U.S. SUPPLEMENT
TO

ABS RULES FOR STEEL VESSELS UNDER 90 METERS (295 FEET) IN LENGTH FOR VESSELS CERTIFICATED FOR INTERNATIONAL VOYAGES

1 JUNE 2003

AMERICAN BUREAU OF SHIPPING

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M I S S I O N S T A T E M E N T

The mission of the American Bureau of Shipping is to serve the public interest as well as the needs of our clients by promoting the security of life, property and the natural environment, primarily through the development and verification of standards for the design, construction and operational performance of marine-related facilities.

Q U A L I T Y & E N V I R O N M E N T A L P O L I C Y

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 Steel Vessels Under 90 Meters (295 Feet) in Length. 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.

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 was codified into a document titled "U.S. Supplement to ABS Rules for Steel Vessels for US Flag Vessels that are Certificated and Classed for International Voyages." This Supplement identified those USCG requirements which are in addition to the ABS Rules and the International Conventions. This publication, subsequently modified to include Subchapter "H" and "L", is used in lieu of 46 CFR Subchapters "D", "H", "I" and "L" for plan review and inspections delegated to ABS by the USCG. The use of the U.S. Supplement is restricted to those vessels which participate in the USCG's Alternate Compliance Program (ACP) with ABS. The procedures for enrollment in the Alternate Compliance Program are addressed in NVIC 2-95, Ch. 1.

In 1998, as a result of the success of the ACP for large vessels, industry demand, and the similarity between the requirements in the ABS Steel Vessel Rules and the ABS Steel Vessels Under 90 Meters (295 Feet) in Length Rules, a new supplement is being issued when the ABS. Under 90 Meter Rules are used for smaller vessels in the Alternate Compliance Program.

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

- **A. A Cargo vessel over 500 gross tons ITC or a Passenger Vessel carrying 12 or more passengers or an OSV over 500 gross tons;**
- **B. Greater than 150 feet in scantling length;**
- **C. Certificated for international voyage.**
- **D. Issued ICLL, SOLAS and MARPOL Certificates.**
- **E. Has electrical plants with an aggregate capacity of 75 kW or greater; and**
- **F. Issued and maintains a valid Certificate of Documentation (US Flag)**

The Supplement is divided into seven sections:

Section I contains supplemental requirements in areas where there are cites in the ABS Under 90m Rules for which the USCG have additional requirements. For ease of reference, each of these cites is identified by the corresponding ABS Rule number. If a Rule cite does not apply to the vessel under consideration, then the associated supplement requirement does not apply.

Section II contains the interpretations of 1974 SOLAS (as amended) from the U.S. Administration for those areas in which the USCG has amplifying or additional requirements. For ease of reference, each of these cites is identified by the corresponding SOLAS cite. If a SOLAS cite is not applicable to the vessel under consideration, then the associated interpretation does not apply.

Section III contains supplemental requirements in areas not contained in the ABS Rules, MARPOL or SOLAS for which the USCG has requirements. For ease of reference, each of these cites is identified by subject area title and an arbitrarily assigned paragraph identifier.

Section IV contains the check sheets to be used both during and after construction.

Section V contains the check sheet to be used during construction.

Section VI contains the U.S. Administration's interpretation of 1974 SOLAS (as amended) for the technical review of passenger vessels. The check sheets for surveys are pending enrollment of a vessel.

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

Section VIII Addendum 1 expands the ACP to include OSV's and the additional requirements that apply to Subchapter L

There are specific cites within this document where U.S. domestic standards are specified as mandatory for certain systems, equipment or components. U.S. Federal law is one of the reasons why many items are mandatory. It is recognized that there exist alternative standards developed by regulatory bodies and industry, both internal and external to the United States, which would define systems, equipment or components that are equivalent to those being specified herein. To the extent authorized by USCG Navigation and Vessel Inspection Circular No. 2-95, Change-1 (NVIC 2-95, Change-1), as amended and supplemented, ABS is empowered to accept alternatives built to these international/industry standards and grant the requested equivalency provided the equivalency evaluation is reviewed and forwarded by ABS with its comments and recommendations to the USCG-MSC for final approval.

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 of the requirements which will be applied in such cases.

Incorporated in this revision is the full authorization for ABS to act as agents of the USCG to review plans and conduct surveys on behalf of the USCG for vessels enrolled in the Alternate Compliance Program. This authorizes ABS to issue all of the relevant documents to support the issuance of a full-term USCG Certificate of Inspection (COI) by the local Officer in Charge of Marine Inspection (OCMI). **Under no circumstance is ABS authorized to endorse or issue a Certificate of Inspection.**

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

The controlling documents pertaining to vessels enrolled in ACP are 1974 SOLAS (as amended), MARPOL 73/78, NVIC 2-95, Change-1 (dated 1 August 1997), Volume II, Section B, Chapter 9 of the USCG Marine Safety Manual, the ABS Steel Vessel Rules, the ABS Steel Vessels Under 90 Meters Rule, and this Supplement.

A vessel enrolled in the Alternate Compliance Program must satisfy all the requirements contained in the applicable sections of the International Conventions, ABS Rules and the U.S. Supplement, prior to the issuance of the COI.

PROCEDURES FOR ENROLLMENT AND PARTICIPATION IN ACP

The process for enrollment in ACP is defined in the USCG Marine Safety Manual, Volume II, Section B, Chapter 9.

NEW CONSTRUCTION

For new construction, since the design, fabrication sequences, and construction cost may be affected by the intended enrollment of a proposed new construction in ACP by the owner, it is imperative that the shipyard and owner consult with ABS as early in the design phase as possible. It is prudent to discuss the proposed enrollment in depth as soon as possible to establish the basic fundamentals and administrative clarifications. Upon the completion of such a meeting, both the shipyard and the owner are to forward a written request to ABS to confirm their intentions. For the shipyard, this could be accomplished in concert with the forwarding of the ABS Request for Classification Survey Details (Form A.B.122). For survey purposes, the owner is to forward a separate letter to the local ABS Office or Regional Office (Survey Manager) to confirm their intention regarding the enrollment of the vessel. While this will assist in the proper processing within ABS, it is very important to note that the application for enrollment in ACP is to be forwarded to the USCG in accordance with NVIC 2-95, Change-1.

EXISTING VESSELS

With existing vessels, the owner or operator applies for enrollment by submitting an Application for Inspection of U.S. Vessel (Form CG-3752) to the OCMI, indicating their desire to have their vessel participate in the program. The USCG will subsequently authorize the ABS Program Manager 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:

a) 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.
b) NVIC 10-81 is the guiding document for re-flagging.
c) the USCG accepted Vessel Deficiency Report or "Gap Analysis" augments the definition of the standards applied to the specific vessel.

HOW TO WITHDRAW

In order to withdraw from ACP, the owner is to advise the USCG in writing. If this is agreeable to the USCG, all data applicable to the vessel during the time period the vessel was enrolled in the program will be forwarded to the USCG for incorporation into the USCG computer files. Upon accomplishment of the information transfer, the owner would then continue the required inspections directly under the jurisdiction of the USCG.

HAND OVER SURVEY

For existing vessels, a "Hand Over Survey" must take place. The Survey is simply a time for the attending USCG and ABS staff to compare notes. The USCG will confirm that the history of the vessel has been properly entered into the ABS Status System. Then the Surveyors and Inspectors will agree on the resolution of any 835s and outstanding requirements. At this time, the USCG will also confirm to the Surveyors that the vessel is in compliance with all CFRs or will advise on those areas that must be corrected. The Surveyor and the Inspector will then complete the ABS Record of Safety Equipment. This record will ensure that the requirements of the USCG continue. The Record of Safety Equipment is to be a permanent part of the vessel's documents.

WHAT HAPPENS WITH THE CERTIFICATE OF INSPECTION?

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

WHAT HAPPENS IF THE VESSEL IS DAMAGED?

It is the responsibility of the vessel's Master to report Marine Damages, as defined in 46 CFR 4.03 to the cognizant USCG Officer in Charge of Marine Inspection (OCMI). ABS takes the lead in determining "Fitness to Proceed" and is obliged to share this with the local OCMI. If the vessel poses a pollution threat to the environment, such as a Class I structural failure, the local OCMI will take precedence. This decision must be coordinated with the Surveyor in Charge.

REPORTABLE CASUALTY

A reportable marine casualty or accident means a casualty or accident involving any vessel within the navigable waters of the U.S., its territories or possessions, or any casualty or accident involving a US Flag vessel anywhere in the world. This definition of marine casualty or accident does not pertain to public vessels.

The definition is contained in 46 CFR 4.05-1, **NOTICE OF MARINE CASUALTY**, as follows:

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

1. An unintended grounding, or an unintended strike of (allision with) a bridge;

2. An intended grounding, or an intended strike of a bridge, that creates a hazard to navigation, the environment, or the safety of a vessel, or that meets any criterion of paragraphs 3 through 7;

3. A loss of main propulsion, primary steering, or any associated component or control that reduces the maneuverability of the vessel;

4. An occurrence materially and adversely affecting the vessel's seaworthiness or fitness for service or route, including but not limited to fire, flooding, or failure of or damage to fixed fire-extinguishing systems, life-saving appliances, auxiliary power generating equipment, or bilge pumping systems;

5. A loss of life;

6. An injury that requires professional medical treatment (treatment beyond first aid) and, if the person is engaged or employed on board a vessel in commercial service, that renders the individual unfit to perform his or her routine duties; or

7. An occurrence causing property damage in excess of $25,000 including the cost of labor and materials to restore the property to its condition before the occurrence, but not including the cost of salvage, cleaning, gas-freeing, drydocking, or demurrage.

HOW TO HANDLE THE FORM 835

The USCG issues their recommendations and deficiencies on a form numbered CG-835. It has become common usage to simply refer to the USCG outstandings and deficiencies as "835s". It is intended that the USCG offices will assist ABS Surveyors by providing the liaison with other USCG offices in dealing with CG-835s. The ABS Surveyor is not expected to communicate directly with a USCG office other than the one in his local area.

The 835 is under the control of the USCG office that did the inspection and wrote the requirements. ABS will be given copies of the 835s for inclusion on the ABS Status as an Outstanding Recommendation. ABS may survey and indicate that an 835 has been satisfactorily completed. This will be done by the writing of a miscellaneous report that receives normal distribution plus one additional copy for the USCG office that wrote the 835. It is the responsibility of the local OCMI to forward the 835 to the appropriate persons to cancel the 835 in the USCG files. ABS Surveyors may "clear" 835 items, on ACP vessels only. This may be done on other US Flag vessels; however, it requires prior approval from the OCMI that issued the 835.

In those situations where compliance with an 835 has not been satisfied, the USCG office that issued the 835 must be contacted for further advice. This will be done through the OCMI at the port where the vessel is being surveyed. **It is important to note that the ABS Surveyor does not have the right to extend or modify the 835**.

NO SAIL ITEMS

This is a term normally used by the USCG when the condition of a vessel is suspect or has deteriorated or has sustained excessive damages. ABS has the same concerns. However, the ABS terminology differs. ABS defines no sail items in various sections of the ABS Process Instructions. ABS does not use the term "Seaworthy." The term used in ABS is "Fitness to Proceed." A vessel is not considered Fit to Proceed if it has suffered structural damage that affects the longitudinal strength of the vessel or its watertight integrity. It also applies if the vessel has lost propulsion, steering or electrical generation capacity, including redundant systems. Any of the foregoing would generate a report of noncompliance with the Rules and be listed as an "Outstanding Recommendation." Conversely, if the problem lies with SOLAS or MARPOL items, it would be listed as a "Deficiency." Deficiencies that would prevent a vessel from sailing would be: (1) Loss of life-saving appliances such as life boats; (2) Lack of life-saving appliances; (3) Failure of critical parts of the fire-extinguishing system. Examples of "No Sail" items are inoperable fire pumps or depleted fixed fire-extinguishing systems. On occasion an item that is a deficiency will also be an outstanding recommendation against Class. The emergency fire pump is such an item. The emergency fire pump is required both for Class and for the Safety Equipment Certificate to be issued and/or remain valid.

OUTSTANDING RECOMMENDATIONS (OSR)

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

WHAT HAPPENS IF ANNUAL OR 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 dry-docking extensions to ACP vessels. Under extenuating circumstances, ABS allows extensions of dry dockings. The vessel must have no record of a grounding since the last dry-docking, 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 Dry-docking (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 91 days up to one year are normally done to allow the vessel's surveys to be harmonized with IMO requirements. A one year extension requires a full Under Water Survey in Lieu of Dry-docking, 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. The Guide for Underwater Surveys In Lieu of Drydocking for Vessels Enrolled in the ABS Based USCG Alternate Compliance Program is now included in NVIC 2-95, Change 1.

OVERSIGHT

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

The foundation of this oversight is ABS's World Wide ISO 9001 Certified Quality System. As with any successful quality system, it is a smoothly functioning in-service process verification scheme. It provides a source of continuous and timely opinion related to the effectiveness of the processes in place to meet customer requirements. An added benefit is the information it provides to both clients and management to prove that controlled work is being accomplished. In this respect it is very important in facilitating the delegation to ABS of USCG vessel inspection. It provides a framework that will 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 conduct renewal and mid-period COI inspections. 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.

I. SUPPLEMENTAL REQUIREMENTS TO CURRENT ABS RULES

(see Addendum 1 for additional requirements pertaining to OSV's)

I. SUPPLEMENTAL REQUIREMENTS TO CURRENT ABS RULES

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

Cargo Gear is to be certified in accordance with the ABS 'Requirements for Certification of Construction and Survey of Cargo Gear on Merchant Vessels, 1975 or the Guide for Certification of Cranes, 1991 as applicable for the type of cargo gear being provided.

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

Cite: 3-3-1/3.1 Intact Stability

Intact stability for cargo and passenger vessels is to comply with the applicable parts of Subchapter S. It has been determined that IMO Resolution A.749 (18) - "Code on Intact Stability" is equivalent to the intact stability requirements of Subchapter S. Where the intact stability requirements contained in IMO Resolution 749 (18) are used, the Regulations contained in Subparts B - Lifting and E - Towing of Subchapter S are also to be satisfied, where applicable. All recommendations that appear in the Code on Intact Stability are required and considered mandatory.

Cite: 3-3-1/3.3 Damage Stability

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

Cite: 4-1-1/13.1 Category A Machinery Spaces

Machinery spaces of Category A are those spaces and trunks to such spaces that contain: internal combustion machinery used for main propulsion; or internal combustion machinery used for purposes other than main propulsion where such machinery has in the aggregate a total power output of not less than 375 kW (500hp); or any oil fired boiler, or other similar oil fired equipment such as an inert gas generator, incinerator wasted disposal unit, etc., or any oil fired unit.

Cite: 4-1-1/13.3 Machinery Spaces

Machinery spaces are all machinery spaces of Category A and all other spaces containing propelling machinery, boilers, oil fuel units, steam and internal combustion engines, generators and major electrical machinery, oil filling stations, refrigerating, stabilizing, ventilation and air conditioning machinery, and similar spaces, and trunks to such spaces.

Cite: 4-1-1/31 Boilers and Pressure Vessels

Boilers, pressure vessels and heat exchangers are to comply with the requirements specified in Section 4-4-1 of the ABS Steel Vessel Rules or the ASME Code. Associated controls and piping systems are to comply with 4-4-1, 4-6-1 and 4-7-1 of the Steel Vessel Rules, as applicable. Boilers, pressure vessels and heat exchangers manufactured to any other standard will be considered on a case-by-case basis.

Cite: 4-2-1/7.1 Internal Combustion Engines and Reduction Gears – Fuel-Oil Injection System – Strainers

Strainers are to be provided in accordance with 4-6-5/3.3.4 & 4-6-4/13.7.5 of the Steel Vessel Rule

Cite: 4-2-1/9.9 Internal Combustion Engines and Reduction Gears – Lubricating Oil Systems – Filters

Filters are to be provided in accordance with 4-6-5/5.3.6 & 4-6-4/13.7.5 of the Steel Vessel Rules.

Cite: 4-3-3/11 Steering Gear – Control System

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: 4-3-3/11.9 Steering Gear – Instrumentation and Alarms

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 degrees from the rudder position ordered by the follow-up control systems for more than:

(a) 30 seconds for ordered rudder position changes of 70 degrees,

(b) 6.5 seconds for ordered rudder position changes of 5 degrees, and

(c) The time period calculated by the following formula for ordered rudder position changes between 5 degrees and 70 degrees:

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

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: 4-4-1/1 Vessels Subject to Damage Stability Requirements

Vessels subject to damage stability requirements are to comply with 4-6-4/3.11 (Gravity Drain Piping), 4-6-4/5.5.12 (Bilge Piping), 4-6-4/7.5.3 (Ballast Piping) and 4-6-4/9.1.3 (Vents, Sounding & Overflow Piping) of the Steel Vessel Rules, as applicable.

Cite: 4-4-2/7 Pumps and Piping Systems - Plastic Pipes

Pipes and piping components made of thermoplastic or thermosetting plastic materials, with or without reinforcement, are to be USCG approved.

Cite: 4-4-2/11 Pumps and Piping Systems – Valves

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

- Positive Shutoff Valves - The closed valve must pass less than 10 ml/hr (0.34fluid oz/hr) of liquid or 3 liters/hr (0.11 ft3/hr) of gas per inch nominal pipe size through the line after removal of all resilient material and testing at full rated pressure. Packing material must be fire resistant. Piping subject to internal head pressure from a tank containing oil (fuel, lube and cargo) must be fitted with a positive shutoff valve at the tank. See 4/6.45.5 of the Rules for additional requirements for such valves. Positive shutoff valves may also be used in any location in lieu of a required Category A or Category B valve.

- Category A Valves – The closed valve must pass less than the greater of 5% of its fully open flow rate or 15% / $\sqrt{(\mathrm{NPS})}$ of its fully open flow rate through the line after removal of all resilient material and testing at full rated pressure. Category A valves may be used in any piping system except where positive shutoff valves are required. Category A valves are required in the following locations:

  - Valves at vital piping system manifolds;
  - Isolation valves in cross-connects between two piping systems, at least one of which is a vital system, where failure of the valve in a fire would prevent the vital system(s) from functioning as designed;
  - Valves providing closure for any opening in the shell of the vessel.

- Category B Valves – The closed valve will not provide effective closure of the line or will permit appreciable leakage from the valve after the resilient material is damaged or destroyed. Category B valves are not required to be tested and may be used in any location except where a Category A or Positive shutoff valve is required.

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

Note: Reference is made to U.S. Coast Guard Notice of Policy, Federal Register (63 FR 10547), March 4, 1998, for alternative arrangements for acceptance of resiliently seated valves.

Cite: 4-4-3/9.5 Pumps and Piping Systems – Vent Pipes – Size

The diameter of each vent pipe must not be less than 1-1/2 inches nominal pipe size for fresh water tanks, 2 inches nominal pipe size for water ballast tanks, and 2-1/2 inches nominal pipe size for fuel oil tanks, except that small independent tanks need not have a vent more than 25% greater in cross-sectional area than the fill line.

Cite: 4-4-7/3.1 Pumps and Piping Systems – Cargo Piping System

The provisions in 4-4-7/3.1 of the Rules, which permit the unrestricted routing of cargo piping through ballast tanks for vessels less than 5000 tons deadweight, is not be acceptable on U. S. flagged vessels.

The requirements of 4-4-4/3.7 of the Rules for positive closing valves to be fitted on pipes emanating from fuel oil tanks which are subject to a static head of oil are also applicable to pipes from cargo oil tanks which are subject to a static head of oil.

Cite: 4-4-7/5.5 Pumps and Piping Systems – Ballast System

The provisions in 4-4-7.5.5 of the Rules, which permit the unrestricted routing of ballast piping through cargo tanks for vessels less than 5000 tons deadweight, is not be acceptable on U. S. flagged vessels.

Cite: 4-4-7/5.9 Pumps and Piping Systems – Cargo Systems – Cargo Heating Systems

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

Cite: 4-4-7/5.19 Pumps and Piping Systems – Cargo Systems – Cargo Vapor Emission Control Systems

In addition to meeting the requirements in ABS Guide for Cargo Vapor Emission Control Systems on Board Tank Vessels (1991):

(a) Personnel training should be verified.

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

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

(c) Manifold flanges should have a stud and the hose/loading arm flange should have a hole.

(d) Markings for overfill protection outside the control room should be in 50 mm (2 in) high black letters on a white background.

(e) Dual overfill alarms on tank barges, when powered from a shore facility, are to be fitted with a cable and plug which meets ANSI/NEMA WD6, NFPA 70 Articles 410-57 and 501-12 as well as be explosion-proof.

(f) Tank barges, when equipped to automatically shut down loading by a shore facility, are to be fitted with a male plug which meets IEC 309-1/309-2 with pins S2 and R1 for the overfill sensor circuit, pin G for the cable shielding, and pins N and T3 reserved for an optional high level alarm. The plug must be labeled with the words "Connector for Barge Overflow Control System" and with the inductance and capacitance of the connecting switching and cabling. The sensor

activating shutdown must have components that generate or store no more than 1.2 V, 0.1 A, 25 mW or $20x10^{-3}$ mJ.

(g) Each cargo tank shall have arrangements that allow oxygen measurements to be taken at a point 1m (3.3 ft) below the tank top and from a point at half the ullage prior to cargo transfer when cargo vapor is collected by a facility that requires the vapor from the vessel to be inerted, or when cargo vapor is transferred between vessels during lightering or topping off operations with vapor balancing.

Cite: 4-5-1/3.5 Fire Extinguishing Systems – Fire Pumps, Fire Mains, Hydrants and Hoses – Fire Main

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

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

Any material with a solidus melting point of 1700^{o} F or less is considered to be capable of being rendered ineffective by heat. Consideration may be given to the acceptance of materials with a solidus melting point of 1700^{o} F or less, on a case by case basis, based on an ABS evaluation and subject to USCG approval.

Gaskets in fire main systems are not required to meet the 1700° F criteria but are required to meet the criteria for flexible pipes contained in IACS Unified Requirement F42 or equivalent.

Cite: 4-6-2/5.5.2 Electrical Installations – Shipboard Systems – Emergency Services – Power Supply – Generator

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

Cite: 4-6-2/5.9 Electrical Installations – Shipboard Systems – Emergency Switchboard

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

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

Cite: 4-6-2/13.3 Electrical Installations – Shipboard Systems – 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: 4-6-2/15.1.2 Electrical Installations – Shipboard Systems – Engine Order Telegraphs

On a vessel with more than one propulsion engine, each engine must have an engine order telegraph.

On a double-ended vessel that has two navigating bridges, this system must be between the engine room and each navigating bridge.

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

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

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

Electric Engine Order Telegraph System

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

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

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

Each electric engine order telegraph system must have transmitters and indicators that are electrically connected to each other.
Each engine room indicator must be capable of acknowledgment of orders.

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

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 much 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: 4-6-4/7.15.4 Electrical Installations – Machinery and Equipment – Emergency Switchboards – Equipment and 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.

Cite: 4-6-6/9.3 Electrical Installations – Specialized Vessels and Services – Chemical Carriers

Each vessel that carries liquid sulphur cargo or inorganic acid cargo must meet the requirements of 4-6-6/1 of the Rules and Cite 4-6-6/1 above for a vessel carrying oil with a flashpoint not exceeding 60° C, except that a vessel carrying carbon disulfide must have only intrinsically safe electric equipment in cargo tanks, cargo handling rooms, enclosed spaces, cargo hose storage spaces, spaces containing cargo piping and hazardous locations in the weather.

Cite: 4-9-1/1 (SVR) Remote Propulsion Control and Automation – General

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

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

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

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.

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, immediately after the installation of the automated equipment or before issuance of the initial Certificate of Inspection, to verify that automated systems are designed, constructed and operate in accordance with applicable requirements. In addition, 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.

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 the 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. The Design Verification and Periodic Safety Tests are to be witnessed by the Surveyor.

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 checkoff 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.

Cite: 4-9-1/5.1.10 Remote Propulsion Control and Automation – General –
4-9-1/9.9 Safety Systems
(SVR)

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 Remote Propulsion Control and Automation – Remote Propulsion
(SVR) Control 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: 4-9-3/1 Remote Propulsion Control and Automation – ACC – General
(SVR)

Propulsion control from the Navigating Bridge is to be provided.

Cite: 4-9-3/3 Remote Propulsion Control and Automation – ACC/ACCU –
(SVR) 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 spaces.

Cite: 4-9-3/9 Remote Propulsion Control and Automation – ACC/ACCU –
(SVR) Monitoring in Centralized Control Station

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

Cite: 4-9-3/13.9.1 Remote Propulsion Control and Automation - ACC/ACCU –
4-9-4/3.7 Continuity of Power
(SVR)

The standby electric power is to be available in no more than 30 seconds.

Cite: 4-9-3/15.5.1 Remote Propulsion Control and Automation – ACC/ACCU –
(SVR) Fire Detection and Alarm Systems

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

Cite: 4-9-3/15.5.2 (SVR) **Remote Propulsion Control and Automation – ACC/ACCU – Propulsion Machinery Space -- Fire Safety – Fire Main System**

The Centralized Control Station must include control of the main machinery space fire pumps. Where one or more fire pumps is required to be independent of the main machinery space, at least one of such pumps must be controlled from the Navigating Bridge.

All required fire pump remote control locations must include the controls necessary to charge the fire main and

1. A fire main pressure indicator; or
2. A fire main low pressure alarm.

Cite: 5-1-1/1.13 (SVR) **Vessels Intended to Carry Oil in Bulk – Pressure Vacuum Valves**

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

Cite: 5-8-5/1 (SVR) **Vessels Intended to Carry Liquefied Gases in Bulk – Process Pressure Vessels and Liquid, Vapor, and Pressure Piping Systems**

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

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

Cite: 5-8-19 (SVR) **Vessels Intended to Carry Liquefied Gases in Bulk – Summary of Minimum Requirements – Explanatory Notes to the Summary of Minimum Requirements**

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

Cite: 5-9-5/2 (SVR) **Vessels Intended to Carry Liquefied Gases in Bulk – Piping Fabrication and Lining Details**

Hoses must have either full threaded connections; ANSI B16.2, 16.24, or B16.31 flanges; or Class 1 quick connect couplings that meet ASTM F1122 and marked "C1-1." The hose should be marked with the date of manufacture and be in good condition (no loose covers, kinks, bulges, soft spots, or gouges/cuts which penetrate the hose reinforcement.) The hose should also be marked with the date of its last inspection, which should be conducted with the hose in a straight, flat, horizontal position and include a static pressure test at the maximum operating pressure.

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

Automatic sprinkler systems are to comply with National Fire Protection Association (NFPA) Standard 13-1996. Also see Section II, Cite II-2/10.6 and FSS Code Chapter 8 for additional requirements.

II. SOLAS INTERPRETATIONS NOT ADDRESSED BY ABS RULES

(see Addendum 1 for additional requirements pertaining to OSV's)

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.)

D. Radiocommunications

E. Safety of Navigation

II. SOLAS INTERPRETATIONS NOT ADDRESSED BY ABS RULES

(see Addendum 1 for additional requirements pertaining to OSV's)

General

Equipment Approvals

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.

When a Mutual Recognition Agreement (MRA) between the U.S. and the European Community comes into effect, it will address a limited number of items of fire protection, lifesaving, and navigation equipment. The MRA will make it possible for a manufacturer with a European Approval (MED/wheelmark) to obtain USCG approval for certain equipment covered by the MRA. This will be accomplished by permitting the "Notified Bodies" responsible for issuing approvals in Europe to issue USCG approval. Likewise, the USCG will be 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" will not be accepted in lieu of USCG approval.

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 mentioned above in the "General" section, the 1996 USCG Authorization Act allows the use of materials approved by or on behalf of other governments under certain circumstances. Because reciprocity is not required for structural fire protection materials, the USCG will accept structural fire protection materials that are approved by a foreign administration once the USCG has determined that a country's approval process is acceptable. There are two countries (Canada and Japan) that produce and approve structural fire protection materials that would be acceptable to the USCG. A key point is that the product must be manufactured in the country and approved by, or on behalf of, that country's administration. For example, a fire door manufactured in Korea and approved by Japan would not be acceptable.

As discussed above, the following structural fire protection materials approved by, or on behalf of, other governments (Canada and Japan) may be used in lieu of USCG type approved materials for ACP vessels:

Item	USCG Approval 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, & 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 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	A-Class	No	No
≥645 cm^2	A-Class	Yes	Yes
>645 cm^2	A-0	Yes	No
≤ 645 cm^2	B-15	No	No
>645 cm^2	B-15	No	Yes
Any dimension	B-0	No	No

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.

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-2/10.2.1.5 Fire Pumps, Fire Mains, Hydrants and Hoses – 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 Pumps, Fire Mains, Hydrants and Hoses – Fire Hoses

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 Pumps, Fire Mains, Hydrants and Hoses – Fire Hoses

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

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

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

Where two 40 mm (1.5 inch) hydrants and hoses are permitted in lieu of one 65 mm (2.5 inch) 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 Pumps, Fire Mains, Hydrants and Hoses – Nozzles

Nozzles must be USCG approved equipment.

Cite: II-2/10.4 & FSS Code Chapter 5 **Fixed Gas Fire-Extinguishing Systems – General**

Fixed gas fire extinguishing systems must be USCG approved equipment.

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

The fixed carbon dioxide system must comply with the manufacturer's approved Design, Installation, Operation and Maintenance Manual that meets Chapter II-2, Regulation 10.4 of SOLAS 2000 Amendments and the following supplemental requirements:

Quantity, Pipe Sizes and Discharge Rate

In dry cargo spaces, the number of kilograms of carbon dioxide required for each space shall be equal to the gross volume of the space in cubic meters divided by 1.873. The gross volume includes trunks extending from the space; however, tonnage openings may be considered sealed. Branch lines to various cargo holds and 'tween decks shall be sized as to ensure a uniform distribution over the space protected.

For CO_2 systems installed for enclosed ventilation systems of rotating electrical propulsion equipment, the number of kilograms of carbon dioxide required for the initial charge shall be equal to the gross volume of the system divided by 0.624 for systems having a volume of less than 57 cubic meters, and divided by 0.749 for systems having a volume of 57 cubic meters or more.

For CO_2 systems installed for enclosed ventilation systems of rotating equipment, in addition to the above there shall be sufficient carbon dioxide available to permit delayed discharges of such quantity as to maintain at least a 25% concentration until the equipment can be stopped. If the initial discharge is such as to achieve this concentration until the equipment is stopped, no delayed discharge need be provided.

For machinery spaces, tanks, pumprooms, paint lockers and similar spaces, any fixed gas fire extinguishing system used to protect these spaces must comply with the requirements of SOLAS Chapter II-2, Regulation 10.4.1.1.1

For spaces specially suitable for vehicles, any fixed gas fire extinguishing system used to protect these spaces must comply with the requirements of SOLAS Chapter II-2, Regulation 20.6.1.1

Controls

If the same cylinders are used to protect more than one space, a manifold with normally closed stop valves shall be used to direct the carbon dioxide into the proper space. If the cylinders are used to protect only one space, a normally closed stop valve shall be installed between the cylinders and the space except for systems for protection of machinery spaces, pumprooms, paint lockers and similar space which contain not more than 130 kilograms of carbon dioxide.

Distribution piping to dry cargo spaces shall be controlled from not more than two stations. One of the stations controlling the system for the main machinery space shall be located as convenient as practicable to one of the main escapes from the space. All control stations and the individual valves and controls shall be distinctly marked to indicate the compartments or parts of the vessel to which they lead.

Systems for protection of machinery spaces, pumprooms, paint lockers and similar spaces shall be actuated at each station by one control operating the valve to the space and a separate control releasing at least the required amount of carbon dioxide. These two controls shall be located in a box or other

enclosure clearly identified for the particular space. Systems installed without a stop valve shall be operated by one control releasing at least the required amount of carbon dioxide.

Where provisions are made for the simultaneous release of a given amount of carbon dioxide by operation of a remote control, provisions shall also be made for manual control at the cylinders. Where gas pressure from pilot cylinders is used as a means for releasing the remaining cylinders, not less than two pilot cylinders shall be used for systems consisting of more than two cylinders. Each of the pilot cylinders shall be capable of manual control at the cylinder, but the remaining cylinders need not be capable of individual manual control.

Systems for machinery spaces, pumprooms and similar type spaces, which are of more than 130 kilograms of carbon dioxide shall be fitted with an approved delayed discharge so arranged that an approved audible alarm will be automatically sounded for at least 20 seconds before the carbon dioxide is released into the space. Such systems of not more than 130 kilograms of carbon dioxide shall also have a similar delayed discharge, except for spaces which have a suitable horizontal escape. The alarm shall depend on no source of power other than the carbon dioxide. In systems where an alarm is required, the alarm shall be conspicuously and centrally located. Adjacent to all carbon dioxide extinguishing alarms there shall be conspicuously marked: "WHEN ALARM SOUNDS VACATE AT ONCE. CARBON DIOXIDE BEING RELEASED."

All distribution valves and controls shall be approved equipment. All controls shall be suitably protected.

On systems in which the CO_2 cylinders are not within the protected space the instructions shall also include a schematic diagram of the system and instructions detailing alternate methods of discharging the system should the manual release or stop valve fail to operate. Each control valve to a branch line shall be marked to indicate the space served.

If the space or enclosure containing the CO_2 supply or controls is to be locked, a key to the space or enclosure shall be in a break-glass type box conspicuously located adjacent to the opening.

Piping

The piping, valves and fittings shall have a bursting pressure of not less than 41 N/mm^2 (6000 psi).

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

Installation test requirements are as follows:

> Upon completion of the piping installation, and before the cylinders are connected, a pressure test in accordance with the manufacturer's Design, Installation, Operation, and Maintenance Manual shall be conducted. Only CO_2 or other inert gas shall be used for this test.

Carbon Dioxide Storage

All cylinders used for storing carbon dioxide must be fabricated, tested, and marked in accordance with 46 CFR 147.60 and 46 CFR 147.65.

Discharge Outlets

Discharge outlets shall be listed or approved by an independent testing laboratory.

Enclosure Openings

In all spaces protected by a carbon dioxide system, except cargo spaces, stopping of the ventilating fans is to be automatically actuated upon operation of the carbon dioxide system. This will not be required where the carbon dioxide system is a secondary system in addition to another approved primary system protecting the space.

Pressure Relief

Where necessary, relatively tight compartments such as refrigeration spaces, paint lockers, etc., shall be provided with suitable means for relieving excessive pressure accumulating within the compartment when the carbon dioxide is injected.

Markings

CO_2 fire smothering apparatus shall be marked "CO_2 FIRE APPARATUS" in not less than 50 mm (2 inch) red letters.

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

Fire extinguishers must be USCG type-approved equipment.

Cite: II-2/10.5.4 **Fire-Extinguishing Arrangements in 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

.

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

Where a water spray system is installed for protection of lamp lockers, paint lockers, or pumprooms, it shall comply with Regulation II-2/10, and the following:

Capacity and Arrangement

The spacing of the spray nozzles shall be on the basis of the spray pattern provided by the lowest pressure at any spray nozzle in the system. In no instance shall a system be designed for any spray nozzle to be operated at a pressure less than that for which it was approved. The maximum permissible height of the spray nozzle above the protected area shall not exceed that specified in its approval. Whenever there are obstructions to coverage by the spray patterns, additional spray nozzles shall be installed to provide full coverage.

If a fire pump is used to supply water to the water spray system it is to be sized to provide the quantity of water required for operation of the water spray system while simultaneously supplying the required water to the fire main system.

Controls

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

Piping

All piping, valves and fittings shall meet the applicable requirements of Section 4/6 of the ABS Steel Vessel Rules as modified by this supplement.

Distribution piping shall be of materials resistant to corrosion, except that steel or iron pipe may be used if inside corrosion resistant coatings which will not flake off and clog the nozzles are applied. Materials readily rendered ineffective by heat of a fire shall not be used.

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

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

Threaded joints shall be metal to metal, with no thread compound used.

Distribution piping shall be used for no other purpose.

All piping shall be thoroughly cleaned and flushed before installation of the water spray nozzles.

Spray nozzles shall be of an approved type.

Markings

The control cabinets or spaces containing valves or manifolds shall be distinctly marked in conspicuous red letters at least 50 mm (2 in) high – "WATER SPRAY FIRE APPARATUS."

Cite: II-2/10.6, II-2/10.7 & FSS Code Chapter 8 **Automatic Sprinkler, Fire Detection and Fire Alarm Systems**

Automatic sprinkler systems are also to comply with National Fire Protection Association (NFPA) Standard 13-1996. Where SOLAS Reg. II-2/10.6 and NFPA Std. 13 have similar requirements, the higher standard is to be satisfied. The following supplemental requirements are applicable:

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

All wiring and electrical circuits and equipment shall meet the applicable requirements of Section 4/5 of the ABS Steel Vessel Rules and this supplement.

All piping, valves, fittings, pressure tanks, etc. must meet the applicable requirements of Sections 4/2 and 4/6 of the ABS Steel Vessel Rules as modified by this supplement.

The fire detecting and manual alarm, automatic sprinkler, and smoke detecting alarm bells in the engine room shall be identified by at least 25 mm (1 in) red lettering "FIRE ALARM", "SPRINKLER ALARM", or "SMOKE DETECTING ALARM" as appropriate. Where such alarms on the bridge or in the fire

control station do not form a part of an easily identifiable alarm cabinet, the bells shall be suitably identified as above.

The control cabinets or spaces containing valves or manifolds shall be distinctly marked in conspicuous red letters at least 50 mm (2 inch) high "AUTOMATIC SPRINKLING SYSTEM."

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

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 that has conductors for more than one zone must be watertight.

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. 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.

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 m^2 (3000 square feet).

(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, the detecting cabinet and alarms must be of an approved type.

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-2/7.2 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 (1/2 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-2/10.10.3 Fireman's Outfit

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

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.

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

In accordance with 46 CFR 127.220, the space around the emergency source of power is required to be of "A-60" construction:

(a) Except as provided in paragraph (b), when a compartment containing the emergency source of electric power, or vital components of that source, adjoins a space containing either the ship's service generator or machinery necessary for the operation of the ship's service generator, each common bulkhead and deck must be of "A-60" Class construction.

(b) The "A-60" Class construction required by paragraph (a) is unnecessary if the emergency source of electrical power is in a ventilated battery locker that:

1. Is located above the main deck;
2. Is located in the open; and
3. Has no boundaries contiguous with other decks or bulkheads

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 sq. meters 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 meters. The angle of inclination with the horizontal of such stairways shall not exceed 50 degrees.

Cite: II-2/10.4 & FSS Code Chapter 14 **Fixed Deck Foam Systems**

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".

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

Cite: III/3 **Definitions**

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

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

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

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

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

"Seagoing condition" means the operating condition of the ship with the personnel, equipment, fluids and ballast necessary for safe operation on the waters where the ship operates. For bottom-bearing mobile offshore drilling units, the term also applies in the bottom-bearing mode, but the "lightest seagoing condition" is considered to be the highest anticipated operating condition.
"Survival craft" means a craft capable of sustaining the lives of persons in distress after abandoning the ship on which they were carried. The term includes lifeboats, liferafts, buoyant apparatus, and life floats, but does not include rescue boats.

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

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

Life-saving appliances 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.

As mentioned above in the “General” section, the 1996 USCG Authorization Act allows the use of materials approved by or on behalf of other governments under certain limited circumstances. In the case of life-saving appliances, there must be a reciprocal agreement in place with another country before equipment approved by that country can be used on a U.S. vessel. Pending finalization of the US-EU MRA, interim reciprocal acceptance agreements have been established with Germany (free-fall lifeboats and associated launching appliances only) and Norway (all life-saving equipment). These agreements require that the equipment be manufactured within the country that approved it. A copy of the USCG acceptance letter must be provided with each piece of equipment supplied to a U.S. flag ship under these interim agreements.

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

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.

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 Officer in Charge of Marine Inspection (OCMI) for use on the ship.

Cite: III/6 Communications

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

Cite: III/7 Personal Life-Saving Appliances

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

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

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

Each lifejacket, immersion suit, and anti-exposure suit container must be marked in block capital letters and numbers with the quantity, identity, and size of the equipment stowed inside the container. The equipment may be identified in words or with the appropriate symbol from IMO Resolution A.760(18).

Cite: III/8 Muster List and Emergency Instructions

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

Cite: III/11 Survival Craft Muster and Embarkation Arrangements

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

Cite: III/13 Stowage of Survival Craft

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

(i) is outboard of the rail or bulwark,

(ii) is on stanchions or on a platform adjacent to the rail or bulwark, or

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

Cite: III/18 Line-Throwing Appliances

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

(1) if other than manila, has a breaking strength of at least 40 kN (9,000 lb);

(2) if other than manila, is of a dark color or of a type certified to be resistant to deterioration from ultraviolet light; and

(3) is at least 450 m (1,500 ft) long.

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

Cite: III/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 degrees north and 32 degrees south latitude regardless of whether it has totally enclosed lifeboats

Cite: III/33 Survival Craft Embarkation and Launching Arrangements

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

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

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 meters per second (256 feet per minute).

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 millimeters (1 foot) above the deck.

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

D. Radiocommunications

Cite: IV/7.1.6 Radiocommunications – Application

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

E. Safety of Navigation

Cite: V/22 Navigation Bridge Visibility

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

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

(see Addendum 1 for additional requirements pertaining to OSV's)

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

A. Diving Support Systems

Diving support systems must meet the following requirements:

(a) Piping for diving installations which is permanently installed on the vessel must meet the requirements of subpart B (Commercial Diving Operations) of 46 CFR part 197.

(b) Piping internal to a pressure vessel for human occupancy (PVHO) must meet the requirements of subpart B of 46 CFR part 197.

B. Accommodations for Officers and Crew

1. Application

(a) The provisions of this section, with the exception of paragraph 13, shall apply to all vessels other than tankships of 100 gross tons and over contracted for on or after November 19, 1952. Vessels other than tankships of 100 gross tons and over contracted for prior to November l9, 1952, shall meet the requirements of paragraph 13.

(b) Vessels other than tankships of less than 100 gross tons shall meet the applicable requirements of this section insofar as is reasonable and practicable.

(c) The provisions of this section, with the exception of paragraphs 14 and 15, apply to all tankships of 100 gross tons and over constructed on or after June 15, 1987.

(d) Tankships of less than 100 gross tons and manned tank barges must meet the requirements of paragraph 14.

(e) Tankships of 100 gross tons and over constructed prior to June 15, 1987, must meet the requirements of paragraph 15.

2. Intent

(a) It is the intent of this section that the accommodations provided for officers and crew on all vessels shall be securely constructed, properly lighted, heated, drained, ventilated, equipped, located, arranged, and, where practicable, shall be insulated from undue noise and effluvia.

(b) The crew referred to herein includes all persons, except the licensed officers, regularly employed on board any vessel. Where the requirements for the accommodation of licensed officers are not otherwise specified, they shall be of at least equivalent to that indicated herein for the crew.

(c) For the purpose of this subpart, the term "crew spaces" shall include sleeping rooms, messrooms, recreational rooms, toilet and shower spaces, etc., which are intended for the exclusive use of the crew.

3. Location of Crew Spaces

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

(b) Crew quarters shall not be located farther forward in a vessel than a vertical plane located at 5 percent 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. For the purpose of this paragraph, the length shall be as defined in CFR 42.13-15 of subchapter E (Load Lines). No section of the deck of the crew spaces shall be below the deepest load line, except that in special cases, on vessels other than tankships, such an arrangement may be approved provided that in no case shall the deck head of the crew space be below the deepest load line.

(c) Hawse pipes or chain pipes shall not pass through crew spaces.

(d) There shall be no direct communication, except through solid, close fitted doors or hatches between crew spaces and chain lockers, cargo, stowage or machinery spaces.

(e) There shall be no access, vents, or sounding tubes from fuel or cargo oil tanks opening into crew spaces, except that sounding tubes and access openings may be located in corridors.

(f) Where practicable, crew spaces shall be located entirely separate and independent of spaces allotted to passengers or licensed officers.

4. Construction

(a) All crew spaces are to be constructed in a manner suitable to the purpose for which they are intended. The bulkheads separating the crew space from cargo and machinery spaces, lamp and paint rooms, storerooms, drying rooms, washrooms, and toilet spaces shall be made odorproof.

(b) Toilet spaces, except when provided as private or semiprivate facilities, shall be so built, fitted, and situated, that no odor from them will readily enter other crew spaces.

(c) Where the shell or unsheathed weather decks form boundaries of crew spaces, suitable protective coverings shall be applied to prevent formation or accumulation of moisture.

(d) Where crew spaces adjoin or are immediately above spaces such as galleys machinery spaces or casings, donkey boilerrooms, etc., they shall be suitably protected from the heat and noise.

(e) The interior sides and deckheads of crew spaces shall be covered with enamel, paint, or other material light in color.

(f) Crew spaces shall be properly drained where considered necessary.

(g) All washrooms and toilet rooms shall be properly drained and so constructed and arranged that they can be kept in a clean, workable, and sanitary condition. The scuppers shall be located in the lowest part of the space, due consideration being given to the average trim of the vessel.

5. Sleeping Accommodations

(a) Arrangements

(1) Separate sleeping accommodations are to be provided for the deck, engine, and steward groups of the crew.

(2) Each watch of seamen, firemen or similar ratings on duty in watches is to be provided with separate sleeping room or rooms, unless the total space for accommodations makes this impracticable.

(3) Where practicable, each licensed officer shall be provided with a separate stateroom.

(b) Size

(1) Sleeping accommodations for the crew shall be divided into rooms, no one of which shall berth more than four persons. Except on passenger ships requiring a large number of personnel in the steward's department, rooms may be arranged to accommodate not more than 10 such persons.

(2) Each room shall be of such size that there are at least 30 square feet of deck area and a volume of at least 210 cubic feet for each person accommodated. The clear headroom shall be not less than 6 ft 3 in. In measuring sleeping quarters allocated to crews of vessels, any equipment contained therein for the use of the occupants is not to be deducted from the total volume or from the deck area.

(c) Equipment

(1) Each person shall have a separate berth and not more than one berth shall be placed above another. The berths shall have a framework of metal or other hard, smooth material not likely to corrode or harbor vermin, and shall be so arranged that they provide ample room for easy occupancy. The overall size of a berth shall not be less than 30 inches wide by 76 inches long, except by special permission of the Commandant, USCG. Where berths adjoin, they shall be divided by a partition not less than 18 inches in height. Where two tiers of berths are fitted, the bottom of the lower must not be less than 12 inches above the deck, and the bottom of the upper must not be less than 2 ft 6 in both from the bottom of the lower and from the deck overhead. The berths shall not be obstructed by pipes, ventilating ducts, or other installations.

(2) A locker of metal or other hard, smooth material shall be provided for each person accommodated in a room. Each locker shall be not less than 300 square inches in cross section area and 60 inches high. It shall be so placed as to be readily accessible. The interior of the locker shall be so arranged as to facilitate the proper stowage of clothes.

6. Wash Spaces, Toilet Spaces; and Shower Spaces

(a) For the purposes of this section

(1) Private facility means a toilet, washing, or shower space that is accessible only from one single or double occupancy sleeping space;

(2) Semiprivate facility means a toilet, washing, or shower space that is accessible from one or two one-to-four person occupancy sleeping spaces; and

(3) Public facility means a toilet, washing, or shower space that is not private or semiprivate.

(b) Each private facility must have one toilet, one shower, and one washbasin, all of which may be in a single space.

(c) Each semiprivate facility must have at least one toilet and one shower, which may be in a single space.

(d) Each room adjoining a semiprivate facility must have a washbasin if a washbasin is not installed in the semiprivate facility.

(e) Each tankship must have enough public facilities to provide at least one toilet, one shower, and one washbasin for each eight persons without private facilities.

(f) Urinals may be installed in toilet rooms, but no toilet required in this section may be replaced by a urinal.

(g) Each public toilet space and washing space must be convenient to the sleeping space that it serves.

(h) No public facility may open into any sleeping space.

(i) Each washbasin, shower, and bathtub must have hot and cold running water.

(j) Adjacent toilets must be separated by a partition that is open at the top and bottom for ventilation and cleaning.

(k) Public toilet facilities and shower facilities must be separated.

(1) Each public facility that is a toilet space must have at least one washbasin unless the only access to the toilet space is through a washing space.

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

(n) Washbasins may be located in sleeping spaces.

7. Messrooms

(a) Messrooms shall be located as near to the galley or suitably equipped serving pantry as is practicable, except where messroom is equipped with a steam table. The messrooms shall be of such size as to seat the number of persons normally scheduled to be eating at one time.

(b) Mess rooms shall be properly equipped with tables, seats, and other necessary equipment and shall be so arranged as to permit access to each seat

8. Hospital Space

(a) Except as specifically modified by paragraph (f) of this section, each vessel, which in the ordinary course of its trade makes voyages of more than 3 days duration between ports and which carries a crew of 12 or more, shall be provided with a hospital space. This space shall be situated with due regard to the comfort of the sick so that they may receive proper attention in all weathers.

(b) The hospital shall be suitably separated from other spaces and shall be used for the care of the sick and for no other purpose.

(c) The entrance shall be of such width and in such a position as to admit a stretcher case readily. Berths shall be of metal and may be in double tier, provided the upper berth is hinged and arranged to be secured clear of the lower berth when not in use. At least one berth shall be so arranged that it can be made accessible from both sides when necessary.

(d) The hospital shall be fitted with berths in the ratio of one berth to every twelve members of the crew or portion thereof who are not berthed in single occupancy rooms, but the number of berths need not exceed six.

(e) The hospital shall have a toilet, washbasin, and bath tub or shower conveniently situated. Other necessary suitable equipment of such character as clothes locker, table, seat, etc., shall be provided.

(f) On vessels in which the crew is berthed in single occupancy rooms a hospital space will not be required: *Provided*, that one room shall be designated and fitted for use as a treatment and/or isolation room. Such room shall meet the following standards:

(1) The room must be available for immediate medical use;

(2) The room must be accessible to stretcher cases;

(3) The room must have a single berth or examination table so arranged that it can be made accessible from both sides when necessary; and,

(4) A washbasin with hot and cold running water must be installed either in or immediately adjacent to the space and other required sanitary facilities must be conveniently located.

9. Other Spaces

   (a) Sufficient facilities, depending upon the number of the crew, shall be provided where the crew may wash their own clothes. There shall be at least one tub or sink fitted with the necessary plumbing, including hot and cold running water.

   (b) Clothes drying facilities or space shall be provided for the needs of the crew.

   (c) Recreation accommodations shall be provided. Where messrooms are used for this purpose, they shall be suitably planned.

   (d) A space or spaces of adequate size shall be available on an open deck to which the crew has access when off duty.

10. Lighting

   (a) All crew spaces shall be adequately lighted.

   (b) Berth lights shall be provided for each member of the crew.

11. Heating

   (a) All crew spaces shall be adequately heated in a manner suitable to the purpose of the space.

   (b) The heating system will be considered satisfactory if it is capable of maintaining a minimum temperature of 70° F. under normal operating conditions without undue curtailment of the ventilation.

   (c) Radiators and other heating apparatus shall be so placed, and where necessary shielded, as to avoid risk of fire, danger or discomfort to the occupants. Pipes leading to radiators or heating apparatus shall be insulated where those pipes create a hazard to persons occupying the space.

12. Insect Screens

   (a) Except in such areas as are considered to be insect free, provisions shall be made to protect the crew quarters against the admission of insects. This may be accomplished by the fitting of suitable screens to ventilating skylights, airports, ventilators, and doors to unscreened spaces and the open deck or by other methods. Insect screens are not required in air conditioned crew quarters for windows, air ports, and doors that are normally kept closed.

13. For all vessels other than tankships contracted for prior to November 19, 1952.

   (a) Vessels of less than 100 gross tons, contracted for prior to November 19, 1952, shall meet the general intent of paragraph and in addition shall meet the following requirements:

      (1) Existing structure, arrangements, materials, and facilities, previously accepted or approved will be considered satisfactory so long as they are maintained in a suitable condition to the satisfaction of the Surveyor. Minor repairs and alterations may be made to the same standard as the original construction.

(b) Vessels of 100 gross tons and over, contracted for prior to March 4, 1915, shall meet the requirements of this paragraph.

(1) Existing structure, arrangements, materials, and facilities, previously approved will be considered satisfactory so long as they are maintained in good condition to the satisfaction of the Surveyor. Minor repairs and alterations may be made to the same standard as the original construction: *Provided*, that in no case will a greater departure from the standards of paragraphs 2 through 12 be permitted than presently exists.

(c) Vessels of 100 gross tons and over, contracted for on or after March 4, 1915, but prior to January 1, 1941, shall meet the requirements of this paragraph.

(1) Existing structure, arrangements, materials, and facilities, previously approved will be considered satisfactory so long as they are maintained in a suitable condition to the satisfaction of the Surveyor. Minor repairs and alterations may be made to the same standard as the original construction.

(2) Where reasonable and practicable, a minimum of one toilet, shower, and washbasin shall be provided for each 10 members of the crew or fraction thereof.

(3) Crew spaces shall have a volume of at least 120 cubic feet and a deck area of at least 16 square feet for each person accommodated.

(4) Each crewmember shall have a separate berth, and berths may not be placed more than two high.

(5) Each vessel, which in the ordinary course of its trade makes a voyage of more than three days' duration between ports and which carries a crew of 12 or more persons, shall be provided with a suitable hospital space for the exclusive use of the sick or injured. Berths shall be provided in the ratio of one berth for each twelve members of the crew or fraction thereof, but the number of berths need not exceed six.

(6) The crew spaces shall be securely constructed, properly lighted, heated, drained, ventilated, equipped, located, and arranged, and where practicable, shall be insulated from undue noise and effluvia.

(d) Vessels of 100 gross tons and over, contracted for on or after January 1, 1941, but prior to November 19, 1952, shall meet the requirements of this paragraph.

(1) Existing structure, arrangements, materials, and facilities, previously approved will be considered satisfactory so long as they are maintained in a suitable condition to the satisfaction of the Surveyor. Minor repairs and alterations may be made to the same standard as the original construction.

(2) Washrooms and Toilet Rooms:

(i) There shall be a minimum of one toilet, shower, and washbasin for each 8 members of the crew or fraction thereof who are not accommodated in rooms having attached private or semiprivate facilities.

(ii) Separate facilities shall be provided for the engine room, deck, or stewards department when the number of crew in that department, exclusive of officers, exceeds 8.

(iii) Toilet rooms shall be separate from the wash rooms. At least one washbasin shall be installed in each toilet room.

(iv) Toilets shall be provided with seats of the open front type. Urinals may be fitted in toilet rooms, if desired, but no reduction will be made in the required number of toilets.

(v) Washbasins, showers, and bath tubs if substituted for showers, shall be equipped with proper plumbing including hot and cold running water.

(3) Crew spaces shall have a volume of at least 120 cubic feet and a deck area of at least 16 square feet for each person accommodated.

(4) Each crewmember shall have a separate berth, and berths may not be placed more than two high.

(5) Each vessel, which in the ordinary course of its trade makes a voyage of more than three days duration between ports and which carries a crew of 12 or more persons, shall be provided with a suitable hospital space for the exclusive use of the sick or injured. Berths shall be provided in the ratio of one berth for each 12 members of the crew or fraction thereof, but the number of berths need not exceed six.

(6) The crew spaces shall be securely constructed, properly lighted, heated, drained, ventilated, equipped, located, and arranged, and where practicable, shall be insulated from undue noise and effluvia.

14. Crew accommodations on tankships of less than 100 gross tons and manned tank barges

(a) The crew accommodations on all tankships of less than 100 gross tons and all manned tank barges must have sufficient size and equipment, and be adequately constructed to provide for the protection of the crew in a manner practicable for the size, facilities, and service of the tank vessel.

(b) The crew accommodations must be consistent with the principles underlying the requirements for crew accommodations on tankships of 100 gross tons or more.

15. Crew accommodations on tankships constructed before June 15, 1987

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

C. Passenger Spaces

1. Ventilation

Passenger Spaces are to be provided with adequate ventilation.

D. Navigation Safety Requirements that Apply to All Vessels

This section applies to all self propelled vessels over 1600 G. T. 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 G.T. 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 kts 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:

   - Turning Circle Diagram to both port and starboard.
   - Time, distance, advance, transfer to alter course 90 deg 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) & 33 CFR 164.33(3)(ii) Charts and Publications

1. Application

(a) The provisions of this section apply to all self propelled vessels over 1600 G.T. 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 G.T. 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) 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)

E. 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.26) outlined in IMO Res. MEPC.86(44) can only be approved by the U.S. Coast Guard (G-MOR)

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

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

Cite: 33 CFR 155.210 Discharge Removal Equipment for Vessels Less Than 400 Feet in Length

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

Cite: 33 CFR 155.225 Internal Cargo Transfer Capability

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

Cite: 33 CFR 155.230 Emergency Towing Capability for Oil Barges

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

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

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

1/2 bbl for lines no more than 2"
1 bbl for lines more than 2" up to 4"
2 bbl for lines no less than 4" up to 6"
3 bbl for lines no less than 6" up to 12"
4 bbl for lines 12" 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 g.t. or more but less than 1600 g.t.
1 bbl for vessels 1600 g.t. or more

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

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

Cite: 33 CFR 155.450 Placard

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

Cite: 33 CFR 155.780 Emergency Shutdown

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

Cite: 33 CFR 155.790 Deck Lighting

Tank vessels must have a means of illuminating the deck in transfer operation work areas – 1.0 foot candle measured 3 feet above the deck – and at transfer connections – 5.0 foot candle measured 3 feet 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 150 psi. Hose flanges must meet ANSI B16.5 or B16.24. The hoses must be marked with the MAWP, type of service, date of manufacture and the date of the last pressure test. The date of manufacture and the date of the last pressure test may be recorded in lieu of being marked on the hoses.

Cite: 33 CFR 155.1010 Response Plans – Purposes

Applies to tank vessels without regard so size. (Reg 26 applies to tank vessels greater than 150 g.t. and all vessels greater than 400 g.t.) Applies to discharges of oil. (Reg 26 applies to all discharges of oil.) Requires formal agreements for spill notification and cleanup. (Reg 26 requires only shipboard procedures and a shoreside contact.) Requires a geographic specific appendix for U.S. ports. (Reg 26 requires a world wide list.)

Cite: 33 CFR 157.03(n) Definition – Oil

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

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

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

Cite: 33 CFR 157.10d Double Hulls on Tank Vessels

U.S. dates for required double hull construction are three (3) years earlier than Reg 13F.

There is no minimum tonnage limit for applicability to vessels. (Reg 13F applies for vessels greater than 5000 dwt.)

Cite: 33 CFR 157.12 Cargo Monitor and Control System

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

Cite: 33 CFR 157.15 Slop Tanks in Tank Vessels

The oil-water detectors installed on slop tanks are to be USCG approved equipment.

Cite: 33 CFR 157.21 Subdivision and Stability

For U.S. Flag vessels, MARPOL damage stability requirements are applicable to the following vessels:

(a) New vessels delivered after 31 December 1977

(b) New vessels contracted after 31 December 1974, and

(c) New vessels whose keels were laid (or similar stage of construction) after 30 June1975

New (defined in 157.03i) applies to vessels as under contract, constructed, or completed between 1975/1976/1979. (Reg 1(26) defines "new" as four (4) years later.

Interpretation: MARPOL Reg 13(5)

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

Interpretation: MARPOL Reg 13F(4)
Prevention of oil pollution in the event of collision or stranding. Mid-deck tankers: The U.S. has not ratified that the mid-deck design is equivalent to a double hull.

Interpretation: MARPOL Reg 13G
Prevention of oil pollution in the event of collision or stranding. Determinations by the Administration: The Commandant, USCG, makes determinations on behalf of the U.S.

Interpretation: MARPOL Reg 25(1)(c)
Subdivision and Stability. Stability for vessels under 100 m: The Commandant, USCG, makes determinations concerning the relaxation requirements for vessels less than 100 m if the standards for a vessel 150 m or longer would impair the operational qualities of the ship.

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 (G-MOR)

ANNEX III (no differences)

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

Cite: 33 CFR 159 Marine Sanitation Devices (MSDs)

All vessels must be installed with either an operable MSD which controls the discharged fecal coliform bacteria count not greater than 200 per 100 ml and the suspended solids not greater than 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 40 ft. must keep records of garbage disposal.

Cite: 33 CFR 151.57 Garbage Pollution – Waste Management Plans

U.S. ships over 40 ft. with galleys must have a waste management plan.

Cite: 33 CFR 151.59 Garbage Pollution – Placards

U.S. ships over 26 ft. must have placards describing prohibited waste discharges.

IV. SURVEYS AFTER CONSTRUCTION

AMERICAN BUREAU OF SHIPPING

CHECK SHEET ON ACP CLASSIFICATION SURVEYS
ALTERNATE COMPLIANCE AND THE US SUPPLEMENT TO ABS RULES TO BE DONE IN CONJUNCTION WITH INITIAL, MAS, AND RENEWAL SLC SURVEYS

VESSEL _____ ABSID _____

Associated REPORT NO. _____ DATE _____

		YES	NO	N/A
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 Procedure dated _____ and found satisfactory.	☐	☐	☐
3.	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.	☐	☐	☐
4.	Throttle control apparatus was demonstrated in manual and power modes at all stations and related alarms and trips were verified operational.	☐	☐	☐
5.	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.	☐	☐	
6.	Draft marks, vessel name and hailing port were accurately affixed and displayed.	☐	☐	
7.	Machinery space tank tops and bilges were examined for accumulation of oil or other substances that. could pose a fire hazard. Unsafe conditions were corrected	☐	☐	
8.	Power operated trucks were marked with testing laboratory mark designation as specified in 46 CFR 35.70-74 and 46 CFR 78.80 or 46 CFR 97.70-7 as applicable and suitable for the hazard classification in the space employed.	☐	☐	☐
9.	An operational test was conducted of the main and emergency bilge pump suctions.	☐	☐	
10.	The main and auxiliary piping systems were examined externally and found free of apparent leakage. 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.	☐	☐	
11.	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.	☐	☐	
12.	The crew did not report, nor did I see any unsafe or unsanitary conditions of a concern.	☐	☐	

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.

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Surveyor

AMERICAN BUREAU OF SHIPPING

CHECK SHEET ON ACP STATUTORY SURVEYS
ALTERNATE COMPLIANCE AND THE US SUPPLEMENT TO ABS RULES TO BE DONE IN CONJUNCTION WITH INITIAL, MAS, AND RENEWAL SLE SURVEYS

VESSEL _____ ABSID _____

Associated REPORT NO. _____ DATE _____

		YES	NO	N/A
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). **The Safety Equipment Certificate may not be issued or endorsed if this is not done.**		☐	☐
Life raft Servicing				
	Note: New Regulations have been published regarding the servicing of life rafts. USCG field offices perform initial service facility approval and periodic spot checks, but third parties may be substituted. A new sticker system on the life raft itself should be used in conjunction with the certificate to determine proper servicing.			
2.	Life raft certificates indicate current servicing by a USCG approved facility. The information must contain the port of servicing (record here) _____ and the date of servicing (record here) _____. **Lack of certification is a No Sail item and the local OCMI must be contacted.**	☐	☐	
Lifeboat Operational Tests				
3.	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.)	☐	☐	
	Note: 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: Note: The USCG will accept load tests done by ABS.			
4.	Each motor lifeboat and hand-propelled boat was operated at full speed both ahead and astern.	☐	☐	
5.	Each installed system, such as any powered bilge pump or water spray system, was successfully operated.	☐	☐	
6.	Compass readings were compared with several known bearings.	☐	☐	
7.	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.			
8.	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.			
9.	Batteries for engine starting and searchlights have a means for recharging, which are in satisfactory condition.	☐	☐	
10.	The condition and quantity of survival equipment was checked as per the standard ABS check sheets.	☐	☐	

VESSEL _____ ABSID _____

Associated REPORT NO. _____ DATE _____

Advice for Lifeboat Weight Tests

The USCG has requirements in addition to SOLAS. The USCG requires weight testing of the lifeboats during each inspection for certification and whenever the falls are turned end-for-end or renewed. The primary references for USCG lifeboat testing and inspection are:
(1) Title 46, Code of Federal Regulations Part 199.45 and
(2) Marine Safety Manual, Vol. 11, Section 6.R

The CFR contains the performance standard required, while the process used to verify compliance with the standard 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.

Tests and Inspections Required

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 whenever the falls are turned end-for-end or renewed. During an inspection for initial or renewal of SLE, any portion of the load test conducted in connection with replacement or end-for-ending a fall since the vessel's previous inspection for initial or renewal of SLE need not be repeated.

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 specially important on older installations to test the condition of rollers, bushings, bearings, and other rolling and sliding parts.

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.

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.

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.

The undersigned confirms this vessel is in compliance with all the above.

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Surveyor

AMERICAN BUREAU OF SHIPPING

ACP ENVIRONMENTAL SURVEYS
ALTERNATE COMPLIANCE AND THE US SUPPLEMENT TO ABS RULES TO BE DONE IN CONJUNCTION WITH INITIAL, MAS, AND RENEWAL MARPOL SURVEYS

VESSEL _____ ABSID _____

Associated REPORT NO. _____ DATE _____

		YES	NO	N/A
1.	Marine Portable Tanks (MPTs), were labeled showing compliance with IM 101, IM 102, or exemption issued according to 49 CFR 107 (Subpart B) and installed and tested IAW 46 CFR 64.	☐	☐	☐
2.	The Vessel's Fuel and Bulk Oil Containment arrangements were examined and found to be in compliance with 33 CFR 155.320.	☐	☐	☐
3.	The Vessel's Oil Placards indicating that discharge of oil is prohibited were examined and found in each machinery space and at control stations for ballast and bilge controls.	☐	☐	☐
4.	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.	☐	☐	☐
5.	Cargo Discharge Containment arrangements were examined and found to be in compliance with 33 CFR 155.310.	☐	☐	☐
6.	Emergency Shutdown of cargo transfers within the vessel was examined and found to be in compliance with 33 CFR 155.780.	☐	☐	☐
7.	On tank vessels, is the illumination of the deck in transfer operation work areas and at transfer connections at least 1.0 foot candle measured 3 feet above the deck?	☐	☐	☐
8.	Cargo Transfer Hose testing was witnessed or an affidavit sighted from a responsible individual, that hoses had been hydrostatically tested and marked according to 33 CFR 155.800. Pipe and manifold labeling was checked for accuracy and legibility.	☐	☐	☐
9.	Tank Vessel's approved OPA Vessel Response Plan complying with 33 CFR 155.1010 was verified onboard.	☐	☐	☐
10.	The Vessel was verified to be keeping Garbage Disposal Records required by 33 CFR 151.55.	☐	☐	☐
11.	The Vessel's approved Waste Management Plan complying with 33 CFR 151.57 was verified onboard.	☐	☐	☐
12.	Placards describing prohibited waste discharges as required by CFR 151.59 were verified as posted.	☐	☐	☐
13.	Vessel's approved shipboard oil pollution emergency plan (SOPEP) (MARPOL ANNEX 1, REGULATION 26), was verified on board.	☐	☐	☐
14.	Tank Vessel of length 400 feet or greater was examined and found to have Oil Discharge Removal Equipment complying with 33 CFR 155.205 for on-deck spills up to 12 bbl stowed in marked location.	☐	☐	☐
15.	Tank Vessel of length less than 400 feet was examined and found to have Oil Discharge Removal Equipment complying with 33 CFR 155.210 for on-deck spills up to 7 bbl stowed in marked location.	☐	☐	☐
16.	Vessel was examined and found to have oil discharge removal equipment complying with 33 CFR 155.220 (Permit issued or NLS Certificate issued) and COI authorized C and D NLS Cargoes.	☐	☐	☐
17.	Tank Vessel's Cargo Internal Transfer Equipment was examined and found to be in compliance with 33 CFR 155.225.	☐	☐	☐
18.	Vapor control systems were examined for compliance with 46 CFR 39, and a representative sample of alarms were tested and found to be in proper operation.	☐	☐	☐

NOTE: Tank Vessel carrying animal fats and "other oils" are considered as a vessel carrying "oil" in accordance with 33 CFR 157.03(n).

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Surveyor

V. SURVEYS DURING CONSTRUCTION

ALTERNATE COMPLIANCE AND THE US SUPPLEMENT TO ABS RULES TO BE DONE IN CONJUNCTION WITH ISSUANCE OF THE INTERIM CLASSIFICATION CERTIFICATE AND CHECK SHEETS B, C AND D

VESSEL _____ ABSID _____

Associated REPORT NO. _____ DATE _____

		YES	NO	N/A
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:			
	Qualitative Failure Analysis	☐	☐	☐
	Planned Maintenance Program	☐	☐	☐
	Test Procedures	☐	☐	☐
8.	Was the steering failure alarm tested and found satisfactory?	☐	☐	☐
9.	On tank vessels, were the additional requirements for cargo vapor emission control systems verified?	☐	☐	☐
10.	Were all required placards, instructions, and identification labels found to be in accordance with the supplement?	☐	☐	☐
11.	For tank vessels, the decks spill coaming between the cargo area and accommodation was verified to be at least 0.3 meters in height.	☐	☐	☐
12.	Are immersion suits and life jackets provided for each person on board plus additional suits and life jackets for designated watch or work stations.	☐	☐	☐
13.	The requirements for officer and crew accommodations were complied with.	☐	☐	☐
14.	Maneuvering information was posted prominently in the wheel house.	☐	☐	☐
15.	Are appropriate sized fixed containers fit under cargo hose connections and around fuel tank vents and fill connections?	☐	☐	☐

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Surveyor

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

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

Cite: II-1/8 Stability of Passenger Ships in Damaged Condition

MSC/Circ. 541 – Guidance notes on the integrity of flooding boundaries above the bulkhead deck of passenger ships should be followed for proper application of SOLAS Chapter II-1, Regulation 8 (Damage Stability) and Regulation 20 (Watertight Integrity of Passenger Ships).

Cite: II-1/15 Openings in Watertight Bulkheads in Passenger Ships

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

Cite: II-1/20 Watertight Integrity of Passenger Ships Above the Margin Line

Provisions of this regulation are mandatory.

Each opening in an exposed weatherdeck must have a coaming of at least 15.2 centimeters and a means for closing it weathertight.

MSC/Circ. 541 – Guidance notes on the integrity of flooding boundaries above the bulkhead deck of passenger ships should be followed for proper application of SOLAS Chapter II-1, Regulation 8 (Damage Stability) and Regulation 20 (Watertight Integrity of Passenger Ships).

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

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

Cite: II-2/13 Means of Escape

Stairways on new passenger ships shall comply with the following:

In no case shall lifts be considered as forming one of the required means of escape.

The two means of escape required by Regulation 13, paragraphs 3.2.1 and 3.2.2 shall be as remote as possible to minimize the possibility of one incident blocking both escapes. Vertical ladders and deck scuttles shall not in general be considered as one of the required means of escape.

However, where it is demonstrated that the installation of a stairway would be impracticable, a vertical ladder may be used as the second means of escape. Doors giving access to either of the two required means of escape shall not be lockable, except that crash doors or locking devices, capable of being easily forced in an emergency, may be employed provided that a permanent and conspicuous notice giving instructions on how to open the door or lock is attached to both sides of the door.

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

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

Readily accessible enclosed stairway is defined to mean it must either be in the MVZ or immediately adjacent to the zone such that entrance into the stairway does not require entering into the adjoining zone to gain access to the stairway.

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

Where a manual sprinkling system is installed for protection of vehicle decks, it shall comply with Regulation II-2/20.6, IMO Assembly Resolution A.123(V), and the following:

Capacity and Arrangement

The system shall be so designed and arranged that the overhead is effectively sprayed and all portions of the deck are covered. The capacity shall be such that at least 5 liters of water per square meter per minute are applied to all parts of the deck area.

Controls

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

Piping

All piping, valves and fittings shall meet the applicable requirements of Section 4/6 of the ABS Steel Vessel Rules as modified by this supplement.

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

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

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

Distribution piping shall be used for no other purpose.

Markings

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

Cite: II-2/20.6 & II-2/20.3.1.3 **Protection of Special Category Spaces**

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

Cite: III/21 **Survival Craft and Rescue Boats**

Each passenger vessel that is less than 500 tons gross tonnage and is certified to permit less than 200 persons on board may carry the following survival craft and rescue boat in lieu of the lifeboat/liferaft combination addressed in 1974 SOLAS as amended Chapter III/21.

(1) On each side of the vessel

(i) liferafts are carried with an aggregate capacity sufficient to accommodate the total number of persons on board and are stowed in a position providing for easy side-to-side transfer at a single open deck level; or

(ii) liferafts are carried with an aggregate capacity sufficient to accommodate 150 per cent of the total number of persons on board. If the required rescue boat is also a lifeboat, its capacity may be included to meet the aggregate capacity requirement.

(2) If the largest survival craft on either side of the vessel is lost or rendered unserviceable, there must be survival craft available for use on each side of the vessel, including those which are stowed in a position providing for side-to-side transfer at a single open deck level, with a capacity to accommodate the total number of persons on board.

Each passenger vessel of less than 500 tons gross tonnage must carry at least one rescue boat.

Cite: III/22 **Personal Life-Saving Appliances**

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

Cite: III/22.3 **Personal Life-Saving Appliances – Lifejacket Lights**

Passenger ships engaged on international and short international voyages are to be fitted with a lifejacket light approved under Approval Series 161.112.

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

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

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

Cite: III/23 Survival Craft and Rescue Boat Embarkation Arrangements

Each lifeboat on passenger vessels of 80 meters (262 feet) in length and upwards must be stowed where the after-end of the lifeboat is at least 1.5 times the length of the lifeboat forward of the vessel's propeller.

The height of the davit head of each davit when it is in position to launch the survival craft should, as far as practicable, not exceed 15 meters (49 feet) to the waterline when the vessel is in its lightest seagoing condition.

VII. RECORD OF REVISIONS

Introduction	Updated to indicate inclusion of Subchapter L. Also revised applicability criteria for Supplement, i.e. item G regarding Automation deleted – see Cite 4-9-1/1.	1 Jan. 2002
Section I		1 Jan. 2002
General	Cite references in the Table of Contents revised to agree with 2002 Edition of the Under 90M Rules.	
1-1-5/1	New cite to clarify requirements for cargo gear.	
4-3-3/11	New cite to clarify that full follow-up control is required for steering gear. This change brings Under 90M Supplement in line with same change made to Steel Vessel Rule (SVR) Supplement.	
4-4-2/7	New cite added to clarify plastic pipe & components must be USCG approved. Brings Under 90M Supplement in line with same change made to SVR Supplement.	
4-4-2/11	Cite revised to reflect changes in USCG requirements for valves employing resilient material and to agree with same change to SVR Supplement.	
4-4-7/3.1	New cite to clarify that arrangements permitted by this Rule are not acceptable on U.S. flag vessels. Clarification added regarding need for remote operation of cargo tank valves. This change brings the Under 90M Supplement in line with SVR Supplement.	
4-4-7/5.5	New cite to clarify that arrangements permitted by this Rule are not acceptable on U.S. flag vessels. This change brings the Under 90M Supplement in line with SVR Supplement.	
4-4-7/5.19	Item g revised to clarify the requirement for oxygen measurements (based on same change top SVR Supplement).	
4-5-1/3.5	Cite revised to clarify material requirements based on same change to SVR Supplement.	
4-6-3/11	First paragraph revised to clarify that either NEC or IEC standards for installations in hazardous areas may be followed, i.e. it is not necessary to comply with both.	
4-6-4/13	Cite revised to recognize USCG acceptance of IEC 92-350 series cables.	
4-9-1/1 (SVR)	New cite to clarify the automation requirements by basing the criteria on the level of manning intended for the propulsion machinery space.	

4-9-3/1 4-9-3/3 4-9-3/9 4-9-3/15.5.1 (SVR)	New cites providing additional USCG requirements which supplement ABS ACC requirements.	
4-9-3/15.5.2 (SVR)	Cite revised to include additional USCG requirements for fire pump control & pressure monitoring. Also made applicable for ACC.	
5-1-1/1.13 (SVR)	Updated cite to indicated USCG approval for high velocity vent valves. Additionally, required approval for pressure vacuum valves clarified.	
5-8-5/1 (SVR)	Updated cite to indicate that safety relief valves for liquefied compressed gas service are to be USCG approved. Additionally, required approval for cargo containment systems and piping systems carrying nitrogen clarified.	
6/5.5 (PVG)	Cite revised to make reference to the ABS Passenger Vessel Guide.	
Section II		1 Jan. 2002
II-2/4.7.2	Cite revised to clarify hydrant and hose arrangements to agree with USCG requirements.	
II-2/4.8.4	Cite revised to clarify required approval for nozzles.	
II-2/5	Cite revised to clarify required approval for fixed gas extinguishing systems.	
II-2/5.2	Requirement addressing release time for CO_2 system deleted as it is not applicable to cargo spaces and the machinery space requirement is covered by SOLAS.	
II-2/6	Cite revised to clarify required approval for fire extinguishers.	
II-2/7	Cite revised to clarify fire detection and fire extinguishing requirements for incinerator spaces.	
II-2/12	Cite revised to clarify that compliance with SOLAS and NFPA 13 required with the higher standard prevailing.	
II-2/13	Cite revised to eliminate the battery capacity requirements as USCG requirements were harmonized with SOLAS. Additionally, the cite was revised to clarify required approval for fixed fire detection and alarm systems.	
II-2/61	Cite revised to clarify required approval for fixed foam systems.	
VI 6.1 & VI 6.1.2.8 (LSA Code)	Cites III/48 & III/48.2 revised to reflect SOLAS. Amendment creating the LSA Code.	

Section III		1 Jan. 2002
B.6m	Deleted as the requirement for open front toilet seat is no longer in CFR.	
Section VI		1 Jan. 2002
III/21	Regulation number of Cite III/20 changed to III/21 per SOLAS Amendments.	
III/22	Regulation number of Cite III/21 changed to III/22 per SOLAS Amendments.	
III/22.3	Regulation number of Cite III/21.3 changed to III/22.3 per SOLAS Amendments.	
III/22.4.1.2	Regulation number of Cite III/21.4.2.2 changed to III/22.4.1.2 per SOLAS Amendments.	
III/23	Regulation number of Cite III/22 changed to III/23 per SOLAS Amendments.	
Section VIII		25 Oct. 2002
VIII	New section incorporates the OSV'S addendum additional requirements	
II/44	Added "A60" construction for space around the emergency source of power.	
IV	Added revised check sheets	
Introduction		
Introduction-1	Revised Title to reflect applicability to include vessels certificated for International Voyages.	
Introduction-2	Revised applicability of Supplement.	
Introduction-3	Expanded guidance regarding equivalency evaluation. Correction of chapter 32 to 9.	
Introduction 4	Re-Flagging wording revised to reflect requirements.	
Introduction-5	Reportable Casualty re-paragraphed.	
Section I		
Cite:3-3-1/3.1	Revised intact stability to include vessels for re-flagging.	
Cite:3-3-1/3.3	Cargo vessels over 80 meters when changing US Flag must meet the probabilistic damage stability regulations.	

Section II

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

Section III

33CFR151.27	Added Pages III-ii, III-12, III-15 Shipboard oil pollution Emergency Plan requirements.	

Section VIII

Cite A-3	Revised Carriage of NLS.	10 March 2003
Section I	Deleted cite 4-6-2/7, 9, 13.1.3, 15; 4-6-3/114-6-4/7.11.1, 7.11.4,13,13. 7/31 4-6-6/1	
	Revised cite 4-6-4/7.15.4 reference to Main AC Swbd's deleted	
Section II	Entire section " General, Equipment Approvals" replaced	
	New section added "Fire Equipment and Arrangements"	
	Added approval series 160.175, 160.176, 161.110 , Deleted ****	
	Deleted 161.010;	
	II-2/5.2 revised last to paragraphs relative to the SOLAS Reg.to 10.4.1.1.1 & 20.6.1.1	
	Under "Carbon Dioxide Storage"deleted last sentence; II/6 Under "Fire Extinguishers" replaced approved with type-approved	
	Cite II-2/10 First sentence rewritten for clarity	
	Cite II-2/56.6 deleted since part of SOLAS	
	Cite III-4 original wording replaced with new paragraphs	
	Revised Cite III-17 to 18, cite III-27.3 to 32.3	
	added /inserted for each person & regardless if it has totally enclosed lifeboats.	
	Revised Cite III/41 to 33; revised cite III/34 LSA Code 6.1.2.9, 6.1.2	
		22 April 2003
Section II	Revised, corrected & clarified as per USCG letter dated 14 May 03	
	General Equipment Approval changed Union to Community, MarED to MED	
	Cite II-2/45 changed .087 radius to 50 degrees	
	Cite III/4 160.132 added "if davits for rescue boat***"	
	Revised II-2/37.1.3 to 20.6, Cite II-2/37.1.3 & 37.1.6.3 to 20.6 & 20.3.1.3.	
	Cite II-2/28 to 13 and changed applicable cites in wording as per Solas 2000 Amendments	
Introduction 1	Added subchapter "L"	
Addendum	Cite A3 revised to include all CFR referenced regulation cites	
Section VIII	Deleted check sheet H/NLS-OSV added refences	
		20 May 2003
	Cite III/4 added 160.115 "if winches for rescue boat***"	
	Revised Cite II-2/44 to 9.2.3.3. II-2/45 to 13, II-2/61 to 10.4 & FSS Code Ch. 14	
	Added wording to Cite A-3 from USCG Reg. 153.470-491 for clarity.	
		23 May 2003
Addendum	Revised/added all References throughout	5 June 2003

Section II	Revised SOLAS II-2 Cites 3.10 to 3.1, 4.5 to 10.21.5, 4.71 to 10.2.3.1.1, 4.72 to 10.2.3.1, 4.84 to 10.2.3.3, 5 to 10.4 & FSS Code Chapter 5, 5.2 to 10.4 & FSS Code Chapter 5.2.2, 6 to 10.3 & FSS Code Chapter 4, 7 to 10.5.4, 10 to 10.4.1.1.3, 10.5 & FSS Code Chapter 7, 12 to 10.6, 10.7 & FSS Code Chapter 8, 13 to 7.2 & FSS Code Chapter 9, 13.2 to 7.2 & FSS Code Chapter 9.2.4, 17.4 to 10.10.3, 18 to 13.
	9 June 2003

ADDENDUM 1

U.S. Supplement to the ABS Rules for Steel Vessels Under 90 Meters (295 Feet) in Length for Vessels on International Voyages dated 1 January 2003

Scope: Pursuant to the change to 46 CFR 126 that expands the ACP to include OSVs, this Addendum specifies the additional requirements that apply to Subchapter L OSVs enrolled or to be enrolled in the Alternate Compliance Program. The following requirements are in addition to the applicable requirements of the ABS Rules for Building and Classing Steel Vessels Under 90 Meters (295 Feet) in Length, the U.S. Supplement to the ABS Rules for Steel Vessels Under 90 Meters (295 Feet) in Length and International Conventions (1974 SOLAS As Amended, MARPOL 73/78 As Amended, 1966 ICLL, 1969 ITC, etc.).

Note: Subchapter L "Lift boats" are not included in this Addendum.

Table of Contents

Cite: A-1 Stability

OSVs under 80 meters (262.5 feet) in length are to meet the intact and damage stability requirements of 46 CFR 174 Subpart G. OSVs 80 meters (262.5 feet) in length and over, in addition to the Subdivision and Damage Stability of Cargo Ships contained in 1974 SOLAS (As Amended) Part B-1, are also to comply with the intact and damage stability requirements of 46 CFR 174 Subpart G.

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^{o} F and above 80^{o} 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^{o} F and above) as well as Grade-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 81/2 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. A portable tank may be filled or discharged aboard the vessel if authorized by an endorsement on the vessel's Certificate of Inspection.

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

(a) No OSV may carry a noxious liquid substances (NLS) in bulk without the approval of the Commandant.

(b) An OSV may carry NLS, in integral and fixed independent tanks, in quantities not to exceed 20 percent of the vessel's deadweight.

(c) Each OSV carrying NLS's in bulk in integral tanks or fixed independent tanks must meet

  (1) Meet the Oceangoing Requirements;

  (2) Have a Certificate of Inspection or NLS Certificate issued by the USCG; and

  (3) Have a Cargo Record Book. See reference 490(a)(1).

(d) An OSV that does not meet the equipment requirements may not discharge NLS residues into the sea. See references 470 through 491.

(e) Each OSV that discharges NLS residues into the sea must meet:

  (1) The Equipment (see references 470 through 491)

  (2) Operating Requirements (see references)

Cite: A-4 Cranes

Cargo Gear is to be certified in accordance with the ABS "Requirements for Certification of Construction and survey of Cargo Gear on Merchant Vessels", 1975 or the Guide for Certification of Cranes, 1991 as applicable for the type of cargo gear being provided.

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

Cite: 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. In no case will the number of offshore workers authorized for carriage exceed 36.

No more than 12 offshore workers may be carried aboard an OSV when on an international voyage, unless the vessel holds a valid passenger-ship-safety certificate issued in compliance with the International Convention for the Safety of Life at Sea, 1974, as amended.

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 millimeters (16 inches) long;

(ii) at most 300 millimeters (12 inches) apart, uniform for the length of the ladder; and

(iii) at least 180 millimeters (7 inches) from the nearest permanent object in back of the ladder;

(2) Have at least 115 millimeters (4\1/2\ inches) of clearance above each rung;

(3) Be made of incombustible materials; and

(4) Have an angle of inclination with the horizontal, greater than 70 degrees but not more than 90 degrees.

(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 OSVs' 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 millimeters (18 inches). 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 meters (15 feet) in length or less must not be less than 610 millimeters (24 inches) wide.

(ii) aisles more than 4.6 meters (15 feet) in length must not be less than 760 millimeters (30 inches) wide.

(iii) where the seating is in rows, the distance from seat front to seat front must not be less than 760 millimeters (30 inches).

(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 meters (6 feet, 3 inches); and

(iii) contain at least 1.9 square meters (20 square feet) of deck and at least 4 cubic meters (140 cubic feet) 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 to the ABS Rules for Steel Vessels Under 90 Meters (295 Feet) in Length for Vessels on International Voyages dated 29 March 1999.

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 4-4-2/11 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.

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 Unattended Machinery Spaces

OSVs intending to operate with unattended machinery spaces are to comply with Cites A-12 through A-14 in lieu of compliance with the requirements of Cites 4-9-1/1 & 7 (SVR), 4-9-1/5.1.10 & 4-9-1/9.9 (SVR), 4-9-2/1(SVR), 4-9-3/1, 3, 9, 13.9.1, 15.5.1 & 15.5.2 (SVR) in Section I of the U.S. Supplement to the ABS Rules for Steel Vessels Under 90 Meters (295 Feet) in Length for Vessels on International Voyages dated 1 January 2003.

Cite: A-12 Automation of Unattended Machinery Spaces – Propulsion Control

Each vessel must have a propulsion-control system operable from the pilothouse. Each piece of machinery under automatic control must have an alternative manual means of control.

Cite: A-13 Automation of Unattended Machinery Spaces – Placement of Machinery Alarms

(a) Visible and audible alarms must be installed at the pilothouse to indicate the following:

(1) loss of power for propulsion control.

(2) loss of power to the steering motor or for control of the main steering gear.

(3) engine-room fire.

(4) high bilge-level.

(5) low lube-oil pressure for each main propulsion engine and each prime mover of a generator.

(6) for each main propulsion engine and each prime mover of a generator:

(i) high lube-oil temperature; and

(ii) high jacket-water temperature.

(7) for each reduction gear and each turbocharger with a pressurized oil system:

(i) low lube-oil pressure; and

(ii) high lube-oil temperature.

(8) loss of normal power for the alarms listed in paragraphs (a)(1) through (a)(7) above.

(b) Sensors for the high-bilge-level alarm required by paragraph (a)(4) above must be installed in:

(1) Each space below the deepest load waterline that contains pumps, motors, or electrical equipment; and

(2) The compartment that contains the rudder post.

(c) Centralized displays must be installed in the machinery spaces to allow rapid evaluation of each problem detected by the alarms required by paragraph (a) above. Equipment-mounted gauges or meters are acceptable for this purpose, if they are grouped at a central site.

Cite: A-14 Automation of Unattended Machinery Spaces – Test Procedure and Operations Manual

(a) A procedure for tests to be conducted on automated equipment by the operator must be submitted for review and approval.

(b) The procedure for tests must:

(1) be in a sequential-check off format;

(2) include the required alarms, controls, and communications; and

(3) set forth details of the tests.

(c) Details of the tests must specify status of equipment, functions necessary to complete the tests, and expected results.

(d) No tests may simulate conditions by maladjustments, artificial signals, or improper wiring.

(e) A detailed operations manual that describes the operation and indicates the location of each system installed to comply with the requirements for an unattended machinery space must be submitted.

Cite: A-15 Fire Stations

Each outlet at a fire hydrant must be at least 38 millimeters (1 1/2 inch) 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 meters (50 feet) in length, with a minimum diameter of 38 millimeters (1 1/2 inches), 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.

Cite: A-17 Hazardous Areas

No OSV that carries flammable or combustible liquid with a flashpoint of below 140ºF (60ºC), or carries hazardous cargoes on deck or in integral tanks, or is involved in servicing wells, may not have electrical equipment installed in pump rooms, in hose-storage spaces, or within 3 meters (10 feet) of a source of vapor on a weather deck unless the equipment is explosion-proof or intrinsically safe.

Cite: A-18 Emergency Source of Power "A60" Class Boundary

In accordance with 46 CFR 127.220, a "A-60" around the space for the emergency source of power is required:

(a) Except as provided in paragraph (b), when a compartment containing the emergency source of electric power, or vital components of that source, adjoins a space containing either the ship's service generator or machinery necessary for the operation of the ship's service generator, each common bulkhead and deck must be of "A-60" Class construction.

(b) The "A-60" Class construction required by paragraph (a) is unnecessary if the emergency source of electrical power is in a ventilated battery locker that:

(1) Is located above the main deck;

(2) Is located in the open; and

(3) Has no boundaries contiguous with other decks or bulkheads.

REFERENCES

(NOTE: The references and their associated numbers cited hereafter are taken from the section numbers of 46CFR Part 153. Cross-references not cited below may be located in 46CFR Part 153.)

470 System for discharge of NLS residue to the sea: Categories A, B, C and D

Unless waived under reference 491, each ship that discharges Category A, B or C NLS residue, or Category D NLS residue not diluted to 1/10th of its original concentration, into the sea must have an NLS residue discharge system meeting the following:

(a) Minimum diameter of an NLS residue discharge outlet. The outlet of each NLS residue discharge system must be perpendicular to the shell's plating and have a diameter at least as great as that given by the following formula:

$$D = \frac{(Q_d)}{5L}$$

where:
D = Minimum diameter of the discharge outlet in meters.
Q_d = Maximum rate in cubic meters per hour at which the ship operator wishes to discharge slops (note: Q_d affects the discharge rate allowed under reference 1126(b)(2)).
L = Distance from the forward perpendicular to the discharge outlet in meters.

(b) Location of an NLS residue discharge outlet. Each NLS residue discharge outlet must be located–

(1) At the turn of the bilge beneath the cargo area; and

(2) Where the discharge from the outlet is not drawn into the ship's seawater intakes

(c) Location of dual NLS residue discharge outlet. If the value of 6.45 for K is used in reference 1126(b)(2), the NLS residue discharge system must have two outlets located on opposite sides of the ship.

480 Stripping quantity for Category B and C NLS tanks on ships built after June 30, 1986: Categories B and C

Unless waived under reference 491, Category B and C NLS cargo tanks on each ship built after June 30, 1986 must have stripping quantities determined under 1604 that are less than –

(a) 0.15 m^3 if Category B; and

(b) 0.35 m^3 if Category C.

481 Stripping quantities and interim standards for Category B NLS tanks on ships built before July 1, 1986: Category B

Unless waived under reference 483 or 491, each Category B NLS cargo tank on ships built before July 1, 1986 must meet the following:

(a) Unless the tank meets the interim standard provided by paragraph (b) of this section and is pre-washed in accordance with reference 1118, the tank must have a stripping quantity determined under reference 1604 that is less than 0.35m^3.

(b) Before October 3, 1994, the tank may have a total NLS residue determined under reference 1608 that is less than 1.0 m^3 or 1/3000th of the tank's capacity and an NLS residue discharge system meeting the following:

(1) The system must be capable of discharging at a rate equal to or less than Q in the following formula:

$$Q = K\ U^{1.4}\ L^{1.6}\ x\ 10^{-5} m^3/hr$$

where:
K = 4.3 except K=6.45 if the discharge is equally distributed between two NLS residue discharge outlets on opposite sides of the ship (see references 470(c) and 1126(b)).
L = ship's length in meters.
U = for a ship that is self-propelled, the minimum speed in knots specified in the approved Procedures and Arrangements Manual for discharging Category B NLS residue, but at least 7;
U = for a ship that is not self-propelled, the minimum speed in knots specified in the approved Procedures and Arrangements Manual for discharging Category B NLS residue, but at least 4.

(2) The system must have equipment capable of automatically recording –

(i) The time of day that discharge of NLS residue through the residue discharge system starts and ends; and

(ii) The dates on which discharge begins and ends unless the equipment allows a person to enter these dates on the record manually.

(3) Each system that has the capacity to exceed Q calculated in paragraph (b)(1) of this section must have equipment that –

(i) Records the NLS residue flow through the system; and

(ii) Is sufficiently accurate that its recorded values averaged over any 30-second period differ no more than 15% from the actual flow averaged over the same 30-second period.

(4) Each system that has the capacity to exceed Q calculated under paragraph (b)(1) of this section and does not automatically control the flow rate must have –

(i) Manual controls that enable the flow to be adjusted to the value of Q calculated in paragraph (b)(1) of this section and that must be moved through at least 25% of their total range of movement for the discharge rate to change from 0.5Q to 1.5Q; and

(ii) A flow rate meter located where the flow is manually controlled.

482 Stripping quantities and interim standards for Category C NLS tanks on ships built before July 1, 1986: Category C

Unless waived under reference 483 or 491, each Category C NLS cargo tank on ships built before July 1, 1986 must meet the following:

(a) Unless the tank meets the interim standard provided by paragraph (b) of this section, the tank must have a stripping quantity determined under reference 1604 that is less than 0.95m^3.

(b) Before October 3, 1994, the tank may have a total NLS residue determined under reference 1608 that is less than 3.0 m^3 or 1/1000th of the tank's capacity

483 Restricted voyage waiver for Category B and C NLS tanks on ships built before July 1, 1986: Categories B and C

At its discretion the Coast Guard waives reference 481 and 482 under this section and allows a ship to carry Categories B and C NLS cargoes between ports or terminals in one or more countries signatory to MARPOL 73/78 if the ship's owner requests a waiver following the procedures in reference 10 and includes –

(a) A written pledge to –

(1) Limit the loading and discharge of Categories B and C NLS cargoes in a foreign port to those ports and terminals in countries signatory to MARPOL 73/78 and listed in accordance with paragraph (b) of this section; and

(2) Pre-wash the cargo tank as required under reference 1118 after each Category B or C NLS is unloaded unless the pre-wash is allowed to be omitted under reference 1114.

(b) A list of –

(1) All foreign ports or terminals at which the ship is expected to load or discharge Category B or C NLS cargo; and

(2) All foreign or terminals at which the ship is expected to discharge Category B or C NLS residue from the tank.

(c) An estimate of the quantity of NLS residue to be discharged to each foreign port or terminal listed under paragraph (b)(2) of this section;

(d) Written statements from the owner of adequate reception facilities in the ports and terminals listed in accordance with paragraph (b)(2) of this section who have agreed to take NLS residue from the ship, showing the amount of NLS residue each agrees to take; and

(e) A written attestation from the person in charge of each port or terminal listed in accordance with paragraph (b)(1) of this section that the administration has determined the port or terminal to have adequate reception facilities for the NLS residue.

NOTE to reference 483: Certificates of Inspection and any IMO Certificates issued to ships on restricted voyage waivers indicate that while the ship carries an NLS cargo or NLS residue, it is limited to voyages between the ports or terminals listed on the certificate.

484 Pre-wash equipment

Unless the ship operator shows that the pre-wash equipment specified in this section will be available at discharge or pre-wash facilities or the equipment is waived under reference 491, to have its Certificate of Inspection or Certificate of Compliance endorsed to carry a Category A NLS or a Category B or C NLS requiring viscosity or melting point information under reference 908 (a) and (b)**,** a ship must have the following:

(a) For the tanks that carry the NLS, a tank washing system capable of washing all interior tank surfaces except those shielded from the washing system spray by ship's structure, and consisting of a wash water supply system and–

(1) A fixed tank washing machine in each tank; or

(2) A portable tank washing machine and, if required by the Coast Guard, equipment to move it during washing and when storing.

(b) Piping, valving, and crossovers needed to arrange the cargo piping so that the wash water passes through the cargo pump and cargo piping during tank washing or discharge of tank wash water.

(c) If the approved Procedures and Arrangements Manual specifies the hot water pre-wash required under **reference 1108**, a means of supplying water to the tank washing machine under paragraph (a) of this section at–

(1) A temperature of at least 60 ^{o}C (140 ^{o}F) when it leaves the washing machine; and

(2) The flow rate needed for the washing machine jets to meet paragraph (a) of this section.

486 Design and equipment for removing NLS residue by ventilation: Categories A, B, C and D

(a) If NLS residue is to be removed from a cargo tank by ventilation, in addition to the equipment required under paragraph (b) of this section, the ship must have –

(1) Openings in the tank deck near the sump or suction point;

(2) If the openings required by paragraph (a)(1) of this section are insufficient, an access opening for visually determining whether liquid remains in the sump area of the cargo tank after ventilation or some other means for making this determination; and

(3) An approved Procedures and Arrangements Manual with instructions that meet reference 490(b)(3).

(b) Unless the ship operator shows that the ventilation equipment specified in this paragraph will be available from shore when needed; if NLS residue is to be removed from a cargo tank by ventilation, in addition to the equipment required under paragraph (a) of this section the ship must have –

(1) Portable forced air ventilating equipment fitting the ventilation openings required in paragraph (a) of this section and able to ventilate the extremities of the tank to the extent prescribed in Appendix C of the IMO Standards for Procedures and Arrangements for the Discharge of Noxious Liquid Substances, Resolution MEPC 18 (22), 1985; and

(2) A connector that allows a fan or air supply to be connected to the hose connections for the tank at the manifold.

NOTE: The Clean Air Act (42 U.S.C. 7401 et seq.) allows states to regulate emissions from tank ventilation. There may be other regulations, both local and Federal, that affect the use of tank ventilation for safety or environmental purposes.

488 Design and equipment for tanks carrying high melting point NLSs: Category B

Unless waived under 491, for a ship to have its Certificate of Inspection or Certificate of Compliance endorsed allowing a tank to carry a Category B NLS with a melting point of 15°C or more, the cargo tank must have –

(a) An arrangement enabling the cargo to be heated before cargo transfer, using heat supplied by the ship or by another source; and

(b) Sides and bottom separate from the ship's side or bottom shell plating.

490 Cargo Record Book and Approved Procedures and Arrangements Manual: Categories A, B, C and D

(a) Unless waived under reference 491 to have a Certificate of Inspection or Certificate of Compliance endorsed to carry NLS cargo, a ship must have – and

(1) If U.S., a Cargo Record Book published by the Coast Guard (OMB App. No. 2115-0089), or, if foreign, a Cargo Record Book having the same entries and format as Appendix 4 of Annex II; and

(2) A Procedures and Arrangements Manual meeting paragraph (b) of this section and approved by –

(i) The Coast Guard, if the ship is a United States ship or one whose Administration is not signatory to MARPOL 73/78; or

(ii) The Administration, if the ship is one whose Administration is signatory to MARPOL 73/78.

(b) Each Procedures and Arrangements Manual under paragraph (a) (2) of this section must include the following:

(1) The standard format and content prescribed in Chapter 2 and Appendix D of the IMO Standards for Procedures and Arrangements for the Discharge of Noxious Liquid Substances, Resolution MEPC 18(22), 1985, or, for ships for which the only NLS carried is a Category D NLS and ships having a waiver under reference 483 or 491, the format and content prescribed by the Commandant (G-MSO).

(2) If the ship has a tank that carries a cargo under a wavier issued under reference 483, procedures ensuring that –

(i) Categories B and C NLSs are discharged from the tank only in the ports or terminals listed in accordance with reference 483(b), and

(ii) The tank is pre-washed after discharging each Category B or C NLS unless reference 1114 allows the pre-wash to be omitted.

(3) If ventilation is used to clean a tank under reference 1102(b) (2), ventilation procedures that meet those in Appendix C of the IMO Standards for Procedures and Arrangements for the Discharge of Noxious Liquid Substances, Resolution MEPC 18(22), 1985.

(4) If tank cleaning agents are used, quantities to use and instructions for using the cleaning agents.

(5) If the tank has the discharge recording equipment required in reference 481(b), procedures to ensure that no NLS residue is discharged from the tank when the recording equipment is incapacitated unless the concentration and total quantity limits for the NLS in Annex II are not exceeded

491 Waiver of certain equipment for dedicated cargo tanks

(a) The Coast Guard waives references 440(a)(3), 480, 481, 482, 488 and endorses a ship's Certificate of Inspection or Certificate of Compliance allowing a cargo tank to carry a single, specific NLS cargo and no other cargo if the ship's owner –

(1) Requests a waiver following the procedures in reference 10; and

(2) Pledges in writing that while any waiver is in effect the cargo tank will–

(i) Carry only the NLS cargo listed on the Certificate of Inspection or Certificate of Compliance;

(ii) Carry no cargo other than the NLS; and

(iii) Not be washed or ballasted unless the wash water or ballast water is discharged to a reception facility.

(b) The Coast Guard waives reference 490(a)(2) if –

(1) The ship's owner requests a wavier following the procedures in reference 10;

(2) The Coast Guard has issued a waiver to each of the ship's NLS cargo tanks under paragraph (a) of this section; and

(3) The ship's owner adds to the ship's operational manual any provisions for preventing NLS discharge specified by the Commandant (G-MSO) as a condition for issuing the waiver.

1126 Discharge of NLS residue from a slop tank to the sea: Categories A, B, C and D

NLS residue in a slop tank may not be discharged into the sea unless –

(a) The ship meets the conditions for discharging the NLS residue from a cargo tank in reference 1128; and

(b) For Category B NLS residue transferred to the slop tank under reference 1119(b), the NLS is discharged –

(1) Through an NLS residue discharge system with the flow recording equipment required in reference 481(b)(2) operating; and

(2) At a rate maintained at or below Q in the following:

$$Q = \frac{VKU^{1.4}L^{1.6}}{N} \times 10^{-5}\ m^3/hr$$

For tank contents that are immiscible

$$Q = KU^{1.4}L^{1.6} \times 10^{-5}\ m^3/hr$$

where:
Q = maximum permissible slops discharge rate in cubic meters per hour
V = volume of slops in the tank in cubic meters
K = 4.3 except K=6.45 if Q is distributed between two NLS residue discharge outlets on opposite sides of the ship (see references 470(c) and 481(b))
U= ship's speed in knots
L = ship's length in meters
N = number of tanks containing Category B NLS residue pumped into the slop tank

1128 Discharge of NLS residue from a cargo tank to the sea: Categories A, B, C and D

The discharge of NLS residue to the sea must be made with the ship at least 22.24 km (12 nautical miles) from the nearest land, and must meet the following additional conditions:

(a) To discharge the following, the ship must be in water at least 25 m (76.2 ft.) deep –

(1) Category B or C NLS residue diluted to less than 1 ppm of the NLS.

(2) Category B or C NLS residue resulting from washing a tank after the following washing procedure has been completed:

(i) If the tank is not required to be pre-washed under 46CFR Part 153, the tank must be washed following the procedures that apply to a pre-wash of a Category B NLS in reference 1120 using one washing machine cycle, and the tank washings discharged to a reception facility or to the sea under reference 1126 or paragraph (a)(1), (c) or (d) of this section.

(ii) After the tank has been pre-washed or has been washed under paragraph (a)(2)(i) of this section, the tank must then be washed with one cycle of the tank washing machine, and the tank washings discharged to a reception facility or to the sea in accordance with reference 1126 or paragraph (a)(1), (c) or (d) of this section.

(b) To discharge a Category D NLS residue to which 10 times its volume in water is added and mixed, the ship must be –

(1) If self-propelled, maintained at a speed of at least 12.97 km/hr (7 knots); and

(2) If not self-propelled, maintained at a speed of at least 7.41 km/hr (4 knots).

(c) Each ship built before July 1, 1986 that discharges Category A, B, or C NLS residues before January 1, 1988 must be –

(1) In water at least 25 m (76.2 ft) deep;

(2) If discharging the residue of a Category A NLS cargo, discharging only residue created by washing the Category A NLS's cargo tank after a pre-wash;

(3) If discharging the residue of a Category B NLS cargo, discharging no more than the larger of 1 m^3 pr $1/3000^{th}$ the volume of the Category B cargo loaded;

(4) If discharging the residue of a Category C NLS cargo, discharging no more than the larger of $3m^3$ of or $1/1000^{th}$ the volume of the Category C cargo loaded;

(5) If self-propelled, maintained at a speed of at least 12.97 km/hr (7 knots); and

(6) If not self-propelled, maintained at a speed of at least 7.41 km/hr (4 knots).

(d) To discharge Category A, B, C or D NLS residue other than as allowed under paragraphs (a) through (c) of this section, the ship must be –

(1) In water at least 25 m (76.2 ft) deep;

(2) Discharging at a rate not exceeding that used for Q_d;

(3) If self-propelled, maintained at speed no less than the minimum specified in the approved Procedures and Arrangements Manual but at least 12.97 km/hr (7 knots);

(4) If not self-propelled, maintained at a speed no less than the minimum specified in the approved Procedures and Arrangements Manual but at least 7.41 km/hr (4 knots);

(5) If discharging the residue of a Category A NLS cargo, discharging only residue created by washing the Category A NLS's cargo tank after a pre-wash;

(6) If discharging the residue of a Category B NLS cargo, discharging no more than the larger of 1 m^3 or $1/3000^{th}$ the volume of the Category B cargo loaded;

(7) If discharging the residue of a Category C NLS cargo, discharging no more than the larger of 3 m^3 or $1/1000^{th}$ the volume of the Category C cargo loaded;

(8) Discharging through an NLS residue discharge system meeting reference 470.

1604 Determining the stripping quantity from the test results

(a) For a single test, the stripping quantity is the volume of water calculated under reference 1602(d).

(b) If multiple tests are made on a tank without modifications to the tank, pumping system, or stripping procedure between the tests, the stripping quantity must be taken as the average of the stripping quantities for all of the tests.

(c) If multiple tests are made on a tank with modifications to the tank, pumping system, or stripping procedure between the tests, the stripping quantity is the stripping quantity determined under paragraph (b) of this section using only those tests performed after the last modifications.

1118 Pre-wash of Categories B and C cargo tanks not meeting stripping standards: Categories B and C

(a) Unless reference 1114 allows the pre-wash to be omitted, a cargo tank from which a Category B NLS is unloaded must be pre-washed if the tank –

(1) Operates under the interim standard in reference 481(b); or

(2) Has a waiver issued under in reference 483.

(b) Unless reference 1114 allows the pre-wash to be omitted, a cargo tank from which a Category C NLS is unloaded must be pre-washed under the procedures in reference 1120(b) if the tank has a waiver issued under reference 483.

1114 Conditions under which a pre-wash may be omitted: Categories A, B and C

A pre-wash required by this part may be omitted if one of the following requirements is met:

(a) A Surveyor has signed a statement in the Cargo Record Book that the next cargo has been determined to be one that may be loaded without washing the tank, and the tank is not washed or ballasted before it is loaded with the next cargo.

(b) A Surveyor has signed a statement in the Cargo Record Book that the approved Procedures and Arrangements Manual contains procedures for removing the NLS residue by ventilation, and the cargo tank is not washed or ballasted before being cleaned following the ventilation procedure.

NOTE: The Clean Air Act (42 U.S.C. 7401 *et seq.)* allows states to regulate emissions from tank ventilation. There may be other regulations, both local and Federal, that affect the use of tank ventilation for safety or environmental purposes.

(c) The tank requiring the pre-wash has a waiver issued under reference 483 or 491 and the waiver states when the tank is to be pre-washed.

1608 Calculation of total NLS residue and clingage NLS residue

(a) The total NLS residue for each tank is calculated by adding the stripping quantity and the clingage NLS residue.

(b) The clingage NLS residue for each tank is calculated using the following formula:

$Q_{clingage} = 1.1x10^{-4} A_d + 1.5x10^{-5} A_w + 4.5x10^{-4} L^{1/2} A_b$

where:

A_b = Area of the tank bottom added to the area in square meters of tank structural components projected on a horizontal surface

A_d = Area of the tank underdecks added to the area in square meters of tank structural components projected on a horizontal surface

A_w = Area of the tank walls added to the area in square meters of tank structural components projected on a vertical surface

L = Length of tank in meters from fore to aft

$Q_{clingage}$ = volume of clingage in cubic meters

When using the formula in this paragraph, areas that are inclined more than 30^o from the horizontal may be assumed to be vertical.

908 Cargo viscosity and melting point information; measuring cargo temperature during discharge: Categories A, B and C

(a) The person in charge of the ship may not accept a shipment of a Category A, B, or C NLS cargo having a reference to this paragraph in the "Special Requirements" column of **46CFR 153 Table 1** unless the person has, from the cargo's manufacturer or the person listed as the shipper on the bill of lading, a written statement of the following:

(1) For Category A or B NLS, the cargo's viscosity at 20^oC in mPa.s and, if the cargo's viscosity exceeds 25 mPa.s at 20^oC, the temperature at which the viscosity is 25 mPa.s.

(2) For Category C NLS, the cargo's viscosity at 20^oC in mPa.s and, if the cargo's viscosity exceeds 60 mPa.s at 20^oC, the temperature at which the viscosity is 60 mPa.s. If the cargo's viscosity varies from shipment to shipment, the maximum viscosity and maximum temperature values may be supplied.

(b) The person in charge of the ship may not accept a shipment of a Category A, B, or C cargo having a reference to this paragraph in the "Special Requirements" column of 46CFR 153 Table 1 unless the person has a written statement of the cargo's melting point in ^oC from the cargo's manufacturer or the person listed as the shipper on the bill of lading. If the cargo's melting point varies from shipment to shipment, the highest melting point may be supplied.

(c) The person in charge of the ship shall ensure that the cargo temperature is read and recorded in the Cargo Record Book following the procedures in paragraph (d) of this section when a cargo having a reference to paragraph (a) or (b) of this section in the "Special Requirements" column of 46CFR 153 Table 1 is unloaded.

(d) The cargo temperature measured in paragraph (c) of this section must be made using the following procedure:

(1) Each reading must be made with the sensor or thermometer required by reference 440(a)(3) or (c). If a portable thermometer is used, it must be located as prescribed for the temperature sensor in reference 440(a)(3).

(2) A total of 2 readings must be made, the first reading to be made no more than 30 minutes after cargo transfer begins and the second reading no more than 30 minutes before the main cargo pump is shut down.

(3) The cargo's temperature is the average of the 2 readings made under paragraph (d)(2) of this section.

10 Procedures for requesting alternatives and waivers; termination and waivers

(a) The Coast Guard considers allowing the use of an alternative in place of a requirement in this part if –

(1) The person wishing to use the alternative sends a written application to the Commandant (G-MSO) explaining –

(i) The requirement in this part that would not be met and the reason why;

(ii) The alternative the person proposes to be substituted; and

(iii) How the alternative would ensure a level of safety and pollution protection at least equal to that of the requirement for which the alternative would substitute;

(2) The alternative does not substitute an operational standard for a design or equipment standard; and

(3) The Commandant (G-MSO) determines that the alternative provides a level of protection for purposes of safety and pollution at least equal to the requirement in this part.

(b) The Coast Guard considers granting a waiver of a requirement for which this part allows a wavier if the person wishing the waiver sends a written application to the Commandant (G-MSO) that includes –

(1) A citation of the regulation that allows the waiver; and

(2) Any information and pledges that the regulation requires to be submitted with the application for the waiver.

(c) The Commandant notifies the applicant in writing –

(1) Whether any further information is necessary to evaluate the request for an alternative or waiver; and

(2) Of the outcome of the request for an alternative or waiver.

(d) A waiver issued under this part terminates if any –

(1) Information required to be supplied with the application for the waiver changes;

(2) Pledges required to be supplied with the application for the waiver are repudiated;

(3) Restrictions or procedures applying to operations under the waiver are violated; or

(4) Requirements in the section of this part authorizing the waiver are violated.

1108 Heated pre-wash for solidifying NLS, high viscosity NLS and required pre-washes of NLS whose viscosity exceeds 25 mPa sec at 20°C: Categories A, B, and C

(a) When a high viscosity or solidifying cargo is unloaded from a cargo tank, the cargo tank must be pre-washed unless reference 1114 or paragraph (c) of this section allows the pre-wash to be omitted.

(b) When a pre-wash is required for a tank that has unloaded a solidifying cargo or a cargo having a viscosity exceeding 25 mPa sec at 20°C, the wash water used in the pre-wash must leave the tank washing machine at a temperature of at least 60°C (140°F).

(c) The pre-wash required under paragraph (a) of this section may be omitted if the approved Procedures and Arrangements Manual contains a procedure for measuring the temperature of all interior cargo tank surfaces throughout unloading and under the measuring procedure the temperature of these surfaces remains above–

(1) The temperature of the cargo's melting point if the cargo is a Category B or C solidifying NLS; or

(2) The temperature at which the cargo's viscosity exceeds –

(i) 25 mPa.s., if the cargo is a high viscosity Category B NLS; or

(ii) 60 mPa.s, if the cargo is a high viscosity Category C NLS.

1102(b)(2) Handling and disposal of NLS residue: Categories A, B, C and D

(b) Except those Category A NLS residues that must be discharged under paragraph (c) of this section, NLS residue from an NLS whose vapor pressure is greater than 5 kPa (50 mbar) at 20°C must be –

(2) Ventilated following a ventilation procedure in the approved Procedures and Arrangements Manual.

440 Cargo temperature sensors

(a) Except as prescribed in paragraph (c) of this section when 46CFR 153 Table 1 refers to this section, the containment system must meet the following requirements –

(1) A heated or refrigerated cargo tank must have a remote reading thermometer sensing the temperature of the cargo at the bottom of the tank.

(2) A refrigerated tank must have a remote reading second thermometer near the top of the tank and below the maximum liquid level allowed by reference 981.

(3) Unless waived under reference 491(a), a cargo tank endorsed to carry a Category A, B or C NLS cargo must have a thermometer whose temperature reading is no greater than the temperature of the cargo at a level above the tank bottom at least one-eighth but no more than one-half the height of the tank of the cargo is –

(i) A Category A NLS or a Category B NLS having a viscosity of at least 25 mPa.s at 20°C;

(ii) A Category C NLS having a viscosity of at least 60 mPa.s at 20°C; or

(iii) A Category A, B, or C NLS that has a melting point greater than 0°C.

(b) A readout for each remote thermometer required by this section must be at the point where cargo transfer is controlled.

(c) A portable thermometer may be substituted for the equipment required in paragraphs (a) and (b) of this section if –

(1) 46CFR 153 Table 1 allows open gauging with the cargo; or

(2) 46CFR 153 Table 1 allows restricted gauging with the cargo, and the portable thermometer is designed to be used through the containment system's restricted gauging system.