



ALTERNATE COMPLIANCE PROGRAM

US SUPPLEMENT

to

**Lloyd's Register's Rules and Regulations
for the
Classification of Mobile Offshore Units**

Alternate Compliance Program
**US SUPPLEMENT TO LR'S RULES AND REGULATIONS FOR THE CLASSING
OF MOBILE OFFSHORE UNITS**

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Acronyms ~ Abbreviations

Lloyd's Register of Shipping	-	(LR)
United States	-	(US)
United States Coast Guard	-	(USCG)
Alternative Compliance Program	-	(ACP)
Code of Federal Regulations	-	(CFR)
International Convention for the Safety of life at Sea	-	(SOLAS)
Officer in Charge Marine Inspection	-	(OCMI)
Mutual Recognition Agreement	-	(MRA)
Navigation and Inspection Circular	-	(NVIC)
Certificate of Inspection	-	(COI)
National Fire Protection Association Standard	-	(NFPA)
Mobile Offshore Drilling Unit	-	(MODU)
Mobile Offshore Unit	-	(MOU)
Life Saving Appliances	-	(LSA)
Marine Equipment Directive	-	(MED)
International Convention on Load Lines	-	(ICLL)
International Labor Organization	-	(ILO)
International Maritime Organization	-	(IMO)
American Society of Mechanical Engineers	-	(ASME)
American Society of Testing and Materials	-	(ASTM)
Self Elevating Drilling Unit	-	(SEDU)
Mine Safety and Health Administration	-	(MSHA)
National Institute for Occupational Safety and Health	-	(NIOSH)
American Petroleum Institute	-	(API)
Emergency Position Indicating Rescue Beacon	-	(EPIRB)
Search and Rescue Transponder	-	(SART)
Marine Sanitation Device	-	(MSD)
European Community	-	(EC)
Carbon Dioxide	-	(CO ₂)

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	<u>Units</u>
Length	
Millimeter	- (mm)
Centimeter	- (cm)
Meter	- (m)
Inch	- (")
Feet	- (ft)
Area	
Square millimeter	- (mm ²)
Square centimeter	- (cm ²)
Square meter	- (m ²)
Square Inch	- (in ²)
Square Feet	- (ft ²)
Volume	
Cubic meter	- (m ³)
Milliliters	- (ml)
Liters	- (ltrs)
Cubic feet	- (ft ³)
Gallons	- (gal)
Temperature	
Fahrenheit	- (F)
Celsius	- (C)
Mass	
Kilogram	- (kg)
Pound	- (lbs)
Power	
Watt	- (W)
Kilowatt	- (kW)
Brake horse power (English)	- (bhp)
Force	
Newton	- (N)
Kilo-Newton	- (kN)
Foot pounds	- (ftlbs)
Pressure	
Pounds per square inch	- (psi)
Velocity	
Minutes per second	- (m/s)
Feet per minute	- (ft/min)
Miscellaneous	
Degree	- (°)
Percent	- (%)
Volt	- (V)
Minutes	- (min)

1. INTRODUCTION

1.1 Alternate Compliance via Recognized Classification Society and US Supplement to the Rules

USCG regulations exist to provide owners of US MODUs an alternative method to fulfill the requirements for inspection and certification of these units. The Alternate Compliance Program (ACP) is a voluntary scheme in which an owner of a US flag MODU may elect to have a Classification Society authorized to participate in the ACP, such as LR, to carry out plan appraisal and surveys on behalf of the USCG.

The final rule for the ACP was published in the Federal Register/Vol. 62, No. 247/Wednesday, December 24, 1997 and came into effect on January 23, 1998. The regulations are contained in 46 CFR Part 8, Subpart D.

Under these regulations, the USCG can issue a COI based upon reports by a Classification Society authorized to participate in the ACP, stating that the MODU complies with SOLAS 1974, as amended, the IMO Code for the Construction and Equipment of Mobile Offshore Drilling Units, 1989, as amended (MODU Code), and other applicable International Conventions, Classification Society Rules and other specified requirements contained in the US Supplement. This procedure reduces the burden on MODU owners and operators by establishing an alternative to the current USCG inspection system normally required by 46 CFR 2.01 that results in plan reviews and inspections by the MODU's Classification Society as well as by the USCG.

The ACP is applicable to US MODUs that are, or will be, certificated and are classed by a recognized Classification Society that is authorized by the USCG to participate in the ACP.

The supplemental requirements given in this document are those of the USCG which are contained in Titles 33 and 46 of the Code of Federal Regulations but are not covered by LR's Rules and Regulations for the Classification of Mobile Offshore Units, applicable international regulations including the 1989 MODU Code, as amended, for vessels certificated under USCG regulations, Subchapter I-A MODU.

The ACP is a scheme to support the issuance or renewal of the COI by the USCG OCMI, the authority for which remains entirely the prerogative of the USCG.

To be enrolled in the ACP and allow a COI to be issued a MODU must comply with the following:

Section 1

- The 1989 MODU Code, as amended (all recommendations must be taken as requirements)
- LR's Rules for the Classification of Mobile Offshore Units 1996, as amended
- ILO Convention, current edition
- This document

1.2 MODU enrolment in the Alternate Compliance Program

Owners, operators, or builders who wish to enroll a MODU in the ACP should apply by submitting an Application for Inspection of US MODU (CG-3752) to the cognizant OCMI. The form must indicate the owner's desire to have the MODU become enrolled in the ACP and the name of the ACP Classification Society that will verify compliance of the MODU with ACP requirements. The applicant must individually identify each MODU proposed for enrolment. For new construction, applications are required from both the builder and the eventual owner.

Full details of the process for enrolment in the ACP are given in the USCG Marine Safety Manual, Volume II, Section B, Chapter 9. This document can be accessed in the USCG's web site at:

<http://www.uscg.mil/hq/g-m/nmc/pubs/msm/index.htm>

For new construction, since the design, plan approval, and construction schedule/costs may be affected by the intended enrolment in the ACP, it is recommended that the builder and the owner consult with LR as early as possible. It is prudent to discuss the proposed enrolment in depth to establish the plans required to be submitted and the procedural arrangements for the survey of materials of construction, equipment and engineering systems. Following agreement of the procedural arrangements, both the builder and the owner are to forward written confirmation of their intentions. For the builder this will be completion of LR's Request for Marine Services. For in-service survey purposes, the owner is to forward a separate letter to the local LR Office confirming the intention to continue survey and certification in the ACP. While this will assist in the proper processing within LR, it is very important to note that the application for enrolment in ACP must be forwarded to the USCG in accordance with NVIC 2-95, current version.

For existing MODUs that satisfy the conditions for enrolment the USCG will subsequently authorize LR's ACP Program Manager and the relevant local

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survey office to commence the process. A "Hand Over Survey" will be scheduled for a mutually convenient time and, upon completion of this survey, the owner/operator will receive official notification from the USCG indicating the enrolment status.

For MODUs intending to change flag to the United States, the provisions of this document will apply in a manner similar to other existing MODUs. The guiding document for re-flagging is NVIC 10-81, current version. All re-flaggings require an initial meeting between the owner and USCG to determine the full scope of survey and certification to be carried out by each of the USCG and LR and must include the required Vessel Deficiency Report ("Gap Analysis").

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 MODU during the time period the MODU was enrolled in the program will be forwarded by LR 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.

1.3 Hand-Over and In-Service Survey Procedures

For existing MODUs, a "Hand-Over Survey" must take place. The purpose of this is for the attending USCG and LR staff to verify the survey status. The USCG will confirm that the history of the MODU has been properly entered in LR's survey status records and agreement will be made for the resolution of any USCG outstanding requirements from CG-835 forms. At this time, the USCG will also confirm to the Surveyors that the MODU is in compliance with all CFRs or will advise on those areas that must be corrected. Where applicable, the Surveyor and the USCG Inspector will then complete an LR Record of Safety Equipment. The Record of Safety Equipment is to be a permanent part of the MODU's documents.

An ACP MODU requires a COI on board. However, it will now be different in that it will not contain details of the life-saving appliances and fire-extinguishing equipment if these have been entered in LR's MODU records.

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 LR Surveyors by providing the liaison with other USCG offices in dealing with CG-835s. The LR Surveyor is not expected to communicate directly with a USCG office other than the one in his local area.

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The 835 is under the control of the USCG office that conducted the inspection and wrote the requirements. LR will be given copies of the 835s for inclusion in LR's survey status records. LR 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. LR Surveyors may "clear" 835 items on ACP MODUs only.

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 through whom the MODU is being surveyed. **LR Surveyors do not have the authority to extend or modify the 835.**

During the service life of a MODU it is the responsibility of the Master to report Marine Damages, as defined in 46 CFR 4.03, to the cognizant USCG OCMI. Further, 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 MODU is involved in a marine casualty. A reportable marine casualty or accident means a casualty or accident involving any MODU/vessel within the navigable waters of the US, its territories or possessions, or any casualty or accident involving a US Flag MODU/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.

NVIC 2-95 (current version) provides procedural guidance for survey procedures of the ACP. The following link may be used to access this document via the internet:

http://www.uscg.mil/hq/g-m/nvic/2_95/n2-95.htm

1.4 **USCG ACP Oversight**

The USCG, in delegating surveys to LR, still retains the ultimate responsibility that MODUs meet regulatory requirements. In order to fulfill this responsibility the USCG has developed an oversight program for ACP delegated responsibilities.

Oversight will consist of audits of LR plan approval and field service offices by the USCG. It will also consist of annual boardings of ACP enrolled MODUs to conduct renewal and mid-period COI inspections. The boardings will be similar to those done in Port State Inspections. A check sheet

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describing the considerations to expand the boardings is a part of the USCG Marine Safety Manual, Volume II, Section B, Chapter 9. Further information on USCG oversight activities is given in NVIC No. 2-95, current version. Procedures for plan review oversight are found in Marine Safety Center Technical Note 04-03, current version.

1.5 Overview of LR's Classification Rules and US Supplement

LR's Rules and Regulations for the Classification of Ships and Rules and Regulations for the Classification of Mobile Offshore Units address structure and essential machinery and systems. They do not contain requirements prescribed by the International Conventions, except for those instances where such regulations directly affect the scope of classification and their inclusion is necessary to ensure compatibility of class and international requirements from the earliest stage of MODU design.

The document also contains interpretations of the International Convention for Safety of Life at Sea 1974, as amended (SOLAS 74), and the MODU CODE for the Construction and Equipment of Mobile Offshore Drilling Units, 1989, where the USCG has amplifying or additional requirements. Only the USCG Marine Safety Center can accept equivalencies or alternatives. Compliance with these requirements, as applicable to MODU type and size, is to be verified during plan review and survey of LR classed MODUs registered or intended to be registered in the US.

The requirements and procedures specified in this document are additional to those contained in the Survey Procedures Manual, which must also be complied with for US flag MODUs.

Plan approval, stability investigation and survey are to be in accordance with the Classification Rules and Survey Procedures Manual concerning Statutory Surveys, Certification and Reporting.

All ACP survey extensions must be processed through the Survey Manager Offshore, LR 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 grace periods (limited period 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 MODU is in jeopardy and will be cancelled 90 days after the due date. Regardless of the circumstances, the USCG retains the ultimate authority for granting dry docking extensions to ACP MODUs

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1.6 Principal Reference Documents

Lloyd's Register:

- Rules and Regulations for the Classification of Mobile Offshore Units
- Rules and Regulations for the Classification of Diving Systems

International Conventions:

Code for the Construction and Equipment of Mobile Offshore Drilling Units, 1989, as amended

International Convention for the Safety of Life at Sea 1974, as amended (SOLAS 74)

International Convention on Load Lines 1966, as modified by the Protocol of 1988 relating thereto (LL Prot 88)

International Maritime Organization Resolutions A.760(18), A.654(16) and A.658(16)

International Labor Organization Code (ILO)

United States:

Title 33, Code of Federal Regulations (USCG Regulations)

Title 46, Code of Federal Regulations (USCG Regulations)

USCG Marine Safety Manual, Volume II, Section B, Chapter 9

Navigation and Vessel Inspection Circular No. 2-95, Current version

National Fire Protection Association Standards

American Petroleum Institute Specification 2C & Recommended Practice 2D

[Note: Access to the US Code of Federal Regulations may be made via the internet at:

<http://www.gpoaccess.gov/cfr/index.html>]

1.7 Equipment Approvals

General

For US flag vessels, USCG 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 USCG accepted 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 US vessel. ACP does not change the requirements to use USCG approved materials and equipment. Therefore, class society approvals do not fulfill the obligations of the USCG, as an Administration, where type approval is required by international convention regulations or this document.

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.

Additionally, an MRA between the US and the EC has entered into effect.

The MRA product scope includes 43 products in three categories:

- Fire protection
- Life saving
- Navigational equipment.

The MRA allows reciprocal approvals to be given by both the US and the EC for certain marine products where it has been found that the approval process is identical or equivalent. This makes 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 US Flag vessels. It allows an alternative means for obtaining USCG approval. The European MED/ "Wheelmark" will not be accepted in lieu of USCG approval.

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Further guidance on marine equipment approvals covered by the US-EC MRA is given in NVIC 8-04

<http://www.uscg.mil/hq/g-m/nvic>

Information concerning the status of USCG approval of marine equipment may be obtained by accessing the following website:

<http://cgmix.uscg.mil/Equipment/>

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Refer: 33 CFR 67.05 Obstruction Lights (MODU CODE 14.7.2)

IMO requires compliance with Coastal State Regulations. This Subpart gives the specific requirements for the US as Coastal State.

Refer: 33 CFR 159 Marine Sanitation Devices

All US MODUs over 19.70m in length with an installed toilet are required to be equipped with a USCG certified MSD that controls the discharged fecal coliform bacteria count to 200/100.0ml and the suspended solids to 150.0mg/ltr or with an operable MSD which retains the sewage on board. An MSD which does not retain sewage on board must be fabricated by a manufacturer that is authorized by the Commandant, USCG to label the MSD with the manufacturer's certification per 33 CFR Part 159 MSDs must:

- Under the test conditions described in 33 CFR 159.123 and 159.125, produce an effluent having a fecal coliform bacteria count not greater than 1,000/100.0ml and no visible floating solids (Type I)
- Under the test conditions described in 33 CFR 159.126 and 159.126a, produce an effluent having a fecal coliform bacteria count not greater than 200/100.0ml and suspended solids not greater than 150.0mg/ltr (Type II) or
- Be designed to prevent the overboard discharge of treated or untreated sewage or any waste derived from sewage (Type III).

The design, construction and testing of MSD are described in 33 CFR 159.

Refer: 33 CFR 164.35 (h) Equipment (SOLAS V/12(k))

Each self-propelled unit must have an echo depth sounding device.

Refer: 46 CFR 16 Chemical Test Plan

The minimum standards, procedures and means to be used to test for the use of dangerous drugs by unit personnel contained in 46 CFR Part 16 must be met.

Refer: 46 CFR 54 Pressure Vessels (MODU CODE 4.1.3)

Boilers, pressure vessels and heat exchangers are to comply with the requirements specified in the ASME Code.

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Refer: 46 CFR 58.60 – Industrial Systems and Components on MODUs

This Subpart applies to the following industrial system on board a MODU:

Cementing systems.

Circulation systems, including:

Pipes and pumps for mud

Shale shakers

Desanders

Degassers

Blow out preventor control systems.

Riser and guideline tensioning systems.

Motion compensation systems.

Bulk material storage and handling systems.

Other pressurized systems designed for the MODUs industrial operation.

Refer: 46 CFR 58.60-2 – Alternatives and substitutions

The USCG may accept substitutes for fittings, material, apparatus, equipment, arrangements, calculations and tests required by 46 CFR Subpart 58.60 if the substitute provides an equivalent level of safety.

In any case where it is shown to the satisfaction of the USCG that the use of any particular equipment, apparatus, arrangement or test is unreasonable or impracticable, the USCG may permit the use of alternate equipment, apparatus, arrangement or test to such an extent and upon such condition as will insure, to his satisfaction, a degree of safety consistent with the minimum standards set forth in this Subpart. Proposed alternatives or substitutions should be forwarded to the USCG Marine Safety Center with pertinent recommendations and information provided by LR.

Refer: 46 CFR 58.60-3 – Pressure Vessel

A pressure vessel that is a component in an industrial system must meet the applicable requirements of 46 CFR 54.01-5.

Refer: 46 CFR 58.60-5 – Industrial Systems : Locations

An industrial system must not be in a space that is:

Concealed

or

Inaccessible to industrial personnel.

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Refer: 46 CFR 58.60-7 – Industrial Systems : Piping

The piping for industrial systems must meet ANSI B31.3 except that blow-out preventor control systems must also meet API RP 53.

Refer: 46 CFR 58.60-9 – Industrial Systems : Design

Each system must be designed and analyzed in accordance with the principles of API RP 14C.

**Refer: 46 CFR 58.60-11 – Analyses, Plans, Diagrams and Specifications :
Submission**

Each industrial system must be analyzed by a registered professional engineer (licensed to perform engineering in one of the United States or the District of Columbia) to certify that the system has been designed in accordance with applicable standards.

The certification must:

Appear on all diagrams and analyses

and

Be submitted per requirements for “Plans and Information” (See Refer. 46 CFR 107.305).

Standards or specifications for non-pressurized, mechanical or structural systems and components such as derricks, drawworks and rotary tables which comply with standard or specifications not referenced in 46 CFR Subchapter F must be referenced on the plan or in the specifications of the unit.

Refer: 46 CFR 58.60-13 – Inspection

An industrial system is accepted by the USCG if the inspector finds:

The system meets the requirements of 46 CFR Subpart 58.60,

There are guards, shields, insulation or similar devices for protection of personnel,

and

The system is not manifestly unsafe.

Refer: 46 CFR 107.305 Plans and Information

Each applicant for approval of plans must submit three copies of each of the following described plans, specifications, and structural calculations concerning the construction, arrangement, required equipment, and safety features of the unit:

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(Note: the asterisk (*) indicates items that are approved by LR for units classed by it, unless the law or USCG regulations contain requirements that are not covered by LR)

General

- Specifications
- General arrangement plan of decks, holds, inner bottoms, etc. including inboard and outboard profile

Hull Structure

- *Inner bottom plating and framing
- *Mid-ship section
- *Shell plating and framing
- *Stern, stern frame and rudder
- *Structural deck plans for strength decks
- *Pillars and girders
- *Watertight and oil tight bulkheads
- *Foundations for main machinery and boilers
- *Arrangement of ports, doors and air ports in shell plating
- *Hatch coamings and covers in weather and watertight decks
- *Details of hinged subdivision watertight doors and operating gear
- *Scuppers and drains penetrating shell plating
- Arrangement of cranes
- For self-elevating units, column stabilised units and units with special hull configuration, structural calculations and plans showing special structural features.

Stability

The plans and information required by 46 CFR 170.075

- For vessels of 100.0m (328.0ft) or more in length contracted for on or after 7th September 1990, a plan must be included which shows how visibility from the navigation bridge will meet the standards contained in 46 CFR 108.801.

Fire Control

- General arrangement plans showing, for each deck, the control stations, fire sections enclosed by fire resisting bulkheads, alarm and extinguishing systems, fire extinguishers, means of access to compartments and other decks, and the ventilation system, including location of ventilation shutdowns, positions of dampers, and the numbers identifying each system.
- Ventilation diagram, including dampers and other fire control features
- Details of fire alarm systems.
- Details of fixed fire extinguishing systems.

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Marine Engineering

- Plans required for marine engineering equipment and systems by 46 CFR Subchapter F.

Electrical Engineering

- Plans required for electrical engineering equipment and systems by 46 CFR Subchapter J.

Life Saving Equipment

- The location and arrangement of each lifesaving system including each embarkation deck, showing each overboard discharge and clearances from projections and obstructions in the way of launching lifeboats, rescue boats, and life rafts throughout the range of list and trim angles required under 46 CFR Part 108, 46 CFR Subpart E.
- The design weight of each lifeboat, rescue boat, and davit-launched life raft when fully equipped and loaded.
- Working loads of davits and winches.
- Types and sizes of falls.
- Manufacturer's name and identification of each item of equipment.
- Personnel accommodations.
- Arrangement plans showing each accommodation space, ventilation, and means of escape.

Construction Portfolio

This portfolio may be included in the operating manual required by the MODU Code 14.1 and 46 CFR 109.121. A construction portfolio must be prepared for each unit and must be approved by the USCG Marine Safety Center. The portfolio must document the location and extent of application of different grades and strengths of materials and include a description of the materials and welding procedures employed and any other relevant construction information. The portfolio must contain the following:

- Structural plans showing areas incorporating different grades and strengths of materials. A simplified plan may be included in the portfolio if it adequately defines the different areas of application.
- A list of different grades or strengths of material that conform to LR or ASTM specifications. For materials that do not conform to LR or ASTM specifications, complete specifications, including chemical and physical properties, special testing and any heat treatment.

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- Each approved weld procedure for the fabrication of each structure using different grades or strengths of material and each approved weld test procedure.
- Information, restrictions or prohibitions regarding repairs or modifications.

Refer: 46 CFR 108.103 Equipment Not Required on a Unit (Excess Equipment) (MODU CODE Chapters 9 & 10)

Each item of lifesaving and fire fighting equipment carried on board the unit in addition to equipment required to be on board is to be USCG approved or be acceptable to the cognizant OCMI for use on the unit.

Refer: 46 CFR 108.137 Structural Fire Protection (MODU CODE Table 9.1)

USCG provides the guidance on structural fire protection in NVIC 9-97 and, specifically:

USCG considers a corridor to be an accommodation space;

Bulkhead separating accommodation space from pantry should be class "A";
Bulkhead separating accommodation space from any store should be class "A".

Refer: 46 CFR 108.143 Accommodation Space (MODU Code 9.2.9)

Except in wash rooms and toilet spaces, each deck covering must be made of an approved material, except an overlay on a deck for leveling or finishing that is no more than 9.375mm (³/₈") thick.

Refer: 46 CFR 108.147 Prohibited Paint in Accommodation Spaces (MODU CODE Table 9.2.10)

No nitrocellulose or other highly flammable or noxious fume-producing paint or lacquer may be used on a unit.

Refer: 46 CFR 108.160 Vertical Ladders (LR MOU Rule Refer: Part 4, Chapter 6, Section 9.18)

Each vertical ladder must have rungs that are:

- At least 410mm (16.0") in length.
- Not more than 300mm (12.0") apart, uniform for the length of the ladder.
- At least 178mm (7.0") from the nearest permanent object in back of the ladder.

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Except when unavoidable obstructions are encountered:

- There must be at least 115mm (4 1/2") clearance above each rung.
- No vertical fixed ladders may be made of wood.

Refer: 46 CFR 108.167 Weather Deck Ladders

Each unit must have at least one permanent inclined ladder between each weather deck.

Refer: 46 CFR 108.170-Classified Locations and Electrical Installations in Classified Locations and 46 CFR 108.177 (MODU CODE Chapter 6) (LR MOU Rules Refer:Part 7, Chapter 2, Section 4.1.5)

An enclosed space that has direct access to a Zone 1 location can be considered non-hazardous if the access has self-closing gas-tight doors forming an air lock. Ventilation and alarms are to comply with LR/IMO requirements.

Note: other options from LR MOU Rules and IMO MODU Code that permit a space to be considered safe when it has direct access to a Zone 1 location are not acceptable.

Electrical equipment and devices installed in spaces adjacent to hazardous areas and made safe by complying with the reference LR and IMO referrals to be limited to only essential equipment.

Refer to LR MOU Rules for New and Existing Vessels Part D, Chapter 5, Section 7 and Part E, Chapter 5, Section 3 respectively for additional requirements relative to electrical installations in hazardous areas.

Refer: 46 CFR 108.181 Ventilation for Enclosed Spaces

There must be a means to close each vent or ventilating system.

Each fan in a ventilating system must have remote controls installed in accordance with 46 CFR 111.103.

- There must be a means to close each doorway, ventilator, and annular space around each funnel or other opening to machinery, stowage, or working spaces.
- The means must be located outside the space.

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Refer: NVIC 9-97 Steel Ducting (*Gauge of Steel*) (MODU CODE Refer: 9.2.11 - 9.2.20) (LR MOU Rule Refer: Part 4, Chapter 2, Section 2 & 4)

“Conventional” ducting is recommended to be constructed of steel with a minimal thickness of 0.73 mm (0.03”), properly stiffened, and rigidly connected to the ship structure. Although conventional ducting is not actually required, its use is recommended to avoid additional arrangements for penetrations such as the use of dampers, sleeves, etc., that would otherwise not be required. If ventilation is constructed of thinner steel, other materials, or in some way of lesser integrity, then the damper requirements outlined in Section 3.16 through 3.18 of NVIC 9-97 may be changed so as to maintain the same degree of integrity.

Refer: 46 CFR 108.185 Ventilation for Enclosed Classified Locations (MODU CODE Refer: 6.4) (LR MOU Rules Refer: Part 7, Chapter 2)

Each ventilation unit is to have alarms that are powered independently of the ventilation motor power and control circuitry and sound at a continuously manned station when the ventilation system for the space is not working.

Refer: 46 CFR 108.187 Ventilation for Brush Type Electric Motors in Classified Spaces (MODU CODE Refer: 6.6) (LR MOU Rules Refer: Part 7, Chapter 2, Section 8)

Ventilation for brush type electric motors in classified locations are to comply with IEC 60079 and NFPA 496-1974, "Standard for Purged and Pressurized Enclosures for Electrical Equipment in Hazardous Locations", except that audible and visual alarms may be used if shutting down the motor may cause unsafe conditions.

Refer: 46 CFR 108.193 Accommodation Spaces – Restrictions

- There must be no direct communication between the accommodation spaces and any chain locker, stowage, or machinery space, except through solid, close-fitted doors or hatches.
- No access, vent, or sounding tube from a fuel or oil tank may open into any accommodation space, except that accesses and sounding tubes may open into corridors.

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Refer: 46 CFR 108.195 Location of Accommodation Spaces

- On surface type units, accommodation spaces must not be located forward of a vertical plane located at 5.0% of the unit's length aft of the stem, at the designed summer load line.
- On all units, the deck head of each accommodation space must be above the deepest load line.

Refer: 46 CFR 108.197 Construction of Accommodation Spaces

- Each sleeping, mess, recreational or hospital space that is adjacent to or immediately above a stowage or machinery space, paint locker, drying room, washroom, toilet space or other odor source must be made odor-proof.
- Each accommodation space that is adjacent to or immediately above a galley, machinery space, machinery casing, boiler room or other noise or heat source, must be protected from the heat and noise.
- Where the shell or an unsheathed weather deck forms a boundary of an accommodation space, the shell of deck must have a covering that prevents the formation of moisture.
- The deck head of each accommodation space must be a light color.
- Each accommodation space in which water may accumulate must have a drain scupper located in the lowest part of the space, considering the average trim of the unit.
- Each public toilet space must be constructed and located so that its odors do not readily enter any sleeping, mess, recreational or hospital space.

Refer: 46 CFR 108.199 Arrangement of sleeping spaces

To the extent practicable, each occupation group must be berthed together in sleeping spaces arranged to minimise disturbance created by personnel leaving for or arriving from a working period.

Refer: 46 CFR 108.201 Size of sleeping spaces

- No sleeping space may berth more than four persons, except that a sleeping space for personnel not regularly employed on a unit may berth up to six persons if the space meets 46 CFR 108.199 and berthing of six persons in that space is authorized by the Commandant (G-MSO).
- Without deducting any equipment used by the occupants, each sleeping space must have for each occupant:

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- 2.8m² (approximately 30 ft²) of deck area
and
- 6.0m³ (approximately 210 ft³) of volume.
- Each sleeping space must have at least 1910mm (approximately 75") of headroom over clear deck areas.

Refer 46 CFR 108.203 Berths and lockers

- Each sleeping space must have a separate berth for each occupant.
- No more than one berth may be placed over another.
- Each berth must have a framework of hard, smooth material that is not likely to corrode or harbor vermin.
- Each berth must be arranged to provide ample room for easy occupancy.
- Each berth must be at least 760 mm (approximately 30") wide by 1930mm (approximately 76") long.
- Adjacent berths must be separated by a partition that extends at least 460mm (approximately 18") above the sleeping surface.
- The bottom of a lower berth must be at least 300mm (approximately 12") above the deck.
- The bottom of an upper berth must be at least 760mm (approximately 30") from the bottom of the berth below it and from the deck or any pipe, ventilating duct or other overhead installation.
- Each berth must have a berth light.
- Each occupant of a sleeping space must have a readily accessible locker of hard, smooth material.
- Each locker must be at least 0.194m² (approximately 300in²) in cross section and 1530mm (approximately 60") high. |

Refer: 46 CFR 108.205 Wash spaces, toilet spaces and shower spaces

- "Private facility" means a toilet, washing, or shower space that is accessible only from one single or double occupancy sleeping space.
- "Semi-private facility" means a toilet, washing or shower space that is accessible from either of two one-to-four person occupancy sleeping spaces.
- "Public facility" means a toilet, washing, or shower space that is not private or semi-private.

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- Each private facility must have one toilet, one shower, and one washbasin, all of which may be in a single space.
- Each semi-private facility must have at least one toilet and one shower, which may be in a single space.
- Each room adjoining a semi-private facility must have a washbasin if a washbasin is not installed in a semi-private facility.
- Each unit must have enough public facilities to provide at least one toilet, one shower, and one washbasin for each eight persons who occupy sleeping spaces that do not have private or semi-private facilities.
- Urinals may be installed in toilet rooms, but no toilet required in this Section may be replaced by a urinal.
- Each public toilet space and washing space must be convenient to the sleeping space that it serves.
- No public facility may open into any sleeping space.
- Each washbasin, shower, and bathtub must have hot and cold running water.
- Adjacent toilets must be separated by a partition that is open at the top and bottom for ventilation and cleaning.
- Public toilet facilities and shower facilities must be separated.
- 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.
- 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.
- Washbasins may be located in sleeping spaces.

Refer: 46 CFR 108.207 Mess rooms

- Each mess room that is not adjacent to the galley that serves it must be equipped with a steam table.
- Each mess room must seat the number of persons expected to eat in the mess room at one time.

Refer: 46 CFR 108.209 Hospital spaces

- Each unit carrying twelve or more persons on a voyage of more than three days must have a hospital space.

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- Each hospital space must be suitably separated from other spaces.
- No hospital space may be used for any other purpose, when used for care of the sick.
- An entrance to each hospital space must be wide enough and arranged to readily admit a person on a stretcher.
- Each berth in a hospital space must be made of metal.
- Each upper berth must be hinged and arranged so that it can be secured clear of the lower berth.
- Each hospital space must have at least one berth that is accessible from both sides.
- Each hospital space must have one berth for every 12 persons or portion thereof on board, who are not berthed in single occupancy rooms, but the number of berths need not exceed six.
- Each hospital space must have a toilet, washbasin and bathtub or shower accessible from the hospital space.
- Each hospital space must have clothes lockers, a table and seats.

Refer: 46 CFR 108.210 Hospital space not required

- A hospital space 46 CFR is not required on a unit if one single or double occupancy sleeping space, designated and equipped as a treatment or isolation room or both is available for immediate medical use, and has:
 - An entrance that is wide enough and arranged to readily admit a person on a stretcher.
 - A single berth or examination table that is accessible from both sides.
 - A washbasin in or immediately adjacent to it.

Refer: 46 CFR 108.211 Miscellaneous accommodation spaces

- Each unit must have enough facilities for personnel to wash their own clothes, including at least one tub or sink that has hot and cold running water.
- Each unit must have enough equipment or space for the personnel to dry their own clothes.
- Each unit must have an accommodation space that can be used for recreation.

Section 2

Refer 46 CFR 108.213 Heating requirements

- Each accommodation space must be heated by a heating system that can maintain at least 20°C (68°F).
- Radiators and other heating apparatuses must be constructed, located or shielded so as to avoid risk of:
 - Fire.
 - Danger.
 - Discomfort to the occupants of each accommodation space.
- Each exposed pipe in an accommodation space, leading to a radiator or other heating apparatus must be insulated.

Refer: 46 CFR 108.215 Insect screens

- Accommodation spaces must be protected against the admission of insects.
- Insect screens must be installed when natural ventilation is provided.

Refer: 46 CFR 108.217 Guardrails and Bulwarks (LR MOU Rule Refer: Part 4, Chapter 6, Sections 9.13, 9.14 and 9.15) (LL Prot 88, Annex I, regulation 25(2))

- Each unit must have guardrails or bulwarks along the edge of the bridge, of each deck and of each deck opening.
- Each guardrail and bulwark must extend at least 1000mm (39.37") above the deck, except where this height may interfere with the normal operation of the unit a lesser height may be approved.
- Removable guardrails may be installed where operating conditions warrant their use.

Refer: 46 CFR 108.219 Guardrails (LR MOU Rule Refer: Part 4, Chapter 6, Sections 9.13, 9.14 and 9.15) (LL Prot 88, Annex I, regulation 25(3))

- Except for exposed peripheries of a freeboard or superstructure deck, each guardrail must have at least two evenly spaced courses.
- At exposed peripheries of a freeboard or superstructure deck, each guardrail must have at least three courses not more than 380mm (15") apart with the lowest course not more than 230mm (9") above the deck.
- For a rounded gunwale, the guardrail must be at the edge of the flat of the deck.

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Refer: 46 CFR 108.221 Storm Rails

Each unit must have a storm rail in the following locations:

- On each deckhouse side that is normally accessible.
- On each side of each passageway that is wider than 1830mm (72").
- On at least one side of each passageway that is less than 1830mm (72") wide.

Refer: 46 CFR 108.223 Guards on Exposed Equipment

Each unit must have hand covers, guards or rails installed on all belts, gears, shafts, pulleys, sprockets, spindles, flywheels or other reciprocating, rotating or moving parts of machinery or equipment normally exposed to contact by personnel.

**Refer: 46 CFR 108.235 Helicopter Facilities - Construction (MODU CODE 13.2)
(LR MOU Rules Refer: Part 4, Chapter 6, Section 5 and 9)**

- Each helicopter deck must be designed to accommodate the loadings (static and dynamic) imposed by operation and stowage of helicopters intended to use the facility as well as environmental loadings (wind, wave, water, snow, etc.) anticipated for the unit.
- The adequacy of each helicopter deck for the loadings required in this Section must be shown by design calculations. Where the placement of a load affects the suitability of a structural member, the load must be evaluated in the most unfavorable position for each member.
- The analysis required in this Section must be based in the dead load of the structure, existing stresses in the deck when it is an integral part of a unit's structure, and each of the following loading conditions:
 - Uniform distribution loading. A loading of 2kg/m² (42lb/ft²) applied to the helicopter deck area.
 - Helicopter landing impact loading. The limit load established by the limit drop test in 14 CFR 29.725, or a load of not less than 75% of the helicopter maximum weight taken on a square area of 300mm x 300mm (12" x 12") under each main landing gear unit applied anywhere on the helicopter deck area.
 - Stowed helicopter loading. The helicopter maximum weight plus inertial forces from the helicopter due to anticipated unit motions and applicable environmental loadings, including wind loads.

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Refer: 46 CFR 108.237 Helicopter Facilities - Fuel Storage Facilities (MODU CODE Refer: 9/11) (LR MOU Rules Refer: Part 5, Chapter 12, Section 6.1)

Helicopter fuel storage tanks that are non-integral with the hull are to be either a Marine Portable Tank complying with 46 CFR 64 if built prior to 1st May 1991 or an IM 107 tank complying with 49 CFR 178.270 if built after 1st May 1991.

Refer: 46 CFR 108.239 Helicopter Facilities - Fuel Transfer Facilities (MODU CODE 9.11) (LR MOU Rules Refer: Part 5, Chapter 12, Section 6.1)

- Each nozzle must be a "Dead-man" type.
- Each hose must have a storage reel.
- Each hose must have a static grounding device.
- Each electric fuel transfer pump must have a control with a fuel transfer pump operation indicator light at the pump.
- There must be a fuel pump shut-off at each of the access routes required by MODU Code 13.4.4.
- Each fuel transfer pump and each hose reel must have a means to contain fuel spills or leaks.
- Each hose must meet Chapter 3, "Aircraft Fueling Hose" of NFPA Standard for Aircraft Fuel Servicing, No. 407-1975.

Refer: 46 CFR Part 108, 46 CFR Subpart D-Fire Extinguishing Systems (Refer: 46 CFR 108.401 – 108.499 as below) (MODU Code 9.4.10)

Each unit must have a fire main system.

Refer: 46 CFR 108.403 Fire extinguishing systems: General (MODU Code 9.4 & 9.5)

- Each of the following on a unit must have a USCG approved fixed gaseous type extinguishing system:
 - Each paint locker, oil room, and similar space.
 - Each enclosed space containing internal combustion or gas turbine main propulsion machinery.
 - Each enclosed space containing internal combustion machinery with an aggregate power of at least 746kW (1000bhp).
 - Each enclosed space containing a fuel oil unit, including purifiers, valves, or manifolds for main propulsion machinery or internal combustion machinery with an aggregate power of at least 746kW (1000bhp).

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- Each enclosed ventilation system for electric motors or generators used for vital services including bilge pumps, fire pumps or propulsion.
- Each space containing an oil fired boiler, the fuel oil unit or valves for the boiler, or manifolds in the line between the fuel settling tanks and the boiler on a unit must have a fixed gas type, foam, or other USCG approved fire extinguishing system.

Refer: 46 CFR 108.403a Fire extinguishing systems: Non-vital services

Each enclosed ventilating system for electric motors or generators not used for vital services must have an access into the system for fire-fighting or be protected by a fixed fire protection system.

Refer: 46 CFR 108.404 Selection of fire detection system (MODU Code 9.7 & 9.8)

- If a fire detector is in a space, it must provide effective detection of fires most likely to occur in the space.
- The fire detection system must be designed to minimise false alarms.

Refer: 46 CFR 108.405 Fire detection system (MODU Code 9.7 & 9.8)

- Each fire detection system and each smoke detection system on a unit must:
 - Be approved by the USCG.
 - Have a visual alarm and an audible alarm in the pilothouse or at a normally manned control station for the system.
- Each fire detection system must be divided into zones to limit the area covered by any particular alarm signal.
- Each visual alarm must:
 - Have a chart or diagram next to the alarm that shows the location of the zones in the system and that contains the instructions for operating, and testing the system.
 - When activated show the zone in the system where fire has been detected.

and

 - Be in a noticeable location in the pilothouse or control station.

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Refer: 46 CFR 108.407 Detectors for electric fire detection system

- Each detector in an electric fire detection system must be located where:
 - No portion of the overhead of a space protected is more than 3.0m (10.0ft) from a detector.
 - Beams and girders extending below the ceiling of the space protected and any other obstructions do not detract from the effectiveness of the detector.

and

 - Damage to the detector is unlikely to occur if it is not protected.

- Each detector must be set to activate at not less than 57°C (135°F) and at not more than 73°C (165°F), except that if a space normally has a high ambient temperature each detector may be set to activate at not less than 80°C (175°F) and not more than 107°C (225°F).

Refer: 46 CFR 108.409 Location and spacing of tubing in pneumatic fire detection system

All tubing in a pneumatic fire detection system must be on the overhead or within 300mm (12") of the overhead on a bulkhead in a location where:

- No portion of the overhead is more than 3.6m (12ft) from the nearest point of tubing.
 - Beams or girders extending below the ceiling or other obstructions do not detract from the effectiveness of the tubing.
- and**
- Damage to the tubing is unlikely to occur if it is not protected.

If tubing in a tubing circuit is installed in an enclosed space, at least 5.0% of the tubing in the circuit must be exposed in the space, except that at least 7.6m (25ft) of tubing must always be exposed in the space.

A pneumatic fire detection system must be set to activate after approximately a 22°C (40°F) per minute increase in temperature at the centre of the circuit in the system.

Refer: 46 CFR 108.411 Smoke detection system

Each smoke accumulator in a smoke detection system must be located on the overhead of the compartment protected by the system in a location:

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- Where no portion of the overhead of the compartment is more than 12m (40ft) from an accumulator.
- That is no closer to the opening of a ventilator than 3 times the diameter or equivalent size of the opening.
- Where damage to the accumulator is unlikely to occur if it is not protected.

Refer: 46 CFR 108.413 Fusible element fire detection system

A fusible element fire detection system may be installed.
The arrangements for the system must be acceptable to the USCG.

Refer: 46 CFR 108.415 Fire pump: General. (MODU CODE 9.4)

Alternative designs that meet the pressure requirement of this paragraph will be considered for column stabilised and self elevating units.

Refer: 46 CFR 108.417 Fire pump components and associated equipment

- Each fire pump in a fire main system must have a relief valve on its discharge side that is set to relieve at 1.75kg/cm² (approximately 25psi) in excess of the pump discharge pressure necessary to meet the pressure required by MODU Code 9.4.5 for the pump or 8.60kg/cm² (approximately 125psi), whichever is greater.
A relief valve may be omitted if the pump operating under shut-off conditions is not capable of developing the pressure described by MODU Code 9.4.5 plus 1.75kg/cm² (25psi).
- Each fire pump in a fire main system must have a pressure gauge on its discharge side.
- Fire pumps may be used for other purposes. One of the required pumps must be kept available for use on the fire system at all times.
 - If a fire pump is used in a system other than the fire main system, except for branch lines connected to the fire main for deck washing, each pipe connecting the other system must be connected to the pump discharge through a shut-off valve at a manifold near the pump.
 - If the fire pump exceeds the pressure required above, the pipe leading from the discharge manifold to other portions of the fire main system must have a reducing station and a pressure gauge in addition to the pressure gauge required by this section.

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- If a fire pump has a reducing station, the relief valve required by this section for the pump and the additional pressure gauge required in this Section must not be located on the discharge side of the reducing station.
- An oil line must not be connected to a fire pump.

Refer: 46 CFR 108.421 Location of fire pumps and associated equipment

Fire pumps to be installed as required by the MODU CODE, 9.4.3.

Refer: 46 CFR 108.423 Fire hydrants and associated equipment

In a main machinery space, except a shaft alley with no assigned space for stowage of combustibles, each spray pattern of water must be from one length of fire hose and each must be from a separate outlet.

- In all other spaces at least one spray pattern of water must be from one length of fire hose.
- No outlet on a fire hydrant may point above the horizontal.
- Each fire hydrant must have at least one spanner and at least one fire hose rack or reel.

Refer: 46 CFR 108.425 Fire hoses and associated equipment

Each length of fire hose in a fire main system must be:

- Of 38mm (1½") or 64mm (2½") nominal hose size diameter.
 - Of 15.25m (50ft) nominal hose size length.
- and**
- Lined commercial fire hose that meets Standard 19 of the Underwriters' Laboratories, Inc., (1971 edition) or Federal Specification ZZ-H-451f.

Fire station hydrant connections shall be brass, bronze, or other equivalent metal.

Couplings shall either:

- Use National Standard fire hose coupling threads for the 1½" (38mm) or 2½" (64mm) hose sizes:
 - 9.0 threads per inch for 1½" (38mm) hose.
 - 7.5 threads per inch for 2½" (64mm) hose.
- or**
- Be a uniform design for each hose diameter throughout the vessel.

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- Each nozzle for a fire hose in a fire main system must be a combination solid stream and water spray fire hose nozzle that is approved under 46 CFR 162.027. Combination solid stream and water spray nozzles previously USCG approved under 46 CFR 162.027 may be retained so long as they are maintained in good condition to the satisfaction of the OCMI.
- A combination solid stream and water spray fire hose nozzle previously approved under 46 CFR 162.027, must have a low-velocity water spray applicator also previously approved under 46 CFR 162.027 when installed in:
 - Machinery spaces containing oil fired boilers, internal combustion machinery or oil fuel units.
 - and**
 - Helicopter decks.

Refer: 46 CFR 108.429 Fire main system protection

Each pipe and fire hydrant in a fire main system must be installed to the extent practicable in locations that are not exposed to damage by materials that are moved on or onto the deck.

Each part of the fire main system located on an exposed deck must either be protected against freezing or be fitted with cut-out valves and drain valves to shut off and drain the entire exposed system in freezing weather.

Refer: 46 CFR 108.430 Automatic Sprinkling Systems: General

Automatic Sprinkler Systems shall comply with NFPA 13-1996.

**Refer: 46 CFR 108.431 CO₂ Systems (Fixed CO₂ Fire Extinguishing Systems):
General**

- High pressure carbon dioxide fire extinguishing systems must comply with 46 CFR 108.431 through 108.457 .
- Low pressure systems, that is, those in which the carbon dioxide is stored in liquid form at low temperature, must be USCG approved.
- Each carbon dioxide system cylinder must be fabricated, tested and marked in accordance with 46 CFR 147.60 and 147.65.

Refer: 46 CFR 108.433 Quantity of CO₂: General

Each CO₂ system must have enough gas to meet the quantity requirements of 46 CFR 108.439 for the space requiring the greatest amount of CO₂.

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Refer: 46 CFR 108.437 Pipe sizes and discharge rates for enclosed ventilation systems for rotating electrical equipment

- The minimum pipe size for the initial charge must meet table 108.441 and the discharge of the required amount of CO₂ must be completed within 2 minutes.
- The minimum pipe size for the delayed discharge must be at least 12.5mm (1/2") standard pipe.
- The pipe used for the initial discharge must not be used for the delayed discharge, except systems having a volume of less than 57m³ (2000ft³).

Refer: 46 CFR 108.439 Quantity of CO₂ for protection of spaces

- The number of pounds of CO₂ required to protect a space must be equal to the gross volume of the space divided by the appropriate factor from Table 108.439.
- If a machinery space includes a casing, the gross volume of the space may be calculated using the reductions allowed in 46 CFR 95.10- 5(e).
- If fuel can drain from a space to an adjacent space or if two spaces are not entirely separate, the requirements for both spaces must be used to determine the amount of CO₂ to be provided and the CO₂ system must be arranged to discharge into both spaces simultaneously.

Table 108.439

Gross volume of space in m³ (ft³)	Gross volume of space in m³ (ft³)	CO₂ Supply Factors
Over	Not over	
0.0 (0)	14.16 (500)	15
14.16 (500)	45.3 (1,600)	16
45.3 (1,600)	127.4 (4,500)	18
127.4 (4,500)	1416 (50,000)	20
1416 (50,000)		22

Refer: 46 CFR 108.441 Piping and discharge rates for CO₂ systems

- The size of branch lines to spaces protected by a CO₂ system must meet Table 108.441.
- Distribution piping within a space must be proportioned from the supply line to give proper distribution to the outlets without throttling.
- The number, type, and location of discharge outlets must distribute the CO₂ uniformly throughout the space.

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Table 108.441, CO₂ System Pipe Size

CO ₂ supply in system		Minimum pipe size	
kilograms	(pounds)	millimetres	(inches)
45	100	12.70	½
104	225	19.05	¾
136	300	25.40	1.0
272	600	31.75	1¼
450	1,000	38.10	1½
1,110	2,450	50.80	2.0
1,130	2,500	63.50	2½
2,023	4,450	76.20	3.0
3,229	7,100	88.90	3½
4,750	10,000	101.60	4.0
6,818	15,000	114.30	4½

- The total area of all discharge outlets must be more than 35.0% and less than 85.0% of the nominal cylinder outlet area or the area of the supply pipe, whichever is smaller.
- The nominal cylinder outlet area in cm² is determined by multiplying the factor 0.0313 by the number of kilograms of CO₂ required. (The nominal cylinder outlet area in in² is determined by multiplying the factor 0.0022 by the number of pounds of CO₂ required). The nominal cylinder outlet area must not be less than 71mm² (0.110in²).
- A CO₂ system must discharge at least 85.0% of the required amount within 2 minutes.

Refer: 46 CFR 108.443 Controls and valves

- At least one control for operating a CO₂ system must be outside the space or spaces that the system protects and in a location that would be accessible if a fire occurred in any space that the system protects. Control valves must not be located in a protected space unless the CO₂ cylinders are also in the protected space.
- A CO₂ system that protects more than one space must have a manifold with a stop valve, the normal position of which is closed, that directs the flow of CO₂ to each protected space.
- A CO₂ system that protects only one space must have a stop valve installed between the cylinders and the discharge outlets in the system, except on a system that has a CO₂ supply of 136kg (300lbs) or less.

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- At least one of the control stations in a CO₂ system that protects a machinery space must be as near as practicable to one of the main escapes from that space.
- All distribution valves and controls must be of a USCG approved type.
- Each CO₂ system that has a stop valve must have a remote control that operates only the stop valve and must have a separate remote control for releasing the required amount of CO₂ into the space protected by the system.
- Each CO₂ system that does not have a stop valve must be operated by a remote control that releases the required amount of CO₂ into the space protected by the system.
- Remote controls to each space must be in an enclosure.
- Each system must have a manual control at its cylinders for releasing CO₂ from the cylinders, except that if the system has pilot cylinders, a manual control is not required other than for pilot cylinders.
- If gas pressure is used to release CO₂ from a system having more than 2 cylinders, the system must have at least 2 pilot cylinders to release the CO₂ from the remaining cylinders.
- If the entrance to a space containing the CO₂ supply or controls of a CO₂ system has a lock, the space must have a key to the lock in a break-glass type box that is next to and visible from the entrance.

Refer: 46 CFR 108.445 Alarm and means of escape

- Each CO₂ system that has a supply of more than 136.0kg (300lbs) of CO₂, except a system that protects a tank, must have an alarm that sounds for at least 20 seconds before the CO₂ is released into the space.
- Each audible alarm for a CO₂ system must have the CO₂ supply for the system as its source of power and must be in a visible location in the spaces protected.

Refer: 46 CFR 108.447 Piping

- Each pipe, valve, and fitting in a CO₂ system must have a bursting pressure of at least 420kg/cm² (6,000psi).
- All piping for a CO₂ system of nominal size of 19.05mm (¾") inside diameter or less must be at least Schedule 40 (standard weight) and all piping of nominal size over 19.05mm (¾") inside diameter must be at least Schedule 80 (extra heavy).
- Each pipe, valve, and fitting made of ferrous materials in a CO₂ system must be protected inside and outside from corrosion.
- Each CO₂ system must have a pressure relief valve set to relieve between 168 and 196kg/cm² (2,400 and 2,800psi) in the distribution manifold or other

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location that protects the piping when all branch line shut-off valves are closed.

- The end of each branch line in a CO₂ system must extend at least 50.0mm (2.0") beyond the last discharge outlet and be closed with a cap or plug.
- Piping, valves and fittings in a CO₂ system must be securely supported and protected from damage.
- Each CO₂ system must have drains and dirt traps located where dirt or moisture can accumulate in the system.
- Discharge piping in a CO₂ system may not be used for any other purpose except as part of a fire detection system.
- Piping in a CO₂ system that passes through accommodation spaces must not have drains or other openings within these spaces.

Refer: 46 CFR 108.449 Piping tests

- Each test prescribed in this section must be performed upon completion of the piping installation.
- When tested with CO₂ or other inert gas under a pressure of 70kg/cm² (1000psi), with no additional gas introduced into the system, the leakage in the piping from the cylinders to the stop valves in the manifold must not allow a pressure drop of more than 10.5kg/cm² (150psi) per minute for a 2 minute period.
- When tested with CO₂ or other inert gas under a pressure of 42kg/cm² (600psi), with no additional gas introduced into the system, the leakage in each branch line must not allow a pressure drop of more than 10.5kg/cm² (150.0psi) per minute for a 2-minute period. The distribution piping must be capped within the protected space.
- Small independent systems protecting emergency generator rooms, lamp lockers and similar small spaces need not meet the tests prescribed in paragraphs (a) and (b) of this Section if they are tested by blowing out the piping with air at a pressure of at least 7kg/cm² (100psi).

Refer: 46 CFR 108.451 CO₂ storage

- Except as otherwise provided in this Section, each cylinder of a CO₂ system must be outside each space protected by the system and in a location that would be accessible if a fire occurred in any space protected by the system.
- A CO₂ system that has a CO₂ supply of 136kg (300lbs) or less may have one or more cylinders in the space protected by the system if the space has a heat detection system to activate the system automatically in

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addition to the remote and manual controls required by 46 CFR Part 108, Subpart D.

- Each space that contains cylinders of a CO₂ system must be ventilated and designed to prevent an ambient temperature of more than 54°C (130°F).
- Each cylinder in a CO₂ system must be securely fastened, supported, protected from damage, in an accessible location, and capable of removal from that location.
- Each unit must have a means for weighing cylinders of a CO₂ system.
- A cylinder in a CO₂ system may not be mounted in a position that is inclined more than 30° from a vertical position, except that a cylinder having flexible or bent siphon tubes may be mounted in a position that is inclined up to 80° from the vertical. The bottom of each cylinder when mounted must be at least 50mm (2") from the deck.
- If a cylinder does not have a check valve on its independent cylinder discharge, it must have a plug or cap to close the outlet when the cylinder is moved.

Refer: 46 CFR 108.453 Discharge outlets

Each discharge outlet must be of an approved type.

Refer: 46 CFR 108.455 Enclosure openings

- Mechanical ventilation for spaces protected by a CO₂ system must be designed to shut down automatically when the system is activated.
- Each space that is protected by a CO₂ system and that has natural ventilation must have a means for closing that ventilation.
- Each space protected by a CO₂ system must have the following means for closing the openings to the space from outside the space:
 - Doors, shutters or dampers for closing each opening in the lower portion of the space.
 - Doors, shutters, dampers or temporary means such as canvas or other material normally on board a unit may be used for closing each opening in the upper portion of the space.

Refer: 46 CFR 108.457 Pressure release

Each air tight or vapor tight space, such as a paint locker, that is protected by a CO₂ system must have a means for releasing pressure that accumulates within the space if CO₂ is discharged into the space.

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Refer: 46 CFR 108.459 Foam Extinguishing Systems, Number and location of outlets

- A foam extinguishing system in a space must have enough outlets to spread a layer of foam of uniform thickness over the deck or bilge areas of the space.
- A foam extinguishing system in a space that has a boiler on a flat that is open to or can drain into a lower portion of the space must have enough outlets to spread a layer of foam of uniform thickness over the:
 - Flat.
 - and**
 - Deck or bilge areas of the space.

A foam extinguishing system for a tank must have enough outlets to spread a layer of foam of uniform thickness over the surface of the liquid in the tank.

Refer: 46 CFR 108.461 Coamings

Each machinery flat in a space that has a foam extinguishing system must have coamings that are high enough to retain spilled oil and foam on the flat on all openings except deck drains.

Refer: 46 CFR 108.463 Foam rate: Protein

- (a) If the outlets of a protein foam extinguishing system are in a space, the foam rate at each outlet must be at least 6.52ltr/min/m² (0.16gal/min/ft²) of area covered by the system.
- (b) If the outlets of a protein foam extinguishing system are in a tank, the foam rate at each outlet must be at least 4.07ltr/min/m² (0.1gal/min/ft²) of liquid surface in the tank.

Refer: 46 CFR 108.467 Water supply

The water supply of a foam extinguishing system must not be the water supply of the fire main system on the unit unless when both systems are operated simultaneously:

- The water supply rate to the foam production equipment meets the requirements of this Section.
- and**
- Water supply rate to the fire hydrants required by the MODU Code section 9.4 allows compliance with the pressure requirement in that Section.

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Refer: 46 CFR 108.469 Quantity of foam producing materials

Except as otherwise provided in this Section, each foam extinguishing system with outlets:

- In a tank must have enough foam producing material to discharge foam for at least 5 minutes at each outlet.
and
- In a space must have enough foam producing material to discharge foam for at least 3 minutes at each outlet.

If a foam system has outlets in more than one tank or space, the system need have only enough foam producing material to cover:

- the largest space that the system covers.
or
- if the liquid surface of a tank covered by the system is larger, the tank with the largest liquid surface.

Refer: 46 CFR 108.471 Water pump

Each water pump in a foam extinguishing system must be outside each machinery space in which the system has outlets and must not receive power from any of those spaces.

Refer: 46 CFR 108.473 Foam system components

- Each foam agent, each tank for a foam agent, each discharge outlet, each control and each valve for the operation of a foam extinguishing system must be USCG approved.
- Each foam agent tank and each control and valve for the operation of a foam extinguishing system with outlets in a space must be outside the space and must not be in a space that may become inaccessible if a fire occurs in the space.
- Each control for a foam extinguishing system with outlets in a space must be near a main escape from the space.

Refer: 46 CFR 108.474 Aqueous film forming foam systems

Aqueous film forming foam systems may be installed if USCG approved.

Refer: 46 CFR 108.475 Piping

- Each pipe, valve and fitting in a foam extinguishing system must meet the applicable requirements in 46 CFR Subchapter F.

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- Each pipe, valve and fitting made of ferrous material must be protected inside and outside from corrosion.
- Each pipe, valve and fitting must have support and protection from damage.
- Each foam extinguishing system must have enough:
 - Dirt traps to prevent the accumulation of dirt in its pipes.
 - and**
 - Drains to remove liquid from the system.
- Piping in a foam extinguishing system must be used only for discharging foam.

Refer: 46 CFR 108.477 Fire hydrants

- If a fixed foam extinguishing system has outlets in a main machinery space, at least 2 fire hydrants, in addition to the fire hydrants required by 46 CFR 108.423, must be installed outside the entrances to the space with each at a separate entrance.
- Each hydrant must have enough hose to spray any part of the space.
- Each hydrant must have a combination nozzle and applicator.

Refer: 46 CFR 108.486 Helicopter decks. Fire Protection for Helicopter Facilities

At least two of the accesses to the helicopter landing deck must each have a fire hydrant on the unit's fire main system located next to them.

Refer: 46 CFR 108.487 Helicopter deck fuelling operations

Each helicopter landing deck on which fuelling operations are conducted must have a fire protection system that discharges protein foam or aqueous film forming foam.

A system that only discharges foam must:

- Have enough foam agent to discharge foam continuously for at least 5 minutes at maximum discharge rate
- Have at least the amount of foam agent needed to cover an area equivalent to the swept rotor area of the largest helicopter for which the deck is designed with foam at:
 - If protein foam is used, 6.52ltr/min/m² (0.16gals/min/ft²) of area covered for 5 minutes.
 - If aqueous film forming foam is used, 4.07ltr/min/m² (0.1gals/min/ft²) of area covered for 5 minutes.

and

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- Be capable of discharging from each hose at 7.0kg/cm² (100.0psi) pressure:
 - A single foam stream at a rate of at least 340.0ltr/min (90gals/min).
 - and**
 - A foam spray at a rate of at least 190.0ltr/min (50.0gals/min).

Each system must have operating controls at each of its hose locations, be protected from icing and freezing, and be capable of operation within 10 seconds after activation of its controls.

Each system must have at least one hose at each of the 2 access routes required by MODU Code 13.4.446 CFR.

Each hose must be reel mounted and long enough to cover any point on the helicopter deck. Each hose that discharges foam must have a nozzle that has foam stream, foam spray and off positions.

Refer: 46 CFR 108.489 Helicopter fueling facilities

Each helicopter fueling facility must have a fire protection system that discharges one of the following agents in the amounts prescribed for the agents over the area of the fuel containment systems around marine portable tanks, fuel transfer pumps and fuel hose reels:

- Protein foam at the rate of 6.52ltr/min/m² (0.16gals/min/ft²) of area covered for five minutes.
- Aqueous film forming foam at the rate of 4.07ltr/min/m² (0.1gal/min/ft²) of area covered for five minutes.
- 22.5kg (50.0lbs) of dry chemical (B-V semi-portable) for each fueling facility of up to 27.87m² (300.0ft²).

If the fire protection system required by 46 CFR 108.487 is arranged so that it covers both a helicopter fueling facility and a landing deck, the system must have the quantity of agents required by this section in addition to the quantity required by 46 CFR 108.487.

Refer: 46 CFR 108.491 Hand Portable and Semi-portable Fire Extinguishing Systems: General

Each hand portable and semi-portable fire extinguisher on a unit must be USCG approved under 46 CFR 162.028 or 162.039.

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Refer: 46 CFR 108.493 Location

Each unit must have the hand portable and semi-portable fire extinguishers prescribed in Table 108.495(a) and installed in the locations prescribed in the Table. Each portable and semi-portable fire extinguisher must be visible and readily accessible.

The location, size and number of each portable and semi-portable fire extinguisher on a unit must be acceptable to the appropriate OCMI. The OCMI may require extinguishers in addition to those prescribed in Table 108.495(a) if he considers them necessary for fire protection on the unit.

Each hand portable and semi-portable fire extinguisher that has a nameplate which states that it is to be protected from freezing must be located where freezing temperatures do not occur.

Refer: 46 CFR 108.495 Spare charges.

Each unit must have enough spare charges for 50% of the hand portable fire extinguishers required under Table 108.495(a) of this subpart that are rechargeable by personnel on the unit.

If a unit has extinguishers that cannot be recharged by personnel on unit, it must also have at least one spare extinguisher for each classification and variety of those extinguishers.

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Table 108.495(a)--Hand Portable Fire Extinguishers and Semi-portable Fire-Extinguishing Systems

Space	Classification (see table 108.495(b))	Quantity and location
Safety Areas		
Wheelhouse and control room	C-I	2 in vicinity of exit.
Stairway and elevator enclosure		None required.
Corridors	A-II	1 in each corridor not more than 45 m (150ft) apart. (May be located in stairways.)
Lifeboat embarkation and lowering stations.	C-I	None required
Radio room		2 in vicinity of exit
Accommodation		
Staterooms, toilet spaces, public spaces, offices, lockers, small storerooms and pantries, Open decks, and similar spaces.		None required.
Service Spaces		
Galleys	B-II or C-II	1 for each 232m ² (2,500ft ²) or fraction thereof suitable for hazards involved.
Paint and lamp rooms	B-II	1 outside each room in vicinity of exit.
Storerooms	A-II	1 for each 232m ² (2,500ft ²) or fraction thereof located in vicinity of exits, either inside or outside the spaces.
Work shop and similar spaces	C-II	1 outside each space in vicinity of an exit.

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Table 108.495(a)--Hand Portable Fire Extinguishers and Semi-portable Fire-Extinguishing Systems Cont'd...

<u>Machinery Spaces</u>		
Oil-fired boilers: Spaces containing oil-fired boilers,	B-II	2 required in each space.
Either main or auxiliary or their fuel oil units.	B-V	1 required in each space
Internal combustion or gas turbine propelling machinery spaces.	B-II	1 for each 745bkW (1,000bhp) but not less than 2 nor more than 6 in each space.
Motors or generators of electric propelling machinery that do not have an enclosed ventilating system.	B-III	1 required in each space. (See note 1).
	C-II	1 for each motor or generator
Motors and generators of electric propelling machinery that have enclosed ventilating systems.		None required.
<u>Auxiliary Spaces</u>		
Internal combustion engines or gas turbine.	B-II	Outside the space containing engines or turbines in vicinity of exit.
Electric emergency motors or generators	C-II	1 outside the space containing motors or generators in vicinity of exit.
Steam driven auxiliary machinery.		None required.
Trunks to machinery spaces		None required.
Fuel tanks		None required.
<u>Miscellaneous Areas</u>		
Helicopter landing decks	B-V	1 at each access route.
Helicopter fuelling facilities	B-IV	1 at each fuel transfer facility. (See note 2).
Drill floor	C-II	2 required.
Cranes with internal combustion engines	B-II	1 required.

Notes:

1. Not required where a fixed gas extinguishing system is installed.
2. Not required where a fixed foam system is installed in accordance with **46 CFR 108.489**.

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Table 108.495(b)

	Classification: Type and Size	Water Liters (Gallons)	Foam Liters (Gallons)	Carbon Dioxide kilograms (Pounds)	Dry Chemical kilograms (Pounds)	Halon 1211 kilograms (Pounds)
A	II	9.5 (2½)	9.5 (2½)		2.25 (5.0) ³	
B	I		4.7 (1 ½)	1.8 (4.0)	0.9 (2.0)	1.1 (2½)
B	II		9.5 (2½)	6.7 (15.0)	4.5 (10.0)	4.5 (10.0) ⁵
B	III		45.5 (12.0)	15.8 (35.0)	9.0 (20.0)	
B	IV		7.6 (2.0)	22.5 (50.0)	13.5	
B	V		152 (40.0)	45 (100.0) ⁴	(30.0)22.5	
C	I			1.8 (4.0)	50.0 ⁴	
C	II			6.7 (15.0)	0.9 (2.0)	
C	III			15.5 (35.0)	4.5 (10.0)	
					9.0 (20.0)	

Note:

1. Fire extinguishers are designed by type as follows:
 - (a) "A" for fires in combustible materials such as wood
 - (b) "B" for fires in flammable liquids and greases
 - (c) "C" for fires in electrical equipment
2. Fire extinguishers are designated by size where size "I" is the smallest and size "V" is the largest. Sizes "I" and "II" are hand-portable extinguishers and sizes "III", "IV" and "V" are semi-portable extinguishers.
3. Must be specifically approved as a type A, B, or C extinguisher.
4. For outside use, double the quantity of agent that must be carried.
5. For outside use only.

Refer: 46 CFR 108.496 Semi-portable fire extinguishers

The frame or support of each size III, IV, and V fire extinguisher required by Table 108.495(a), except a wheeled size V extinguisher provided for a helicopter landing deck, must be welded or otherwise permanently attached to a bulkhead or deck. If the following semi-portable fire extinguishers have wheels, they must be securely stowed when not in use to prevent them from rolling out of control under heavy sea conditions:

- Each size V extinguisher required for a helicopter landing deck.
- Each size III, IV, and V extinguisher that is not required by Table 108.495(a).

Refer: 46 CFR 108.497 Miscellaneous Firefighting Equipment: Fireman's outfits

Each unit must have at least 2 fireman's outfits. Each fireman's outfit on a unit must consist of:

A pressure-demand, open-circuit, self-contained breathing apparatus, approved by the MSHA and by the NIOSH and having at a minimum a 30 minute air supply, a full face piece and a spare charge:

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but

a self-contained compressed-air breathing apparatus previously approved by MSHA and NIOSH under 46 CFR 160.011 may continue in use as required equipment if it was part of the vessel's equipment on 23rd November 1992, and as long as it is maintained in good condition to the satisfaction of the OCMI.

A Type II or Type III flashlight constructed and marked in accordance with ASTM F1014-1986.

An oxygen and explosive meter with the Underwriter's Laboratories, Inc. label or the Factory Mutual label.

A lifeline that:

is attached to a belt or a suitable harness.

is made of bronze wire rope, inherently corrosion-resistant steel wire rope or galvanized or tinned steel wire rope.

is made up of enough 15.2m (50ft) or greater lengths of wire rope to permit use of the outfit in any location on the unit.

has each end fitted with a hook with a 16mm ($\frac{5}{8}$ ") throat opening for the keeper.

has a minimum breaking strength of 680kg (1,500lbs).

Boots and gloves that are made of rubber or other electrically non-conductive material.

A helmet that meets the requirements in ANSI standard Z-89.1- 1969.

Clothing that protects the skin from scalding steam and the heat of fire and that has a water resistant outer surface.

Refer: 46 CFR 108.500 Life-Saving Equipment – General

Each drill ship must meet the lifesaving system requirements in 46 CFR Subchapter W for a tank vessel certificated to carry cargoes that have a flash point less than 60°C (140°F) as determined under

ASTM D 93 (incorporated by reference, see 46 CFR 108.101).

The OCMI may require a unit to carry specialized or additional lifesaving equipment other than as required by this part, if the OCMI determines the conditions of the unit's service present uniquely hazardous circumstances which are not adequately addressed by existing requirements.

Refer: 46 CFR 108.503 Life-Saving Equipment (MODU CODE Refer: 10.6)

Each lifejacket, immersion suit and EPIRB must be marked with the unit's name in accordance with 46 CFR 108.649 and 108.580.

- Containers of lifejackets, immersions suit and anti-exposure suits must be marked as specified in 46 CFR 108.649.

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Survival craft must be arranged to allow safe disembarkation onto the unit after a drill in accordance with 46 CFR 108.540. The requirements for guarding of falls in 46 CFR 108.553 must be met. The winch drum requirements described in 46 CFR 108.553 must be met for all survival craft winched, not just multiple drum winches.

An auxiliary line must be kept with each line-throwing appliance in accordance with 46 CFR 108.597.

Immersion suits are required on all units, except those operating between the 32° north and 32° south latitude .

Refer: 46 CFR 108.530 Stowage of Survival Craft - General

In addition to the requirements of the MODU Code 10.5.1, each survival craft required to be served by a launching appliance or marine evacuation system must be stowed as follows:

- Each survival craft must be stowed as close to the accommodation and service spaces as possible.
- Each survival craft must be stowed where the survival craft, in the embarkation position, is above the waterline with the unit:
 - In the fully loaded condition
 - and**
 - Listed up to 20° either way or to the angle where the unit's weather deck edge becomes submerged, whichever is less.
- Each survival craft must not require lifting from its stowed position in order to launch, except that a davit-launched life-raft may be lifted by a manually powered winch from its stowed position to its embarkation position.
- Additional lifeboat-specific stowage requirements. In addition to meeting the survival craft requirements of this Section and the requirements of the MODU Code 10.5, each lifeboat must be provided with a means for recharging the lifeboat batteries from the unit's power supply at a supply voltage not exceeding 50V.

Additional life-raft specific stowage requirements. In addition to meeting the survival craft requirements of this Section and the requirements of the MODU Code 10.5, each life-raft must be stowed as follows:

- Each life-raft must be stowed at a height above the waterline in the lightest seagoing condition, not greater than the maximum stowage height indicated on the life-raft.

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- Each life-raft without an indicated maximum stowage height must be stowed not more than 18m (59ft) above the waterline in the unit's lightest seagoing condition.
- Each life-raft must be arranged to permit it to drop into the water from the deck on which it is stowed. A life-raft stowage arrangement meets this requirement if it:
 - Is outboard of the rail or bulwark.
 - Is on stanchions or on a platform adjacent to the rail or bulwark

or

- Has a gate or other suitable opening to allow the life-raft to be pushed directly overboard.

Each davit-launched life-raft must be stowed within reach of its lifting hook, unless some means of transfer is provided that is not rendered inoperable:

- Listed up to 20° either way or to the angle where the unit's weather deck edge becomes submerged, whichever is less.
 - By unit motion
- or**
- By power failure.
- Each rigid container for an inflatable life-raft to be launched by a launching appliance must be secured in a way that the container or parts of it are prevented from falling into the water during and after inflation and launching of the contained life-raft.
 - Each life-raft must have a painter system providing a connection between the unit and the life-raft.
 - Each life-raft or group of life-rafts must be arranged for float-free launching. The arrangement must ensure that the life-raft or life-rafts when released and inflated are not dragged under by the sinking unit.
 - A hydrostatic release unit used in a float-free arrangement must be USCG approved under 46 CFR 160.162.

**Refer: 46 CFR 108.540 Survival Craft Muster and Embarkation Arrangements
(MODU CODE 10.3)**

Means must be provided for bringing each davit-launched survival craft against the side of the unit and holding it alongside to allow persons to be:

- Safely embarked in the case of a survival craft intended to be boarded over the edge of the deck.
- and**
- Safely disembarked after a drill in the case of a survival craft not intended to be moved to the stowed position with a full complement of persons on board.

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**Refer: 46 CFR 108.550 Survival Craft Launching and Recovery Arrangements:
General (MODU Code 10.6)**

Each launching appliance for a lifeboat must be a davit approved under 46 CFR 160.132, with a winch approved under 46 CFR 160.115. Each launching appliance for a davit-launched life-raft must be USCG approved under 46 CFR 160.163, with an automatic disengaging apparatus approved under 46 CFR 160.170.

Each survival craft must be arranged to be launched down the straight side of the unit or be mounted on a structure intended to provide clearance from lower structures of the unit.

Each lifeboat of aluminum construction in the hull or canopy, and each aluminum launching appliance must be protected in its stowage position by a water spray system meeting the requirements of 46 CFR 34.25.

With the exception of the secondary means of launching for free- fall lifeboats, each launching appliance together with all its lowering and recovery gear must be arranged in a way that the fully equipped survival craft it serves can be safely lowered when loaded with its full complement of persons, and also without persons, against:

- A list of up to 20° on the high side
and
- A list of up to 20° or the degree of list where the survival craft becomes waterborne, whichever is the greater, on the low side.

**Refer: 46 CFR 108.553 Survival Craft Launching and Recovery Arrangements
using Falls and a Winch (MODU Code 10.6)**

Survival craft launching and recovery arrangements, in addition to meeting the requirements in 46 CFR 108.550, must meet the following requirements:

Each unguarded fall must not pass near any operating position of the winch, such as hand cranks, payout 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 that is not more than 300mm (12.0") above the deck.

- For calculation of the lowering speed for a fully loaded survival craft per the MODU Code 10.6.1 that references SOLAS requirements, "H" must not be greater than 30m, regardless of the lowering height.

The lowering speed for a survival craft loaded with all of its equipment must be not less than 70.0% of the speed required above for a fully loaded survival craft

If a survival craft is recovered by electric power, the electrical installation, including the electric power-operated boat winch, must meet the requirements in 46 CFR Part 111.

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Refer: 46 CFR 108.560 Rescue boats (MODU Code 10.8 & 10.9)

The requirements for additional lifeboat-specific stowage requirements of Refer: 46 CFR 108.530 must be met.

Each inflated rescue boat must be kept fully inflated at all times.

Refer: 46 CFR 108.580 Personal Lifesaving Appliances

Lifebuoys must be approved under 46 CFR 160.150.

- Lifebuoys must be stowed as follows:
 - Each lifebuoy must be capable of being rapidly cast loose.
 - Each lifebuoy must not be permanently secured to the unit in any way.
 - Lifebuoys must be so distributed as to be readily available on each side of the unit and, as far as practicable, on each open deck extending to the side of the unit.
 - Lifebuoys with attached self-activating smoke signals should, when released, fall directly into the water without striking any part of the unit.
 - At least one lifebuoy on each side of the unit must be fitted with a buoyant lifeline that is
 - , if synthetic, a dark color or certified by the manufacturer to be resistant to deterioration from ultraviolet light.
- Lifebuoys fitted with a self-igniting light must be approved under 46 CFR 161.010. A self-igniting light must not be attached to the lifebuoys required by this section to be fitted with lifelines.
- Lifebuoys fitted with a self-activating smoke signal must be approved under 46 CFR 160.157.

Lifejackets. Each unit must carry lifejackets approved under 46 CFR 160.155, 160.176, or 160.177. If the unit carries inflatable lifejackets, they must be of the same or similar design and have the same method of operation.

- (ii) Stowage. Lifejackets must be stowed as follows:
 - The lifejackets must be readily accessible.
 - The additional lifejackets required by the MODU Code 10.10.1 must be stowed in places readily accessible to the work stations and industrial work sites.
 - Where, due to the particular arrangements of the unit, the lifejackets could become inaccessible, the OCMI may require an increase in the number of lifejackets to be carried, or require provision of suitable alternative arrangements.

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- Attachments and fittings. Lifejackets must have the following attachments and fittings:
 - Lifejacket lights must be approved under 46 CFR 161.112
 - 46 CFR Lifejacket lights bearing USCG approval number 161.012/2/1 are not permitted unless the unit is certificated to operate only on waters between 32°N and 32°S latitude.

- (a) Immersion suits must be approved under 46 CFR 160.171. Anti-exposure suits must be approved under 46 CFR 160.153.
 - In addition to the requirements of the MODU Code 10.11, each unit, except units operating between 32°N latitude and 32°S latitude, must carry:
 - Immersion suits or anti-exposure suits must be of suitable size for each person assigned to the rescue boat crew
 - Immersion suits approved under 46 CFR 160.171 of the appropriate size for each person on board, which count toward meeting the requirements of this section
 - and**
 - In addition to the immersion suits required for each person assigned to the rescue boat crew, each watch station, work station and industrial work site must have enough immersion suits to equal the number of persons normally on watch in, or assigned to, the station or site at one time. However, an immersion suit is not required at a station or site for a person whose cabin or berthing area (and the immersion suits stowed in that location) is readily accessible to the station or site.

- Immersion suits or anti-exposure suits must have the following attachments and fittings:
 - Each immersion suit or anti-exposure suit must have a lifejacket light approved under 46 CFR 161.112 securely attached to the front shoulder area of the immersion suit or anti-exposure suit
 - Lifejacket lights bearing USCG approval number 161.012/2/1 are not permitted on units certificated to operate on waters where water temperature may drop below 10°C (50°F).
 - Each immersion suit or anti-exposure suit must have a whistle firmly secured by a cord to the immersion suit or anti-exposure suit.

Refer: 46 CFR 108.597 Line-Throwing Appliances

With each line-throwing appliance, an auxiliary line must be kept that meets the following:

- Has a breaking strength of at least 40.0kN (9,000lbs-force).

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- Is, if synthetic, a dark color or certified by the manufacturer to be resistant to deterioration from ultraviolet light
and
- Is:
 - At least 450.0m (1500ft) long, if the line-throwing appliance is USCG approved under 46 CFR 160.040.
or
 - At least 150.0m (500ft) long, if the line-throwing appliance is USCG approved under 46 CFR 160.031.

Refer: 46 CFR 108.601 Cranes (MODU CODE 12.1) (LR MOU Rules Refer: Part 3, Chapter 11)

Crane design must meet API Spec 2C, with Supplement 2.

Each crane must have the following:

- Each control marked to show its function.
- Instruments with built in lighting.
- Fuel tank fills and overflows that do not run onto the engine exhaust.
- No gasoline engines.
- Spark arrestors fitted on engine exhaust pipes.

Refer: 46 CFR 108.621 Equipment Markings: General

Unless otherwise provided, each marking required must be printed in English in red letters with a contrasting background, permanent, easy to be seen at least 13mm (½") in height.

Refer: 46 CFR 108.623 General Alarm Bells Switch

Each general alarm bell switch must be marked "GENERAL ALARM" on a plate or other firm non-corrosive backing.

Refer: 46 CFR 108.625 General Alarm Bell

Each general alarm bell must be identified by marking "GENERAL ALARM-WHEN BELL RINGS GO TO YOUR STATION" next to the bell.

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Refer: 46 CFR 108.627 Carbon Dioxide Alarm

Each carbon dioxide alarm must be identified by marking "WHEN ALARM SOUNDS VACATE AT ONCE. CARBON DIOXIDE BEING RELEASED" next to the alarm.

Refer: 46 CFR 108.629 Fire Extinguishing System Branch Line Valve

Each branch line valve of each fire extinguishing system must be marked with the name of the space or spaces it serves.

Refer: 46 CFR 108.631 Fixed Fire Extinguishing System Controls

Each cabinet or space that contains a valve, control, or manifold of a fixed fire extinguishing system must be marked by one of the following: "CARBON DIOXIDE FIRE APPARATUS", "FOAM FIRE APPARATUS" or "WATER SPRAY APPARATUS" in letters at least 50mm (2") high.

Instructions for the operation of a fixed fire extinguishing system must be posted next to a fire apparatus described in this Section.

Refer: 46 CFR 108.633 Fire Stations

Fire stations marking: Each fire station must be identified by marking: "FIRE STATION NO. -" next to the station in letters and numbers at least 50mm (2") high.

Refer: 46 CFR 108.635 Self-Contained Breathing Apparatus

Each locker or space containing self-contained breathing apparatus must be marked: "SELF CONTAINED BREATHING APPARATUS".

Refer: 46 CFR 108.636 Work Vests

Each space containing a work vest must be marked: "WORK VEST".

Refer: 46 CFR 108.637 Hand Portable Fire Extinguishers

- Each hand portable fire extinguisher must be marked with a number that identifies it in relation to all other hand portable fire extinguishers.
- The location of each hand portable fire extinguisher must be marked with the same number that is marked on the extinguisher.

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Refer: 46 CFR 108.639 Emergency Lights

Emergency lights markings must meet the requirements of 46 CFR 108.621 and each emergency light must be marked: "E".

Refer: 46 CFR 108.641 Instructions for Changing Steering Gear

Instructions stating, in order, the different steps to be taken for changing to emergency and secondary steering gear must be posted in the steering gear room and at each secondary steering station in 13mm (1/2") letters and numerals of contrasting color to the background.

Refer: 46 CFR 108.643 Rudder Orders

At each steering station, the direction which the wheel or steering device must be moved for RIGHT RUDDER or LEFT RUDDER must be marked in letters of contrasting color to the background on the wheel or steering device or in a place that is directly in the helmsman's line of vision to indicate "RIGHT RUDDER" and "LEFT RUDDER".

Refer: 46 CFR 108.645 Markings on Lifesaving Appliances

- Lifeboats and rescue boats. Each lifeboat and rescue boat must be plainly marked as follows:
Each side of each lifeboat and rescue boat bow must be marked in block capital letters and numbers with:
 - The name of the unit
and
 - The name of the port required to be marked on the unit to meet the requirements of 46 CFR 67.123.
- The number of persons the boat is equipped for, which may not exceed the number shown on its nameplate, must be clearly marked in permanent characters.
- The number of the boat and the unit's name, must be plainly marked or painted so that the markings are visible from above the boat.
- Type II retro-reflective material approved under approval series 46 CFR 164.018 must be placed on the boat and meet the arrangement requirements in IMO Resolution A.658(16).
- Rigid life-rafts. Each rigid life-raft must be marked as follows:
 - The name of the unit must be marked on each rigid life-raft.
 - The name of the port required to be marked on the unit to meet the requirements of 46 CFR 67.123.

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- The length of the painter must be marked on each rigid life-raft.
- At each entrance of each rigid life-raft, the number of persons the rigid life-raft is equipped for, not exceeding the number shown on its nameplate, must be marked in letters and numbers at least 100mm (4") high, in a color contrasting to that of the life-raft.

Refer: 46 CFR 108.646 Markings on Stowage Locations

Containers, brackets, racks and other similar stowage locations for lifesaving equipment, must be marked with symbols in accordance with IMO Resolution A.760 (18), indicating the devices stowed in that location for that purpose.

- If more than one device is stowed in that location, the number of devices must also be indicated.
- Survival craft should be numbered consecutively starting from the unit's bow. Survival craft on the starboard side should be numbered with odd numerals and survival craft on the port side should be numbered with even numerals.
- Each life-raft stowage location should be marked with the capacity of the life-raft stowed there.

Refer: 46 CFR 108.647 Inflatable Life-rafts

The number of the life-raft and the number of persons it is permitted to accommodate must be marked or painted in a conspicuous place in the immediate vicinity of each inflatable life-raft in block capital letters and numbers. The word "LIFE-RAFT", or the appropriate symbol from IMO Resolution A.760 (18), shall be used to identify the stowage location.

Life-rafts stowed on the sides of the unit should be numbered in the same manner as the lifeboats. This marking must not be on the inflatable life-raft container.

Refer: 46 CFR 108.649 Lifejackets, Immersion Suits and Lifebuoys

Each lifejacket must be marked:

- In block capital letters with the name of the unit
and
- With type I retro-reflective material approved under approval 46 CFR 164.018. The arrangement of the retro-reflective material must meet IMO Resolution A.658(16).

The stowage positions for lifejackets, other than lifejackets stowed in staterooms, must be marked with either the word "LIFEJACKET" or with the appropriate symbol from IMO Resolution A.760(18).

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Each immersion suit or anti-exposure suit must be marked to identify the person or unit to which it belongs.

Immersion suits or anti-exposure suits must be stowed so they are readily accessible, and the stowage positions must be marked with either the words "IMMERSION SUITS" or "ANTI-EXPOSURE SUITS", or with the appropriate symbol from IMO Resolution A.760(18).

Each lifebuoy must be marked:

- In block capital letters with the unit's name and with the name of the port required to be marked on the unit under 46 CFR 67.123.
and
- With type II retro-reflective material approved under 46 CFR 164.018. The arrangement of the retro-reflective material must meet IMO Resolution A.658(16).

Each lifebuoy stowage position must be marked with either the words "LIFEBUOY" or "LIFE BUOY", or with the appropriate symbol from IMO Resolution A.760(18).

Each lifejacket, immersion suit, and anti-exposure suit container must be marked in block capital letters and numbers with the minimum quantity, identity, and if sizes other than adult or universal sizes are used on the unit, the 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).

Refer: 46 CFR 108.650 EPIRBs and SARTs

EPIRB and SART should have the name of the unit plainly marked or painted on its label, except for EPIRBs or SARTs in an inflatable life-raft or permanently installed in a survival craft.

Refer: 46 CFR 108.651 Portable Magazine Chests

Each portable magazine chest must be marked: "PORTABLE MAGAZINE CHEST - FLAMMABLE - KEEP LIGHTS AND FIRE AWAY" in letters at least 75mm (3") high.

Refer: 46 CFR 108.653 Helicopter Facilities

Each helicopter fueling facility must be marked adjacent to the fueling hose storage:

- "WARNING - HELICOPTER FUELING STATION - KEEP LIGHTS AND FIRE AWAY".

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Each storage tank for helicopter fuel must be marked:

- "DANGER - FLAMMABLE LIQUID".

Each access to a helicopter landing area must be marked:

- "BEWARE OF TAIL ROTOR".

Each marking required by this Section must be in letters at least 75mm (3") high.

Refer: 46 CFR 108.655 Operating Instructions

Each unit must have posters or signs displayed in the vicinity of each survival craft and the survival craft's launching controls that illustrate:

- The purpose of controls.
- The procedures for operating the launching device.
- That they give relevant instructions or warnings.
- That they can be easily seen under emergency lighting conditions.
- That they display symbols in accordance with IMO Resolution A.760(18).

Refer: 46 CFR 108.659 Lifesaving Signal Instructions

On all units, there must be readily available to the offshore installation manager, Master, or Person in Charge a placard containing instructions for the use of the lifesaving signals set forth in SOLAS 1974, as amended, Chapter V, Regulation 16. These signals must be used by vessels or persons in distress when communicating with lifesaving stations and maritime rescue units.

Refer: 46 CFR 108.661 Unit Markings: Draft Marks

Each unit must have draft marks for each foot (if English units are used) or 0.2 meters (if metric units are used) of immersion:

- If the unit is a surface unit, on both the port and starboard sides of the stem and the stern-post or rudderpost or at any other place at the stern of the unit as may be necessary for easy observance.
- If the unit is a self-elevating unit, near each corner of the hull but not more than 4 required.
- If the unit is a column-stabilised unit, on each corner column, continuing to the footing or lower displacement hull.

The bottom of each mark must be at the draft indicated by that mark.

Each mark must be in numerals equal in height to one-half the draft mark interval; and in contrasting color to the background.

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For the purposes of this section, "draft" means the distance from the bottom of the keel or the lowest shell plate on the outer surface of the unit to the surface of the water, except that where a unit has a permanent appendage extending below the bottom of the keel, "draft" means the distance from the lowest part of the appendage to the surface of the water.

In cases where draft marks are obscured due to operational constraints or by protrusions, the vessel must be fitted with a reliable draft indicating system from which the drafts can be determined.

Refer: 46 CFR 108.665 Appliances for Watertight Integrity (MODU CODE Refer: 3.6)

Each watertight door, scuttle and hatch required for watertight integrity which may be opened during normal operations, must be marked in letters of contrasting color to the background "KEEP CLOSED".

Refer: 46 CFR 108.701 Sounding Equipment (IMO: SOLAS V/12(k))

Each self-propelled unit must have a mechanical or electronic sounding apparatus.

Refer: 46 CFR 109.121 Operations Manual (MODU CODE 14.1) (LR MOU Rules Refer: Part 3, Chapter 1, Section 3)

In addition to the requirements of section 14.1 of the MODU Code, the Operations Manual is to include the following:

- Major Dimensions of Unit.
- Tonnages.
- Dry Bulk Capacities.
- Standard to which designed.
- Hook load capacity.
- Rotary capacity.
- Helicopter maximum deadweight (kg & lbs).
- Helicopter rotor size (m & ft).
- Cross-flooding valve locations.
- Progressive flooding valve location.
- Guidance on avoidance of structural damage.
- Evacuation procedures.
- Emergency shutdowns list.
- Guidance for the operation of the ballast system.
- Procedures for evacuating personnel from the unit.

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The manual is to include the following plans:

- Mechanical.
- Ventilation.
- Electrical emergency shutdowns.
- Flooding alarms.
- Fire & gas detectors.
- Access to compartments and decks.

Refer: 46 CFR 109.201 Steering Gear, Whistles, General Alarm, and Means of Communication

The LR Surveyor is to confirm that the Master or Person in Charge has ensured that the:

Steering gear, whistles, general alarm bells and means of communication between the bridge or control room and the engine room on self-propelled units are inspected and tested:

- Within 12 hours before getting under way
and
- At least once each week if under way or on station
and
- Whistles and general alarm bells on all other units are inspected examined and tested at least once each week.

Refer: 46 CFR 109.203 Sanitation

The LR Surveyor is to confirm that the Master or Person in Charge has ensured that the accommodation and engineering spaces are in a clean and sanitary condition.

Refer: 46 CFR 109.211 Testing of Emergency Lighting and Power Systems

The LR Surveyor is to confirm that the Master or Person in Charge has ensured that:

- Each emergency lighting and each emergency power system are tested at least once each week.
- Each emergency generator is tested at least once each month by operating it under load for at least 2 hours.
- Each storage battery for emergency lighting and power systems is tested every 6 months under actual connected load for a period of at least 2 hours. After the 2 hour test period the voltage values under load or specific gravity of electrolyte must be measured. Measured values must be extrapolated to approximate the values that would result following a 12 hour test period. The test must be extended if a trend cannot be

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determined to allow extrapolation. The capacity of the battery corresponding to the extrapolated values of voltage or specific gravity must be sufficient to supply the actual connected load.

Refer: 46 CFR 109.213 Emergency Training and Drills

The LR Surveyor is to confirm that the Master or Person in Charge has ensured that the abandonment training material is on board each unit. The training material must consist either of a manual of one or more volumes, written in easily understood terms and illustrated wherever possible, or audio-visual training aids, or both as follows:

- Training manuals required by section 14.10 of the MODU Code must be made available to each person on board the unit. If audiovisual training aids are used, they must be incorporated into the onboard training sessions described under section 14.12 of the MODU Code.
- The training material must explain, in detail, all the requirements set forth in 46 CFR 199.180.

The LR Surveyor is to confirm that the Master or Person in Charge has ensured that the required drill procedures are undertaken on board the unit.

Refer: 46 CFR 109.301 Operational Readiness, Maintenance and Inspection of Lifesaving Equipment

The LR Surveyor is to confirm that the Master or Person in Charge has ensured that:

Operational Readiness:

Except as otherwise provided in this section, each lifesaving appliance must be in good working order and ready for immediate use at all times when the unit is in operation.

Maintenance:

- The manufacturer's instructions for onboard maintenance of lifesaving appliances must be onboard and must include the following for each appliance:
 - Checklists for use when carrying out the inspections required.
 - Maintenance and repair instructions.
 - A schedule of periodic maintenance.
 - A diagram of lubrication points with the recommended lubricants.
 - A list of replaceable parts.
 - A list of sources of spare parts.
 - A log for records of inspections and maintenance.

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- In lieu of compliance with the above requirements for onboard maintenance of lifesaving appliances, the OCMI may accept a planned maintenance program that includes the items listed in that paragraph.
- If lifeboats, rescue boats or rigid life-rafts are maintained and repaired whilst the unit is in operation, there must be a sufficient number of lifeboats and life-rafts remaining available for use to accommodate all persons on board.

Spare parts and repair equipment must be provided for each lifesaving appliance and component subject to excessive wear or consumption and that needs to be replaced regularly.

Weekly inspections and tests:

- Each survival craft, rescue boat, and launching appliance must be visually inspected to ensure its readiness for use.
- Each lifeboat and rescue boat engine must be run ahead and astern for not less than 3 minutes, unless ambient temperature is below the minimum temperature required for starting the engine. During this time, demonstrations should indicate that the gear box and gear box train are engaging satisfactorily. If the special characteristics of an outboard motor fitted to a rescue boat would not allow the outboard motor to be run other than with its propeller submerged for a period of 3 minutes, the outboard motor should be run for such period as prescribed in the manufacturer's hand-book.
- The general alarm system must be tested.

Monthly Inspections.

- Each life-saving appliance, including lifeboat equipment, must be inspected monthly using the checklists required under this section to ensure it is complete and in good working order. A report of the inspection, including a statement as to the condition of the equipment, must be recorded in the unit's official logbook.
- Each EPIRB and SART (not located in life-rafts) must be tested monthly. The EPIRB must be tested using the integrated test circuit and the output indicator to determine that it is operative.

Annual inspection and repair must include the following:

- Each survival craft, except for inflatable life-rafts, must be stripped, cleaned, inspected and repaired as needed, at least once in each year, including emptying and cleaning each fuel tank, and refilling it with fresh fuel.
- Each davit, winch, fall and other launching appliance must be thoroughly inspected and repaired as needed, once in each year.
- Each item of survival equipment with an expiration date must be replaced during the annual inspection and repair, if the expiration date has passed.

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- Each battery clearly marked with an expiration date that is used in an item of survival equipment must be replaced during the annual inspection and repair, if the expiration date has passed.
- Except for a storage battery used in a lifeboat or rescue boat, each battery without an expiration date that is used in an item of survival equipment must be replaced during the annual inspection and repair.

Servicing of inflatable lifesaving appliances, inflated rescue boats, and marine evacuation systems.

- Each inflatable lifesaving appliance and marine evacuation system must be serviced:
 - Within 12 months of its initial packing
and
 - Within 12 months of each subsequent servicing, except when servicing is delayed until the next scheduled inspection of the unit, provided the delay does not exceed 5 months.
- Each inflatable lifejacket must be serviced in accordance with servicing procedures meeting the requirements of 46 CFR 160.176.
- Each hybrid inflatable lifejacket must be serviced in accordance with the owners manual and meet the requirements of 46 CFR 160.077.
- Each inflatable life-raft must be serviced:
 - In accordance with servicing procedures meeting the requirements of 46 CFR 160.151
and
 - Whenever the container of the raft is damaged, or the straps or seal broken.
- Each inflated rescue boat must be repaired and maintained in accordance with the manufacturer's instructions and in accordance with servicing procedures meeting the requirements of 46 CFR 160.151 . All repairs must be made at a servicing facility approved by the USCG, except for emergency repairs carried out on board the unit.

Periodic servicing of hydrostatic release units. Each hydrostatic release unit, other than a disposable hydrostatic release unit, must be serviced:

- Within 12 months of its manufacture and within 12 months of each subsequent servicing, except when servicing is delayed until the next scheduled inspection of the unit, provided the delay does not exceed 5 months
and
- In accordance with repair and testing procedures meeting the requirements of 46 CFR 160.062.

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Periodic servicing of launching appliances and release gear.

- Launching instructions, or as set out in the shipboard planned maintenance program in accordance with the requirements of 46 CFR 160.062.
- Launching appliances must be thoroughly examined at intervals not exceeding 5 years and upon completion of the examination, the launching appliance must be subjected to a dynamic test of the winch brake.
- Lifeboat and rescue boat release gear must be serviced at the intervals recommended in the manufacturer's instructions, or as set out in the planned maintenance program.
- Lifeboat and rescue boat release gear must be subjected to a thorough examination by properly trained personnel familiar with the system at each inspection for certification.
- Lifeboat and rescue boat release gear must be operationally tested under a load of 1.1 times the total mass of the lifeboat when loaded with its full complement of persons and equipment, whenever overhauled, or at least once every 5 years.

Maintenance of falls.

- Each fall used in a launching appliance must be turned end-for-end at intervals of not more than 30 months and must be renewed when necessary due to deterioration or at intervals of not more than 5 years, whichever is earlier.
- As an alternative to the above requirements for maintenance of falls, each fall may be inspected annually and renewed whenever necessary due to deterioration or at intervals of not more than 4 years, whichever is earlier.

Rotational deployment of marine evacuation systems.

- In addition to or in conjunction with the servicing intervals of marine evacuation systems required by this section, each marine evacuation system must be deployed from the unit on a rotational basis. Each marine evacuation system must be deployed at least once every 6 years.

Refer: 46 CFR 109.335 Stowage of Work Vests

The LR Surveyor is to confirm that the Master or Person in Charge has ensured that no work vest is stowed where life preservers are stowed.

Refer: 46 CFR 109.337 Fireman's Outfit

The LR Surveyor is to confirm that the Master or Person in Charge has ensured that:

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At least 2 persons who are trained in the use of the fireman's outfit are on board at all times.

Each fireman's outfit and its spare equipment are stowed in a separate and accessible location.

A fireman's outfit is not used for any purpose other than fire fighting except as provided in 46 CFR 108.703.

Refer: 46 CFR 109.339 Location of Fire Axes

The LR Surveyor is to confirm that the Master or Person in Charge has ensured that the fire axes required are located in the enclosures for fire hoses marked in accordance with 46 CFR 108.633, if the fire axes are not located in plain view.

Refer: 46 CFR 109.347 Pilot Boarding Equipment

The LR Surveyor is to confirm that the Master or Person in Charge has ensured that the boarding equipment is maintained as follows:

- The equipment must be kept clean and in good working order.
- Each damaged step or spreader step on a pilot ladder must be replaced in kind with an approved replacement step or spreader step, prior to further use of the ladder. The replacement step or spreader step must be secured by the method used in the original construction of the ladder, and in accordance with manufacturer instructions.

The LR Surveyor is to confirm that the Master or Person in Charge has ensured that:

- Only approved pilot boarding equipment is used.
- The pilot boarding equipment rests firmly against the hull of the vessel and be clear of overboard discharges.
- Two man ropes, a safety line and an approved lifebuoy with an approved water light must be at the point of access and be immediately available for use during boarding operations.
- Rigging of the equipment and embarkation/debarkation of a pilot must be supervised in person by a deck officer.
- Both the equipment over the side and the point of access must be adequately lit during night operations.
- If a pilot hoist is used, a pilot ladder must be kept on deck adjacent to the hoist and available for immediate use.

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Refer: 46 CFR 109.419 Report of Unsafe Machinery

The LR Surveyor is to confirm that the Master or Person in Charge has ensured that if a boiler, unfired pressure vessel, or other machinery on a unit is unsafe to operate, the Master or Person in Charge has reported the existence of the unsafe condition to the OCMI.

Refer: 46 CFR 109.421 Report of Repairs to Boilers and Pressure Vessels

The LR Surveyor is to confirm that the Master or Person in Charge has ensured that before making repairs, except normal repairs and maintenance such as replacement of valves or pressure seals, to boilers or unfired pressure vessels in accordance with 46 CFR 50.05–10, that they have reported the nature of the repairs to the OCMI.

Refer: 46 CFR 109.425 Repairs and Alterations: Fire Detecting and Extinguishing Equipment

The LR Surveyor is to confirm that the Master or Person in Charge has ensured that prior to making repairs or alterations, except emergency repairs or alterations to fire detecting and extinguishing equipment, they have reported the nature of the repairs or alterations to the OCMI.

The LR Surveyor is to also confirm that the Master or Person in Charge has ensured that when emergency repairs or alterations to fire detecting or fire extinguishing equipment have been made, they have reported the nature of the repairs or alterations to the OCMI.

Refer: 46 CFR 109.433 Logbook Entries

The LR Surveyor is to confirm that the Master or Person in Charge has ensured that the following applicable entries are made in the logbook :

- The date of each test of the steering gear, whistle, general alarm, and communications equipment and the condition of the equipment.
- The time and date of each opening and closing, while the unit is afloat, of each required appliance for watertight integrity not fitted with a remote operating control or alarm system and the reasons for the action.
- The date of each test of emergency lighting and power systems and the condition and performance of the equipment.
- The logbook must include record information on emergency training drills required in 46 CFR 109.213.
- Prior to getting underway, the fore and aft drafts, the position of the Load-line marks in relation to the surface of the water, and the density of the water in which the vessel is floating, if in fresh or brackish water.

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- After loading and prior to getting underway and at all other times necessary to assure the safety of the vessel, a statement verifying vessel compliance with applicable stability requirements.
- The date of each inspection of each accommodation space.
- The date of each inspection required if performed by the Master or Person in Charge.

Refer: 46 CFR 109.435 Record of Fire Fighting Equipment Inspection

The LR Surveyor is to confirm that the Master or Person in Charge has ensured that:

A record of each test and inspection for fire fighting equipment is maintained on board until the unit is re-inspected or inspected for certification.

The record required in this section must show:

- The date of each test and inspection.
- The number or other identification of each item of equipment tested or inspected.
- The name of the person and the company he represents, if any, who conducts the test or inspection.

Refer: 46 CFR 109.437 Crane Record Book

The LR Surveyor is to confirm that the Master or Person in Charge has ensured that the following are maintained in a crane record book:

Descriptive information which will identify each crane including:

- API nameplate data required by API RP 2C, Section 11.
- The rates load chart for each line reeving and boom length which may be utilized.

Information required by API RP 2D, Section 3, Operation and Maintenance of Offshore Cranes.

Dates and results of frequent inspections and tests required in paragraph (b) of this section.

Dates and results of periodic inspections and tests required in paragraph (b) of this section.

Date and result of each rated load test.

Date and description of each replacement or renewal of wire rope, hooks and other load components.

Date and description of each failure of the crane, or any component or safety feature.

Date and description of each repair to the crane structure, boom or equipment.

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Refer: 46 CFR 109.439 Crane Certificates

The LR Surveyor is to confirm that the Master or Person in Charge has ensured that the following certificates and records for each crane are maintained on the unit:

- Each certificate issued by a crane certifying authority.
- Each record and original certificate, or certified copy of a certificate, or manufacturers or testing laboratories, companies or organizations for:
 - Loose gear.
 - Wire rope.
 - The annealing of wrought iron gear.

Refer: 46 CFR 109.557 Flammable and Combustible Liquids: Carriage

The LR Surveyor is to confirm that the Master or Person in Charge has ensured that:

- Flammable and combustible liquids in bulk are not carried, except as allowed by endorsement to the Certificate of Inspection.
- Portable tanks are handled and stowed in accordance with 46 CFR 98.30 and 46 CFR 98.33 the provisions of 49 CFR Parts 171 through 179 that apply to portable tanks.
- Grades B and lower liquids are:
 - Authorized, by the USCG, to be carried.
 - Carried only in fixed independent or integral tanks.

Refer: 46 CFR 109.559 Explosives and Radioactive Materials

The LR Surveyor is to confirm that the Master or Person in Charge has ensured that explosives or radioactive materials and equipment on a unit are not used unless authorized.

Refer: 46 CFR 109.563 Posting of Documents

The LR Surveyor is to confirm that the Master or Person in Charge has ensured that the following are posted under glass in the pilot house or control center:

- General arrangement plans for each deck showing:
 - Each fire retardant bulkhead.
 - Each fire detecting, manual alarm, and fire extinguishing system.
 - Each fire door.
 - Each means of ingress to compartments.
 - Each ventilating system, including the location of each damper, fan and remote means of stopping the fans.

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- For units constructed on or after September 30, 1997 and for existing units which have their plans redrawn, the symbols used to identify the aforementioned details shall be in accordance with IMO Assembly Resolution A.654(16). The identical symbols can be found in ASTM Adjunct F 1626.

- The International Load Line certificate and/or stability letter issued by the USCG.
- Each international and USCG certificate issued to the unit.

Refer: 46 CFR 109.564 Maneuvering Characteristics

The LR Surveyor is to confirm that the Master or Person in Charge has ensured that each self-propelled unit of 1,600 gross tons and over has a maneuvering information fact sheet prominently displayed in the pilot-house. For surface type units, the maneuvering information in 46 CFR 97.19 must be displayed. The maneuvering information requirements for column stabilised, self-elevating and other units of unusual design will be specified on a case- by- case basis.

Refer: 33CFR 109.573 Riveting, Welding and Burning Operations

The LR Surveyor is to confirm that the Master or Person in Charge has ensured that there is no riveting, welding, or burning:

- In a fuel tank.
- On the boundary of a fuel tank.
- On pipelines, heating coils, pumps, fittings, or other appurtenances connected to fuel tanks.
- On the boundary of spaces adjacent to tanks carrying Grades A, B, or C flammable liquids in bulk.

The above operations prohibited by this section may be allowed if:

- An inspection conducted in accordance with NFPA No. 306-1974, "Standard for the Control of Gas Hazards on Vessels to be Repaired" is made:
 - In ports or navigable waters of the US, its territories and possessions, by:
 - A marine chemist certified by the NFPA.
 - or**
 - If a certified marine chemist is not available, a person designated by the OCMI.
 - or**
 - In all other locations by:
 - Marine chemist certified by the NFPA.

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- If a certified marine chemist is not available, a person designated by the OCMI.
- If the persons required in paragraphs (a) & (b) above are not available, the Master or Person in Charge; or a welding supervisor designated in writing, by the Master or Person in Charge
and
- A certificate is issued by the person conducting the inspection stating:
 - That he conducted the inspection in accordance with NFPA No. 306-1974, "Standard for the Control of Gas Hazards on Vessels to be Repaired".
 - The operations that may be conducted.
 - A list of precautions to be followed during the operations.

The LR Surveyor is to confirm that the Master or Person in Charge has ensured that the precautions listed above in this section are followed.

Refer: 46 CFR 109.577 Helicopter Fueling

The LR Surveyor shall confirm that the Master or Person in Charge has ensured that the portable tanks (for helicopter fueling) are handled and stowed in accordance with 46 CFR 98.30 and 46 CFR 98.33, the provisions of 46 CFR Parts 171 through 179 that apply to portable tanks and CGD 73 – 251, 43 FR 56828 as amended by CGD 84 – 043, 55 FR 37413.

Refer: 46 CFR 170.185 Stability Test Preparations (MODU CODE 3.1)

The preparations must be made before conducting an inclining test required by section 3.1 of the MODU Code that comply with all recommendations and requirements of the IMO Code on Intact Stability:

Each tank must be empty and dry, except that a tank may be partially filled or full if the USCG Marine Safety Center or the LR Surveyor determines that empty and dry tanks are impracticable and that the effect of filling or partial filling on the location of the centre of gravity and on the displacement can be accurately determined. The draft and axis of rotation selected for testing a mobile offshore drilling unit must be those that result in acceptable accuracy in calculating the center of gravity and displacement of the unit.

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Refer: 46 CFR 174.040 Stability Requirements (MODU CODE Refer: 3.3)

Each unit must be designed to have at least 50mm (2") of positive meta-centric height in the upright position for the full range of drafts, whether at the operating draft for navigation, towing or drilling afloat, or at a temporary draft when changing drafts.

Refer: 46 CFR 174.045 Intact Stability Requirements for Restricted Service and Severe Storm Conditions (MODU CODE Refer: 3.2.4 & 3.3.2) (LR MOU Rules Refer: Part 4, Chapter 7)

The following are requirements in addition to the requirements of the MODU Code:

For the purposes of this section, openings fitted with the weather-tight closing appliances specified in 46 CFR 174.100(b) are not considered as openings through which down-flooding could occur if they can be rapidly closed and would not be submerged below the units' waterline prior to the first intercept angle, except that ventilation intakes and outlets for machinery spaces, crew spaces and other spaces where ventilation is normally required are considered as openings through which down-flooding could occur regardless of location.

Refer: 46 CFR 174.050 Stability on Bottom (MODU CODE Refer: 3.3) (LR MOU Rule Refer: Part 4, Chapter 4, Section 2)

Each bottom bearing unit must be designed so that, while supported on the sea bottom with footings or a mat, it continually exerts a downward force on each footing or the mat when subjected to the forces of wave and current and to wind blowing at the velocities described in paragraph 3.2.4 of the MODU Code .

Refer: 46 CFR 174.065 Damage Stability Requirements (MODU CODE Refer: 3.4.3)

- The ability of each unit to meet paragraph 3.4.2 of the MODU Code must be demonstrated so that, while in each of its normal operating conditions and severe storm conditions, its final equilibrium waterline would remain below the lowest edge of any opening through which additional flooding could occur.

Damage stability requirements must be met for normal operating and severe storm conditions.

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**Refer: 46 CFR 174.080 Flooding on Self-Elevating and Surface Type units.
(MODU CODE Refer: 3.5.5 & 3.5.8)**

On the mat of a self-elevating unit, all compartments of the mat must be assumed to be subject to individual flooding.

If fitted with a mat, USCG requires all compartment of the mat to be subject to individual flooding.

**Refer: 46 CFR 174.100 Appliances for Watertight and Weather-tight Integrity
(MODU CODE Refer: 3.6.4 & 3.6.5) (LR MOU Rules Refer: Part 3, Chapter 2,
Section 2.9)**

Appliances to ensure watertight integrity include:

- Watertight doors
- Hatches
- Scuttles
- Bolted manhole covers
- Other watertight closures for openings in watertight decks and bulkheads
- Each internal opening equipped with appliances to ensure watertight integrity that is used intermittently during operation of the unit while afloat

Appliances to ensure weather-tight integrity include:

- Weather-tight doors and hatches
- Closures for air pipes
- Ventilators and ventilation intakes and outlets
- Closures for other openings in deckhouses and superstructures

- Each door, hatch, and scuttle must:
 - Be remotely controlled from a normally manned control station and be operable locally from both sides of the bulkhead.
 - or**
 - If there is no means of remote control there must be an alarm system that signals whether the appliance is open or closed both locally at each appliance and in a normally manned control station.
- Each closing appliance must remain watertight under the design water pressure of the watertight boundary of which it is a part.
 - Each external opening fitted with an appliance to insure weather-tight integrity must be located so that it would not be submerged below the final equilibrium waterline if the unit is subjected simultaneously to the damage described in paragraph 3.4.2 of the MODU Code.

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If a unit is equipped with sliding watertight doors, each sliding watertight door must:

- Be designed, constructed, tested and marked in accordance with ASTM F-1196.
- Have controls in accordance with ASTM F-1197, except that a remote manual means of closure, as specified in paragraphs 7.1 and 7.5.1, and a remote mechanical indicator, as specified in paragraph 7.5.2 will not be required.
- If installed in a subdivision bulkhead, meet Supplemental Requirements Nos. S1 and S3 of ASTM F-1196 unless the watertight doors are built in accordance with plans previously approved by the USCG, in which case only Supplemental Requirements No. S1 and S3.1.4 of ASTM F-1196 must be met. In either case, control systems for watertight doors must have power supplies, power sources, installation tests and inspection, and additional remote operating consoles in accordance with Supplemental Requirements No. S1 through S4 of ASTM F-1197.

Installations of sliding watertight door assemblies must be in accordance with the following:

- Before a sliding watertight door assembly is installed in a vessel, the bulkhead in the vicinity of the door opening must be stiffened. Such bulkhead stiffeners or deck reinforcement where flush deck door openings are desired, must not be less than 152.5mm (6") nor more than 305mm (12") from the door frame so that an un-stiffened diaphragm of bulkhead plating 152.5mm to 305mm (6" to 12") wide is provided completely around the door frame. Where such limits cannot be maintained, alternative installations will be considered by the USCG Marine Safety Center. In determining the scantlings of these bulkhead stiffeners, the door frame should not be considered as contributing to the strength of the bulkhead. Provision must also be made to adequately support the thrust bearings and other equipment that may be mounted on the bulkhead or deck.
- Sliding watertight door frames must be either bolted or welded watertight to the bulkhead.
 - If bolted, a suitable thin heat and fire resistant gasket or suitable compound must be used between the bulkhead and the frame for water tightness. The bulkhead plating shall be worked to a plane surface in way of the frame when mounting.
 - If welded, caution must be exercised in the welding process so that the door frame is not distorted.

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Refer: 46 CFR 199.60 Communications

- Radio life-saving appliance installations and arrangements must meet the requirements of 46 CFR Part 80.
- Each EPIRB and SART should have the name of the vessel plainly marked or painted on its label, except for EPIRBs or SARTs in an inflatable life-raft or permanently installed in a survival craft.
- Each vessel must carry not less than 12 rocket parachute flare distress signals approved under 46 CFR 160.136. The flares are to be stowed on or near the vessel's navigating bridge.
- Each vessel must meet the requirements for onboard communications between emergency control stations, muster and embarkation stations, and strategic positions on board. Each vessel must also meet the emergency alarm system requirements in 46 CFR subchapter J of this chapter, which must be supplemented by either a public address system or other suitable means of communication.

Refer: 46 CFR 199.80 Muster List and Emergency Instructions

Clear instructions must be provided on the vessel that details the actions each person on board should follow in the event of an emergency.

Copies of the muster list must be posted in conspicuous places throughout the vessel including on the navigating bridge, in the engine room and in crew accommodation spaces. The muster list must be posted before the vessel begins its voyage. After the muster list has been prepared, if any change takes place that necessitates an alteration in the muster list, the Master must either revise the existing muster list or prepare a new one.

Each muster list must at least specify:

- The instructions for operating the general emergency alarm system and public address system
- The emergency signals
- The actions to be taken by the persons on board when each signal is sounded
- How the order to abandon the vessel will be given
- The officers that are assigned to make sure that lifesaving and fire-fighting appliances are maintained in good condition and ready for immediate use
- The duties assigned to the different members of the crew. Duties to be specified include:

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- Closing the watertight doors, fire doors, valves, scuppers, side scuttles, skylights, portholes and other similar openings in the vessel's hull
- Equipping the survival craft and other lifesaving appliances
- Preparing and launching the survival craft
- Preparing other lifesaving appliances

- Mustering the passengers and other persons on board
- Using communication equipment
- Manning the emergency squad assigned to deal with fires and other emergencies
- Using fire-fighting equipment and installations.
- The duties assigned to members of the crew in relation to other persons on board in case of an emergency. Assigned duties to be specified include:
 - Warning the other persons on board
 - Seeing that other persons on board are suitably dressed and have donned their lifejackets or immersion suits correctly
 - Assembling other persons on board at muster stations
 - Keeping order in the passageways and on the stairways and generally controlling the movements of the other persons on board
 - Making sure that a supply of blankets is taken to the survival craft
 - The substitutes for key persons if they are disabled, taking into account that different emergencies require different actions.

(c) Emergency instructions and illustrations in English and any other appropriate language as determined by the OCMI, must be posted in in spaces occupied by persons other than crew, and must be conspicuously displayed at each muster station. The illustrations and instructions must include information on:

- The fire and emergency signal
- Their muster station
- The essential actions they must take in an emergency
- The location of lifejackets
- The method of donning lifejackets.

Refer: 46 CFR 199.120 Launching Stations

Each launching station must be positioned to ensure safe launching with clearance from the propeller and from the steeply overhanging portions of the hull. Each launching station in the forward part of the vessel must be in a sheltered position that is located aft of the collision bulkhead and have a launching appliance approved with an endorsement as being of sufficient strength for forward installation.

Section 2

Refer: 46 CFR 199.145 Marine Evacuation System Launching Arrangements

- (a) Each marine evacuation system must:
- Be capable of being deployed by one person;
 - Enable the total number of persons for which it is designed to be transferred from the vessel into the inflated life-rafts within a period of 30 minutes in the case of a passenger vessel and 10 minutes in the case of a cargo vessel from the time an "abandon-ship" signal is given
 - Be arranged so that life-rafts may be securely attached to and released from the marine evacuation system platform by a person either in the life-raft or on the platform
 - Be capable of being deployed from the vessel under unfavorable conditions of trim of up to 10° either way and of list of up to 20° either way
 - If the marine evacuation system has an inclined slide, it must:
 - Be arranged so the angle of the slide from horizontal is within a range of 30° to 35° when the vessel is upright and in its lightest seagoing condition
and
 - If the vessel is a passenger vessel, be arranged so the angle of the slide from horizontal is no more than 55° in the final stage of flooding as described in subchapter S of this chapter
and
 - Be capable of being restrained by a bowsing line or other positioning system that is designed to deploy automatically and if necessary, is capable of being adjusted to the position required for evacuation.
- (b) Each marine evacuation system must be stowed as follows:
- There must not be any openings between the marine evacuation system's embarkation station and the vessel's side at the waterline with the vessel in its lightest seagoing condition.
 - The marine evacuation system's launching positions must be arranged, as far as practicable, to be straight down the vessel's side and to safely clear the propeller and any steeply overhanging positions of the hull.
 - The marine evacuation system must be protected from any projections of the vessel's structure or equipment.
 - When deployed the marine evacuation system's passage, platform, stowage container and its operational arrangement must not interfere with the operation of any other lifesaving appliance at any other launching station.
 - The marine evacuation system's stowage area must be protected from damage by heavy seas.

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- (c) Stowage of associated life-rafts. Inflatable life-rafts used in conjunction with the marine evacuation system must be stowed:
- Close to the system container, but capable of dropping clear of the deployed chute and boarding platform.
 - So it is capable of individual release from its stowage rack.
 - In accordance with the requirements of 46 CFR 108.530.
 - With pre-connected or easily connected retrieving lines to the platform.

**Refer: 46 CFR 199.150 Survival Craft Launching and Recovery Arrangements:
General**

Unless expressly provided otherwise in this section, each survival craft must be provided with a launching appliance or marine evacuation system, except those survival craft that:

- Can be boarded from a position on deck less than 4.50m (14.75ft) above the waterline with the vessel in its lightest seagoing condition and that are stowed for launching directly from the stowed position under unfavorable conditions of trim of 10° and list of 20° either way
 - Are carried in excess of the survival craft for 200% of the total number of persons on board the vessel, and that have a mass of not more than 185.0kg (407.0lbs)
- (a) Are carried in excess of the survival craft for 200% of the total number of persons on board the vessel and that are stowed for launching directly from the stowed position under unfavorable conditions or trim of 10° and list of 20° either way
- or**
- Are provided for use in conjunction with a marine evacuation system and that are stowed for launching directly from the stowed position under unfavorable conditions of trim of 10° and list of 20° either way.

If there is a danger of the survival craft being damaged by the vessel's stabilizer wings, the stabilizer wings must be able to be brought inboard using power from the emergency source of electrical power. Indicators operated by the vessel's emergency power system must be provided on the navigating bridge to show the position of the stabilizer wings.

Refer: 46 CFR 199.178 Marking of Stowage Locations

If more than one device is stowed in a location, the number of devices stowed must be indicated.

Section 2

Refer: 46 CFR 199.180 Training and Drills

Training material must be on board each vessel and must consist of a manual of one or more volumes written in easily understood terms and illustrated wherever possible, or of audiovisual training aids, or of both as follows:

- The training material must explain in detail:
 - The procedures for donning lifejackets, immersion suits and anti-exposure suits carried on board
 - The procedure for mustering at the assigned stations
 - The procedure for boarding, launching and clearing the survival craft and rescue boats
 - The method of launching from within the survival craft
 - The procedure for releasing survival craft from launching appliances
 - The method and use of water spray systems in launching areas when such systems are required for the protection of aluminum survival craft or launching appliances
 - The illumination in the launching areas
 - The use of all survival equipment
 - The use of all detection equipment for the location of survivors or survival craft
 - With the assistance of illustrations, the use of radio lifesaving appliances
 - The use of sea anchors
 - The use of the survival craft engine and accessories
 - The recovery of survival craft and rescue boats, including stowage and securing
 - The hazards of exposure and the need for warm clothing
 - The best use of the survival craft for survival
 - The methods of retrieval, including the use of helicopter rescue gear such as slings, baskets, and stretchers; the use of breeches-buoy and shore lifesaving apparatus; and the use of the vessel's line-throwing apparatus
 - All other functions contained in the muster list and emergency instructions
 - The instructions for emergency repair of the lifesaving appliances.

Familiarity with emergency procedures.

(i) Every crewmember with emergency duties assigned on the muster list must be familiar with their assigned duties before the voyage begins.

(ii) On a vessel engaged on voyage when the special personnel are scheduled to be on board for more than 24 hours, musters of the special personnel must take place within 24 hours after their embarkation. Special personnel must be instructed in the use of the lifejackets and the action to take in an emergency.

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(iii) Whenever new special personnel embark, a safety briefing must be given immediately before sailing or immediately after sailing. The briefing must include the Muster List and Emergency Instructions and must be made by means of an announcement in one or more languages likely to be understood by the special personnel. The announcement must be made on the vessel's public address system or by other equivalent means likely to be heard by the special personnel who have not yet heard it during the voyage. The briefing may be included in the muster required by this section if the muster is held immediately upon departure. Information cards or posters, or video programs displayed on the vessel video displays, may be used to supplement the briefing, but may not be used to replace the announcement.

(a) Drills.

- Drills must, as far as practicable, be conducted as if there were an actual emergency.
- Every crewmember must participate in at least one abandon-ship drill and one fire drill every month. The drills of the crew must take place within 24 hours of the vessel leaving a port if more than 25% of the crew have not participated in abandon-ship and fire drills on board that particular vessel in the previous month.

- Drills must be held before sailing when a vessel enters service for the first time, after modification of a major character, or when a new crew is engaged.
- The OCMI may accept other equivalent drill arrangements for those classes of vessels for which compliance with this paragraph is impracticable.

(b) Abandon-ship drills.

(1) Abandon-ship drills must include:

- (i) Summoning persons on board to muster stations with the general alarm, followed by drill announcements on the public address or other communication system and ensuring that the persons on board are made aware of the order to abandon ship.
- (ii) Reporting to stations and preparing for the duties described in the muster list.
- (iii) Checking that persons on board are suitably dressed.
- (iv) Checking that lifejackets or immersion suits are correctly donned.
- (v) Lowering of at least one lifeboat after any necessary preparation for launching.
- (vi) Starting and operating the lifeboat engine.
- (vii) Operating davits used for launching the life-rafts.

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- (2) Abandon-ship drills should also include conducting a mock search and rescue of passengers or special personnel trapped in their staterooms, and giving instructions in the use of radio lifesaving appliances.
- (3) Different lifeboats must, as far as practicable, be lowered to comply with the requirements of this Section at successive drills.
- (4) Except as otherwise provided in this Section, each lifeboat must be launched with its assigned operating crew aboard and manoeuvred in the water at least once every 3 months during an abandon-ship drill.
- (5) Lowering into the water, rather than launching of a lifeboat arranged for free-fall launching, is acceptable when free-fall launching is impracticable, provided that the lifeboat is free-fall launched with its assigned operating crew aboard and is maneuvered in the water at least once every 6 months. However, when compliance with the 6-month requirement is impracticable, the OCMI may extend this period to 12 months, provided that arrangements are made for simulated launching at intervals of not more than 6 months.

The OCMI may exempt a vessel operating on short international voyages from the requirement to launch the lifeboats on both sides of the vessel if berthing arrangements in port and operations do not permit launching of lifeboats on one side. However, all lifeboats on the vessel must be lowered at least once every 3 months and launched at least annually.

- (6) As far as is reasonable and practicable, rescue boats, other than lifeboats which are also rescue boats, must be launched with their assigned crew aboard and maneuvered in the water each month. Such launching and maneuvering must occur at least once every 3 months.
- (7) If lifeboat and rescue boat launching drills are carried out with the vessel making headway, such drills must, because of the dangers involved, be practiced in sheltered waters only and be under the supervision of an officer experienced in such drills.
- (8) If a vessel is fitted with marine evacuation systems, drills must include an exercising of the procedures required for the deployment of such a system up to the point immediately preceding actual deployment of the system. This aspect of drills should be augmented by regular instruction using the on-board training aids. Additionally, every crewmember assigned to duties involving the marine evacuation system must, as far as practicable, participate in a full deployment of a similar system into water, either on board a vessel or ashore, every 2 years but not longer than every 3 years. This training may be associated with the deployments required.
- (9) Emergency lighting for mustering and abandonment must be tested at each abandon-ship drill.
- (10) If a vessel carries immersion suits or anti-exposure suits, the suits must be worn by crewmembers in at least one abandon ship drill in any 3-month period. If wearing the suits is impracticable due to warm weather, the crewmembers must be instructed on their donning and use.

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- (11) If a vessel carries immersion suits for persons other than the crew, the abandon-ship drill must include instruction to these persons on the stowage, donning and use of the suits.
- (c) Line-throwing appliance. A drill must be conducted on the use of the line-throwing appliance at least once every 3 months. The actual firing of the appliance is at the discretion of the Master.
- (d) Fire drills.
- (1) Fire drills must, as far as practicable, be planned with due consideration given to the various emergencies that may occur for that type of vessel and its cargo.
- (2) Each fire drill must include:
- Reporting to stations and preparing for the duties described in the muster list for the particular fire emergency being simulated
 - Starting of fire pumps and the use of 2 jets of water to determine that the system is in proper working order
 - Checking the firemen's outfits and other personal rescue equipment
 - Checking the relevant communications equipment
 - Checking the operation of watertight doors, fire doors, and fire dampers and main inlets and outlets of ventilation systems in the drill area
 - Checking the necessary arrangements for subsequent abandonment of the vessel.
- (3) The equipment used during drills must immediately be brought back to the fully operational condition. Any faults and defects discovered during the drills must be remedied as soon as possible.
- (e) Onboard training and instruction.
- (1) Onboard training in the use of the vessel's lifesaving appliances, including survival craft equipment, and in the use of the vessel's fire-extinguishing appliances must be given as soon as possible but not later than 2 weeks after a crewmember joins the vessel.
- (2) If the crewmember is on a regularly scheduled rotating assignment to the vessel, the training required in this Section need be given only within 2 weeks of the time the crewmember first joins the vessel.
- (3) The crew must be instructed in the use of the vessel's fire-extinguishing and lifesaving appliances and in survival at sea at the same interval as the drills. Individual units of instruction may cover different parts of the vessel's lifesaving and fire-extinguishing appliances, but all the vessel's lifesaving and fire-extinguishing appliances must be covered within any period of 2 months.
- (4) Every crewmember must be given instructions that include, but are not limited to:

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- (i) The operation and use of the vessel's inflatable life-rafts.
 - (ii) The problems of hypothermia, first aid treatment for hypothermia and other appropriate first aid procedures.
 - (iii) Any special instructions necessary for use of the vessel's lifesaving appliances in severe weather and severe sea conditions.
 - (iv) The operation and use of fire-extinguishing appliances.
- (5) Onboard training in the use of davit-launched life-rafts must take place at intervals of not more than 4 months on each vessel with davit-launched life-rafts. Whenever practicable, this training must include the inflation and lowering of a life-raft. If this life-raft is a special life-raft intended for training purposes only and is not part of the vessel's lifesaving equipment, this life-raft must be conspicuously marked.
- (f) Records.
- When musters are held, details of abandon-ship drills, fire drills, drills of other lifesaving appliances and onboard training must be recorded in the vessel's official logbook. Logbook entries must include:
 - The date and time of the drill, muster or training session
 - The survival craft and fire-extinguishing equipment used in the drills
 - Identification of inoperative or malfunctioning equipment and the corrective action taken
 - Identification of crewmembers participating in drills or training sessions
 - The subject of the onboard training session.
 - If a full muster, drill or training session is not held at the appointed time, an entry must be made in the logbook stating the circumstances and the extent of the muster, drill or training session held.

Refer: 33 CFR 164.33 Charts and Nautical Publications

The LR Surveyor is to confirm that the Master or Person in Charge has ensured that the self-propelled units have the following adequate, up to date and appropriate items for the intended voyage:

- Charts, Sailing directions
- Coast pilots
- Light lists
- Notices to Mariners
- Tide Tables
- Current Tables
- All other nautical publications necessary

For US units or on the navigable waters of the US see 33 CFR 164.33.

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Record of Revisions