quantitative Failure Analysis (QFA) and Design Verification Test Procedures of Cite 4-9-1/7 of this Supplement. The FMEA and the schedule of tests must be submitted, reviewed and approved in advance of the test date.
- (c) Upon completion and installation of the Dynamic Positioning System complete performance test required as per 4-3-5/15.13.2 to the Surveyor's satisfaction at the sea trials.

Cite: 4-4-1/1 Pressure Vessels and Fired Equipment – General

Boilers, pressure vessels and fired equipment are to comply with the requirements specified in 4-4-1 of the 2013 ABS Rules for the Building and Classing of Offshore Support Vessels or the ASME Code. Boilers, pressure vessels and fired equipment manufactured to any other standard will be considered on a case-by-case basis in coordination with the Marine Safety Center (MSC).

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

Valves employing resilient materials and installed at the following locations must meet the requirements for a Category A valve:

- (a) Vital piping system manifolds; and
- (b) Closure for any opening in the shell of the vessel.

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.

Cite: 4-7-3/1 Fire Safety Systems – Fire-extinguishing Systems and Equipment – Fire Main Systems

Fire mains may not be used for anything 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.

USCG acceptable category “A” valves may be used in fire main systems.

Cite: 4-7-3/3.3 Fire Safety Systems – Fire-extinguishing Systems and Equipment – CO₂ 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 its accidental discharge during those times of 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 Source of Electrical Power – Power Source – 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 & Use & 5.17 of Emergency Generator in Port

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.

The emergency generator may not be used during lay time in port, unless approved by the Marine Safety Center.

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

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 – General & Cable Sizing
& 7.7**

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

**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: 4-8-2/11.3 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: 4-8-2/11.5.1 Electrical Systems – System Design – Interior Communication
& 11.5.5 Systems – General & Power Supply**

Means of communications are to be provided between the navigation bridge and the engineer officer's accommodation for vessels with minimally attended or periodically unattended machinery spaces.

The voice communication system power supply must ensure sufficient redundancy and capacity to be considered able to operate independent of the vessel's electrical system in which the loss of any one system component will not disable the rest of the system.

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

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 Systems – Voice 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: 4-8-3/5.5.4 Electrical Systems – Electrical Equipment – Main and 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.

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 – Standards of Compliance

IEEE RP 1580-2001, UL 1309, MIL-DTL-24640C, MIL-DTL-24643C, IEC 60092-350, IEC 60072-353 and IEC 60092-354 are acceptable cable constructions standards to be used.

For electric cables in hazardous areas, the electric cable construction and the cable glands are to achieve the appropriate seal so that gas cannot migrate or pass through the cable.

Cite: 4-8-3/13 Electrical Systems – Electrical Equipment – Certified Safe Equipment & 4-8-4/29.5 Certified Safe Equipment in Hazardous Areas

Electrical installations in hazardous locations must comply with one of the following:

- (a) Equipment required to be identified for Class I locations in NFPA 70 (NEC) Articles 500 through 504 must be tested and listed by an independent laboratory to ANSI/UL 913 or ANSI/UL 1203.
- (b) Equipment required to be identified for Class I locations must be tested and listed by an independent laboratory to one or more of the types of protection in ANSI/ISA Series of standards incorporated in NFPA 70 Article 505.
- (c) Equipment must be tested or approved to the referenced IEC 60079 Series of standards in 46 CFR 111.105 and listed or certified under the IECEx scheme by an independent laboratory. Certification under the ATEX scheme is not acceptable. See Section II/Cite: II-1/45 of this Supplement.

Note: An independent laboratory means a laboratory that is accepted by the Commandant under 46 CFR Part 159 for the testing and listing or certification of electrical equipment.

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

Cite: 4-8-4/21.1.5 Electrical Systems – Shipboard Installation and Tests – Paint on Cables

Painting of cables is not permitted.

Cite: 4-9-1/7 Remote Propulsion Control and Automation – General Provisions – 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.

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(COI) (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 1 of Section 4-9-2 of ABS Rules for Building and Classing Offshore Support Vessels, Table 2 of 4-9-3 and Tables 3 through 6 of 4-9-4, 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 COI.

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 requested from the USCG.

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 USCG approved automation testing procedures shall be maintained on board and made available upon request.

**Cite: 4-9-1/5.1.10 Remote Propulsion Control and Automation – General & Safety
& 4-9-1/9.17 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: 4-9-2/1&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: 4-9-2/5 Remote Propulsion Control and Automation – Remote Propulsion
Control – Control on Navigation Bridge**

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

Cite: 4-9-3/1 Remote Propulsion Control and Automation – ACC Notation – Application

Propulsion control from the Navigating Bridge is to be provided.

Cite: 4-9-3/3 Remote Propulsion Control and Automation – ACC Notation – 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: 4-9-3/9 Remote Propulsion Control and Automation – ACC Notation – Monitoring in Centralized Control Station

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

Cite: 4-9-3/13.7.1, 4-9-4/3.7, & 4-8-2/3.11 Remote Propulsion Control and Automation – ACC/ACCU – Continuity of Power – Starting Generators – System Power Supply

ACC - The Engineering Control Center must include the controls and instrumentation necessary to place the ship service and propulsion generators in service in 30 seconds.

ACCU – Automatically restore power in not more than 30 seconds.

Cite: 4-9-3/15.5.1 Remote Propulsion Control and Automation – ACC Notation – Propulsion Machinery Space – 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: 4-9-3/15.5.2 Remote Propulsion Control and Automation – ACC Notation – Propulsion Machinery Space– Fire Main System

The Centralized Control Station must include control of the main machinery space fire pumps. Where one or more fire pumps 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.

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II. SOLAS INTERPRETATIONS NOT ADDRESSED BY ABS RULES

General

Equipment Approvals

Approvals of safety equipment, materials and installations are covered by regulations contained in 46 CFR 2.75. For U.S. flag vessels, specific and type approvals for fire suppression equipment, structural fire protection materials and life-saving appliances are performed by the USCG as mandated by SOLAS 1974, generally through independent laboratory testing and inspection. 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 before equipment approved by that country could be used on a U.S. vessel. ACP does not change the requirements to use USCG approved materials and equipment. Therefore, class society approvals cannot be used to fulfill the obligations of the USCG, as an Administration, where type approval is required by the regulations.

The USCG approves applicable “SOLAS” lifesaving equipment using the IMO LSA Code. For fire protection items, the USCG approves “SOLAS” materials using the IMO Fire Test Procedures Code and the IMO Fire Safety Systems Code.

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. The MRA makes it possible for a manufacturer with a European Approval (MED/wheelmark) to obtain USCG approval for certain equipment covered by the MRA. This is accomplished by permitting the “Notified Bodies” responsible for issuing approvals in Europe to issue USCG approval. Likewise, the USCG is able to issue the European Approval (MED/wheelmark) for manufacturers having a USCG approval if the item is included within the scope of the MRA. It is important to note that this MRA does not change the requirement of using USCG approved equipment and materials on U.S. Flag vessels. It allows an alternative means for obtaining USCG approval. The European Marine Equipment Directive (MED) “wheelmark” is not accepted in lieu of USCG approval. Further guidance is contained in NVIC 8-04 and NVIC 8-04 Change 1.

Fire Equipment and Arrangements

USCG type-approved materials and equipment from both U.S. and foreign sources approved in accordance with the procedures contained in 46 CFR 159 will continue to be acceptable, and those items manufactured in a country with which the United States has a Mutual Recognition Agreement in force or the USCG has found to have an equivalent approval program will also be acceptable.

As discussed above, the following structural fire protection materials approved by the MRA may be used in lieu of USCG type approved materials for ACP vessels.

Item	USCG Approved Category
Deck assembly	164.105
Primary deck covering	164.106
Structural insulation (“A” and “B” class)	164.107
Bulkhead panels (“B” class)	164.108
Non-combustible material	164.109
Structural ceiling	164.110
Draperies, curtains, and other suspended textiles	164.111
Interior finish	164.112
Floor coverings	164.117
Fire doors (“A” and “B” class): limited to doors without windows or with total window area no more than 645 cm ² (100 in ²) in each door leaf. Approval limited to maximum door size tested. Doors must be used with fire tested frame design.	164.136
Windows* (see note below)	164.137
Penetration seals (fire stops)	164.138
Dampers	164.139
Bedding components	164.142
Upholstered furniture	164.144
Fire door control system	164.146

*Note: the following table must be used to determine when the applicable hose stream and thermal radiation test are required for “A” and “B” class windows.

Window Dimension	Classification	Hose Stream Test Required?	Heat Flux Test Required?
≤645 cm ² (100 in ²)	A-Class	No	No
≥645 cm ² (100 in ²)	A-Class	Yes	Yes
>645 cm ² (100 in ²)	A-0	Yes	No
≤ 645 cm ² (100 in ²)	B-15	No	No
>645 cm ² (100 in ²)	B-15	No	Yes
Any dimension	B-0	No	No

Navigation Equipment Approvals for Ships

Equipment Name	USCG Approved Category*
GENERAL	
Magnetic Compass	165.101
Transmitting Magnetic Heading Device (TMHD)	165.102
Gyrocompass	165.103
Speed and Distance Indicating Device	165.105
Rate of Turn Indicator	165.106
Echo Sounding Equipment	165.107
Heading Control System	165.110
Auto-Tracking Aid	165.111
Track Control	165.112
Radar Equipment with Automatic Radar Plotting Aid (ARPA)	165.115
Radar Equipment with Automatic Tracking Aid (ATA)	165.116
Radar Equipment with Electronic Plotting Aid (EPA)	165.117
Automatic Radar Plotting Aid (ARPA)	165.120
Electronic Plotting Aid	165.121
Chart Facilities for Shipborne Radar	165.122
Electronic Chart Display and Information System (ECDIS)	165.123
ECDIS Back-up Equipment	165.124
Raster Chart Display Systems (RCDS)	165.125
Global Positioning System Equipment (GPS)	165.130
Global Navigation Satellite System Equipment (GLONASS)	165.131
Differential Global Position System (DGPS)	165.132
Differential Global Navigation Satellite System Equipment (DGLONASS)	165.133
Combined Global Position System and Global Navigation Satellite System Receiver Equipment (GPS/GLONASS)	165.134
Loran-C Equipment	165.135
Chayka Equipment	165.136
Integrated Bridge System	165.140
Integrated Navigational System	165.141
Voyage Data Recorder (VDR)	165.150
Simplified Voyage Data Recorder (S-VDR)	165.151
Automatic Identification System (AIS)	165.155
Automatic Identification System (AIS) Class B	165.156
Radar Reflector	165.160
Sound Reception System	165.165
Daylight Signaling Lamp	165.166
Gyrocompass for High Speed Craft	165.203
Long Range Identification Tracking (LRIT)	165.207
Heading Control System for High Speed Craft	165.210
Night Vision Equipment for High Speed Craft	165.251
Radar Equipment for Automatic Plotting Aid (ARPA) for High Speed	165.216

Craft	
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*For detail USCG Approval Process for the above-listed equipment please refer to NVIC 8-01, Change 2.

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) The requirements of 46 CFR 111.105; or
- (b) 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.
- (c) Any U.S. flag OSV that operates seaward of the boundary line and that is certified to carry hazardous or NLS cargoes must comply with CG-ENG Policy Letter 03-12 “POLICY ON THE IMPLEMENTATION OF IMO RESOLUTION A.673(16), GUIDELINES FOR THE TRANSPORT AND HANDLING OF LIMITED AMOUNTS OF HAZARDOUS AND NOXIOUS LIQUID SUBSTANCES IN BULK ON OFFSHORE SUPPORT VESSELS, FOR NEW AND EXISTING U.S OFFSHORE SUPPLY VESSELS.

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. Limited lengths (not exceeding 76 cm) of flexible hose that have been fire and pressure tested to the requirements of ISO 15540 or SAE J1942 are acceptable.

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 & FSS Code Chapter 9.2.4 Fixed Fire Detection and Fire Alarm Systems – Installation Requirements

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) except as specifically provided in 46 CFR 127.220 in Subchapter L for Offshore Supply Vessels or 46 CFR 92.05-15 in Subchapter I, 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-2/10.2.1.5 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 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.)

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 Fire

Nozzles must be USCG approved equipment.

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

Fire extinguishers must be USCG type-approved equipment.

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

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

The control cabinets or spaces containing valves or manifolds for the various fire extinguishing systems must be marked "STEAM/CARBON DIOXIDE/CLEAN AGENT/FOAM /WATER SPRAY [as appropriate] APPARATUS" in not less than 50 mm (2 in) red letters.

**Cite: II-2/10.4.1.1.3, Fixed Pressure Water-Spraying 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) 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-2/10.4 & Fixed Deck Foam Systems
FSS Code
Chapter 14**

The system must be USCG approved equipment and must comply with the manufacturer's approved Design, Installation, Operation and Maintenance Manual that meets Chapter II-2, Regulation 10.4 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-2/10.5.4 Fire-Extinguishing Arrangements in Machinery Spaces – Other Machinery Spaces – Incinerator Space

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

When fitted as additional equipment, 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-2/10.10.3 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 offshore workers 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 offshore workers 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.

“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 must be approved to the appropriate CFR, SOLAS or IMO standard. USCG approved products and systems are accepted regardless of country of manufacture. The

USCG recognizes that with the Life-saving Appliances Code (LSA Code) there exists an acceptable IMO standard for approval.

Equipment carrying a CG approval number issued under the US-EC or US-EFTA Mutual Recognition Agreements, discussed above the “General” section, are acceptable.

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.

In addition, life-saving equipment accepted under the reciprocal acceptance agreement with Norway may also be used on U.S. flag vessel.

The following approval series indicate approval to the SOLAS requirements:

160.017	Embarkation-Debarkation Ladders (only if marked “SOLAS 74/83”)*
160.040	Line-throwing appliances
160.115	Winches (if winches for rescue boat)**
160.117	Embarkation-Debarkation Ladders*
160.118	Rigid liferafts***
160.121	Hand red flares
160.122	Floating orange smoke signals
160.132	Davits (if davits for rescue boat)**
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)****

Those items without an asterisk (*) are to be forwarded directly to the USCG for their approval.

* indicates those items for which ABS possesses USCG acceptance to conduct approval (design review and testing) work on behalf of the USCG.

** indicates items which come under the U.S. District Court Order of 31 May 1983, which declares invalid any inspection or test not conducted by or in the presence of a USCG Marine Inspector. The Order does not address pre-approved reviews. This Order remains

in effect until such time as the USCG publishes a final regulation in the Federal Register removing the requirement for a USCG Marine Inspector to witness the inspections or test.

*** indicates that the USCG reserves the right to attend prototype testing of this equipment as a condition of approval. This option will normally be exercised in the case of a manufacturer seeking approval of this equipment for the first time, or for a substantially new or innovative design.

**** 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-2/Reg. 3-9.

Where a particular life-saving appliance or arrangement is required, the Commandant, USCG, may accept any other appliance or arrangement that is at least as effective as that specified. If necessary, the Commandant, USCG, 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 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 offshore workers 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/32.3 Personal Life-Saving Appliances – Immersion Suits and Thermal Protective Aids (Cargo Ships)

Immersion suits must be carried for each person on board on all cargo vessels except those operating between 32° north and 32° south latitude regardless of whether it has totally enclosed lifeboats.

**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.

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 (1 ft) above the deck.

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

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

The lowering speed for a survival craft loaded with all of its equipment must be not less than 70 percent of the speed required under Regulation VI 6.1.2.8 (LSA Code).

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

D. Radiocommunications

Cite: IV/1 Radiocommunications – Application

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

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

A. Diving Systems

- (a) Diving Systems are to be Classed by ABS or a USCG-authorized Classification Society in accordance with the applicable Classification Society Rules for Diving Systems and the IMO Code of Safety for Diving Systems; and
- (b) Pressure Vessels for Human Occupancy (PVHOs) and associated pressurized equipment (such as Viewports, Medical Locks, Clamps, Closures, Trunks, etc.) are to meet the requirements of the ASME Safety Standard for Pressure Vessels for Human Occupancy, PVHO-1; and
- (c) Pressure vessels are to meet the requirements of ABS Rules for pressure vessels or the ASME Boiler and Pressure Vessel Code, Section VIII, Division 1 or 2.

B. Accommodations for Officers and Crew

1. Application

- (a) Vessels of less than 100 gross tons shall meet the applicable requirements of this section insofar as is reasonable and practicable.
- (b) Accommodations for offshore workers are addressed in Section IV.

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 insulated from undue noise, heat, and odors.
- (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 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 46 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 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.

- (b) 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.

4. Construction

All crew spaces are to be constructed in a manner suitable to the purpose for which they are intended and so they can be kept in a clean, workable, and sanitary condition.

5. Sleeping Accommodations

(a) Arrangements

- (1) Where practicable, each licensed officer shall be provided with a separate stateroom.
- (2) Sleeping accommodations for the crew shall be divided into rooms, no one of which shall berth more than four persons.

(b) Size

Each room shall be of such size that there are at least (2.78 m³) 30 ft² of deck area and a volume of at least (5.8 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 must be composed of material not likely to corrode. The overall size of a berth shall not be less than (68 cm) 27 in wide by (190 cm) 75 in long, except by special permission of the Commandant, USCG. The berths shall not be obstructed by pipes, ventilating ducts, or other installations.
- (2) A locker shall be provided for each person accommodated in a room.

6. Wash Spaces, Toilet Spaces; and Shower Spaces

- (a) There must be provided at least 1 toilet, 1 washbasin, and 1 shower for each 8 members of portion thereof in the crew who do not occupy rooms to which private or semi-private facilities are attached.
- (b) The toilet rooms and washrooms must be located convenient to the sleeping quarters of the crew to which they are allotted but must not open directly into such quarters except when they are provided as private or semiprivate facilities.
- (c) All washbasins, showers, and bathtubs shall be equipped with adequate plumbing, including hot and cold running water. All toilets must be installed with adequate plumbing for flushing.
- (d) At least 1 washbasin must be fitted in each toilet room, except where private or semi-private facilities are provided and washbasins are installed in the sleeping rooms.
- (e) Where more than 1 toilet is located in a space or compartment, each toilet must be separated by partitions.

7. Messrooms

- (a) Messrooms shall be located as near to the galley as is practicable except where the messroom is equipped with a steam table.
- (b) Each messrooms must seat the number of persons expected to eat in the messroom at one time.

8. Hospital Space

- (a) 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, must 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 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.
- (d) 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.
- (e) 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 or isolation room. Such room shall meet the following standards:

- (1) The room must be available for immediate medical use.
- (2) 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 where the crew may wash and dry their own clothes. There shall be at least one tub or sink fitted with the necessary plumbing, including hot and cold running water.
- (b) Recreation spaces.
- (c) 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

Each berth must have a light.

11. Heating

- (a) All manned spaces shall be adequately heated and cooled in a manner suitable to the purpose of the space.
- (b) The heating and cooling system for the accommodations must be capable of maintaining a 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

Provisions shall be made to protect the crew quarters against the admission of insects.

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 155.310 Containment of Oil and Hazardous Material Cargo Discharge

Under those 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

Offshore Support vessels must have an emergency means of stopping transfers within a vessel.

Cite: 33 CFR 155.790 Deck Lighting

Offshore Support 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.

ANNEX II

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

USCG 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). 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):

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

IV. REQUIREMENTS FOR OFFSHORE SUPPLY VESSELS CERTIFICATED UNDER SUBCHAPTER L, EXCEPT LIFTBOATS

Scope: This section specifies additional or different requirements that apply to Subchapter L OSV's (except liftboats) certificated under Subchapter L enrolled or to be enrolled in the ACP.

Note: Subchapter L "Liftboats" is not included in this Section.

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Cite: A-1 Stability

In addition to Section I/Cite: 3-3-1/3.1 for intact stability, OSVs are also to comply with the subdivision and damage stability requirements contained in either (a) IMO Res. MSC.235(82), section 3, or (b) 46 CFR 174.195, 174.200, 174.205, and 174.207.

Cite: A-2 Carriage of Flammable or Combustible Liquid Cargoes in Bulk

An OSV may carry the following in integral tanks:

- (1) Grade-D combustible liquids (having a flashpoint below 150°F and above 80°F), in quantities not to exceed 20 percent of the vessel's deadweight, except that the vessel may carry drilling fluids and excess fuel oil, Grade-E (combustible liquid having a flashpoint of 150°F and above) as well as Grads-D, without limit.
- (2) Grade-E combustible liquids, in quantities not to exceed 20 percent of the vessel's deadweight, except that the vessel may carry drilling fluids and excess fuel oil. Grade-D as well as Grade-E, without limit.
- (3) An OSV may carry the following in fixed independent tanks on deck: Grade-B (flammable liquid having a Reid vapor pressure under 14 pounds and over 8½ pounds) and lower-grade flammable and combustible liquids, in quantities not to exceed 20 percent of the vessel's deadweight.
- (4) An OSV may carry hazardous materials in approved portable tanks. The portable tank may be filled or discharged aboard the vessel if authorized by and endorsement on the vessel's Certificate of Inspection.

Cite: A-3 Carriage of Hazardous and Noxious Liquid Substances in Bulk

- (1) See CG-ENG Policy Letter 03-12 "POLICY ON THE IMPLEMENTATION OF IMO RESOLUTION A.673(16), GUIDELINES FOR THE TRANSPORT AND HANDLING OF LIMITED AMOUNTS OF HAZARDOUS AND NOXIOUS LIQUID SUBSTANCES IN BULK ON OFFSHORE SUPPORT VESSELS, FOR NEW AND EXISTING U.S. OFFSHORE SUPPLY VESSELS" dated 15 May 2012.
- (2) For hazardous locations, refer to cite II-1/45 of Supplement.

Cite: A-4 Cranes

Cargo Gear is to be certified in accordance with the ABS Guide for Certification of Lifting Appliances, 2007 for the type of cargo gear being provided.

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

Cite: A-5 Carriage of Offshore Workers

Offshore worker means an individual carried aboard an OSV and employed in a phase of exploration, exploitation, or production of offshore mineral or energy resources served by the

vessel; but it does not include the master or a member of the crew engaged in the business of the vessel, who has contributed no consideration for carriage aboard and is paid for services aboard.

Cite: A-6 Means of Escape

- (a) A vertical ladder ending at a deck scuttle may be the second means of escape if the:
- (1) primary means of escape is a stairway or passageway;
 - (2) installation of another stairway or passageway is impracticable;
 - (3) scuttle is located where stowed deck cargo could not interfere;
 - (4) scuttle is fitted with a quick-acting release, and with a hold-back device to hold it open; and
 - (5) scuttle meets the requirements for location, strength, and height of coaming in the International Convention on Load Lines.
- (b) Each vertical ladder must:
- (1) Have rungs that are:
 - (i) at least 410 mm (16 in) long;
 - (ii) at most 300 mm (12 in) apart, uniform for the length of the ladder; and
 - (iii) at least 180 mm (7 in) from the nearest permanent object in back of the ladder;
 - (2) Have at least 115 mm (4-1/2 in) of clearance above each rung;
 - (3) Be made of incombustible materials; and
 - (4) Have an angle of inclination with the horizontal, greater than 70° but not more than 90°.
- (c) No means may be provided for locking any interior door giving access to either of the two required means of escape, except that a crash door or locking-device, capable of being easily forced in an emergency, may be employed if a permanent and conspicuous notice to this effect is attached to both sides of the door. A means may be provided for locking an exterior door to a deckhouse if the door is:
- (1) Locked only by a key under the control of one of the OSV's officers; and
 - (2) Always operable from the inside.

Cite: A-7 Accommodations for Crew Members and Offshore Workers

The following requirements apply to accommodations for offshore workers on each vessel:

- (1) Each offshore worker aboard must be provided with adequate fixed seating. The width of each seat should be at least 460 mm (18 in). The spacing of fixed seating must be sufficient to allow ready escape in case of fire or other emergency. The following are minimal requirements:
 - (i) aisles 4.6 m (15 ft) in length or less must not be less than 610 mm (24 in) wide.
 - (ii) aisles more than 4.6 m (15 ft) in length must not be less than 760 mm (30 in) wide.

- (iii) where the seating is in rows, the distance from seat front to seat front must not be less than 760 mm (30 in).
- (2) If the intended operation of a vessel is to carry offshore workers aboard for more than 24 hours, quarters for them must be provided. Each stateroom for use by them must:
- (i) berth no more than six workers;
 - (ii) have clear headroom of at least 1.9 m (6 ft 3 in); and
 - (iii) contain at least 1.9 m² (20 ft²) of deck and at least 4 m³ (140 ft³) of space for each worker accommodated. The presence in a stateroom of equipment for use by the occupants does not diminish the area or volume of the room.
- (3) There must be at least one toilet, one washbasin, and one shower or bathtub for every eight or fewer offshore workers who do not occupy a stateroom to which a private or a semiprivate facility is attached.

OSVs are not required to be outfitted with a Hospital Space required by Section III Cite B.8 of the U.S. Supplement.

Cite: A-8 Keel Cooler Installations

Fillet welds may be used in the attachment of channels and half-round pipe sections to the bottom of the vessel.

Cite: A-9 Liquid-Mud Systems

Liquid-mud piping systems may use resiliently seated valves of Category A to comply with Cite 4-6-2/5.1.1 of this Supplement.

Cite: A-10 Dual-Voltage Generators

If a dual-voltage generator is installed on an OSV the neutral of the dual-voltage system must be solidly grounded at the switchboard's neutral bus and be accessible for checking the insulation resistance of the generator to the ground. Resistance or impedance grounding in lieu of solid grounding must be approved by the Coast Guard Marine Safety Center.

Any Current flow due to a ground fault may not flow through a hazardous (classified) location.

Grounded neutral and resistance or impedance grounded AC systems must have a suitably sensitive ground detection system which indicates current in the ground connection, is able to withstand the maximum fault current without damage, and provides continuous indication of circuit status to ground. The system must provide for comparison of indications under fault conditions with those normal conditions.

Dual voltage DC systems must have a suitably sensitive ground detection system which indicates current in the ground connection, has a range of at least 150 percent of neutral rating and indicates polarity of the fault.

Cite: A-10a Grounded Distribution System

If a grounded distribution system is provided, there must be only one connection to ground, regardless of the number of power sources.

Cite: A-11 Automation of Machinery Spaces

OSVs intended to operate with automated machinery spaces are to comply with the ABS SVR requirements for class notation ACCU as well as other applicable requirements of this Supplement. See Cites 4-9-1/7 through 4-9-3/15.5.2 of Section I.

Cite: A-15 Fire Stations

Each outlet at a fire hydrant must be at least 38 mm (1-1/2 in) in diameter and, to minimize the possibility of kinking, must be fitted so that no hose leads upward from it.

Each fire hydrant must have a fire hose 15.2 m (50 ft) in length, with a minimum diameter of 38 mm (1-1/2 in), connected to an outlet, for use at any time.

A suitable hose rack or other device must be provided for each fire hose. Each rack on a weather deck must be placed so as to protect its hose from heavy weather.

Cite: A-16 Fire Monitors

When a fire monitor is connected to the fire main system, it must be led from the discharge manifold of the fire pump. Each fire monitor must be fitted with a shut-off valve at the monitor and at the connection to the fire pump discharge manifold.

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

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**V. 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-9 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-10 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-11 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-12 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-13 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-14 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-15 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-16 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-17 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-18 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-19 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-20 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-21 Fixed Fire Suppression System

A fixed carbon dioxide system shall be installed in all chemical storerooms. Carbon dioxide systems for chemical storage areas are required to be automatically activated (46 CFR 194.20-7).

Cite: B-22 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-23 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-24 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-25 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-26 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-27 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.

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

Cite: B-28 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

VI. SURVEYS DURING AND AFTER CONSTRUCTION

**CHECKLIST ON ACP CLASSIFICATION SAFETY CONSTRUCTION
(SLC) SURVEYS** **VI-1**

**CHECKLIST ON ACP STATUTORY SAFETY EQUIPMENT (SLE)
SURVEYS** **VI-3**

**CHECKLIST ON ACP ENVIRONMENTAL SURVEYS AND
MARPOL V** **VI-5**

The following checksheet will be completed by the ABS Surveyor during surveys after construction including initial, annual or renewal surveys. These check sheets are in addition to the normal classification, SOLAS and MARPOL check sheets the surveyor will complete to verify compliance with the ABS Rules, SOLAS and MARPOL convention.

**CHECKLIST ON ACP CLASSIFICATION SURVEYS
ALTERNATE COMPLIANCE AND THE US SUPPLEMENT TO ABS RULES
TO BE DONE IN CONJUNCTION WITH INITIAL, MANDATORY ANNUAL SURVEY
(MAS), AND RENEWAL SAFETY CONSTRUCTION (SLC) SURVEYS**

1. On vessels not classed ACC, automation systems for propulsion and auxiliary boilers were tested with USCG-approved procedures and found satisfactory.
2. The vessel's Chief Engineer certified that all aspects of the vessel's automated equipment has been routinely and recently tested using the USCG-approved Periodic Automation Test Safety Procedure (or approved by ABS on behalf of the USCG) and found satisfactory.
3. Was the ABS Class Annual Automation Survey (AAS) satisfactorily carried out, utilizing the USCG or ABS approved Periodic Automation Test Safety Procedure?
4. It was confirmed that vessels with periodically unattended or minimally attended Machinery Spaces had a planned maintenance program, including maintenance and repair manuals and routine maintenance and checksheets?
5. The remote controls of valves in hull penetrations were randomly tested. Proper operation of reach rods, control actuators and function indicators were randomly verified and found satisfactory.
 - a. At the SLC renewal, a more detailed examination, to the satisfaction of the Surveyor, was conducted.
6. Throttle control apparatus was demonstrated in manual and power modes at all stations and related alarms and trips were verified operational.
7. A general examination was conducted of ladders, handrails, ramps, catwalks, accommodation ladders, and protective guards on machinery to ensure these items were in good general repair and suitable to protect personnel.
8. Draft marks, vessel name and hailing port were accurately affixed and displayed.
9. Machinery space tank tops and bilges were examined for accumulation of oil or other substances that could pose a fire hazard.
 - a. Unsafe conditions were corrected.
10. An operational test was conducted of the main and emergency bilge pump suction.
11. The main and auxiliary piping systems were examined externally and found free of apparent leakage.
 - a. The flexible non-metallic expansion pieces in the circulating system were identifiable by manufacturer and verified by the Chief Engineer to have less than 10 years of service.
12. The vessel's Master and Chief Engineer confirmed that the vessel had no 835s or other conditions that needed to be brought to my attention.
13. The crew did not report, nor did I see any unsafe or unsanitary conditions of a concern.

14. If any of the above questions is answered "No," the local OCMI must be informed before the vessel sails. The source of the information is to be kept confidential.

**CHECKLIST ON ACP STATUTORY SURVEYS
ALTERNATE COMPLIANCE AND THE US SUPPLEMENT TO ABS RULES
TO BE DONE IN CONJUNCTION WITH INITIAL, MANDATORY ANNUAL SURVEY
(MAS), AND RENEWAL SAFETY EQUIPMENT (SLE) SURVEYS**

I. Fire Hose Testing

1. All fire hoses were hydrostatically tested to the maximum fire pump pressure to which they may be exposed but not less than a minimum pressure of 6.9 bar (100 psi). Note: The Safety Equipment Certificate may not be issued or endorsed if this is not done.

II. Liferaft Servicing

Note: Lack of certification is a No Sail item and the local OCMI must be contacted.

1. Note: New Regulations have been published regarding the servicing of liferafts. USCG field offices perform initial service facility approval and periodic spot checks, but third parties may be substituted. A new sticker system on the liferaft itself should be used in conjunction with the certificate to determine proper servicing.
2. Liferaft certificates indicate current servicing by a USCG approved facility. Note: The information must contain the port of servicing and the date of servicing.

III. Lifeboat Operational Tests

1. Proper operation of the propelling gear and/or motors was demonstrated. (IMO allows this testing to be carried out while the boat is secured in the falls.)
 - a. The CG inspectors will have a crew proficiency test to conduct during their boarding. At that time, the crew must operate each boat in the water, and the following tests will be carried out:
 - b. The USCG will accept load tests done by ABS.
2. Each motor lifeboat and hand-propelled boat was operated at full speed both ahead and astern.
3. Each installed system, such as any powered bilge pump or water spray system, was successfully operated.
4. Compass readings were compared with several known bearings.
5. Each air tank buoyancy unit was visually inspected and appears fit for service. Note: In case of doubt, air tanks may be tested for air-tightness per Marine Safety Manual, Chapter 6, Section R.
6. Water tanks were inspected and confirmed watertight. Note: This should be demonstrated by either an airtight test or filling with water and watching for leaks. Refer to Marine Safety Manual, Chapter 6, Section R.
7. Batteries for engine starting and searchlights have a means for recharging, which are in satisfactory condition.
8. The condition and quantity of survival equipment was checked as per the standard ABS checklists.

IV. Advice for Lifeboat Weight Tests

1. The USCG has requirements in addition to SOLAS. The USCG requires weight testing of the lifeboats during each inspection for certification.

2. The primary references for USG lifeboat testing and inspection are:
 - a. Title 46, Code of Federal Regulations Part 199.45 and
 - b. Marine Safety Manual, Vol. 11, Section 6.R
3. The CFR contains the performance standard required, while the process used to verify compliance with the standards is found in the Marine Safety Manual (MSM). A brief summary of the lifeboat test and inspection requirements and the verification process follows. If difficulties are encountered, please ask for advice from the local OCMI.

V. Tests and Inspections Required

1. At each Safety Equipment Inspection that will be used by the United States Coast Guard for their renewal or mid-period Certification, a demonstration showing the proper condition and operation of lifeboats and their launching appliances at loads ranging from light load to full load is required. A demonstration of the proper condition and operation of launching appliances at loads ranging from light load to 10% overload is required at intervals not exceeding five years. During an inspection for initial or renewal of SLE, any portion of the five year load test since the vessel's previous inspection for initial or renewal of SLE need not be repeated.
2. **Light Load Test** The boat should be lowered into the water and released. Operating the launching system at light load demonstrates that the mass of the boat is sufficient to overcome the frictional resistance of the winch, falls, sheaves, blocks and associated gear. This test is especially important on older installations to test the condition of rollers, bushings, bearings, and other rolling and sliding parts.
3. **Full Load Test** The boat is lowered to the embarkation position. Tricing pendants are disconnected. Weight is added to bring the lifeboat to full load condition. During loading, the boat should be held alongside the ship by means of the installed frapping and/or bowsing gear. The fully loaded boat should be lowered using the normal lowering procedure and using the on-deck winch control position. During lowering, alternatively release and apply the brake so that the boat stops at approximately 2 m intervals. Complete at least three start-stop cycles. Stop lowering just as the boat reaches the water. The keel should be at or in the water but there should still be tension on the falls. Release the boat using the on-load release mechanism control. Release mechanisms with a hydrostatic lock will require use of the emergency override device to permit on-load release. The release mechanism must open all hooks simultaneously and release the boat into the water. Unload the boat, recover it with the winch, and return it to its stowed position. Observe operation of the limit switches as the davit approaches the stowed position. Anyone on board the boat should disembark at the deck level.
4. **Caution: NO ONE SHOULD BE IN THE BOAT WHEN THE WEIGHT OF THE DAVIT IS TAKEN UP BY WINCH AND THE DAVIT MOVES INTO ITS STOWAGE POSITION.**
5. During the test, there should be no deformation of, or damage to the launching appliance or its connection to the vessel. The brake must be a "DEADMAN" type. When the operator releases the brake handle, the davit must apply the brake, stopping the boat, without any additional force.

**CHECKLIST ACP ENVIRONMENTAL SURVEYS
ALTERNATE COMPLIANCE AND THE U.S. SUPPLEMENT TO ABS RULES
TO BE DONE IN CONJUNCTION WITH INITIAL, MAS, AND RENEWAL MARPOL
ANNEX IV (Sewage) SURVEYS**

1. Marine Sanitation Devices were examined, devices found to be certified in accordance with 33 CFR 159 as Type I, II, or III, as appropriate, and continue to be in satisfactory operating condition and arrangement.

**CHECKLIST ACP ENVIRONMENTAL SURVEYS
ALTERNATE COMPLIANCE AND THE U.S. SUPPLEMENT TO ABS RULES
TO BE DONE IN CONJUNCTION WITH INITIAL, MAS, AND RENEWAL MARPOL
ANNEX V (Garbage) SURVEYS**

1. The Vessel was verified to be keeping Garbage Disposal Records required by 33 CFR 151.55.
2. The Vessel's approved Waste Management Plan complying with 33 CFR 151.57 was verified onboard.
3. Placards describing prohibited waste discharges as required by CFR 151.59 were verified as posted.

VII. SURVEYS DURING CONSTRUCTION

CHECKLIST ON ACP CLASSIFICATION SURVEYS NCS

VII-1

The following check sheet will be completed by the ABS Surveyor during new construction surveys. The check sheet is in addition to the normal classification checksheets the Survey will complete to verify compliance with the ABS Rules.

**ACP NEW CONSTRUCTION SURVEYS
ALTERNATE COMPLIANCE AND THE US SUPPLEMENT TO ABS RULES –
NEW CONSTRUCTION
TO BE DONE IN CONJUNCTION WITH ISSUANCE OF THE INTERIM
CLASSIFICATION CERTIFICATE**

1. The Surveyors involved with the new construction were qualified in the ACP process and the ABS processes for new construction.
2. Are communication cables routed to avoid high risk fire areas and are telephone installations in the weather located in a watertight enclosure with an external audible signaling device?
3. Is the stop control for the emergency generator located only in the room containing the emergency generator?
4. Were the additional requirements for vessels carrying hazardous cargoes complied with and tested as necessary?
5. Were valves verified to meet the requirements of positive shutoff category A or category B in the required piping system?
6. Sounding tubes, where fitted to oil tanks, were verified to not have perforations or openings throughout their length?
7. For vessels with automatic or remote control and monitoring systems, are the following approved manuals found on board:
 - a. Qualitative Failure Analysis (propulsion controls, monitoring and alarm systems, automated electric power management system, all other automated systems that may potentially constitute a safety hazard (e.g. stabilization systems, integrated propulsion/steering systems)
 - b. Planned Maintenance Program
 - c. Design Verification Test Procedures (all automated systems)
 - d. Periodic Safety Test Procedures
8. Where the Design Verification Tests and the periodic Safety Tests described in cite 4-9-1/7 of this Supplement satisfactorily conducted?
9. Was the steering failure alarm tested and found satisfactory?
10. Were all required placards, instructions, and identification labels found to be in accordance with the supplement?

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
