NVIC 10-81
5 Oct 1981

NAVIGATION AND VESSEL INSPECTION CIRCULAR No. 10-81, CHANGE 1 INCLUDED
Electronic Version for Distribution Via the World Wide Web

Subj: Coast Guard Certification and Inspection of Certain Categories of Existing Vessels

1. PURPOSE The purpose of this Circular is to provide the marine industry and Coast Guard personnel with uniform guidance regarding the application of Coast Guard rules and regulations to certain categories of existing vessels.

2. DIRECTIVE AFFECTED. This Circular and enclosed guide supersedes the previously issued NVC 12-65.

3. APPLICATION. This guidance applies to the following categories of existing vessels:

   a. Foreign flag vessels brought under U.S. flag and Coast Guard certification and inspection, that are at least two but not more than ten years old

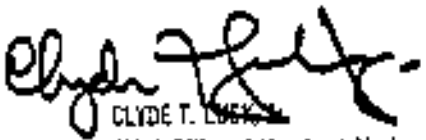
   b. U.S. flag vessels that are Coast Guard certificated and inspected and undergoing major alteration or modification

   c. U.S. flag vessels that are brought under Coast Guard certification and inspection

   d. Wrecked vessels that are eligible to register under the provisions or 46 U.S.C. 14

4. DISCUSSION. Enclosure (1) is a guide for determining the extent to which current Coast Guard regulations should be applied to the above categories or existing vessels. The guide was developed for vessels that are Coast Guard certificated and inspected as Cargo and Miscellaneous Vessels, Tank Vessels and Oceanographic Vessels. Passenger Vessels, Offshore Supply Vessels and Mobile Offshore Drilling Units are not included in the guide. Other alternatives to those in the guide may be equally acceptable based on a specific application. Nothing contained in this guide shall be taken as amending the applicable requirements set forth in the Code or Federal Regulations, nor as limiting the authority of the Officer in Charge, Marine Inspection in his determination of acceptable materials, construction and testing.

5. ACTION. Enclosure (1) is for use by the marine industry and Coast Guard personnel in determining the extent to which current Coast Guard rules and regulations should be applied to certain categories of existing vessels.



CLYDE T. [illegible]
Chief, Office of Merchant Marine Safety

End: (l) Guide for Coast Guard Certification and Inspection of Certain Categories of Existing Vessels

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GUIDE FOR COAST GUARD CERTIFICATION AND INSPECTION OF CERTAIN CATEGORIES OF EXISTING VESSELS

INTRODUCTION

In 1981 the Coast Guard developed and promulgated NVIC 10-81 to provide a consistent and uniform set of guidelines for the inspection and certification of certain categories of existing vessels. These guidelines have provided a means to demonstrate equivalence to Coast Guard regulations based on such factors as: service and operating history, extent of repairs and modifications, standards and inspections used during construction, and a history of vessel repairs and upgrades.

Based on the experience gained while using the guidelines, input from the marine industry, and changes in many of the regulations cited, the need to update NVIC 10-81 became apparent. This change provides a major update of guidance in the fire protection, automation, steering, electrical, and inspection areas and adds Mobile Offshore Drilling Units (MODUs) to the list of vessels to which this NVIC applies. Other minor changes are made throughout the guidelines.

These guidelines are based on the premise that with the passage of time, existing vessels will be retired and only those built to newer standards will continue in service. For this reason, it is costly and impractical to require existing vessels to be modified each time a safety standard is updated. However, when a major conversion or modification of an existing vessel is planned, there is a definite intent to extend the service life of the vessel. when this is the case, it is appropriate to bring the entire vessel into compliance with the latest safety standards where reasonable and practicable. It is also appropriate to review the entire vessel to current standards when bringing existing U.S. or foreign vessels under certification for the first time, or when a vessel has been wrecked or otherwise taken out of service for an extended period of time. The applicable inspection standards and guidelines can generally be identified under one or more of the following categories.

MAJOR CONVERSION or MODIFICATION: Major conversions or modifications include jumboizing, lengthening, and modifying for a change in service. Re-powering may be deemed a major conversion if the intent is to extend the economic life of the vessel. Other re-engining modifications may not be deemed a major conversion if the economic savings of the conversion would be realized during the vessel's normal life. In general, conversions of steam plants to diesel propulsion for fuel efficiency reasons on vessels in good condition have not been classed as major conversions. Determinations of major conversions are to be made by Commandant (G-MVI). The entire vessel must meet all current standards, as far as is reasonable and practicable, in effect at the contract date of a major conversion. These standards are found in the new vessel requirement portion for each system in this enclosure.

REPAIRS: Repairs, regardless of extent, are not normally considered a major modification if the vessel's carrying capacity, service, or life expectancy is not changed. Repairs and alterations to vessel equipment and systems must meet standards in effect at the time the work is performed. For example, an automation change can be quite extensive, but it may not be a major modification. The new automation, however, must meet current standards (see NVIC 6-84). Repairs must be made to the satisfaction of the cognizant Officer in Charge, Marine Inspection (OCMI).

FOREIGN FLAG VESSELS: Existing foreign flag vessels may be brought under U.S. flag in a manner consistent with the principles and levels of safety in current Coast Guard regulations. At the time of application for inspection, the vessel should be at least two years but not more than ten years old. A vessel with at least two years of operation should have a service history that will assist in making determinations of general equivalence for specific systems. Also, a vessel less than ten years old should already meet many of the more recent international standards. As a result, Coast Guard certification may be more economically and technically feasible. Installed equipment should be generally equivalent to that on similar U.S. flag vessels under Coast Guard certification. Some specific systems and components may be accepted

on the basis of performance standards. The applicable inspection requirements must be equivalent to those of a comparable U.S. vessel of the same age and type. If the vessel underwent a major modification, it must then meet the requirements that were in effect at the time of modification. The OCMI will make equivalence determinations and decide the extent to which the vessel will be upgraded.

UNCERTIFICATED U.S. FLAG VESSELS: The number of existing uninspected U.S. flag vessels that are brought under Coast Guard certification is relatively small. Some examples are: an inland deck cargo barge changing service to oceans, a vessel being recertificated after a prolonged lay-up, or a Military Sealift Command vessel that was previously not certificated. This guide, in conjunction with the current Coast Guard rules and regulations, should be used to determine the extent to which such vessels must be modified for Coast Guard certification. In this case, the OCMI will determine the extent to which a vessel must be upgraded.

* * * * *

The remainder of this enclosure provides additional guidance on the application of Coast Guard standards to certain categories of existing vessels. New standards are listed under the "Requirements" section for each subject. These standards should be used when current requirements are appropriate as previously discussed in each of the sections above. The criteria for establishing equivalencies to Coast Guard standards and for accepting existing equipment is a major portion of this enclosure and is addressed in the "Acceptance Criteria" and "Additional Inspection" sections following each "Requirement" section. The regulations cited in each "Requirement" section should be read in conjunction with the "Acceptance Criteria" and "Additional Inspection" sections in order to fully understand their application to existing vessels.

APPLICABLE REGULATIONS

The regulations cited in this guide are found in:

Name	CFR Title	Subchapter
Tank Vessels	46	D
Load Line	46	E
Marine Engineering	46	F
Documentation and Measurement	46	G
Cargo and Miscellaneous Vessels	46	I
Mobile Offshore Drilling Units	46	I-A
Electrical Engineering	46	J
Equipment, Construction, and Materials: Specifications and Approval	46	Q
Subdivision and Stability	46	S
Oceanographic Vessels	46	U
Pollution	33	O

PLANS, CORRESPONDENCE, AND ADMINISTRATIVE PROCEDURES

Normal plan review and inspection procedures will be used when bringing vessels under certification for the first time. However, the process for reflagging or certification of existing U.S. vessels

is often accomplished in a much shorter period of time than new construction. Therefore early and complete plan submittals are essential for timely vessel plan review. Since many of the equivalency determinations can only be made by reviewing plans, technical data, and construction standards, late or incomplete submittal of plans and other forms of documentation will delay the certification of the vessel. To alleviate this problem, all submittals should be through a single point of contact, be legible and in English, and be submitted as soon as possible after the "Application for Inspection" (form CG-3752) has been completed.

A report of vessel deficiencies should accompany the "Application for Inspection." This report should be submitted by the owner or his representative to both the local OCMI and the cognizant merchant marine technical (mmt) office. It will list, in general, those areas of the vessel that do not meet the requirements of these guidelines, and how those problem areas will be addressed.

All plans, information and technical data should be submitted using the recommendations in NVIC 8-84 "Recommendations for the Submittal of Merchant Vessel Plans and Specifications." Specifically, a list of available plans must be submitted so that the reviewing office can designate which plans need to be reviewed. All correspondence, plans, technical data, copies of standards, and specifications shall be in English or be accompanied by English translations. As stated in paragraph 4 g. of NVIC 8-84, "Those plans ... not ready for review (i.e. illegible, not in English, or diagrammatic without an attached bill of material, etc.) will be returned disapproved without itemized comments." NVIC 11-84 (section IV.B.), "Guidelines for New Construction or Major Modification of U.S. Flag Vessels in Foreign Shipyards", should be consulted when comparing foreign material standards to U.S. standards.

Dimensions on drawings may be in English or Metric units.

If the owner has the vessel plans and the report of vessel deficiencies (as indicated above) available when the vessel's "Application for Inspection" has been submitted, the plan review and inspection process may be further shortened by arranging an early meeting with the cognizant mmt office. This meeting would allow mmt personnel the opportunity to perform a cursory review of the plans to ensure they are adequate to begin review, and to discuss the deficiency report with the owner's representative. This meeting would help to identify problem areas early in the plan review process and reduce the possibility that vessel certification will be delayed.

INSPECTION

The responsibility for demonstrating to the Coast Guard compliance with the regulations rests solely with the owner. Prior to assigning inspectors or initiating plan review, the owner, who must be a U.S. citizen eligible to document the vessel under U.S. law, must make an application for inspection to the cognizant OCMI and have submitted all paperwork for documentation. Limited availability of Coast Guard marine inspectors may become a factor to consider in scheduling shipyard work on the vessel.

Inspection for certification within the United States will follow standard procedures.

Reflagging of foreign flag vessels overseas is complicated due to delays in communications, establishment of equivalencies, the availability of Coast Guard inspectors, and different procedures followed by foreign shipyards. In general, considerable delays should be expected for decision making and inspection scheduling in foreign ports, as an inspector cannot be assigned full time to a foreign shipyard unless the workload justifies a continual presence. However, the ultimate aim is a degree of inspection equivalent to that obtained if the vessel were being inspected in the United States. The vessel owner must contact the Commandant (G-MVI-l) prior to commencing reflagging to initiate a memorandum of

agreement which delineates the owner's responsibilities for reimbursing the Coast Guard for travel and subsistence -expenses for foreign inspections. When foreign inspection is authorized, the Commandant (G-MTH) will assign the plan approval function to one of the field merchant marine technical offices listed in 46 CFR 91.55-15(a)(3).

TONNAGE MEASUREMENT

Since the tonnages of a foreign flag vessel intended to be brought under U.S. flag are calculated under a system different from the U.S. tonnage measurement systems in 46 USC 71, 75, 77, and 83/83k, the vessel is required to be measured under a U.S. system before it may be documented as a vessel of the United States.

Tonnage certificates for either documentation or international purposes may be issued to a vessel prior to its arrival in the United States. Vessels undergoing major modifications may be subject to measurement under the 1969 Tonnage Convention for an International Tonnage Certificate (see NVIC 6-83, "Admeasurement of Vessels in Accordance with the Rules of the International Convention on Tonnage measurement of Ships, 1969").

Vessel owners may request on-site measurement of U.S. owned vessels that are constructed or rebuilt in foreign shipyards. Applications should be submitted sufficiently in advance of the vessel's completion to permit arrangements to be made for personnel assignment, submittal of plans, and preliminary review and computations.

Applications for measurement services abroad should be submitted to Commandant (G-MVI-5) or to the American Bureau of Shipping (per NVIC 5-84). when Coast Guard services are requested, the applicant must include a statement of agreement to reimburse the Coast Guard for such services. Reimbursement includes compensation of the traveler, travel costs, and subsistence expenses of personnel assigned to measure the vessel (46 USC 2110).

For U.S. vessels coming under certification or undergoing major alteration in U.S. shipyards, applications for tonnage measurement will be submitted in accordance with 46 CFR 69.01-17.

DOCUMENTATION

In view of the Second Proviso of 46 App. U.S.C. 883, if a vessel of more than 500 gross tons that has entitlement to coastwise trading privileges is altered outside the United States in a manner which gives rise to a reasonable belief that the vessel is rebuilt, or if a major component of the hull or superstructure not built in the United States is added to the vessel, the submissions required by 46 CFR 67.27-3(c) must be made to the Commandant (G-NVD/13).

HULL STRUCTURE

If the vessel was ever certificated by the Coast Guard, plan review is not required for any structure which has already been accepted by the Coast Guard. Plans or correspondence indicating prior Coast Guard acceptance must be available for inspection by the cognizant OCMI or merchant marine technical office.

For all other vessels, except those built and maintained under ABS class, the plans for major hull structural items must be approved by the Coast Guard regardless of whether or not the vessels are, or have been, classed by a classification society. English translations of the following structural plans must be submitted for technical review:

Midship Section
Scantling Profile
Strength Deck Structural Plan
Shell Plating and Framing
Typical Watertight Bulkhead
Typical Tank Bulkhead

Generally, acceptance of a vessel's hull structure will be based upon compliance with the rules. of the American Bureau of Shipping (ABS). Compliance with the appropriate ABS rules in effect at the time of vessel construction must be demonstrated (i.e. for ships, Rules for Building and Classing Steel Vessels). For Mobile Offshore Drilling Units (MODUs) acceptance of structure will be based upon compliance with the MODU rules of the American Bureau of Shipping or Det Norske Veritas. The standards of other classification societies for ships or MODUs may also be accepted upon specific approval by the Commandant (G-MTH-5).

Prints bearing the approval stamp of the ABS will in general be accepted as satisfactory except insofar as the law or the Coast Guard regulations contain requirements which are not covered by the ABS. Other drawings will be reviewed by the Coast Guard. To facilitate plan review, the plan submitted should submit calculations with the drawings to show that the structure complies with ABS or DNV rules, as applicable, or is equivalent to those rules.

Plans and calculations must be submitted for major alterations. The portion of a vessel receiving a major alteration, and other portions of the vessel where design may be affected by the alteration, must conform to the requirements for new vessels built in the United States. Repairs, regardless of extent, will not be considered as major alterations as long as sizes, configurations, and materials basically conform to acceptable original scantlings. Repairs must be made to the satisfaction of the cognizant OCNI.

Since complete guidance cannot be provided in this document to cover the acceptance of the hull structure of existing vessels, discussions with the Coast Guard are encouraged at an early stage in preparing for Coast Guard certification. This will enable the owner to better assess the economic impact of making the conversion before substantial investment is made to comply with other Coast Guard requirements.

In order to fully assess the hull structure, drydocking the vessel with Coast Guard inspectors in attendance is required prior to certification. A special exam in lieu of drydocking may be conducted for certain MODUs in accordance with 46 CFR 107.261 and 107.265.

LOADING INFORMATION

Loading manuals must be submitted for approval to the Commandant (G-MTH), or must have been approved by a recognized classification society acceptable to the Commandant, for the following types of vessels:

Ore or bulk carriers over 400 feet in length

Specialized carriers over 400 feet in length such as container or barge carriers in which cargo is designed to be stowed in specific cells or locations

Tank vessels over 400 feet in length

Tank vessels over 300 feet in length on which construction began on or after September 6, 1977

The manuals must show the effects of various loading conditions on the longitudinal bending and shear stresses. The information must be in a format that can be supplied to the master of the vessel, or to the person in charge of handling, loading or off-loading operations. Alternative methods of obtaining information on vessel stresses, such as computer devices, must be verified by the Coast Guard to give the same results as the required approved loading manual.

VESSEL ARRANGEMENT

Vessel arrangement requirements are found in 46 CFR Parts 32, 92, 105, and 190 of the applicable regulations. Stairs should be a minimum of 28 inches wide and allow for access of emergency equipment. Emergency escapes should be in full compliance with applicable regulations. Avenues providing a means of escape and access for fire fighting must be made of steel or have equivalent fire resistant qualities. Aluminum or fiberglass gratings or catwalks in non-vital areas are acceptable, provided they are not in an area used as a means of escape or for fire fighting access.

FIRE PROTECTION

Both active and passive fire protection systems must meet the current requirements for new United States flag vessels, or be proven equivalent. It is the responsibility of the owner to demonstrate equivalence to the satisfaction of the Coast Guard. Evidence of compliance with SOLAS 1974 as amended may assist in determining equivalence.

All fire fighting system storage and discharge capacities, location of controls, type and location of media storage, operating instructions, and all other fire protection system details not discussed in this enclosure must be satisfactory to the cognizant OCMI.

* * * *

The below listed words when underlined will have the following definition when used in this enclosure:

Requirements: Basic New Vessel Requirements in 46 CFR.

Acceptance Criteria: Equivalent acceptance criteria for existing vessels.

Additional Inspection: Item. needing additional inspection on existing vessels (If this item is not present, no additional inspection is needed).

* * * * *

Structural Fire Protection

Structural fire protection must comply with applicable Coast Guard regulations. Noncombustible materials, bulkhead panels, structural insulation, deck coverings and interior finishes shall be Coast Guard approved in accordance with 46 CFR Subchapter Q. The Coast Guard will consider acceptance of non-approved structural fire protection materials which have not been granted type-approval, provided these materials are tested and found to be in compliance with the criteria in Subchapter Q. The owner must forward samples, taken from the vessel in the presence of a Coast Guard marine inspector, to an independent testing laboratory recognized by the Coast Guard.

Details of construction and arrangement shall be as follows (references per 46 CFR):

1. LAMP, PAINT AND OIL LOCKER CONSTRUCTION

   Requirements: 32.57-10(b), 92.07-10(b), 108.127, 190.05-10. Acceptance Criteria: A-Class. 11 gage USSG/3mm will generally meet A-0.

2. HULL, SUPERSTRUCTURE, STRUCTURAL BULKHEADS, DECKS, AND DECKHOUSE CONSTRUCTION

   Requirements: 32.57-10(a), 92.07-10(b), 108.133, 190.07-10(b).

   Acceptance Criteria: Steel.

3. CONSTRUCTION OF BOUNDARIES SEPARATING ACCOMMODATIONS AND CONTROL STATIONS FROM CARGO SPACES, MACHINERY SPACES, GALLEYS, MAIN PANTRIES AND STOREROOMS

   Requirements: 32.57-10(c), 92.07-10(c), 108.135, 190.07-10(c). Acceptance Criteria: A-Class.

4. CORRIDOR BULKHEAD CONSTRUCTION

   Requirements: 32.57-l0(d)(l), 92.07-10(d)(l), 108.143(a) and (b), 190.07-10(d) (1).

   Acceptance Criteria: A- or B-Class intact from deck to deck, unless continuous B-class ceilings fitted on both sides of bulkheads.

   Additional Inspection: Joiner details should be checked to insure compliance with good marine practice. NVIC 6-80 should be used for guidance. It should be verified that materials used on the vessel for panels and doors are actually those indicated on drawings.

5. STAIRTOWER, DUMBWAITER, ELEVATOR, AND OTHER TRUNK CONSTRUCTION

   Requirements: 32.57-l0(d)(2), 92.07-l0(d)(2), 108.143(c), 190.07-10(d) (2).

   Acceptance Criteria: A-Class.

6. STAIRTOWER DOORS

   Requirements: 32.57-10(d)(4), 92.07-10(d)(4), 108.143(f) and (g), 190.07-10(d)(2)

Acceptance Criteria: A-Class doors at all levels.

7. STATEROOM BOUNDARY CONSTRUCTION (NOT CORRIDOR SIDE)

Requirements: 32.57-10(d)(3), 92.07-10(d)(3), 108.143(d), 190.07-l0(d)(3):

Acceptance Criteria: Noncombustible A-, B-, or C- class.

8. STAIRWAY CONSTRUCTION

Requirements: 32.57-l0(d)(4), 92.07-l0(d)(4), 108.143(e), 190.07-l0(d)(4).

Acceptance Criteria: A- or B-Class bulkheads and doors at one level only as an alternative arrangement for required stairtowers. Stairways may not be stacked.

9. INTERIOR STAIR CONSTRUCTION (STRINGERS & TREADS)

Requirements: 32.57-l0(d)(5), 92.07-l0(d)(5), 108.143(h), 190.07-l0(d)(5). Acceptance Criteria: Steel.

10. DECK COVERINGS (EXCEPT TOILET & WASHROOM SPACES)

Requirements: 32.57-l0(d)(6), 92.07-l0(d)(6), 108.143(i), 190.07-l0(d)(6).,

Acceptance Criteria: Must meet 164.006 or 164.009 except unapproved overlays for leveling or finishing may be used up to 3/8 inch total thickness.

11. RUGS AND CARPETS IN CORRIDORS$_1$ STAIRWAYS AND STAIRTOWERS

Requirements: 32.57-10(d)(6), 92.07-10(d)(6), 108.143(i), 190.07-1O(d)(6).

Acceptance Criteria: All carpets made or sold in the U.S. must meet Dept. of Commerce standard FF-1-70 (16 CFR 1630). Existing carpet will be evaluated against that standard to determine its acceptability.

12. CEILINGS, LININGS, INSULATIONS, PIPE AND DUCT LAGGINGS

Requirements: 32.57-10(d)(7), 92.07-1O(d)(7), 108.143(j), 190.07-1O(d)(7).

Acceptance Criteria: Approved noncombustible materials.

13. SHEATHING, FURRING OR HOLDING PIECES INCIDENTAL TO SECURING OF BULKHEADS LININGS, CEILINGS & INSULATIONS

Requirements: 32.57-1O(d)(8), 92.07-1O(d)(8), 108.143(k), 190.07-1O(d)(8).

Acceptance Criteria: Approved noncombustible materials.

14. INTERIOR FINISH REQUIREMENTS (NOT CORRIDORS, STAIRWAYS, STAIRTOWERS OR HIDDEN SPACES)

Requirements: 32.56-50, 92.07-1O(d)(9), 108.143(1), 190.07-10(d)(9).

Acceptance Criteria: Thickness requirements same as above for new vessel. Any interior finish material or paint under 164.012 is acceptable for all vessels. Testing in accordance with ASTM E-84 may be accepted in lieu of 164.012 on a case by case basis.

15. INTERIOR FINISH REQUIREMENTS FOR CORRIDORS, STAIRWAYS, STAIRTOWERS AND CONCEALED SPACES

Requirements: 32.56-50, 92.07-10(d)(9), 108.143(m), 190.07-1O(d)(9).

Acceptance Criteria: An approved interior finish material or paint under 164.012.

16. DRAFT STOPS BEHIND CEILINGS AND LININGS IF BULKHEADS ARE TERMINATED AT CEILING

Requirements: 32.56-45.

Acceptance Criteria: Draft stop every 14 meters (45 Feet) or less. Draft stops must be 22 gage USSG steel or equal noncombustible material.

17. FIRE LOADING

Acceptance Criteria: Not normally evaluated except where extreme amounts of combustible materials are present. Maximum loading is generally 10 lb/sq.ft. which includes 2.5 lb/sq.ft. for personal effects (see NVIC 6-80).

Additional Inspection: The addition of fiberglass or other combustible shower and toilet modules may cause limits to be exceeded.

Fire Extinguishing Systems

Fire Main

Design shall be in accordance with applicable regulations. Piping, pumps and valves may be of foreign manufacture if equivalency is established. Fire hoses and hose fittings shall meet the applicable regulations. Combination nozzles and applicators shall be Coast Guard approved. International shore connections will be accepted if they comply with Regulation 11-2/19 of SOLAS 1974, as amended.

Carbon Dioxide

Design should be in accordance with applicable regulations. Normally, Coast Guard approved systems will be required; however, on a case by case basis, other systems may be accepted if shown to be equivalent. Components such as cable pulleys, cable, etc., which form part of the remote control system but are not essential to the carbon dioxide distribution, must be acceptable to the OCMI for the service intended. Acceptance of components of foreign manufacture which are listed by Underwriters Laboratories,

Factory Mutual, Inc., or other laboratories acceptable to the Coast Guard will be considered on a case by case basis.

Foam

Design shall be in accordance with applicable regulations. Proportioning equipment, foam outlets, nozzles, foam liquid, hose fittings and other devices unique to foam systems shall be Coast Guard approved.

Water Spray

Design shall be in accordance with applicable regulations. Nozzles and strainers shall be Coast Guard approved.

Halon

Halogenated hydrocarbon extinguishing systems normally require Coast Guard approval of the complete system. Other systems may be accepted, on a case by case basis, provided they can be shown fully equivalent to those approved by the Coast Guard. All components, except piping, must be Coast Guard approved. Components such as cable pulley, cable, etc., which form part of the remote system but are not essential to the Halon distribution, must be acceptable to the OCMI for the service intended.

Inert Gas

Design should be in accordance with applicable regulations. Inert gas systems may be of foreign manufacture, provided equivalence is shown. Alarms, controls, and instrumentation must meet Coast Guard requirements. Piping and valves may be of foreign manufacture provided equivalence is shown. Systems meeting SOLAS 1974, as amended, will be accepted if they have been so certified by the Flag State.

Fire Detection

Design shall be in accordance with the applicable regulations. Required systems should be Coast Guard approved. Consideration will be given to granting equivalencies, especially systems meeting SOLAS 1974, as amended. Fire detection systems that are installed, but not required, shall comply with NVIC 7-80, "Use of Fire Detection Systems which are Not Approved Under 46 CFR 161.002."

Portable and Semiportable Fire Extinguishers

Fire extinguishers shall be of a type and number required by the applicable regulations, and shall be Coast Guard or U.L. approved (see NVIC 3-82).

Fixed Fire Protection

Machinery Space Fire Protection

1. OIL FIRED BOILERS AND ASSOCIATED EQUIPMENT

Requirements: 34.05-5(a)(5), 95.05-10(d), 108.403(b), 193.05-10(e).

Acceptance Criteria: Tank and Oceanographic vessels - carbon dioxide systems; Cargo vessels and MODUs - carbon dioxide, or water spray. See comments on system requirements.

Additional Inspection: Systems must cover all flats as well as bilges. Foam systems are no longer accepted for new construction and should be viewed critically on existing vessels.

2. SPACES CONTAINING INTERNAL COMBUSTION ENGINES OR GAS TURBINES OF 1000 BHP OR MORE.

Requirements: 34.05-5(a)(7), 95.05-l0(e)(2), 108.403(a)(4), 193.05-10(c) (3).

Acceptance Criteria: Carbon dioxide or Halon 1301. See comments on system requirements.

3. ENCLOSED VENTILATION SYSTEM FOR MOTOR-GENERATORS AND ELECTRICAL PROPULSION MACHINERY

Requirements: 34.05-5(a)(8), 95.05-10(f), 108.403(a)(5).

Acceptance Criteria: Carbon dioxide. See comments on system requirements.

Fire Protection Systems for Other Spaces

1. LAMP AND PAINT LOCKERS AND OTHER SIMILAR SPACES

Requirements: 34,O5-5(a)(3), 95.05-10(c), 108.403(a)(1), 193.05-10(d).

Acceptance Criteria: Cargo, MODU, and Oceanographic vessels - carbon dioxide only. Tank vessels - carbon dioxide or water spray.

2. SPACES SPECIALLY SUITED FOR VEHICLES

Requirements: 95.05-1(c), 95.05-10(b)(4), 95.15-5(f)(2).

Acceptance Criteria: Carbon dioxide or Halon 1301 in enclosed spaces; water spray or sprinklers if not enclosed. In lieu of the requirements in 46 CFR 95.15-5(f)(2) (100% carbon dioxide in 2 minutes),the Coast Guard will accept the SOLAS criteria (66 2/3% carbon dioxide in 10 minutes). Fire detection systems as required in 46 CFR 76.27 through 76.35. See comments on system requirements.

3. CARGO COMPARTMENTS

Requirements: 34.05-5(a)(l), 95.05-10(b), 193.05-10(d).

Acceptance Criteria: Carbon dioxide. See comments on system requirements.

4. CARGO TANKS

Requirements: 34.05-5(a)(2), 95.05-1(b).

Acceptance Criteria: Deck foam and inert gas depending on size and type of vessel. See comments on system requirements.

5. PUMPROOMS

Requirements: 34.05-5(a) (4).

Acceptance Criteria: Carbon dioxide, or water spray. See comments on system requirements.

Fire. Protection Equipment

Fire Main System

1. FIRE PUMPS

Requirements: 34.10-5, 95.10-5(a), 108.415-.421, 193.10-5.

Acceptance Criteria: Fire pumps should meet number, capacity, separation and performance requirements.

Additional Inspection: Pump should be tested to insure delivery of required hose streams and pressures. If the fire main supplies water for services in addition to fire fighting, requirements must be met while simultaneously providing the additional water. Routing of electrical cable and controls should be checked to ensure a single casualty cannot affect more than one pump.

2. FIRE HOSE NOZZLES

Requirements: 34.10-10(e), 95.10-10(i), 108.425(c), 193.10-10.

Acceptance Criteria: Replace with nozzles meeting 46 CFR 162.027.

3. FIRE HOSE

Requirements: 34.10-10, 95.10-10, 108.425, 193.10-10.

Acceptance Criteria: Hose and fittings must meet Coast Guard requirements.

Additional Inspection: Hose lengths checked to ensure that hydrant locations meet requirements. Hose must be rubber lined. Threads must be National Standard.

4. PIPING

Requirements: 34.10-15, 95.10-15, 108.415-.429, 193.10-15.

Acceptance Criteria: Must be equivalent to Coast Guard standards.

Carbon Dioxide System

1. QUANTITY AND DISCHARGE

Requirements: 34.15-5, 95.15-5, 108.433-.441, 193.15-5.

Acceptance Criteria: Same as above for new vessel.

2. CONTROLS

Requirements: 34.l5-10, 95.15-10, 108.443, 193.15-10.

Acceptance Criteria: Controls must be Coast Guard approved with the exception of cable pulleys, cables, etc. which are not essential to the carbon dioxide distribution. These must be acceptable to the OCMI for the service intended.

3. PIPING AND DISCHARGE OUTLETS

Requirements: 34.15-15, 95.15-15, 108.441, 193.15-15, 34.15-25, 95.15-25, 108.447, 193.15-25.

Acceptance Criteria: Discharge outlets shall be of an approved type. Piping must be equivalent to Coast Guard requirements for carbon dioxide systems. Piping and controls shall be arranged as shown in manufacturer's approved “typical” arrangement drawing.

Additional Inspection: System should have been serviced within the last year.

4. CARBON DIOXIDE STORAGE

Requirements: 34.15-20, 95.15-20, 108.451, 193.15-20.

Acceptance Criteria: Same as above for new vessel.

5. ALARMS

Requirements: 34.15-30, 95.15-30, 108.445, 193.15-30.

Acceptance Criteria: Same as above for new vessel.

6. ENCLOSURE OPENINGS

Requirements: 34.15-35, 95.15-35, 108.455, 193.15-35.

Acceptance Criteria: Same as above for new vessel.

Foam systems

1. QUANTITY

Requirements: 34.17-5, 95.17-5, 108.469.

Acceptance Criteria: Same as above for new vessel.

2. CONTROLS

Requirements: 34.17-10, 95.17-10, 108.473.

Acceptance Criteria: Same as above for new vessel.

3. PIPING

Requirements: 34.17-15, 95.17-15, 108.475.

Acceptance Criteria: Same as above for new vessel.

Water Spray System

1. CAPACITY AND ARRANGEMENT

Requirements: 34.25-5.

Acceptance Criteria: Same as above for new vessel.

2. CONTROLS

Requirements: 34.25-10.

Acceptance Criteria: Same as above for new vessel.

3. PIPING AND SPRAY NOZZLES

Requirements: 34.25-15.

Acceptance Criteria: Spray nozzles shall be of an approved type. Piping may be equivalent to Coast Guard requirements.

Inert Gas System

1. INERT GAS GENERATORS AND BLOWERS

Requirements: 32.53-20, 35, and 45.

Acceptance Criteria: Equivalent to Coast Guard requirements.

2. INSTRUMENTATION, ALARMS AND CONTROLS.

Requirements: 32.53-60 and 70.

Acceptance Criteria: Same as above for new vessel.

3. PIPING AND STOP VALVES.

Requirements: 32.53-55.

Acceptance Criteria: Equivalent to Coast Guard requirements.

Halon System

1. HALON FIRE EXTINGUISHING SYSTEMS

Requirements: Approval by Coast Guard.

Acceptance Criteria: Approval by Coast Guard.

Portable and Semi-portable Fire Extinguishers

1. EXTINGUISHERS

Requirements: 34.05-10, 95.05-15, 108.491-.495, 193.05-15, 34.50, 95.50, 108.496, and 193.50.

Acceptance Criteria: Coast Guard approved or U.L. listed (see NVIC 3-82). Type, capacities and locations must be the same as for new vessels.

Fire Detection System

1. ENTIRE DETECTION SYSTEM

Requirements: NVIC 1-69, NVIC 6-84, 95.05-1, 108.404-.413, 193.05-1.

Acceptance Criteria: Coast Guard Approved, or equivalent (see discussion on page 12).

LIFESAVING EQUIPMENT

Lifesaving equipment must be provided in the number and arrangement required in the applicable vessel regulations. Any new equipment that must be provided must fully comply with the vessel regulations including Coast Guard approval. The following equipment already on the vessel need not be Coast Guard approved, provided that it (1) meets the acceptance criteria on the following pages, (2) is approved by a national Administration signatory to SOLAS, (3) has waterproof labeling, operating instructions, and maintenance manuals, as appropriate, in English, (4) is in good and serviceable condition, and (5) is replaced by Coast Guard approved equipment when and if replacement becomes necessary. Liferafts on MODUs that are launched from a position more than 3 meters (10 feet) above the water must be davit launched.

1. LIFEBOATS (SURVIVAL CAPSULES)

Requirements: 46 CFR 33.05, 94.10, 108.503, and 192.10.

Acceptance Criteria: (See text above and detailed requirements in following section.)

2. DAVITS

Requirements: 46 CFR 33.10, 94.25, 94.33, 108.507, 192.25, and 192.33.

Acceptance Criteria: (See text above and detailed requirements in following section.)

3. WINCHES

Requirements: 46 CFR 33.10, 94.30, 108.507, and 192.30.

Acceptance Criteria: (See text above and detailed requirements in following section.)

4. PILOT LADDERS

Requirements: 46 CFR 32.90, 96.40, 108.719, and 195.40.

Acceptance Criteria: (See text above.) Must meet minimum requirements of SOLAS 1974, Ch. V, Reg. 17.

5. PILOT HOISTS

Requirements: 46 CFR 32.90, 96.40, l0B.719, and, 195.40.

Acceptance Criteria: (See text above.) Must meet minimum requirements of IMO Resolution A.275(VIII).

Inflatable liferafts, hydrostatic releases, Emergency Position Indicating Radio Beacons (EPIRBs), ring life buoys, water lights, buoyant apparatus, debarkation ladders, life preservers, PFD lights, retroreflective material (where required), pyrotechnics (including line-throwing appliance), and lifeboat equipment must all be Coast Guard approved. The portable lifeboat radio must be approved by the Federal Communications Commission. Unapproved rigid liferafts may be used if they are found to be equivalent to inflatable liferafts upon special review by Commandant (G-MVI-3).

Detailed Requirements for Lifeboats
(see 46 CFR 160.035 for new vessel requirements)

1. GENERAL

Acceptance Criteria: Must be in good, seaworthy condition. Damaged parts to be repaired or replaced. Repairs to be made per NVIC 2-63 or 46 CFR 16Q.035 as appropriate.

2. MATERIALS

Acceptance Criteria: Hulls must be aluminum, steel, or fibrous glass reinforced plastic (FRP) (No wooden hulls). Wasted parts must be replaced using material specified in 46 CFR 160.035.

FRP must be fire retardant. If no fire retardant affidavit is available, boat must be coated with intumescent paint inside and out.

3. HULL FITTINGS

Acceptance Criteria: Doubler plates provided at points where boat hull contacts davits. One or more automatic drain plugs with screw-on caps in bottom of hull. Location to be marked with arrow & word "PLUG". Limber holes in transverse frames as necessary for drainage. Grabrails and handrails to be provided except on totally enclosed self-righting boats.

Additional Inspection: Drain plug readily accessible. If rails must be added, they must meet 46 CFR 160.035-3(w) and -3(x).

4. RELEASE GEAR

Acceptance Criteria: Fittings for towing boat and a means to attach painter must be provided. The release gear must be controlled from a single point and provide simultaneous release of the hooks while supporting full weight of boat. Release lever must have a safety latch and require at least a two-step process to activate. Release gear control handle must be red with warning plate to effect that operation drops boat. Location of handle must be marked with band of color contrasting with surrounding color running athwartships.

Additional Inspection: Retrofit release gear must meet 46 CFR 160.033.

5. WEIGHT

Acceptance Criteria: Weight, fully equipped and loaded, must not exceed 44,800 lb. considering each person as 165 lb. Weight of fully loaded boat must not exceed maximum weight established by original approving Administration.

6. ACCOMMODATION SPACE

Acceptance Criteria: No lifeboat will be accepted with capacity in excess of 150 persons. Oar propelled boats limited to 59 persons. Hand propelled boats limited to 100 persons.

Additional Inspection: Review capacity per NVIC 3-79.

7. EQUIPMENT

Acceptance Criteria: Equipment to be Coast Guard approved. Watertight tanks to be provided for storage of food and water. Lockers for small items must also be provided.

8. HAND PROPELLING GEAR

Acceptance Criteria: Hand propelling gear must be capable of propelling boat both ahead and astern, and of propelling fully loaded boat over 1000 ft. course at 3 kts.

9. ENGINE

Acceptance Criteria: Motor propelled boat must be powered by diesel engine. Engine box in open boat must be waterproof to level of cover. Cover must be weatherproof. Engine starting system must be hand starting or hand energized, capable of starting engine at 20 deg. F. without starting aids. Alternative starting system with aide may be accepted if aids are permanently installed type capable of starting engine at 5 deg. F. with aids and 40 deg F. without aids. Engine must be capable of propelling boat at 6 kts. for 4 hrs. without overheating. Fuel capacity must be sufficient for 24 hrs at 6 kts. Means must be provided to determine fuel level. Engine must be capable of running at least 5 mm. at idle out of water without overheating. Transmission or controllable pitch propeller must be provided that allows engine to start with propeller shaft disengaged and to operate ahead and astern. Sufficient gages must be provided to determine proper engine operation. Normal operating ranges must be indicated on all gages.

Additional Inspection: Additional starting systems may also be provided. Low temp. starting may be established by affidavit or test. Normal gages are oil pressure and coolant temperature. Also tachometer if overspeed is possible.

10. PERFORMANCE DURING FLOODING

Acceptance Criteria: Must float upright and relatively level when loaded with persons and equipment and flooded to gunwales.

Additional Inspection: Confirm by affidavit or test.

11. DATA PLATE

Acceptance Criteria: Corrosion resistant plate must be attached to bow of boat and contain: (1) indication the boat is accepted by Coast Guard for use only on (vessel name and official number); (2) date of inspection and acceptance of boat; (3) identification of Marine Inspection Office; (4) weight for which the lifeboat is accepted; (5) fully loaded (condition B) weight for which boat is accepted.

12. COLOR

Acceptance Criteria: Open lifeboat must have interior colored international orange. Enclosed lifeboat must have canopy with international orange exterior and light colored interior.

13. TESTING

Acceptance Criteria: Each boat must be tested to 46 CFR 160.035-11(c), 11(d), and -13(a).

Davits and Winches
(see 46 CFR 160.015 and 160.032 for new vessel requirements)

1. TYPE

Acceptance Criteria: Davit type (gravity, etc.) must be in accordance with requirements in applicable regulations.

2. STRESS ANALYSIS

Acceptance Criteria: Principal stresses of critical parts and cross-sections must be less than the yield strength of the material when a load of 2.2 times the working load is applied throughout the range of positions possible at any combination 15^0 list and 10^0 trim.

Additional Inspection: May be established by review of test results or affidavit provided by manufacturer or by stress analysis or actual test.

3. LIMIT SWITCHES

Acceptance Criteria: Limit switches must be provided to prevent davit arms from being drawn hard against the stops.

4. WINCHES AND FALLS

Acceptance Criteria: If multiple lays of cable are used on mechanical davit winch drums, the winch must be provided with a level winding device or other means to assure that the cable winds onto the drum in a smooth and level wrap. Stainless steel wire is not recommended for running rigging.

5. GUARDS

Acceptance Criteria: Moving parts must be suitably guarded.

6. LUBRICATION

Acceptance Criteria: Bearings must be provided with a means for lubrication. A lubrication chart Rust also be provided.

7. TESTING

Acceptance Criteria: Davits and winches must be subjected to the installation test required in the applicable regulations.

Additional Inspection: Ensure that original davits have not been improperly modified or repaired.

8. DATA PLATE

Acceptance Criteria: Corrosion resistant plate must be attached to davit and winch and contain: (1) indication the device is accepted by Coast Guard for use only on (vessel name and official number); (2) date of inspection and acceptance of device; (3) identification of Marine Inspection Office; (4) weight for which the davit or winch is accepted.

SUBCHAPTER Q ITEMS
(other than lifesaving and fire protection equipment)

Equipment such as safety and relief valves, flame arresters, pressure vacuum relief valves, and pollution abatement equipment required to be Coast Guard approved must meet the specifications contained in 46 CFR Subchapter Q and 33 CFR.

BOILERS, HOT WATER HEATERS AND FIRED THERMAL FLUID HEATERS.

Acceptance of boilers and heaters within the scope of this guide will be based on satisfactory service history, satisfactory material condition, and other factors at the time the vessel is certificated. Every reasonable effort should be made to show that the design, fabrication and outfitting provide for personnel and vessel safety substantially equivalent to requirements for Coast Guard certificated vessels. Sufficient information will be required to establish a safe maximum allowable working pressure, maximum operating temperature, and hydrostatic test pressure. Adequate information must also be submitted to properly determine the size of safety and relief valves, and to provide a basis for evaluation of present and future repair procedures.

Prior to acceptance of boilers or heaters the following minimum information should be submitted:

Drawings of pressure parts which include arrangement, dimensions, details and material specifications (mill certificates are not normally required). For vessels with diesel engine main propulsion outfitted with a waste heat recovery and oil-fired auxiliary boiler system, drawings shall include; a piping arrangement, location of feed water and circulation pumps, location and number of safety relief valves, system operating pressure and temperature[1] and standard and rating for which the interconnected feed water and steam piping and components are designed.

Calculations verifying the design factor of safety based on ultimate tensile or yield strength (not required for vessels stamped ASKE else. or

Acceptable documentation or certification showing the vessel has been built to a code or standard which includes requirements for (1) general design, and (2) independent third party shop inspection with approval of design, welding procedures, welder performance, heat treatment, and nondestructive examination.

Determination of the maximum generating capacity of steam boilers by calculations based on heat input, heating surface, etc., or based on the manufacturer's certification.

If, in the opinion of the cognizant OCMI, excessive deterioration has occurred, suitable repair or renewal will be required. Controls, alarms and shutdowns should be shown fully equivalent to those required on Coast Guard certificated vessels. 46 CFR Part 63 and NVIC 1-69 should be used for guidance.

A fluid used for heat transfer must be intended for such service by the fluid manufacturer. For shipboard applications, such fluids are restricted to use at temperatures below their flash point.

In addition to fired power and heating boilers, unfired steam boilers or unfired thermal fluid heaters must be approved by Commandant (G-MTH-2).

Initial and periodic testing and inspection requirements in addition to those normally performed on certificated vessels will not normally be required once a unit has been determined suitable for service. In some cases a reduction in hydrostatic test pressures may be required, depending on specific unit design.

Fired Power and Heating Boilers and Waste Heat Boilers As Appropriate.

1. DESIGN, CONSTRUCTION AND TESTING PER SECTION I OR IV OF THE ASME CODE

Requirements: 52.01-1, 53.01-1.

Acceptance Criteria: ASME Code design not required. See comments above.

Additional Requirements: A full inspection will be conducted to determine condition of unit.

2. APPROVED FUSIBLE PLUGS FOR FIRE TUBE BOILERS 30 PSIG AND GREATER

Requirements: 52.01-50.

Acceptance Criteria: The fusible plugs used need not be Coast Guard approved. All other portions of 52.01-50 apply, particularly the inspection and recording section in 52.01-50(k).

3. VISIBLE AND AUDIBLE ALARMS FOR EXCESSIVE SUPERHEATER TEMPERATURE

Requirements: 52.01-95.

Acceptance Criteria: Same as above for new vessel.

4 ECONOMIZER DESIGN PRESSURE AT LEAST 10% ABOVE HIGHEST SAFETY VALVE SETTING

Requirements: 52.01-95.

Acceptance Criteria: Show system suitable for actual economizer maximum operating pressure.

5. CONSIDERATION OF ADDITIONAL LOADS

Requirements: 52.01-95.

Acceptance Criteria: Not required for vessel with satisfactory service history.

6. GENERAL PIPING REQUIREMENTS

Requirements: Part 56, 52.01-105.

Acceptance Criteria: See piping requirements.

7. TWO INDEPENDENT MEANS OF DETERMINING WATER LEVEL INCLUDING A GAGE GLASS.

Requirements: 52.01-110.

Acceptance Criteria: Two reliable means.

8. TWO SEPARATE MEANS OF SUPPLYING FEEDWATER TO VITAL BOILERS.

Requirements: 52.01-115.

Acceptance Criteria: Same as above for new vessel.

9. FEEDWATER DESIGN PRESSURE AT LEAST 25% OR 250 PSIG (WHICHEVER IS LESS) ABOVE BOILER MAWP

Requirements: 52.01-115.

Acceptance Criteria: See piping requirements.

10. COAST GUARD APPROVED SAFETY VALVES, CERTIFIED CAPACITY-6% MAXIMUM PRESSURE RISE-SEALING PROVISION

Requirements: 52.02-120, 53.05-1, 53.05-2.

Acceptance Criteria: Same as above for new vessel.

11. APPROVED ARRANGEMENT FOR PILOT-ACTUATED SAFETY VALVES

Requirements: 52.01-120.

Acceptance Criteria: Same as above for new vessel.

12. CONTROLS, ALARMS AND SHUTDOWNS

Requirements: 52.01-10, NVIC 1-69, NVIC 6-84, 53.12-1.

Acceptance Criteria: Same as above for new vessel.

13. PLAN APPROVAL BY COMMANDANT (G-MTH-2)

Requirements 52.01-5, 53.15-1.

Acceptance Criteria: Plans will be "EXAMINED" with comment by the Commandant (G-MTH-2) subject to cognizant OCMI approval.

14. WELD REPAIRS AUTHORIZED BY COMMANDANT AFTER REVIEW OF SPECIFIC INFORMATION

Requirements: 52.01-125.

Acceptance Criteria: Same as above for new vessel.

15. FOUNDATION DESIGN

Requirements: Approval (Part 52).

Acceptance Criteria: Not required for vessel with satisfactory service history.

16. HYDROSTATIC TEST

Requirements: 52.01-135. 61.05-10.

Acceptance Criteria: Safe hydro pressure must be determined during design review.

17. OPERATING TESTS

Requirements: 52.01-135, 53.10-3, 63.05-90, 63.10-90.

Acceptance Criteria: Same as above for new vessel.

18. COAST GUARD STAMPING

Requirements: 52.01-140, 53.10-10.

Acceptance Criteria: Same, but also include hydro test pressure.

19. COAST GUARD SHOP INSPECTION

Requirements: 52.01-135, 53.10-3

Acceptance Criteria: Not possible.

20. QUALIFIED WELD PROCEDURES AND WELDERS

Requirements: Prt 57, 52.05-5, 52.05-40, 52.05-55, 53.13-1.

Acceptance Criteria: Required for repairs or alterations only.

21. NONDESTRUCTIVE EXAMINATION

Requirements: 52.01-20, 52.05-45.

Acceptance Criteria: Required for repairs, alteration, or when a significant weld defect is suspected.

22. SPECIFIC REQUIREMENTS FOR WASTE HEAT BOILERS

Requirements: 52.01-110, 54.01-5(a), 54.01-10.

Acceptance Criteria: Same as above for new vessel.

Electric Hot Water Heaters

1. DESIGN PER PART 52, PART 53, OR UNDERWRITERS LABORATORIES INC. (UL)

Requirements: 53.10-10

Acceptance Criteria: Same as for pressure vessels per following text.

2. TEMPERATURE REGULATION (194 DEG. F MAX.), CONTROL AND RELIEF, PLUS PRESSURE RELIEF

Requirements: 63.15-15, 63.15-20, 63.15-25, 63.15-30, 63.15-40.

Acceptance Criteria: Same as above for new vessel.

Fired Thermal Fluid Heaters

1. DESIGN PER SECTION I OF THE ASME CODE

Requirements: 52.25-15.

Acceptance Criteria: Same as for boilers.

2. GENERAL PIPING AND WELDING REQUIREMENTS

Acceptance Criteria: Same as for boilers.

3. FUEL CONTROLS

Requirements: 63.05, 63.10

Acceptance Criteria: Same as above for new vessel.

4. SPECIFIC REQUIREMENTS FOR FLUID HEATERS

Requirements: 63.05-20(d)and(e), 63.05-25, 63.05-30, 63.05-40, 63.05-90, a -(c), 63.10-30, 63.10-40.

Acceptance Criteria: Same as above for new vessel.

MAIN AND AUXILIARY MACHINERY

Machinery in satisfactory operating condition will generally be accepted when certified by a classification society recognized by the Coast Guard.

1. MAIN & AUXILIARY MACHINERY

Requirements: 58.05.

Acceptance Criteria: Turbine., shafts, gears, cranks, etc. certified by a recognized classification society.

Additional Inspection: Condition satisfactory to cognizant OCMI and compliance with 58.01-10, -15, -20, -25, & -30.

2. FUEL USED

Requirements: 46 CFR 58.01-10 and 15.

Acceptance Criteria: Plash point requirements must be met. Use of propane, even for boosting, not acceptable.

PRESSURE VESSELS

Pressure vessels other than those for low temperature service or those containing dangerous substances will be accepted primarily on the basis of design to an acceptable national standard, certification by a recognized classification society and successful operating experience. Sufficient information must be submitted to establish the maximum allowable working pressure, maximum and minimum operating temperatures, and test pressure.

The following plans must be submitted:

- Drawings of pressure parts showing arrangement, dimensions, details and material specifications (mill certificates are not normally required).

- Calculations verifying the design factor of safety based on ultimate tensile or yield strength (not required for vessels stamped ASME “U” or "UM"). The calculations must include a comparison of the design with that required by the ASME Code. Any significant differences should be discussed.

- Acceptable documentation or certification showing the vessel has been built to a code or standard which includes requirements for (1) general design, and (2) independent third party shop inspection with approval of design, welding procedures, welder performance, heat treatment, and nondestructive examination.

Pressure vessels with a design factor less than 3:1 (based on minimum tensile strength) are generally not permitted and will require special consideration by Commandant (G-MTH). Additional nondestructive examination (NDE) may be required for pressure vessels with a design factor less than 4:1 depending on the contents of the pressure vessel and its operating conditions.

1. LOADINGS/CORROSION ALLOWANCE/EXTERNAL PRESSURE

Requirements: 46 CFR 54.01-30, 35, & 40.

Acceptance Criteria: Information should be submitted as part of calculations.

Additional Inspection: Thickness gaging may be required by the OCMI.

2. MARKING & STAMPING

Requirements: 46 CFR 54.10-20.

Acceptance Criteria: A new nameplate with the information required in 54.10-20 (a) (l)-(7) shall be attached and stamped by the inspector.

Additional Inspection: Prior to stamping, the vessel shall be hydrostatically tested to 1-1/4 times the MAWP.

3. RELIEF DEVICES

Requirements: 46 CFR 54.15.

Acceptance Criteria: All pressure vessels shall be provided with relief devices meeting the requirements of 54.15.

4. POSTWELD HEAT TREATMENT

Requirements: 46 CFR 54.25-7.

Acceptance Criteria: Verification of acceptable PWHT for all Class I vessels regardless of thickness.

5. RADIOGRAPHY

Requirements: 46 CFR 54.25-B.

Acceptance Criteria: Verification of full radiography for all Class I vessels regardless of thickness.

Additional Inspection: NDE of welds may be required by OCMI on any pressure vessel.

6. TESTING

Requirements: 46 CFR 61.10.

Acceptance Criteria: For initial certification, both a hydro test and visual inspection should be conducted. Additional NDE shall be conducted as deemed necessary by the cognizant OCMI. pressure vessels for low temperature service or those containing dangerous substances must have sufficient documentation to establish full equivalence with 46 CPR Part 54.

PIPING AND SPECIAL SYSTEMS

Piping systems are classified as Class I, II, I-L or II-L depending on system operating pressure and temperature. Piping may also be considered as vital or hazardous. Vital piping systems are those that in the event of failure institute a hazard to the seaworthiness or maneuverability of the ship. hazardous systems, in the event of failure, constitute a hazard to vessel personnel or the marine environment. In general, Class II non-vital, on-hazardous systems may be accepted on the basis of classification society certification. Other piping systems and their components must (1) be designed an acceptable national standard, (2) be certified by a recognized classification society, and (3) have received third party inspection by 'surveyors of the recognized classification society during vessel construction.

Plans must be submitted for the piping systems identified below. These should include a schematic and an arrangement of the system including; system operating pressure and temperature, and standard and rating for which pipe and components are designed.

Main steam (include evidence that thermal stress analysis was performed with satisfactory results)
Boiler feed
Fuel oil service, transfer, fill
Fire extinguishing (fire main, foam)

Bilge and ballast
Circulating water
Vent, sounding, overflow
Vital pneumatic and hydraulic
Lube oil service, transfer, fill
Cargo Oil

1. WELDING.

Requirements: 46 CFR 56.70 & Part 57.

Acceptance Criteria: See 56.70 and Part 57. Weld joint and procedural details differing from these requirements will be considered on a case by case basis. Qualifications by acceptable third parties for welding procedures, welder performance, nondestructive examination, etc. may be accepted for existing ships. Otherwise, additional nondestructive examination may be needed.

2. INSPECTION AND TESTING

Requirements: 46 CFR 56.95, 56.97, and 61.15.

Acceptance Criteria: See 56.95. Generally, where acceptable third party inspection occurred during construction, Coast Guard inspection will be visual and external. In the absence of acceptable third party inspection (such as ABS +Al, +AMS registry), a Coast Guard inspection comparable to that required for new construction may be necessary.

Additional Inspection: See 56.97 and 61.15. Hydrotests of vital and hazardous systems and operating test of all other systems of interest will generally be required. Renewed piping will require 1.5 hydro.

3. MATERIAL RESTRICTIONS.

Requirements: 46 CFR 56.10-5(b), (c) & (d), 56.60-3, 5, 10, & 25.

Acceptance Criteria: Same as above for new vessel.

4. FRESH WATER.

Requirements: Applicable USPHS sanitation regulations.

Acceptance Criteria: Same as above for new vessel.

5. PLAMMABLES AND COMBUSTIBLES.

Requirements: There are specific restrictions on materials based on ductility and heat resistance. See 46 CFR 56.10-5, 56.60-2, -10, -15, -20, and -25. Insulation is sometimes an acceptable substitute for heat resistance.

Acceptance Criteria: Evaluate risk and existing installation for each case.

6. VALVES.

Requirements: 46 CFR 56.20.

Acceptance Criteria: For design and materials see appropriate system class above; otherwise, 56.20 applies. In particular:

- Right hand turn to shut off

- Rising stem or shut-off indicator

- High pressure design restrictions

- Plug retention

- Markings - loss or destruction of labels is permissible if inspector can obtain sufficient information about the valve from other sources.

- Resilient seats - tank stop valves must be either "Positive shut off" as determined by Commandant or meet an acceptable industry or foreign "fire safe" standard. Valves required to be category "A" will be evaluated on an individual basis.

- Alternatives may be considered on a case by case basis for the above requirements for valves.

7. OVERPRESSURE PROTECTION.

Requirements: 46 CFR 56.07-10.

Acceptance Criteria: Relief devices must meet location, setting, and capacity requirements and must be suitable for the intended service.

8. FLANGES AND BOLTING.

Requirements: 46 CFR 56.25 and 30.

Acceptance Criteria: See 46 CFR 56.25 and 30. For materials see appropriate system class above. Generally, foreign flange standards are acceptable to 75% of the manufacturers rating. Heavy series bolts and nuts are required unless the bolts are tight in holes. This requires special analysis of design.

Additional Inspection: Inspectors will look for evidence of leakage, yielded or bent bolts, etc.[1] and hard full face gaskets in low pressure systems.

9. SPECIAL JOINING FITTINGS.

Requirements: 46 CFR 56.30 and 35.

Acceptance Criteria: See 56.30 and 35. Existing flared, flareless, compression, grip, bite, slip-on, expansion, sleeve couplings and other proprietary joints will be examined for suitability in each

application. In particular, slip-on type couplings will generally require the addition of positive means to prevent creeping or pullout, and heat resistant gasketing.

10. FUEL SHUT-OFFS.

Requirements: 46 CFR 58.01-25.

Acceptance Criteria: Must provide controls required by 58.01-25. Details on an individual case by case basis.

11. ASTERN POWER.

Requirements: 46 CFR 58.05-5.

Acceptance Criteria: Adequate control in all normal circumstances must be demonstrated.

12. INTERNAL COMBUSTION ENGINES.

Requirements: 46 CFR 58.10-5, 10, 15.

Acceptance Criteria: See 58.10-5, 10, 15. Must be met in full except that exhaust piping which would normally have to meet Part 56 will be evaluated on a case by case basis for worker safety.

13. DOMESTIC LPG SERVICES.

Requirements: 46 CFR 58.16.

Acceptance Criteria: May be used for heating, cooking, incineration of sewage or garbage, etc. but not as machinery fuel. where used, must meet 58.16 in full.

14. REFRIGERATION.

Requirements: 46 CFR 58.20.

Acceptance Criteria: Systems used for cargo reliquefaction or containing hazardous refrigerants will be reviewed on a case by case basis. Conventional freon systems for ships stores, air conditioning, and perishable cargoes may meet any national standard or recognized classification society rules, but 58.20-10(a) and (b) and -15(c) must also be met.

15. FLUID POWER AND CONTROLS.

Requirements: 46 CFR 58.30. Also appropriate regulations in 46 CFR Part 56, such as 56.07 & 56.60, unless altered by 58.30.

Acceptance Criteria: Note that only vital or hazardous systems are subject to all details of 58.30. 58.30-50 must be met for all systems. Where 58.30 lists specific material specifications, or refers to Part 56 for design and materials, use the general design and material requirements for vital and hazardous systems above. See pressure vessel requirements for accumulators. Four-bolt split flanges are not permitted in steering gear or controllable pitch propeller systems.

16. INDEPENDENT TANKS.

Requirements: 46 CFR 58.50.

Acceptance Criteria: Generally, tanks which contain fuel for vital services must have a level of safety and reliability equal to 58.50. Others may either have an equivalent level of safety or be located in a space which is normally manned, not containing vital or emergency equipment and equipped with fixed fire protection.

17. MISCELLANEOUS SPECIFIC REQUIREMENTS.

Requirements: 46 CFR 56.50-1.

Acceptance Criteria: See 56.50-1. Full compliance required for these items. Sluice gates & cocks - case by case evaluation.

18. SYSTEMS CONTAINING OIL.

Requirements: 46 CFR 56.50-5, 56.50-60, 32.50-15.

Acceptance Criteria: See Flammables and Combustibles section. Full compliance required except: 56.50-60(d) tank stop valve pressure retaining materials must have minimum elongation of 15% in 2" (50mm); and fire safe/positive shut off design on a case by case evaluation.

19. GAGE, INSTRUMENTATION SAMPLING, CONTROL.

Requirements: 46 CFR 56.50-10, -97.

Acceptance Criteria: If not equipped with root valve at piping connection, must meet same requirements as piping to which it is attached.

20. STEAM AND EXHAUST EXCLUDING INTERNAL COMBUSTION ENGINE EXHAUST.

Requirements: 46 CFR 56.50-15.

Acceptance Criteria: Must comply in full with intent of 56.50-15. Minor deviations in detail (i.e. by-pauses on valves over 8" vice over 6" etc.) considered on case by case basis.

21. RELIEF PIPING.

Requirements: 46 CFR 56.50-20 and -25.

Acceptance Criteria: See 56.50-20, -25. Flow areas, back pressures, stop valves and interlocks will be considered on a case by case basis.

Additional Inspection: Check hangers for adequacy as per 56.50-25(b). Peak flow rates may destroy expansion joints if excessive motion possible.

22. FEED, CONDENSATE, BLOWOFF

Requirements: 46 CFR 56.50-30, -35, -40.

Acceptance Criteria: Must have equivalent safety, reliability, and redundancy to one of the permitted arrangements. Details evaluated on case by case basis. Generally must meet valving requirements in full.

23. CIRCULATING PUMPS & SUCTIONS.

Requirements: 46 CFR 56.50-45.

Acceptance Criteria: See 56.50-45. Must meet intent in full. Note that two suctions from one sea chest or two adjacent sea chests are not independent because a single minor fouling or grounding can close both. Alternative sources of either water or power independent of such sea chests will be considered.

24. BILGE AND BALLAST.

Requirements: 46 CFR 56.50-50, 55.

Acceptance Criteria: Systems not meeting requirements in full will be considered on a case by case basis. The full required water delivery rate must be met for bilge pumps. Pipe size requirements may be relaxed if satisfactory output can be demonstrated. Pump separation should be met. This may mean that fire pumps must be bilge pumps, and suctions from sources of oil more concentrated than normally found in bilges must be disconnected. Independent and emergency suctions with reliability and output equal to requirements must be available; detail differences will be considered on a case by case basis.

25. PIPING SEPARATION.

Requirements: 46 CFR 56.50-50(h) ,(j), (k).

Acceptance Criteria: 56.50-50(h) must be met in most cases. Common bilge & ballast systems will not be accepted unless satisfactory safeguards are provided to prevent interference with rapid bilge pumping.

26. BOILER FUEL SERVICE, GASOLINE FUEL SYSTEMS, DIESEL FUEL SYSTEMS, & LUBE OIL SYSTEMS.

Requirements: 46 CFR 56.50-56, -70, -75, and -80.

Acceptance Criteria: Meet requirements in full. Material and thickness deviations will be considered on a case by case basis, if general design and material requirements for vital and hazardous systems are met.

27. HEAT TRANSFER OIL.

Requirements: 46 CFR table 56.04-2, 56.50-5.

Acceptance Criteria: Must meet general requirements for systems conveying oil for applicable piping classification. Fired heater controls per 46 CFR Part 63. Oil may not be used to heat

potable water without special precautions, e.g. intermediate transfer fluid or double tube and tubesheet exchangers. Excess temperature shutdown must never be set higher than heat transfer fluid flash point. When fluid is heated by exhaust gas or other waste heat, safety provisions must be provided in addition to temperature controls to prevent possibility of overheating if controls fail.

28. TANK VENT AND OVERFLOW.

Requirements: 46 CFR 56.50-85 and 95.

Acceptance Criteria: Must meet in full, unless existing structure cannot handle the head of the required piping. Alternatives such as overfill protection will then be considered on a case by case basis.

29. LEVEL AND SOUNDING.

Requirements: 46 CFR 56.50-90.

Acceptance Criteria: There must be a safe and reliable way to determine level in all tanks. Deviations from specific requirements of 56.50-90 will be examined on a case by case basis.

30. SUCTIONS AND DISCHARGES (APPLIES TO ALL SHELL PENETRATIONS NOT COVERED BY VENT AND OVERFLOW).

Requirements: 46 CFR 56.50-95.

Acceptance Criteria: Must meet SOLAS requirements in effect at time of vessel construction as a minimum. Other deviations from current U.S. requirements will be considered on a case by case basis. Note that the absence of remote operation of skin valves may impact on machinery space manning levels. Sea valves must be ductile (15% elongation in 2" (50mm) if ferrous, 10% if nonferrous), have a minimum melting temperature solids of 1700^0 F (925^0 C), and if employing resilient materials be equivalent to category "A" (See 56.20-15(b)). Remote operating devices must have damage resistance comparable to the valve. Current tank vessel oil discharge location requirements are applicable to tankships regardless of keel laying date (see "Protection of the Marine Environment" section, page 45). A sea valve is not considered "efficient and accessible" if it can be locked open; if it can be locked closed, there must be sufficient freedom to tighten it after seat damage.

31. PLASTIC PIPE.

Requirements: 46 CFR 56.60-25(a),(b).

Acceptance Criteria: Not permitted in concealed spaces in accommodations or service areas unless completely enclosed within class "A" divisions. When used, must meet general requirements of 56.60-25(a),(b). Guidelines for the use of Reinforced Thermosetting Resin Pipe (RTRP) are found in NVIC 4-83.

32. NONMETALLIC FLEXIBLE HOSES.

Requirements: 46 CFR 56.60-25(c).

Acceptance Criteria: Hose must have a burst rating four times the maximum allowable working pressure. If they cannot be determined fire resistant or self-extinguishing as required with appropriate documentation or testing, they must be replaced with Coast Guard approved hoses.

33. KEEL COOLERS.

Requirements: 46 CFR 56.50-96.

Acceptance Criteria: Those not equipped with isolation valves meeting the skin valve requirements above must meet 56.50-96 in full.

34. LOW TEMPERATURE PIPING.

Requirements: 46 CFR 56.50-105.

Acceptance Criteria: Must meet 56.50-105 in full, except that designs complying with the present IMO gas ship code, with a safety factor of four on ultimate stress and 1.6 on yield, will be considered on a case by case basis.

ELECTRICAL

Shipboard electrical installations are to be reviewed using the following guidelines:

a. Eliminate requirements for "unspecified construction details" to be in accordance with specific U.S. industrial standards and military specifications. Equipment approvals may be based upon classification society approval and construction to a foreign standard that has received recognition in it's own country.

b. Eliminate stringent "numerical" requirements. Alternate numbers will be accepted when approved by a classification society. For example, our regulations require branch circuit conductors supplying a single motor to have a current-carrying capacity of 125% of motor full-load rating. Some classification societies only require a current-carrying capacity of 100%. The same acceptance criteria would hold for dimensions, cable sizes (including 1.5 sq.mm. power and lighting cable), overcurrent protection ratings or settings, and other "numerical" requirements contained in the Electrical Engineering Regulations (46 CFR Subchapter J).

c. Allow alternate materials and equipment which are routinely used aboard foreign flag vessels, and which have been shown to perform satisfactorily.

d. Maintain general "system" requirements for overall vessel safety.

e. Rely upon a more detailed vessel inspection to eliminate obvious hazards. Inspectors should look for personnel hazards such as the presence of energized parts and hot surfaces, inadequate mechanical protection of moving parts, dangerous wear or deterioration, and inadequate equipment grounding. This inspection will address some of many safety related items which are normally covered by our references to specific equipment standards.

In general, new equipment and installations must fully comply with current regulations that apply to new vessels. Exceptions would be for new installations where it is impractical or unreasonable to meet the equipment requirements of the Electrical Engineering Regulations, such as when adding additional 220 volt receptacles (the standards referenced in the regulations are written for different standard voltages and distribution configurations), or where a safer installation would result from remaining with the original installation standard, such as keeping the same cable color coding.

Plan submittal generally should be in accordance with 46 CFR 110.25; detailed submittals need not be made for equipment and systems that are acceptable based upon classification society approval.

All inspections and tests specified in 110.30 should be performed and all requirements met.

1. GENERAL EQUIPMENT SUITABILITY FOR THE AREA (WATERTIGHT, DRIPPROOF, CORROSION RESISTANT, AMBIENT TEMPERATURE, ETC.)

   Requirements: 46 CFR 111.01.
   Acceptance Criteria: As per 111.01, except that ambient temperature assumptions may be in accordance with classification society requirements. Porcelain items are permitted but should be replaced or resiliently mounted if failures are evident.

   Additional Inspection: Visual examination for corrosion, especially with regard to aluminum alloys. Porcelain fuses and fuseholders and other porcelain fittings should be carefully examined for failure (cracking), especially in high vibration areas.

2. EQUIPMENT GROUND, GROUND DETECTION, AND GROUNDED SYSTEMS

   Requirements: 46 CFR 111.05.

   Acceptance Criteria: Per 111.05.

3. POWER REQUIREMENTS

   Requirements: 46 CFR 111.10.

   Acceptance Criteria: Per 111.10-1, 111.10-3, 111.10-4, 111.10-7.

4. ROTATING MACHINERY (MOTORS, GENERATORS, PRIME MOVERS)

   Requirements: 46 CFR 111.12, 111.25.

   Acceptance Criteria: Per classification society.

5. VOLTAGE REGULATION

   Requirements: 46 CFR 111.12-7.

   Acceptance Criteria: Per classification society.

6. GENERATOR PROTECTION

Requirements: 46 CFR 111.12.

Acceptance Criteria: Per 111.12-11, except that trip settings approved by the classification society are acceptable.

7. BATTERIES AND BATTERY INSTALLATIONS

Requirements: 46 CFR 111.15.

Acceptance Criteria: Per 111.15, except that equipment should meet the requirements for hazardous locations (111.105) of this enclosure. Additional Inspection: Visual examination for corrosion.

8. TRANSFORMERS

Requirements: 46 CFR 111.20.

Acceptance Criteria: Per classification society and 111.20-10.

9. SWITCHBOARDS

Requirements: 46 CFR 111.30.

Acceptance Criteria: Per 111.30-1 through -21. Dimensions, requirements for clearances, bus bar locations and working space need not be met, provided such dimensions are considered adequate. Per classification society for switchboard wiring, bus bar capacity, ratings, spacing and arrangement. Per 111.30-25, 27, and 29 for required switchboard equipment.

Additional Inspection: Visual inspection for adequate working space.

10. POWER SEMICONDUCTOR RECTIFIER SYSTEMS

Requirements: 46 CFR 111.33.

Acceptance Criteria: Per 111.33.

11. ELECTRIC PROPULSION

Requirements: 46 CFR 111.35.

Acceptance Criteria: Per 111.35.

12. PANELBOARDS

Requirements: 46 CFR 111.40.

Acceptance Criteria: Per 111.40-5 through 111.40-13.

13. OVERCURRENT PROTECTION

Requirements: 46 CFR 111.50, 111.51, 111.52.

Acceptance Criteria: Per 111.50-1 and -3, except that conductor current-carrying capacities may be as determined by the classification society. Per 111.50-5 and -7 for location and enclosure requirements. Coordination of overcurrent devices per 111.51. Short circuit calculations should be reviewed for technical validity.

14. FUSES

Requirements: 46 CFR 111.53.

Acceptance Criteria: Fuses per and fuseholders are permitted. per classification society (see Suitability).

15. CIRCUIT BREAKERS AND SWITCHES

Requirements: 46 CFR 111.54, 111.55. 111.53-l(a)(2) and (b). Porcelain fuses UL listing is not required. Construction paragraph no. 1 on General Equipment
Acceptance Criteria: Per 111.54 and 111.55 except construction details per classification society in lieu of referenced standards.

16. CURRENT LIMITING DEVICES

Requirements: 46 CFR 111.57.

Acceptance Criteria: Per 111.57-1(a), (b)$_9$ (d).

17. BUSWAYS

Requirements: 46 CFR 111.59.

Acceptance Criteria: Per classification society and 111.59-3.

18. WIRING MATERIAL AND METHODS

Requirements: 46 CFR 111.60.

Acceptance Criteria: Type, size, and current-carrying capacity per classification society, except that solid conductor cable shall not be permitted. Installation per 111.60-5, 111.60-9, 111.60-11(a), (b), 111.60-13(b), (d), (e), (f), 111.60-17 and 111.60-19, except that equipment is not required to meet referenced standards.

19. MOTOR CIRCUITS AND PROTECTION

Requirements: 46 CFR 111.70.

Acceptance Criteria: Motors and motor circuits must be provided with the types of protection specified in 111.70. Motor controllers and motor control centers per 111.70-3, heaters per 111.70-5, and remote control, interlock, and indicator circuits per 111.70-7, except ratings or setting. of devices, sizing of cables, and equipment construction details may be per classification society.

20. LIGHTING CIRCUITS

Requirements: 46 CFR 111.75..

Acceptance Criteria: Per 111.75, except that lighting branch circuit sizing per classification society. Unspecified equipment construction details per classification society. Navigation lights approved by Commandant (G-MTH-2) to 72 COLREGS. (Type approval based on UL 1104 or specific vessel approval based on compliance with the technical requirements (color, intensity, arcs of visibility) of Annex I to the 72 COLREGS).

21. APPLIANCES, RECEPTACLES, AND OUTLET BOXES

Requirements: 46 CFR 111.77, 111.79, 111.81.

Acceptance Criteria: Per 111.77, 111.79, 111.81 except construction per classification society in lieu of referenced standards.

22. SHORE CONNECTION BOX

Requirements: 46 CFR 111.83.

Acceptance Criteria: Per 111.83.

23. ELECTRIC OIL IMMERSION HEATERS

Requirements: 46 CFR 111.85.

Acceptance Criteria: Per 111.85.

24. ELECTRIC AIR HEATING EQUIPMENT

Requirements: 46 CFR 111.87.

Acceptance Criteria: Per classification society and 111.87-1 and 111.87-3(b) through (e).

25. ELEVATORS AND DUMBWAITERS

Requirements: 46 CFR 111.91.

Acceptance Criteria: General construction per classification society. Hoistway and car door locks, undercar safeties, and terminal stopping devices must meet ANSI A17.1. If an emergency exit is provided, it must have an interlocked stop switch. Emergency signal device must be provided.

26. ELECTRIC POWERED LIFEBOAT WINCHES

Requirements: 46 CFR 111.95.

Acceptance Criteria: Per classification society.

27. WATERTIGHT DOOR SYSTEMS

Requirements: 46 CFR 111.97.

Acceptance Criteria: Per 111.97.

28. SUBMERSIBLE MOTOR-DRIVEN BILGE PUMPS

Requirements: 46 CFR 111.101-55.

Acceptance Criteria: Per 111.101-55.

29. REMOTE STOPPING DEVICES

Requirements: 46 CFR 111.103.

Acceptance Criteria: Per 111.103.

30. HAZARDOUS LOCATIONS

Requirements: 46 CFR 111.105.

Acceptance Criteria: Per 111.105, except that equipment need not meet referenced standards. All equipment in hazardous locations must be of a type recognized in the regulations (i.e. explosionproof (flameproof) or intrinsically safe) and must be approved by the classification society. Such equipment must be listed or labeled by a third party electrical equipment certification agency such as UL, FM, CSA, PTB or BASEEFA. Classification society approval based on manufacturer's certification is not acceptable. Non-incendive equipment (permitted in Div 2 only) and purged and pressurized equipment must meet 111.105 (listing or labeling is not required).

Additional Inspection: Visual examination for labeling.

31. EMERGENCY POWER AND LIGHTING SYSTEM

Requirements: 46 CFR 112.

Acceptance Criteria: Per 46 CFR 112, except that non-emergency loads may remain on the emergency switchboard provided that they automatically disconnect upon loss of normal power. Generating capacity must be sufficient to supply all remaining loads that can be simultaneously connected to the emergency switchboard.

32. COMMUNICATION AND ALARM SYSTEMS

Requirements: 46 CFR 113.

Acceptance Criteria: Per 46 CFR 113, except that sound powered phones need not be approved under Subchapter Q. Steering failure alarm must be provided (see page 42). For fire and smoke detection equipment requirements, see page 17.

AUTOMATION

General

Pending publication in 46 CFR Part 62 of final rules for automated vital systems, self-propelled vessel automation should generally be in accordance with NVIC 1-69 and NVIC 6-84. Automation of vital, non-industrial systems on MODUs should be evaluated on an individual vessel basis for general safety and reliability. Upon publication of final rules, all vital system automation should meet or be equivalent to those rules, except as noted below. For the purposes of this section, "vital systems" include the propulsion plant, the ship service electrical plant, flooding safety systems, fire safety systems, MODU ballast systems, and the auxiliaries, controls, and alarms necessary for the safe and effective operation of these systems and plants. In all cases, automated vessels shall be at least as safe as vessels with vital systems under direct manual operator supervision.

Technical Review

Technical acceptance of vital system automation can be achieved in four ways:

(a) As a result of technical review and approval of the plans and information listed in NVIC 1-69.

(b) As a result of technical review and approval of an automated system functional description and failure analysis. The description and analysis should be of adequate detail to show compliance with applicable requirements.

(c) As a result of technical review and approval of a combination of (a) and (b) above.

(d) Certification by the prior flag state, or by a recognized classification society on its behalf, that the automation complies with SOLAS 74, as amended. This method will remain acceptable after publication of final automation rules.

Testing

When technical acceptance is based upon options (a), (b), or (c) above, a design verification test procedure should be provided and demonstrated to the cognizant OCMI prior to acceptance of the automation. This test procedure is intended to verify that an entire system performs in the specified manner, (e.g. remote controls can be overridden by adequate alternate controls, throttles fail in a safe manner, interlocks function as described). This test procedure shall be provided in addition to the periodic test procedure required by NVIC 1-69, which is required for all automated vessels.

Upon specific approval of the OCMI, and only as a means of last resort, a design verification test may be accepted in lieu of technical review of a specific item of equipment.

Manning

The engineering manning of self-propelled vessels incorporating automated vital systems is conditioned by the requirements of 46 CFR Part 157 and the following considerations:

(a) The technical review and testing being to the satisfaction of the cognizant OCMI;

(b) The combination of personnel, equipment, and systems necessary to ensure the safety of the vessel in all sailing conditions, including maneuvering;

(c) The personnel necessary to operate the plant in the event of a control or monitoring system failure, and to perform routine maintenance, inspection, and testing to ensure the continued performance and reliability of the plant as designed;

(d) The personnel necessary to fight a fire or other emergency;

(e) The proven performance of the plant during an initial trial period; and

(f) The prior operating history and manning of the vessel and any sister vessels.

STEERING

For the purpose of these requirements, "steering systems" include the steering gear, power units, control units, indicating and alarm systems, rudder angle indicator systems, and steering failure alarm systems, as referred to in Titles 33 and 46 of the Code of Federal Regulations.

All vessels must meet the requirements of the Marine Engineering Regulations, 46 CFR Subchapter F, that were in effect for vessels of U. S. registry at the time the vessel was built. See 46 CFR 58.25, and page 31, item 15 (fluid power and control) of this enclosure.

Tank vessels must meet the requirements that are in effect for new vessels of U.S. registry at the time the vessel is inspected.

All vessels other than tank vessels must meet the requirements of SOLAS 74, as amended, and the following requirements:

(a) Steering systems shall be independent of equipment that is not dedicated to steering service.

(b) A means to entirely disconnect autopilots from required steering systems shall be provided at the navigating bridge steering station.

(c) Rudder angle indicator systems must be independent of each other and of all other steering systems.

(d) A steering failure alarm system, as described in 46 CFR 113.43, shall be provided.

STABILITY

Foreign Flag Vessel or MODU to be Brought Under U.S. Flag

1. STABILITY TEST

Requirements: Each vessel must be inclined to determine its lightship characteristics unless the vessel can meet Coast Guard stability criteria when assuming a conservative value of lightship vertical center of gravity (VCG). In that case a deadweight survey may be required in order to

verify the vessel's lightship displacement and longitudinal center of gravity (LCG). (46 CFR 170 Subpart F).

Acceptance Criteria: If an inclining experiment had been performed and had been witnessed and approved by one of the recognized classification societies (and the vessel has remained in class), the Coast Guard may accept their approved lightship values after review of the inclining experiment report. If, prior to certification, significant changes are made in structure, joiner work, heavy equipment, etc., a new inclining may be required.

2. STABILITY STANDARDS

Requirements: Calculations must be submitted to show that the vessel meets the Coast Guard stability criteria which would be applied to new U.S. vessels being built at the time of application for reflagging, in all allowable loading conditions. (46 CFR Subchapter S).

Acceptance Criteria: Same as above for new vessel.

3. STABILITY INFORMATION

Requirements: The master of each vessel must be provided with approved stability information (usually in the form of a stability booklet or operating manual for MODUs) based upon the approved stability calculations. 46 CFR 170.110 - 135.

Acceptance Criteria: Same as above for new vessel.

4. WATERTIGHT DOORS

Requirements: Each watertight door installed in required subdivision bulkheads must meet the current requirements of 46 CFR Subchapters S and Q (46 CFR 163)as applicable.

Acceptance Criteria: Watertight doors installed in required subdivision bulkheads must be of the type required by Subchapter S for the specific location. The door must also be controlled and marked in accordance with 46 CFR Subchapter S. Watertight doors will be accepted based upon visual examination and operational testing.

Additional Inspection: All watertight doors shall be operated locally by manual power and also by hydraulic or electric power, if so fitted, at all annual inspections and reinspections. where remote control is fitted, the doors shall also be operated by the remote control apparatus.

5. LOAD LINES

Requirements: Each vessel to which 46 CFR Subchapter E applies must receive a Load Line Certificate in accordance with those regulations.

Acceptance Criteria: If the vessel already has a valid International Load Line Certificate issued by a recognized classification society, that classification society may be authorized to issue a Load Line Certificate on the behalf of the U.S. upon the Coast Guard’s approval of the stability information. This applies only to countries signatory to the ICLL, 1966, and must be requested by the owner.

Major Alteration or Modification of U.S. Flag Vessel or MODU

1. STABILITY TEST

Requirements: After completion of the alterations, an inclining experiment will be required if, in the opinion of the cognizant mmt office, the alterations substantially affect the stability of the vessel.

Acceptance Criteria: If in the opinion of the cognizant mmt office, the alterations or modifications do not significantly affect the stability of the vessel or if it can be shown that the originally approved lightship values can be accurately adjusted for the alterations, a stability test may not be required. A deadweight survey may be required in order to verify the accuracy of the lightship adjustments.

2. STABILITY STANDARDS

Requirements: If in the opinion of the cognizant mmt office, the alterations: (1) substantially alter the stability characteristics, dimensions, or carrying capacity of the vessel, (2) change the type of vessel, or (3) substantially prolong the vessel's service life, the vessel will have to comply with the stability standards in force at the time of the conversion.
Acceptance Criteria: If, in the opinion of the cognizant mmt office, the alterations, modifications or repairs do not result in any of these three criteria being met, the vessel may be permitted to comply with the stability standards to which it had to comply prior to the conversions.

3. STABILITY INFORMATION

Requirements: Revised stability information will have to be prepared and approved based upon the new approved lightship values.

Acceptance Criteria: Same as above for new vessel.

4. WATERTIGHT DOORS

Requirements: Each watertight door installed as part of the alterations must comply with the regulations in force at the time of the conversion.

Acceptance Criteria: Same as above for new vessel.

5. LOAD LINES

Requirements: A vessel which had a load line prior to the conversion must notify the assigning authority as to the conversion in order to maintain a valid load line. Attention should be paid to the effect the alteration has on the vessel’s admeasurement tonnage. It is possible that a previously non-load lined vessel would have to obtain a load line as the result of the alteration.

Acceptance Criteria: Same as above for new vessel.

Uninspected U.S. Flag Vessel or MODU Brought Under Inspection

1. STABILITY TEST

Requirements: A stability test will be required for each vessel.

Acceptance Criteria: If the Coast Guard had previously witnessed a stability test on the vessel and approved lightship values, and it can be verified by the OCMI that there is no indication of modifications having been made to the vessel since original construction (or last stability test), the requirement for the stability test may be waived. However, a deadweight survey will normally be required in order to verify the original lightship values.

2. STABILITY STANDARDS

Requirements: Each vessel will have to comply with the stability standards in force at the time of being brought under inspection.

Acceptance Criteria: If the vessel has had stability approved by the Coast Guard for load line assignment, no new stability analysis will be required unless the results of the inclining experiment or deadweight survey indicate that the vessel has been changed substantially since the -original approval, or the assignment was based on a less severe stability standard. If this is the case, a new stability analysis would then be required using the current criteria.

3. STABILITY INFORMATION

Requirements: Stability information must be prepared for each vessel based upon approved lightship values and stability calculations.

Acceptance Criteria: Same as above for new vessel.

4. WATERTIGHT DOORS

Acceptance Criteria: Same criteria as for foreign flag vessels to be brought under U.S. flag.

5. LOAD LINES

Requirements: Each vessel to which the load line regulations apply must have a valid Load Line Certificate.

Acceptance Criteria: Same as above for new vessel.

PROTECTION OF THE MARINE ENVIRONMENT

The regulations in 33 CFR Parts 151, 155 and 157 apply to foreign vessels that operate in the navigable waters of the United States. Therefore, only minor changes, such as translation of required documents, should be necessary if the vessel is currently trading or operating in the U.S. In addition, these regulations are based on MARPOL 73/78, and any vessel whose flag state is party to MARPOL 73/78 should be able to meet these regulations with only minor changes required.

The applicability of the requirements in the above regulations depend on the vessel's contract date, keel laying date or delivery date, or on the commencing date or completion date of a "major conversion." A "major conversion", for this section, is defined in the regulations (33 CFR 157.03(k)) as a conversion that substantially alters the dimensions or carrying capacity of the vessel, or prolongs its service life. The

conversion necessary to complete the reflagging, or any design or equipment change necessary to fit segregated ballast tanks, dedicated clean ballast tanks or crude oil washing, is not normally considered a "major conversion."

The one exception to the above is in 33 CFR Part 157. Although the standards are derived from MARPOL 73/78, the compliance dates for some of the standards occur earlier for U.S. flag vessels than for foreign flag vessels. Therefore, special attention should be paid to the reflagging of a tank vessel from a country that has not traded to the U.S., even though its flag state is party to MARPOL 73/78.

For the requirements contained in 33 CFR Part 159, an existing Marine Sanitation Device (MSD) certified by the U.S. Coast Guard will be acceptable if it meets current U.S. sewage abatement standards. However, non-U.S.C.G. certified MSD's will undergo the normal MSD certification process. The MSD must comply with 46 CFR Subchapters "F" and "J" to the degree noted above, and be acceptable in the judgment of the cognizant OCMI.

For the requirements contained in 46 CFR Part 162, non-U.S. Coast Guard approved oily-water separating equipment and oil content meters will be allowed under the following conditions:

a. The equipment must be tested and certified under IMO Resolution 393(x).

b. The equipment must be in compliance with 46 CFR Subchapters F and J where applicable.

c. The testing and certifying country must be party to the 1978 MARPOL Protocol.

d. A Certificate of Type test and test particulars as set out in IMO Resolution A.393(x) that is satisfactory to the United States must be on deposit at IMO headquarters.

The U.S. will accept certificates issued on the basis of tests and evaluation performed by a recognized classification society, provided that the government on whose behalf the classification society is acting fully guarantees the completeness and accuracy of the results as evidenced by appropriate signature and official stamps on the Certificate of Type test deposited.

Nothing above relieves a vessel from complying with the "visible sheen" requirement as defined in 40 CFR 110.

ADDITIONAL REQUIREMENTS APPLICABLE TO MOBILE OFFSHORE DRILLING UNITS

The requirements listed below Rust be met in addition to those requirements for MODUs listed in each section throughout this enclosure.

1. CRANES.

Requirements: 46 CFR 107.258 - .260 and 108.601.

Acceptance Criteria: Plan approval will not normally be required of any crane which conforms to the specifications of the manufacturer as originally installed. A rated load test as described in 107.260 will be required unless the crane has been load tested while under certification by an approved certifying authority as provided for in 107.258, or a recognized classification society. Prior to the rated load test, the crane should be identified by manufacturer and model number to determine that the correct load rating chart is being used. The owner Rust submit to the OCMI details and calculations of any alterations to a crane which were accomplished without manufacturer's documentation in order to verify the rated load of the crane.

2. CLASSIFIED LOCATIONS.

Requirements: 46 CFR 108.170 - .177.

Acceptance Criteria: Same as above for new vessel.

3. INDUSTRIAL SYSTEMS.

Requirements: 46 CFR Subpart 58.60 and 46 CFR 111.105.

Acceptance Criteria: Same as above for new vessel.

4. HELICOPTER FACILITIES.

Requirements: 46 CFR 108.231 - .241 and 108.486 - .489.

Acceptance Criteria: Same as above for new vessel.

5. OPERATING MANUAL.

Requirements: 46 CFR 109.121, 170.110, 170.130.

Acceptance Criteria: Same as above for new vessel.