



16711/OSV  
D8(m) Policy ltr 09-2001  
5 July 2001

From: Commander, Eighth Coast Guard District  
To: Distribution

Subj: CERTIFICATION OF MULTI-SERVICE OFFSHORE SUPPLY VESSELS (OSVs)

Ref: (a) Commandant (G-MOC) ltr 16711 dtd 25 November 1999

1. PURPOSE: This letter provides policy by which certain vessels may be designed, inspected, and certificated for service as an OSV under 46 CFR Subchapter L as well as for other services within the scope of 46 CFR Subchapter I (Cargo and Miscellaneous Vessels). Subsequent modifications of this letter may be developed to broaden its applicability to existing OSVs inspected under 46 CFR Subchapter I. This policy does not apply to any type of passenger vessel (Subchapters T, K or H) or to liftboats inspected under Subchapters I or L.

2. DISCUSSION:

a. Currently, OSVs have been restricted exclusively to support of the offshore oil and mineral industry. Increasingly, these vessels have requested changes in service to freight, industrial or towing vessels. Although the regulations allow for multi-service certification, OCMI's have been reluctant to issue a certificate, let alone two, without conducting an inspection each time the operator physically alters the vessel as it shifts from one service to the other. In fact, past practice has been to issue one certificate at a time for the appropriate service, thus creating an administrative and inspection burden each time a vessel changes service. Issuing a single Certificate of Inspection (COI) will allow more judicious use of Coast Guard resources, while at the same time ensuring public safety and facilitating industry. Reference (a) authorized the Eighth Coast Guard District to take the lead in developing a multi-service vessel certification policy. With the concurrence of Commandant (G-MOC), D8 (mvs) has developed this policy based on the input from a work group consisting of industry and Coast Guard representatives.

b. This policy letter is solely applicable to new OSVs built to 46 CFR Subchapter L standards which have a need to engage in both offshore supply service and various missions that are not in support of the offshore industry, such as the carriage of freight, industrial, or towing vessel service. As a general rule, multi-service vessels should be designed, built, and outfitted to the more stringent applicable standards of Subchapters L and I and applicable SOLAS requirements. This concept is the fundamental philosophical basis for multi-service certification of OSVs. Operational requirements imposed on the vessel will be dependent on the service the vessel is engaged in at that time (e.g. manning, carriage of certain cargoes, etc.). Under this policy, multi-service certification will only be available to vessels in the OSV and cargo and miscellaneous vessel categories.

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c. Multi-service certification is acceptable when the OCMI is reasonably satisfied that the vessel is constructed, maintained, and outfitted so as to be in compliance with the applicable regulations regardless of which service the vessel is in at any given time. With the vessels material condition and outfitting fixed, operating conditions, manning, and possibly total persons allowed may vary depending on the applicable regulations and can be addressed accordingly in a COI endorsement for the alternative service. The material condition and outfitting of the vessel should not normally be among the variables, otherwise the OCMI is put in a position of verifying compliance as changes are made.

d. This policy incorporates the following assumptions:

(1) Only one COI should be issued to each multi-service vessel.

(2) A multiple service vessel must conform at all times to the most stringent design and equipment standards of the applicable rules and regulations (including SOLAS if applicable). Operational requirements, such as manning, carriage of oil, licensing of crew, etc, will vary depending on actual vessel use.

(3) Conditions of operation for each service will be specified on the COI; therefore, additional inspections should not be required each time a change in service takes place. It is the responsibility of the vessel owner, operator, and master to ensure that the vessel is operated within the terms and conditions specified on its COI.

(4) User fees for multi-service certification will be based upon the service that results in assessment of the higher user fee amount.

e. This policy letter does not address the multi-service certification of existing OSVs built to the standards of 46 CFR Subchapter I. Although multi-service certification of these vessels is not prohibited by this policy, there are significant technical and regulatory issues associated with multi-service certification of existing OSVs certificated under 46 CFR Subchapter I. Possible readmeasurement of these existing Subchapter I OSVs seeking multi-service certification may be required due to loss of water ballast and other tonnage exemptions available exclusively to vessels engaged in OSV service. If the vessel's new tonnage is greater than 500 GT, the requirements of SOLAS (for vessels on international voyages) and the marine engineering and electrical regulations in 46 CFR Subchapters F & J will have to be carefully considered. That analysis is beyond the scope of this policy.

f. Currently, vessels inspected under 46 CFR Subchapter I are allowed to participate in the Alternative Compliance Program (ACP) while OSVs inspected under 46 CFR Subchapter L are not. The regulations at 46 CFR 8.400 through 8.450 and Change 1 to NVIC 2-95, "U.S. Coast Guard's Alternative Compliance Program," describe procedures for accepting certain plan review, and inspection functions performed by recognized classification societies. Regulations are expected to be proposed in the next few months to allow OSVs inspected under 46 CFR Subchapter L to participate in the ACP. After these regulations are finalized, plan review and

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inspection of multi-service vessels (under 46 CFR Subchapters I and L) may be conducted under the provisions of the ACP.

3. ACTION: Eighth district OCMI shall:

a. Use the guidelines provided by this policy letter to promote a consistent district wide approach to certification and operation of multi-service vessels.

b. Use the guidelines in enclosure (1) when evaluating multi-service certification of OSVs designed and built to the standards of 46 CFR Subchapter L.

c. Use the guidance in enclosure (2) when considering automation requirements for multi-service vessels.

d. Use the sample COI endorsements in enclosure (3) when developing COI endorsements for multi-service vessels.

e. Consider the table in enclosure (4) to help determine the differences between requirements of 46 CFR Subchapter L, I and SOLAS.

4. Equivalencies may be granted by Commander, Eighth Coast Guard District (m) in certain cases where it can be demonstrated that the safety of a vessel or its crew will not be affected by accepting an alternative standard. All such requests must be forwarded to the Eighth District via the cognizant OCMI who should provide an endorsement and recommendations.



R. J. MORRIS

By direction

Encl: (1) General guidance on multi-service certification of OSVs built to 46 CFR Subchapter L

(2) General Automation Considerations

(3) Sample Multi-Service Vessel COI Endorsements

(4) Comparison Table: 46 CFR Subchapter L, I and SOLAS

Dist: All Eighth District MSOs, MSU and MSDs

Copy: COMDT (G-MOC), (G-MSO), (G-MSE)  
Marine Safety Center

## General Guidance on Multi-Service Certification of OSVs Built to 46 CFR Subchapter L

1. General: This enclosure is designed to highlight a number of significant design and operational differences between OSVs constructed to the standards of 46 CFR Subchapter L and vessels certificated as cargo and miscellaneous vessels under 46 CFR, Subchapter I. This information was developed during earlier efforts to certify multi-service OSVs. It is not expected that this list is all-inclusive, however, it describes a number of the more significant issues encountered during multi-service certification of OSVs.

2. Application for Inspection: Vessel owners and/or operators must submit a Coast Guard Application for Inspection (CG Form 3752) or locally accepted equivalent form to the cognizant OCMI to have a new construction or existing Subchapter L OSV considered for multi-service certification. The Application for Inspection must specify the cargo and miscellaneous vessel service(s) in which the vessel wishes to engage (e.g. freight, industrial and/or towing).

3. Plan Review and Inspection:

a. Plan Review: The Commandant is tasked with the responsibility to determine that vessels subject to inspection meet the applicable sections of the regulations. The primary means of carrying out this task, in addition to actual inspection of a vessel by field units, is by review and approval of vessel plans and specifications. The general requirements for plans, drawings, and blueprints are found in 46 CFR 2.90-1. Specific recommended practices and procedures for the submittal of plans and specifications are detailed in NVIC 8-84 (Recommendations for the Submittal of Merchant Vessel Plans and Specifications). Plans may be submitted to the OCMI, the Marine Safety Center (MSC) or to the American Bureau of Shipping (ABS) in accordance with NVIC 8-84 or the Memorandum of Understanding between the Coast Guard and ABS as discussed in NVIC 10-82, CH2 (Plan Review and Inspection Tasks Performed by the American Bureau of Shipping (ABS) for New Construction or Major Modification of U.S. Flag Vessels). Plan submission in accordance with NVIC 10-92, Change 1 (Coast Guard Recognition of Registered Professional Engineer Certification of Compliance with Coast Guard Requirements) is also allowed. Vessel owners must inform the cognizant OCMI of their desire to have the plans reviewed for multi-service certification. Plan review will not begin by either party until receipt of an Application for Inspection by the cognizant OCMI has been confirmed.

b. Plan submission: Plan submission to the Marine Safety Center will be required for all new construction projects involving multi-service certification. In addition, OCMI's are strongly encouraged to insure that vessel owners/operators submit plans to the Marine Safety Center for existing Subchapter L OSVs applying for multi-service certification. In addition to the plans identified in 46 CFR 127.110, the plans noted in 46 CFR 91.55-5(b) will also be required as applicable.

c. OCMI Involvement: Frequently, the local OCMI may have knowledge or concerns regarding the design or operation of a particular vessel or class of vessels. In these cases, the MSC should be notified promptly of any items that the OCMI considers worthy of special consideration. OCMI's are encouraged to communicate with the MSC or Commandant (G-MOC), as appropriate, when requests are received for inspection of new construction or conversions of multi-service vessels for which approved plans and related correspondence are not held.

d. Engineering vital systems and automation: New OSVs less than 500 GT which meet the automation requirements in 46 CFR Subchapter L need not meet any of the additional automation requirements in 46 CFR Parts 61 and 62. For Subchapter L OSVs greater than 500 GT, with any vital system automation, a Coast Guard technical review must be conducted to ensure compliance with the requirements in 46 CFR 61.40 and the applicable sections of 46 CFR part 62.

(1) Engineering Control Center (ECC) Definition: The centralized engineering control, monitoring, and communications location. Because of the compact environment and location of vital machinery within the enginerooms of most OSVs, the engineroom may be considered as the ECC. To be considered an ECC, an OSV's engineroom must contain all the vessel's vital propulsion and electrical generating equipment and associated control systems. Vital valves, motors and control systems must be operable from above the deck plates. A separate and distinct ECC will not be required for the purposes of this policy letter.

(2) Minimally attended: Vessels under consideration for a minimally attended engineroom must undergo a review to ensure compliance with 46 CFR 61.40 and 62.01 through 62.50-20. Minimally attended machinery plants are automated, but not to a degree where the plant could be left unattended. Emphasis is placed primarily on centralized remote control and monitoring of the machinery plant and machinery spaces. In addition, adequate communications are required for the safety of the engineer and to allow summoning of additional personnel in case of an equipment emergency. In most cases, one licensed engineer will be on watch at all times. Recently, a policy decision was developed by G-MSE-3 regarding the equivalency of the American Bureau of Shipping's ACC notation to the U.S. Coast Guard's "minimally attended" regulations (see G-MSE-3 memorandum "Minimally Attended/ACC Holding File" dated 23 April 2001). The Coast Guard concluded that six additional items beyond ABS ACC notation would be required to meet USCG minimally attended requirements.

(3) Periodically unattended: Vessels under consideration for periodically unattended enginerooms must undergo a review to ensure compliance with 46 CFR 61.40 and 62.01 through 62.50-30. If SOLAS requirements are applicable, plans must be reviewed to determine if compliance exists with the regulations of Subpart E of Chapter II-1. The regulations set forth in Subpart E of SOLAS are only one grouping of regulations that apply to periodically unattended machinery spaces. The following SOLAS regulations apply to vessels with a periodically unattended machinery spaces endorsement: II-1/46; II-1/47; II-1/48; II-1/49; II-1/50; II-1/51; II-1/52; II-1/53; II-2/4.3.4.3; II-2/11.7; II-2/14; II-2/15.5 (SOLAS 1997, Consolidated Edition).

e. Second means of Egress from occupied spaces: For OSVs operating as a freight vessel with a periodically unattended, minimally attended, or fully manned engine room, compliance with 46 CFR 92.10-5 must be verified. If the vessel has a separate engineering control center (ECC), there must be two means of escape from the ECC (one of which does not go through the engine room).

f. Fire fighting: On vessels greater than 1500 GT, exterior fire fighting stations may substitute a Siamese configuration using 1½ inch diameter hoses instead of 2½ inch diameter hoses as is allowed for interior locations by 46 CFR 95.10-10(b)(a). For vessels employing this substitution, the firemain system must meet the water demand requirements in 46 CFR 95.10-5(c) and 95.10-15(c) which require the fire pump capacity be determined as if 2 1/2 inch outlets had been provided. If a larger capacity fire pump is required on an existing OSV to meet this requirement, an analysis of the emergency generator load is necessary.

g. Structural Fire Protection: 46 CFR Subchapter L has minimal requirements for structural fire protection (46 CFR 127.220). Subchapter I requires more rigorous structural fire protection for all cargo and miscellaneous vessels over 4000 GT *and* for those industrial vessels over 300 GT that also carry more than 12 industrial personnel (46 CFR 92.07). SOLAS structural fire protection requirements are also applicable to vessels to which SOLAS applies.

h. Rescue Boats: Both 46 CFR Subchapter I and Subchapter L require rescue boats. Subchapter L, however, allows substitution of the required rescue boat with a “workboat or launch” or an alternative personnel recovery device (sometimes referred to as a rescue platform) in certain circumstances (46 CFR 133.135). These alternatives are not available for vessels inspected under 46 CFR Subchapter I. Thus, multi-service certificated vessels will be required to carry a Coast Guard approved rescue boat at all times, not simply when operating under Subchapter I.

i. Stateroom capacities:

(1) 46 CFR Subchapter I does not specifically mention accommodations for industrial personnel. However, the Coast Guard has gone on record that there should be no difference in accommodation spaces for a vessel’s regular complement of industrial personnel and the required crew (e.g. Federal Register of December 4, 1978, Preamble of the final rule for Mobile Offshore Drilling Units, page 56791). Industrial personnel on board industrial vessels are employed and berthed in a manner and duration very similar to that encountered by the industrial personnel on MODUs. Accordingly, the application of a MODU accommodation standard (46 CFR 108.201) would philosophically and logically be more appropriate than an OSV standard (for offshore workers) for vessels being employed as industrial vessels.

(2) 46 CFR Subchapter L OSVs engaged in freight, towing or industrial vessel operations will have the number of persons on board, based on the berthing specifications of 46 CFR 127.280(a). Thus, a multi-service vessel authorized for OSV and one or more cargo and miscellaneous vessel services shall have sleeping rooms of such size that there is at least 30 square feet of deck area and a volume of at least 210 cubic feet of space for each person accommodated. This standard applies to vessel crew, industrial personnel and offshore workers.

(3) The total number of persons on board while a vessel is engaged in operations as a freight, towing or industrial vessel will be based on the berthing as follows:

(a) Each stateroom may accommodate a maximum of 4 persons unless specific approval has been granted by Commandant, in which case a maximum of 6 persons may be accommodated in any one stateroom.

(b) Where practical, the Master and Chief Engineer should have individual staterooms per 46 CFR 92.20-20. The remaining officers may be berthed two per room.

(c) Staterooms for crew members must be separate from those provided for offshore workers (or industrial personnel) per 46 CFR 127.270(h) unless alternative arrangements are approved by the OCMI.

j. Hospital Space: A hospital space is required (46 CFR 92.20.35) when the vessel is operating in any cargo and miscellaneous vessel service (freight, industrial or towing) on voyages of more than three days duration and when there are 12 or more crew on board. The maximum number of crew required in any operating condition on the vessel's Certificate of Inspection will be used to determine the need for a hospital space, regardless of the number of installed accommodations. When a hospital space is required, an existing stateroom may be designated as a hospital space. This stateroom must be configured for single occupancy so long as it is utilized as the required hospital space. This space must not be normally occupied when set aside as the designated hospital and must have a washbasin with hot and cold running water installed in the space, or immediately adjacent.

(1) The total persons allowed on the vessel while it operates as a freight or industrial vessel must be reduced, if necessary, to account for any reductions in required berthing when a stateroom is set aside as the required hospital space.

(2) In a recent appeal (Commandant G-MOC letter 16711 of 6 March 2000), Commandant ruled that when a vessel is operating as an industrial or freight vessel on an oceans route not more than 200 miles from shore and not on an international voyage, the requirement for a hospital space may be waived provided the following provisions are met:

(a) An approved medical emergency evacuation procedure must be on board each vessel that participates in the multi-service program. The medical emergency evacuation procedure must be approved by the cognizant OCMI.

(b) The medical emergency evacuation procedures must include the procedures for segregating the injured/sick crewmembers until emergency evacuation can be effected.

(c) The vessel must have resources necessary to adequately respond to crew medical emergencies including evacuations of a sick or injured crewmember.

(d) The OCMI shall place a permanent note in each affected vessel's file indicating that the vessel is prohibited from engaging in any international voyages until a hospital space meeting the requirements of 46 CFR 92.20-35 is provided on the vessel.

k. Streamlined Inspection Program (SIP): A vessel's status as a multi-service vessel does not necessarily invalidate the opportunity for a vessel to remain or participate in SIP. However, vessels that have undergone a major conversion as defined by the Marine Safety Center (MSC), and as a result of retrofitting for the purposes of being certified as multi-service, the local OCMI will make the determination if the vessel will remain in the SIP.

l. Alternative Compliance Program (ACP): Currently, vessels inspected under 46 CFR Subchapter I are allowed to participate in the Alternative Compliance Program (ACP) while OSVs inspected under 46 CFR Subchapter L are not. The regulations at 46 CFR 8.400 through 8.450 and Change 1 to NVIC 2-95, "U.S. Coast Guard's Alternative Compliance Program," describe procedures for accepting certain plan review, and inspection functions performed by recognized classification societies. Regulations are expected to be proposed in the next few months to allow OSVs inspected under 46 CFR Subchapter L to participate in the ACP. After these regulations are finalized, plan review and inspection of multi-service vessels (under 46 CFR Subchapters I and L) may be conducted under the provisions of the ACP.

m. Keel Cooler attachment to the hull: Subchapter L allows keel coolers to be attached to the hull with fillet welds while Subchapter I and Subchapter F require keel coolers to be attached by using full penetration welds. Keel coolers may be attached to the hull using the Subchapter L standard (fillet welds) for OSVs operating under multi-service certification as a cargo and miscellaneous vessel with the following restrictions:

(1) The vessel must be designed to survive flooding of the space where the keel coolers pass through the hull plate. Only one compartment flooding need be considered at any one time, but the worst case scenario must be analyzed for compliance with the damage stability standards required by Subchapter L; or

(2) If a keel cooler penetrates the hull in a compartment that is not normally considered for, or cannot pass the damage stability required for Subchapter L, isolation valves must be installed at or near each shell penetration. Each isolation valve must be easily accessible.

#### 4. Operational requirements:

a. Manning: The fundamental manning difference between OSVs and freight and industrial vessels is that OSVs are allowed to use a "two-watch system" when engaged on a voyage of less than 600 miles (46 USC 8104(g)). Towing vessels are also allowed to use a two-watch system when engaged on a voyage of less than 600 miles. With limited exceptions, other seagoing merchant vessels over 100 GT (including freight and industrial vessels) are required to use a three-watch system when at sea (46 USC 8104(d)). Thus, multi-service vessel COIs will have to be structured such that appropriate manning is specified for different vessel services and voyage lengths. The local OCMI is responsible for determining acceptable manning levels for vessels inspected in their respective OCMI zones. Recommended COI endorsements (VFODs) for

manning under various operating conditions are included in enclosure (3). A discussion of deck and engine department manning on multi-service vessels is provided below.

(1) Deck Department Manning General: The recommended manning scales provided in Volume III of the Marine Safety Manual may be used as a general basis for deck department manning for multi-service vessels operating as OSVs, freight, industrial or towing vessels. The prescribed manning will vary, particularly between OSV and the other vessel services (freight, industrial, and towing). Under 46 USC, OSVs have been granted special treatment for deck (and engine) department manning. However, when a multi-service vessel is not operating as an OSV, it will be required to meet the generally higher manning requirements of the applicable service. The deck manning for licensed individuals is taken from the requirements of 46 USC 8301. The number of Able and Ordinary Seamen (AB and OS) will vary depending upon the OCMI's evaluation of the vessel and her operations.

(a) Deck Officers on Mechanically propelled vessels other than OSVs

(1) A licensed master is required on every vessel subject to Coast Guard inspection (46 USC 8301(a)(1)).

(2) Three licensed mates are required on each vessel over 1000 GT (Regulatory Tonnage) per 46 USC 8301(a)(2). This statute provides for establishment of an alternate tonnage under Convention Measurement rules (46 USC 14302) if prescribed by interpretive regulation by the Secretary under 46 USC 14104. An alternate tonnage has not yet been established for this statute. Until alternate tonnage equivalencies are established, multi-service vessels that measure over 1000 GT under any tonnage measurement system must have three licensed mates (in addition to the master). On voyages of less than 400 miles this requirement may be reduced to two licensed mates (46 USC 8301(a)(2)(A)).

(3) Two licensed mates are required on each vessel that measures between 200 and 1000 GT (Regulatory Tonnage). An alternate Convention Measurement tonnage is authorized but has not been established (46 USC 8301(a)(3)).

(4) One licensed mate is required on vessels between 100 and 200 GT (Regulatory Tonnage). An alternate Convention Measurement tonnage is authorized but has not been established (46 USC 8301(a)(4)).

(b) Deck Officers on Offshore Supply Vessels:

(1) A licensed master is required on every vessel subject to Coast Guard inspection (46 USC 8301(a)(1)).

(2) OSVs on a voyage of more than 600 miles must have a master and two licensed mates (46 USC 8301(b)). There is no tonnage limitation to this rule other than the general requirement that an OSV is less than 500 GT (Regulatory Tonnage) or 6000 GT (ITC).

(3) OSVs on a voyage of less than 600 miles must have a master and one licensed mate (46 USC 8301(b)).

(c) Unlicensed Deck Personnel:

(1) General: Neither 46 USC nor the corresponding regulations prescribe the number of unlicensed Able Seamen or Ordinary Seamen to be carried aboard particular categories of vessels. This decision is left to the discretion of the OCMI following an evaluation of the vessel and her intended operations. The OCMI is responsible for ensuring that the vessel can be safely operated with her assigned complement of officers and crew.

(2) Historical Manning of Deck Crew: A review of numerous existing OSV and small cargo and miscellaneous vessel COIs has revealed that many OCMI's have required one unlicensed member of the deck department to be on duty for each watch aboard the vessel. Thus, for a three-watch system many OCMI's have required two Able Seamen and one Ordinary Seaman. For such vessels, the deck department consists of one licensed officer and one unlicensed crew member on duty together for each watch. For OSVs and towing vessels authorized a two watch system on voyages of less than 600 miles, the unlicensed deck personnel are typically reduced to one Able Seaman and one Ordinary Seaman. The following statutory provisions must also be complied with in establishing deck crew manning:

[a] Three-watch system: At least 65 percent of the unlicensed deck crew must be rated as Able Seaman on vessels with a three-watch system (46 USC 8702(b)(2)).

[b] Two-watch system: At least 50 percent of the unlicensed deck crew must be rated as Able Seaman on vessels with a two-watch system (46 USC 8702(b)(2)(i)).

(2) Engine Department Manning General: All of the discussion below is predicated on the fact that the vessels under consideration are of OSV size and are under 500 GT Regulatory tonnage or 6,000 GT ITC tonnage.

(a) Engine Department Manning Considerations: The manning level described below assumes that at least two individuals (one licensed engineer and one Oiler) is appropriate for each watch on a vessel with no or limited automation. Typically, for a vessel that meets the requirements for "minimally attended," one licensed engineer is appropriate for each watch. For a periodically unattended engine room, one Chief Engineer and one Assistant Engineer should be considered as the "base case" engine department manning. The OCMI should consider the guidance in Volume III, Chapter 25 "Manning Requirements for Automated Vessels" in establishing the required manning for a periodically unattended engine room. The OCMI must be satisfied that the proposed engine department personnel will be satisfactory to operate the vessel's engineering equipment on a continuing basis.

(b) Engineering Manning (Cargo & Miscellaneous Vessel Services): The following engine department manning levels have been developed as a general guideline for OCMI's. The recommended engine room manning for a multi-service vessel operating in one of the cargo and miscellaneous vessel services (e.g. freight, industrial or towing) is shown below. The various

manning levels are based upon the level of engineroom automation and are also dependent upon the OCMI's evaluation of the vessel and crew.

(1) Fully manned: 1 Chief Engineer, 2 Asst Engineers, 3 oilers

(2) Minimally attended: 1 Chief Engineer, 2 Asst Engineers

(3) Periodically unattended: 1 Chief Engineer, 1 Asst. Engineer\*

\* Provided the OCMI has reviewed, accepted and verified the vessel automation as well as the crew's ability to maintain the vessel and perform all required evolutions.

(c) Engineering Manning for OSV Service: 46 USC 8301(b) requires a licensed engineer on each OSV over 200 GT (Regulatory tonnage). No specific number of unlicensed engine department personnel is required on an OSV by law or regulation. OCMI's have the authority to require additional engine department personnel (either licensed or unlicensed) but must base this requirement on information that these increases are necessary to insure safety. Volume III of the Marine Safety Manual provides a sample manning scale for OSVs that includes three designated duty engineers and three oilers on voyages over 600 miles or; two designated duty engineers and two oilers on voyages less than 600 miles. This recommended manning level is contingent upon the level of engine automation.

(d) Historical Manning of OSV Engine Department: A review of a number of OSV COIs reveals that many Eighth District OCMI's have limited required engine department personnel to a single Chief Engineer on OSVs over 200 GT. Presumably, this has been done based upon a review of engine automation, reliability and engine department workload. Thus, for many existing OSVs the designated engine department manning is one Chief Engineer. This manning level is not an absolute. Future workload and/or fatigue studies may be needed to verify proper OSV engine department manning, particularly considering the increasing size, complexity, operational requirements and endurance of these vessels.

(3) Requests for reduced engineroom manning: The OCMI shall consider all requests for reductions in engineroom manning. Acceptance by the Coast Guard of automated systems to replace specific crew members or to reduce overall requirements for crew members depends on the capabilities of the automated system; as well as the combination of crew members, equipment, and systems necessary to ensure safety of the vessel, personnel, and environment.

(a) Each vessel operating condition should be considered including maneuvering; the ability of the crew members to perform each operational evolution, including to cope with emergencies such as fire and the failure of control or monitoring systems. In addition, the OCMI should consider the role of the vessel's crew in conducting a planned maintenance program with regular testing procedures; as well as the automated system's demonstrated reliability during its initial trail period (usually 3000 hrs) and its continued reliability.

(b) The OCMI shall consider all relevant information in determining a reduction in crew size to ensure there is no adverse effect on safety. A review of automated vessel experiences show varying degrees of reliability in engineering automation. Accordingly, manning reductions in the engine department will be made only after a system has operated for a sufficient period of time to demonstrate its reliability, as well as the crew's ability to maintain the vessel and perform all required evolutions. The duration of the trial period shall normally be 3000 hours (based upon underway time).

b. Log entries regarding service: Any vessel operating as a multi-service vessel is required to have the type of service entered into the vessel's log book or record. Although an official logbook is not required for all OSVs or cargo and miscellaneous vessels operating in domestic service, 46 CFR Subchapter L requires that an OSV without an official logbook have an unofficial log or record (46 CFR 131.610). This entry shall be made each time the vessel changes service. The master is to ensure that the service of the vessel (either freight or OSV) is officially noted in the vessel's logbook or record. This requirement should be entered into the conditions of operation on the vessel's COI.

c. Bulk Liquid Cargo: COIs should indicate that when a vessel is in freight industrial or towing vessel service, the vessel is prohibited from transferring bulk liquid cargoes to other vessels or offshore facilities. Additionally, a multi-service certified vessel when operating as a freight, industrial or towing vessel may carry bulk liquid cargoes provided:

(1) it meets the applicable double hull requirements of 33 CFR 157.10(d)

(2) the bulk liquids have an aggregate volume of not more than 20% of the vessel's deadweight tonnage (DWT), and

(a) For Freight vessels:

[1] Grades D & E cargoes may be carried in integral tanks

[2] Certain Grade C cargo and Grades D & E cargoes may only be carried in portable tanks per 46 CFR 98.30

(b) For Industrial vessels:

[1] Grades D & E cargoes may be carried in integral tanks

[2] Grades D & E and specifically named Grade C cargoes may be carried in portable tanks per 46 CFR 98.30

## Engineering Automation Considerations

1. This enclosure was developed to highlight some of the more significant engineering automation differences between 46 CFR Subchapter L (OSVs), 46 CFR Subchapter F (Marine Engineering) and SOLAS. This enclosure will undoubtedly become obsolete over time as changes to Coast Guard regulations and SOLAS occur. Applicable Coast Guard regulations and SOLAS requirements will always prevail. This enclosure should **NOT** be used alone, as it is only intended to point out some of the more significant engineering automation differences between 46 CFR Subchapter L, 46 CFR Subchapter I and SOLAS.

### 2. **Offshore Supply Vessel (L)**

a. Qualitative Failure Analysis (QFA) and Design Verification Testing Procedure (DVTP) are required for the remote or automatic propulsion controls.

b. Single non-concurrent failure of each easily replaceable component of the propulsion automatic or remote controls must not cause the propulsion engine, or the pitch of the propeller, to increase. Alternative manual means of propulsion control is required.

c. Propulsion control in the pilothouse is required.

d. Required alarms are very limited, and are only required for unattended machinery spaces.

e. Test procedures (periodic safety test procedures) and operations manual are required only for unattended machinery spaces.

f. For unattended machinery spaces, machinery displays (instrumentation) are required to be grouped or centralized in the machinery space.

### 3. **Sub I Vessel (>500 GT)**

a. A QFA is required for the automated systems listed in 46 CFR 62.20-3(b). Whenever a QFA is required, a DVTP document is also required.

b. Propulsion control failures are required to be failsafe, i.e., speed and direction of thrust maintained, until local manual or alternate manual control is in operation. Failures are required to be alarmed in the navigating bridge and the machinery spaces. NOTE: Credit is given to vessels with “independent duplicate propulsion systems”, i.e., a vessel with multiple propellers with independent controls, do not have to maintain the speed and direction of thrust of the affected propulsion plant, provided the reduced propulsion capability of the vessel using the remaining propulsion plant(s) is not below that necessary for the vessel to run ahead at 7 knots or half speed, whichever is less, and is adequate to maintain control of the ship.

c. Propulsion controls in the pilothouse are not required for a vessel with a fully-manned machinery plant operation, implying propulsion control in the machinery spaces is required.

d. If pilothouse control is provided, a means to pass propulsion orders (EOT) between the navigating bridge and the engine room is required. Normal propulsion control transfers require acknowledgement from the receiving station. Control location transfer between control stations required. Engine control room station must have means to take propulsion control from the navigating bridge or any other secondary control stations at any time. Local manual control must have the capability to override all remote and automatic control locations.

e. Two sources of power are required for all primary control, safety control, instrumentation and alarm systems. One source must be from the emergency power source. Alarms are required to be continuously powered (typically provided by UPS or batteries.)

f. **Additional requirements for fully manned machinery spaces (46 CFR 62.30 and 62.35).** This is NOT a comprehensive list.

(1) Primary closed loop propulsion control systems must be independent and physically separate from required safety control, alarm or instrumentation sensors.

(2) Propulsion machinery automatic safety trip control is required if continued operation could result in serious damage, complete breakdown, or explosion of the equipment.

(3) Remote controls for flooding safety equipment must remain functional under flooding conditions.

(4) Fire pump remote controls must include a firemain pressure indicator or firemain low pressure alarm.

(5) Automatically filled fuel oil day tanks, settlers, and similar fuel oil service tanks that are filled automatically or by remote control must have high level alarm that annunciates in the machinery spaces, and an automatic fuel-fill shutdown control system or overflow arrangement.

(6) Starting capacities for main engines and ship's service generator prime movers require a certain number of consecutive starts, depending on type of starting system and propulsion engine.

g. **Additional requirements for minimally attended machinery plant operation (46 CFR 62.50-20).** This is NOT a comprehensive list.

(1) ECC must include control and monitoring of:

(a) propulsion plant, propulsion auxiliaries,

- (b) electrical power generation,
- (c) machinery space fire pump,
- (d) bilge pump control to counter machinery space flooding, and
- (e) the ability to place on-line the required standby systems (unless systems are automatically controlled) and to shutdown such equipment when necessary.
- (f) Minimum alarms and instrumentation are specified in 46 CFR Table 62.35-50.

(2) Personnel alarm (dead-man alarm) required.

(3) Machinery space fire alarms must activate alarms throughout the machinery spaces and engineers' accommodations. The fire alarms in the ECC and navigating bridge must visually indicate which machinery space is on fire.

(4) Watertight doors in required subdivision bulkheads must be Class 3 watertight doors, and must be controlled from the ECC and navigating bridge.

(5) Controls of sea inlet and discharge valves, and the emergency bilge suction, must be located and arranged to allow time for operation in the event of flooding. Time consideration in the proper location of the valve operators, must include flooding detection, crew response and valve control operation time.

(6) Engineers' call system (operable from the ECC) required.

(7) ECC must have controls and instrumentation necessary to place the ship's service and propulsion generators in service in 30 seconds.

(8) Switchboard distribution, propulsion and generator controls must be located in the ECC, or additional requirements apply if located outside the ECC.

(9) Maintenance program required.

**h. Additional requirements for periodically unattended machinery plant operation (46 CFR 62.50-30). This is NOT a comprehensive list.:**

(1) Required redundant vital auxiliaries and power sources must automatically transfer to the back-up unit upon failure of the operating units.

(2) Capacity of fuel oil service tanks to be determined by the OCMI, depending on the route of the vessel, otherwise, must be sufficient for 24-hour operation at normal power, 8 hours for automatically filled tanks. Low fuel oil level alarm is required.

(3) Starting system receivers, accumulators or batteries must be automatically and continuously charged.

(4) Engineer's assistance needed alarm must be activated when the alarm system normal source of supply fails, and when an alarm at the ECC is not acknowledged within a period of time where an engineer is expected to respond to the alarm.

(5) ECC alarms that require immediate attention of the navigating bridge officer for the safe navigation of the vessel must be extended to the pilothouse.

(6) All required ECC alarms must be extended in the engineers' accommodations. This may be in the form of a summary alarm.

(7) Fire and flooding alarms must not be summarized.

(8) A fire control station is required. The station must be outside the machinery spaces.

(9) Daily check-off list must be completed prior to leaving the machinery plant unattended.

(10) Standby ship's service generator must automatically start and assume the ship's service loads within 30 seconds to permit propulsion and steering, and to ensure the safety of the vessel, and automatic restarting of essential auxiliaries. The emergency generator is not considered for this purpose. See item 4.e.(4) below under SOLAS which allows the administration to dispense with the continuity of power requirements outlined in this paragraph for vessels of less than 1600 gross tons.

(11) If ship's service power is supplied by more than one generator in parallel operation, provisions to prevent overload of the remaining generator to ensure the remaining generator are kept in operation to permit propulsion and steering, and to ensure the safety of the vessel.

#### 4. **SOLAS**

a. Contains no provisions to verify compliance with the failsafe regulations.

b. Same as Paragraph 3.b (above), for Subchapter I vessels, except the NOTE does not apply for SOLAS vessels.

c. Propulsion controls required in the navigating bridge for periodically unattended machinery plant operation.

d. Provisions for continuous manual supervision from a control room is similar to a minimally manned machinery plant operation for Sub I vessels, Paragraph 3(g), above.

e. Additional requirements for **periodically unattended machinery spaces**:

(1) Crankcase oil mist detectors or bearing engine temperature monitors or similar devices are required for internal combustion engines of 2250kW and above or

having cylinders of at least 300 mm bore. As per D8(m) Policy Letter 05-2001: It has been determined by G-MSE that high crankcase pressure switches are an equivalent to oil mist detectors, required by SOLAS II-1/47.2, on medium sized (900 to 5000hp) Electro-Motive Division (EMD) General Motors Corp two cycle engines. The difference between the two systems is that the detector senses misted oil and a high crankcase pressure switch senses the loss of a vacuum in the crankcase. The intent of both systems is to prevent the occurrence of a crankcase fire as a result of a mechanical engine failure by signaling an alarm and /or shutting down the engine.

(2) The number of consecutive automatic starts of propulsion machinery must be limited and alarmed. The low starting air pressure alarm must be set at a level to permit starting operations of the propulsion machinery locally. This typically applies to reversible main engines.

(3) SOLAS II-2/14 Fixed fire detection and fire alarm systems for periodically unattended machinery spaces. A fixed fire detection system and fire alarm system of an approved type in accordance with the relevant provisions of regulation 13 shall be installed. Another area of concern is regulation 14.2 which states; except in spaces of restricted height and where their use is specially appropriate, detection systems using only thermal detectors shall not be permitted.

(4) The administration may dispense with the continuity of power requirements outlined in paragraph 3.h.(10) above for vessels of less than 1600 gross tons.

## **SAMPLE MILTI-SERVICE VESSEL COI ENDORSEMENT**

The paragraphs below describe the sample manning and operational endorsements that might be found on the Certificate of Inspection of a vessel authorizing service as both an OSV and one or more cargo and miscellaneous vessel services under 46 CFR Subchapter I. It is not expected that the sample endorsements below represent a comprehensive list of manning and operational COI endorsements. However, this list was developed to provide OCMI's guidance in preparing COI endorsements for multi-service vessel operations.

### **FREIGHT (TOWING OR INDUSTRIAL) VESSEL SAMPLE MANNING**

For vessels that either have no or some degree of basic automation:

1 MASTER	1 CHIEF ENGINEER
2* LICENSED MATES	2 LICENSED ENGINEERS
2 ABLE SEAMEN	3 OILERS
1 ORDINARY SEAMAN	

For vessels that have automation fully complying with 46 CFR 61.40 and 62.01 through 62.35 and meeting the intent of 62.50-20 for a minimally attended engine room as determined by the Cognizant OCMI :

1 MASTER	1 CHIEF ENGINEER
2* LICENSED MATES	2 LICENSED ENGINEERS
2 ABLE SEAMEN	
1 ORDINARY SEAMAN	

For vessels that have automation fully complying with 46 CFR 61.40 and 62.01 through 62.35 and meeting the intent of 62.50-30 for a periodically unattended engine room as determined by the Cognizant OCMI:

1 MASTER	1 CHIEF ENGINEER**
2* LICENSED MATES	1 LICENSED ENGINEER**
2 ABLE SEAMEN	
1 ORDINARY SEAMAN	

\* If vessel is over 1000 GT, must provide 3 Licensed mates for voyages 400 miles or more in length.

\*\* Provided the OCMI has reviewed, accepted and verified the vessel automation. Manning reductions in the engine department will be made only after a system has operated for a sufficient period of time to demonstrate its reliability, as well as the crew's ability to maintain the vessel and perform all required evolutions.

\*\*\*OCEANS\*\*\*

THIS VESSEL HAS BEEN INSPECTED AND APPROVED FOR MULTI-SERVICE EMPLOYMENT AS AN OFFSHORE SUPPLY VESSEL (OSV), FREIGHTSHIP, TOWING VESSEL OR INDUSTRIAL VESSEL, UNDER THE PROVISIONS OF D8 POLICY LETTER 09-2001. IT MUST CONFORM AT ALL TIMES TO THE MOST STRINGENT DESIGN AND EQUIPMENT STANDARDS OF EITHER SUBCHAPTER L, I, OR SOLAS REGARDLESS OF THE SERVICE IN WHICH IT IS ENGAGED. THE MASTER IS REQUIRED TO RECORD THE TYPE OF SERVICE IN THE VESSEL'S LOGBOOK WHEN THE VESSEL'S SERVICE HAS CHANGED.

THE SPECIFIED MANNING LEVEL IS CONTINGENT UPON THE PROPER OPERATION OF THE ENGINEERING AUTOMATED CONTROL/MONITORING SYSTEMS. ANY MAJOR ALTERATION OR ESSENTIAL COMPONENT FAILURE MUST BE REPORTED IMMEDIATELY TO THE COGNIZANT OFFICER IN CHARGE MARINE INSPECTION.

IMMERSION SUITS ARE NOT REQUIRED WHEN THE VESSEL IS OPERATING IN THE ATLANTIC OCEAN BETWEEN 32 DEGREES NORTH AND 32 DEGREES SOUTH LATITUDE OR ANY OTHER WATERS BETWEEN 35 DEGREES NORTH AND 35 DEGREES SOUTH LATITUDES.

\*\*\*OFFSHORE SUPPLY VESSEL\*\*\*

THE FOLLOWING OPERATING CONDITIONS APPLY WHILE THE VESSEL IS OPERATING AS AN OFFSHORE SUPPLY VESSEL, AS DEFINED BY 46 U.S.C. 2101(19), ENGAGED IN THE SUPPORT OF EXPLORATION, EXPLOITATION, OR PRODUCTION OF OFFSHORE MINERAL AND OIL INDUSTRY RESOURCES.

VESSEL IS PROHIBITED FROM DISCHARGING NOXIOUS LIQUID SUBSTANCE RESIDUE TO THE SEA.

WHILE ENGAGED IN SUPPORT OF EXPLORATION, EXPLOITATION, OR PRODUCTION OF OFFSHORE MINERAL OR ENERGY RESOURCES VESSEL MANNING MAY BE REDUCED AS FOLLOWS:

1 MASTER	1 CHIEF ENGINEER
2 LICENSED MATES	
2 ABLE SEAMEN	
1 ORDINARY SEAMAN	

IN ADDITION, THE VESSEL MAY CARRY XX OTHER PERSONS IN THE CREW, YY PERSONS IN ADDITION TO CREW, AND ZZ OFFSHORE WORKERS.

WHEN THE VESSEL IS OPERATING AS AN OSV AND IS ON A VOYAGE OF LESS THAN 600 MILES, THE MANNING MAY BE REDUCED BY 1 LICENSED MATE AND 1 ABLE SEAMAN. CONCURRENTLY, ZZ OFFSHORE WORKERS MAY BE CARRIED.

\*\*\*TOWING VESSEL\*\*\*

WHEN THE VESSEL IS OPERATING AS A TOWING VESSEL AND IS ON A VOYAGE OF LESS THAN 600 MILES, THE MANNING MAY BE REDUCED BY 1 LICENSED MATE AND 1 ABLE SEAMAN.

\*\*\* FREIGHT (TOWING OR INDUSTRIAL) VESSEL \*\*\*

THE FOLLOWING OPERATING CONDITIONS APPLY WHILE OPERATING AS A FREIGHT (TOWING OR INDUSTRIAL) VESSEL.

THIS VESSEL DOES NOT MEET THE U.S. DOUBLE HULL DESIGN STANDARDS OF 33 C.F.R. 157.10(d) AND MAY NOT CARRY OIL, AS DEFINED BY 33 CFR 157.03, IN BULK IN INTEGRAL TANKS.

WHEN OPERATING AS A FREIGHT (TOWING OR INDUSTRIAL) VESSEL, THE DISCHARGE OF FUEL OIL, PETROLEUM BASED DRILLING FLUIDS, OR OTHER COMBUSTIBLE LIQUID TO A PLATFORM, FACILITY, MODU, OR OTHER VESSEL IS PROHIBITED.

**COMPARISON TABLE: 46 CFR SUBCHAPTER L, I & SOLAS**

Issue	Subchapter L	Subchapter I	SOLAS
1. Double Hull requirements per OPA 90	OSVs exempt per 46 USC 3702(b)	Must have double hull for cargo tanks containing OPA cargoes	No requirements for double hull if considered "other than an oil tanker" with cargo tanks coming under regulation 2(2) of Annex I MARPOL
2. Bulk Cargo	<p>May discharge bulk liquid cargoes to another vessel</p> <p>Unlimited amounts of excess fuel as cargo</p> <p>Grade D and E cargoes limited to 20 % of DWT except may carry Grade D &amp; E drilling fluids without limit (46 CFR 125.110)</p> <p>Grade B cargo limited to 20% DWT and may only be carried in fixed independent tanks on deck.</p> <p>May carry hazardous materials in portable tanks in accordance with 46 CFR 98.30</p> <p>May carry NLS per 46 CFR 125.120</p>	<p>May not discharge bulk liquid cargoes to another vessel</p> <p>No provisions for excess fuel as cargo except as part of the limited quantities of Grade D &amp; E mentioned below</p> <p>May carry limited quantities (20% DWT) as follows (46 CFR 90.05-35:</p> <p><i>a. Cargo vessels:</i> Grades D &amp; E cargoes in integral tanks.</p> <p>Certain Grade C cargo and Grades D &amp; E cargoes in portable tanks IAW 46 CFR 98.30</p> <p><i>b. Industrial vessels:</i> Grades B &amp; lower cargoes in fixed independent or integral tanks authorized by CMDT.</p> <p>Grades D &amp; E and specifically named Grade C cargoes in portable tanks per 46 CFR 98.30</p> <p>NLS not addressed</p>	<p>Silent</p> <p>Silent</p> <p>Vessels carrying 200m<sup>3</sup> or more in oil cargo must meet MARPOL Annex I Regulations 9,10,14,15(1),(2), (3), 18, 20, and 24(4) in addition to normal requirements for cargo vessels.</p> <p>NLS carriage per MARPOL Annex II</p>
3. Primary Lifesaving	100% aggregate required	100% required each side	100% required each side
4. Structural Fire Protection	Minimal. See 46 CFR 127.220	46 CFR 92.07 applies if Vessel > 300GT and carries >12 industrial personnel	SOLAS CH II-2 Part C applies NVIC 10-99 (Interpretations of SOLAS II-2) should be consulted for recent interpretations of SOLAS fire protection requirements

Issue	Subchapter L	Subchapter I	SOLAS
5. Fire Protection	<p>Fixed gaseous systems required for paint lockers only (with exceptions for size and location); no requirements for spaces containing internal combustion engines.</p> <p>Only 1 fire pump required</p> <p>1 1/2 inch hoses at all interior and exterior fire hydrants</p> <p>Halon 1211, 1301 and mixtures for BI, BII, CI, CII portable extinguishers</p>	<p>No exceptions for paint lockers. If vessel &gt;1000 GT, spaces containing internal combustion engines must have fixed gaseous systems.</p> <p>Only 1 fire pump required</p> <p>1 1/2 inch hoses for interior spaces, 2 1/2 inch hoses for exterior hydrants.<sup>1</sup></p> <p>Halon not allowed for portable fire extinguishers</p>	<p>Spaces containing internal combustion engines required to have fixed system plus set of portable air-foam equipment.</p> <p>2 Fire pumps required with sufficient firemain diameter to convey max required discharge from both fire pumps operating simultaneously or 616 GPM.</p> <p>No diameter hose specified as long as output/performance satisfied.</p> <p>Halon allowed only in machinery spaces, pump rooms, vehicle (cargo) spaces.</p> <p>NVIC 10-99 (Interpretations of SOLAS II-2) should be consulted for recent interpretations of SOLAS fire protection requirements</p>
6. Fire Detection	Required for unattended machinery spaces	Required in machinery spaces designed to be minimally attended and periodically unattended.	Required for unattended machinery spaces and in accommodation spaces and/or escape routes contingent upon the method of SFP.
7. Electrical NOTE: Compliance w/Sub J is required for items not specifically addressed in Sub. L. The following compares differences in the items specifically addressed in Sub L	For OSVs 19.8m (65 ft) or less in length, the Alternative Standards listed in 46 CFR 129.120 are acceptable	Must meet Sub J	In general, vessel meeting Sub I and Sub J, meets SOLAS with the exception of Fire Detection (see above).

<sup>1</sup> Exterior stations may be outfitted with siamese 1 1/2 inch hoses as long as pump capacity and performance is based on 2 1/2 inch outlet

Issue	Subchapter L	Subchapter I	SOLAS
Power Sources	<ul style="list-style-type: none"> <li>Vital systems identified in 46 CFR 128.130(a) and loads identified in 46 CFR 129.310(a)(1) (ii) -(v) must be arranged so that they can be energized from 2 sources of electricity. (e.g. a generator, or an alternator driven by a propulsion engine, in combination with a battery having sufficient capacity to supply the loads above for 3 hours, is an acceptable 2 source system).</li> <li>Vessel 100 GT and over must have 2 power generating sets, one of which may be propulsion driven.</li> </ul> <p><b>Emergency:</b> source not required. Vessels &lt; 100 GT must have emergency lighting along line of escape to the main deck from accommodations or working (machinery) spaces below main deck</p>	<p><b>Normal:</b> Each ship service generator required to have sufficient capacity to supply vsl's service loads (defined in 46 CFR 111.10-1)</p> <p><b>Emergency:</b> Source required, for emergency loads in 46 CFR 112.15.5 and capacity sufficient for period of operation in Table 46 CFR 112.05-5(a)</p>	<p><b>Normal:</b> Same as I</p> <p><b>Emergency:</b> Self contained emergency power source required with period of operation dependent on loads required. (See SOLAS Chap II-1, Regulation 43.)</p>
Cable	UL listed cable allowed	Use of boat cable not addressed	Flame retardant but no specific requirements
Steering gear	Orbitrol system allowed although not considered a full follow-up control system. Credit given to vessels with multiple-screw propulsion if capable of steering vessel.	Power driven main steering gear must have full follow-up control of the rudder.	Main steering gear must provide rudder rate of 28 secs from 35 to 30 degrees of rudder movement, may use all power units to get max rate.
8. Stability	<p>Intact: See 46 CFR 170.170 (weather) and 46 CFR 170.173 or 46 CFR 174.185(b)-(e)</p> <p>Damage: See 46 CFR 174.200 and 174.205 if carrying more than 16 offshore workers</p>	<p>Intact: See 46 CFR 170.170 (weather) and 46 CFR 170.173</p> <p>Damage: none required</p>	<p>Intact: same as CFR</p> <p>Damage: SOLAS Chap II-1, Part B-1, applies if vessel &gt;300 ft.</p>

Issue	Subchapter L	Subchapter I	SOLAS
9. Automation QFA/DVT	Only required if unattended machinery space.	Required regardless of manning.	Not required.
Propulsion Controls	Failsafe state defined as "no increase in speed or thrust" must result when the remote prop control system fails. This allows complete engine shutdown if a failure of the remote prop control system occurs	Failsafe state defined as "speed and direction of thrust must remain as-is" upon failure of remote prop control system, until alternate means of control is established. Only partial reduction in prop capability is allowed, as long as 7 knots or half design speed can be maintained.	Same as I
Engine Order Telegraph	Not required	Required	Same as I
Independence	Independence of propulsion control, alarm and monitoring, and safety control systems not required.	Independence required. Single non-concurrent failures of major components within each system must not prevent sustained or restored operation of that system.	Independence not specifically addressed
Required alarms and monitoring	Minimal for diesel engines	Adopts ABS tabulated list	No tabulated list
Powering	Alarms not required to be continuously powered, but 2 <sup>nd</sup> (emergency) power source required	Alarms required to be continuously powered, and 2 <sup>nd</sup> (emergency) power source required	Same as I
Unattended machinery plants	No ECC required	ECC required	Same as I
	No fire control station	Fire control station required	Same as I
	No Ass't-Needed alarm	Ass't-Needed alarm required	No Ass't-Needed alarm
	No dead-man's alarm	Dead-man's alarm required	Same as I
	No sea valve control	Sea valve control required	Same as I
	No continuity of electrical power requirement	Continuity of electrical power requirement	Same as I
	Alarms extend to pilothouse	Alarms extend to pilothouse, ECC, & engineers' accommodations	Same as I
	Redundant vital auxiliaries not required	Auto transfer of redundant auxiliaries	Same as I
10. User Fee	\$1470/year, \$1260/year if vessel enrolled in alternate reinspection program	\$1870/year	N/A

Issue	Subchapter L	Subchapter I	SOLAS
11. Manning	2 watch system using 1 mate, 1 master for voyages less than 600 miles. Voyages > 600 miles must have 2 mates plus master 46 USC 8301(b)	3 watch system. Required 3 mates if vessel > 1000GT, unless on voyage less than 400 miles in which case may reduce to 2 mates 46 USC 8301(a)(2)	Subject to Administration and STCW (same as I or L)
12. Hospital Space	None	Required by 92.20-35 if vessel makes voyages more than 3 days and carries 12 or more crew	Silent
13. Keel coolers	Allows attachment to hull using filet welds per 46 CFR 128.420	Attachment to hull must use full penetration welds per 46 CFR 56.50-96.	Silent
14. Stateroom capacity & size	For vessels >100GT: Max 4 persons/room for crew members @30 square feet/person; Max 6 persons/room for offshore workers @ 20 square feet/person (46 CFR 127.280)	Max 4 persons/room for crew members @ 30 square feet/person. Where <i>practicable</i> , each licensed officer must be provided with a separate stateroom (46 CFR 92.20-20)	Silent...but ILO has standards similar to 46 CFR: <b>ILO 1970 (C133)</b> Art 5.2.a: for ratings: vessels 1000 GT - 3000 GT: 30 square feet/person , 3000 GT - 10,000 GT: 35 square feet/person. Max 2 persons per room. <b>ILO 1949 (C92)</b> Art. 10.4 Vessels < 800 GT... 20 square feet/person; 800 GT - <3000 GT: 25 square feet/person 3000 GT and up 30 square feet/person 1 officer per room if in charge of navigation or engineering watch. Other officers may be 2/room. Ratings may be 4/room