

MSC Guidelines for the Review of Application for Foreign Liquefied Gas Carrier COC Endorsement

Procedure Number: C1-43

Revision Date: March 16, 2012



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Purpose

To establish the procedures for reviewing and processing Foreign Liquefied Gas Carrier Certificate of Compliance endorsement applications and generating Subchapter O Endorsements (SOEs).

References

- a. 46 CFR Subchapter O, Part 154
 - b. IMO Code for Existing Ships Carrying Liquefied Gases in Bulk, Resolution A.329(IX)
 - c. IMO Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk, Resolution A.328(IX)
 - d. IMO International Gas Carrier (IGC) Code, Resolution MSC.5(48) and Resolution MSC.30(61), 1993 Edition
 - e. Marine Safety Manual (MSM), Volume II, Section D, Chapter 6
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Contact Information

If you have any questions or comments concerning this document, please contact the Marine Safety Center (MSC) by email or phone. Please refer to the Procedure Number C1-43.

Email: MSC@uscg.mil

Phone: 202-475-3403

Website: <http://homeport.uscg.mil/msc>

Responsibilities

Using applicable portions of references (a) through (e), the submitter shall provide sufficient documentation and plans to indicate compliance with the applicable requirements. The submission shall be made electronically to the above email address or, if paper, in triplicate to the MSC's address found on the above website. To facilitate plan review and project management, all plans and information specified in these guidelines should be submitted as one complete package through a single point of contact for the project.

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General Guidance

The Marine Safety Center will:

- Determine whether the vessel's flag administration is signatory to SOLAS and MARPOL: (Status of Conventions is available at <http://www.imo.org/HOME.html>. Click the "Conventions" button, then view the Status of Conventions, Complete List)
- If the vessel's flag administration does NOT issue IMO Certificates, refer to 46 CFR 154.22 (b), reference (a). In this case, plans will be submitted and reviewed individually by respective branches in the standard method:
 - Account for all required parts of the application as per 46 CFR 154.15(b) regarding specific plans and information from 46 CFR, part 54, 56, 91 and 110.
- If vessel's flag administration does issue IMO Certificates:
 - Account for all required parts of the application. See 46 CFR 154.22 (a).
 - The vessel's valid IMO Certificate of Fitness (COF)
 - A description of the vessel
 - Specifications for the cargo containment system
 - A general arrangement plan of the vessel
 - A midship section plan of the vessel
 - Schematic plans of the liquid and vapor cargo piping
 - A firefighting and safety plan
 - If the applicant is requesting an endorsement for the carriage of ethylene oxide, a class society certification that the vessel meets 154.1725(a)(4),(5), and (7)
 - If the vessel is a new gas vessel, or an existing vessel that does not meet 154.12 (b), (c), or (d)
 - A certification from a class society that the vessel –
 - Has enhanced grades of steel meeting 154.170 and
 - Meets 154.701, or 154.703 and
 - The vessel's valid SOLAS Cargo Ship Safety Construction Certificate and Cargo Ship Safety Equipment Certificate.

Note: For an existing vessel initially was operating under U.S. Flag and then later on changed to another administration's flag, the item (9)(i) need not to be met. However, the vessel needs to meet 46 CFR 154.12 (b), (c) or (d) and 46 CFR 154.24 (b).

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- Verify that the vessel has a valid Certificate of Financial Responsibility (COFR) by using the National Pollution Funds Center's e-COFR search <https://npfc.uscg.mil/cofr/default.aspx>, or on the Certificates tab on the MISLE vessel screen.
 - Review certificates and plans, paying attention to validity dates, vessel identification information and content. Ensure that certificates are complete and signed by a representative of the flag state or class society.
 - Complete the Initial SOE Checklist, attached to this document and also located at www.homeport.uscg.mil/msc
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SOE Administration, General

Before May 2005, the SOE document specifically referenced a vessel's IMO Certificate of Fitness (COF) by certificate number, issue and expiration dates. As such, 46 CFR 154.1803 requires that a current COF be maintained on file at MSC for the vessel's Certificate of Compliance to remain valid.

In May 2005, the MSC modified the SOE procedures to eliminate the administrative overhead associated with updating and reissuing the SOE. After the initial SOE is issued, the owner/operator need only submit an updated IMO Certificate of Fitness (COF) to the Marine Safety Center if the subject vessel's cargo containment system and/or list of authorized cargoes on the IMO COF have changed.

Certification of Fitness Review, All Vessels

Because the newly formatted SOE no longer references a specific IMO COF, resubmission of the subject vessel's COF is not necessary when the name, issue/expiration dates, and/or certificate number changes. Therefore, if the vessel's cargo containment system and/or list of authorized cargoes on the IMO COF have not changed, the local Coast Guard Officer in Charge of Marine Inspections (OCMI) can issue the SOE after the COC inspection.

- The COF must have a valid signature and issue and expiration dates, and correct vessel name. Ensure that the certificate includes a list of authorized cargoes, conditions of carriage and a tank plan. The COF should follow the format prescribed in the IGC Code, reference (d).
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- Determine which resolution applies to the vessel based on the Build/Keel Laid date on the COF. This will determine whether the vessel is a “New” or “Existing” vessel. The following defines the current resolutions:

“Existing” Ships

- Code for Existing Ships Carrying Liquefied Gases in Bulk Resolution A.329 (IX), reference (b).
Adopted: 12 November 1975
Applies to: Ships delivered on or before 31 October 1976, or
Ships delivered after 31 October 1976 but prior to the application of the Gas Carrier Code (Resolution A.328 (IX))

“New” Ships

- Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (Gas Carrier Code), reference (c). Resolution A.328 (IX)
Adopted: 12 November 1975
Applies to: Ships for which a building contract is placed after 31 October 1976, or
In the absence of a building contract, the keel of which is laid or which is at a similar stage of construction after 31 December 1976, or

Ships for which the delivery date is after 30 June 1980,

or

Major conversions for which the contract was placed after 31 October 1976, or
In the absence of a contract, the conversion of which is begun after 31 December 1976, or
Conversion was completed after 30 June 1980.

- International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code), reference (d). Resolution MSC.5(48)
Adopted: 17 June 1983
Applies to: Ships for which the keel is laid, or
Construction identifiable with the ship began; and
assembly of that ship commenced comprising at least 50 tonnes or 1% of the estimated mass of all structural material, whichever is less, or

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Irrespective of the construction date, construction for conversion to a Gas Carrier that commenced, On or after 1 July 1986

- International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code) 1993 edition: Resolution MSC.30(61)
 - Adopted: December 1992, amendments that entered into force on 1 July 1994
 - Applies to: Ships for which the keel is laid, or Construction identifiable with the ship began; and assembly of that ship commenced comprising at least 50 tonnes or 1% of the estimated mass of all structural material, whichever is less, or On or after 1 October 1994
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Certificate of Fitness Review, New Vessels

Tank types will either be Integral; Independent Type A, B, or C; Membrane; or Semi-membrane. See reference (a) for definitions of the tank types.

- **Membrane and Semi-Membrane Tanks:** 154.426 limits the design pressure of these tank types to 24.5 kPa gauge without specific approval from Commandant, Hazardous Material Standards Division (CG-5215; was CG-5223) accepts a design pressure of 25 kPa. For tanks exceeding 25 kPa, the vessel must submit a waiver request to CG-5215 to operate in US waters at a higher pressure.
 - **Membrane, Semi-Membrane, or Independent Type B Tanks:** For an initial application, verify CG-5215 has previously approved the cargo containment system's conceptual design. If not, a request for special approval must be submitted to CG-5215, in accordance with 46 CFR 154.34. MSC will not issue an SOE if the tank design has not been approved by CG-5215. A table with a list of approved conceptual designs for each type is located at the end of this document.
 - **Independent Type A Tanks:** 154.438(a) limits the design pressure of these tank types to 69 kPa gauge. In Harbor MARVS are acceptable for Type A tanks, provided that they do not exceed this value.
 - **Independent Type B or Independent Type C Cargo and Deck Tanks:**
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- Check to ensure the proper stress factor was used in determining the Tank Maximum Allowable Relief Valve Setting (MARVS), based on the tank material. For Type C Tanks, use stress factor of A=4. For type B tanks see Table 2, 46 CFR 154. If an incorrect stress factor has been applied, the COF will not be accepted. See references (a) and (e), and 46 CFR 154.447.
- Ambient design criteria listed on the COF:
 - Check the minimum design temperature of the cargo tanks, which should be listed in the “Conditions of Carriage” section of the COF. Compare this to 46 CFR 154.459, Table 3 to determine if a secondary barrier is required. If a secondary barrier is NOT required, ensure the ambient design temperature values are less than or equal to 5°C for Air and 0°C for Water. (ref. (d) Ch. 4.7). These ambient temperatures are acceptable for all waters. If a secondary barrier is required, proceed to the following step.
 - If a secondary barrier is required, check the ambient design temperature values. Ensure they are less than or equal to -18°C for Air and 0°C for Water. This allows cargo carriage in the United States, EXCLUDING Alaska. For carriage in ALL US waters INCLUDING Alaska, ensure the temperatures are less than or equal to -29°C for Air and -2°C for Water. If the ambient design temperatures are not within these standards, the vessel must meet 46 CFR 154.178 for hull heating systems. If documentation is not provided certifying this, then the vessel can ONLY be authorized carriage of those cargoes that do NOT require a secondary barrier. See 46 CFR 154.459, Table 3, and 154.465/6.
- The MARVS must meet 46 CFR 154.405:
 - If the vessel has a refrigeration system meeting 46 CFR 154.702, the minimum design temperature of the tanks must be equal to or lower than the lowest cargo temperature at the MARVS pressure.
 - If no refrigeration system is installed, the MARVS must be greater than or equal to the vapor pressure of the authorized cargoes at 45° C (113° F). This is especially important when the US MARVS are lower than the IMO MARVS, and typically affects propane, propylene and

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- butane/propane mixtures. Butane/propane mixtures may be limited to a maximum propane content.
 - Cargoes with vapor pressures exceeding the MARVS may not be carried in US waters and will not appear on a vessel's SOE.
 - Pressure-Temperature curves may be found in several publications, including the Matheson Gas Data Book.
- Review the list of cargoes. Ensure that they are approved for carriage in the United States and are listed in Table 1 of 46 CFR 153 or Table 4 of 46 CFR 154, and are listed in Chapter 19 of the International Gas Carrier Code.
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Certificate of Fitness Review, Existing Vessels

Existing vessels were originally approved for cargo carriage in US waters based on vessel plan review. Therefore, as a general rule, the authorizations granted and/or restrictions placed on the vessel through the plan review process should remain in effect. Some general things we review are:

- Verify that the vessel had previously been issued a SOE based on USCG plan review. If no SOE has previously been issued, the vessel must be reviewed and certified under reference (c) or (d).
- Check the ambient design temperature values. Ensure they are less than or equal to 5°C for Air and 0°C for Water, in accordance with the International Gas Carrier (IGC) Code.
- Verify whether or not the vessel has been granted authorization for cargo carriage in Alaskan waters. Note: As a result of Coast Guard Plan Review, the vessel may have been granted authorization for carriage in Alaskan waters without Type C tanks and/or without meeting the lower ambient design temperatures. This authorization will remain in effect (i.e. we will not place Alaska Restriction on these vessels because the hull ambient design temperatures don't meet IGC Code). See 46 CFR 154.12 (b).
- Check the minimum design temperature of the tanks. The temperature must be equal to or lower than the lowest boiling temperature at atmospheric pressure of the cargoes being carried. If the minimum design temperature is not within this standard, the vessel must meet 46 CFR 154.701 for cargo refrigeration systems.

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- ❑ Compare the cargo list of the current COF to that of the previous COF and/or previous “new” format SOE. The lists should be the same. Only cargoes authorized through plan review should be carried. Authorization for other cargoes requires a special request. See procedures in 46 CFR 154.12.

Subchapter O Endorsement (SOE)

The following list details specific cargo carriage requirements which may appear on the vessel’s SOE depending on the cargoes authorized for carriage:

- ❑ Per chapter 17.20 of the ICG Code, Propylene Oxide is authorized for carriage subject to the following special restrictions:
 - Classification certification that the required cargo piping separation has been achieved must be on board the vessel and available to Coast Guard boarding personnel.
 - All gaskets which may contact propylene oxide liquid or vapor must be constructed from spirally wound stainless steel with a filler of Teflon or similar fluorinated polymer.
 - Neoprene, natural rubber, asbestos mixed with other materials, and materials containing oxides of magnesium (such as mineral wools) may not be used for packing, insulation, and similar items in the propylene oxide containment system and piping.
- ❑ Per chapter 17.16 and 17.20 of the ICG Code, the following requirements apply to the carriage of ethylene oxide/propylene oxide mixtures (containing a maximum of 30% ethylene oxide):
 - The requirements for propylene oxide listed in the Certificate of Fitness and listed above must be followed.
 - When this cargo is carried without refrigeration, the cargo tank relief valve setting shall not be less than 120 kPa gauge (17 psig).
- ❑ The following requirements apply to the cargo C-4 Mixture:
 - The weight percent of acetylene may not exceed 5.0 percent.
 - The weight percent of propadiene may not exceed 0.5 percent.
 - If the weight percent of butadiene exceeds 10 percent, the C-4 Mixture must be inhibited to prevent self-reaction in accordance with paragraph 11 above.
 - A manufacturer’s certificate specifying the composition of the cargo must be on board the vessel and available to Coast Guard boarding personnel.

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- ❑ Methyl acetylene propadiene mixtures (MAPP gas) shall be carried only in one of the two compositions specified in section 17.12.2 of the IMO Gas Code (Resolution A.328(IX)).

- ❑ The person in charge of the transfer of vinyl chloride shall ensure that:
 - Fixed or portable instruments shall be used to continuously monitor for vinyl chloride vapor leaks during vinyl chloride transfer operations. The method of monitoring and measurement shall have an accuracy (with a confidence level of 95 percent) of not less than $\pm 50\%$ from 0.25 through 0.5 ppm, $\pm 35\%$ from over 0.5 ppm through 1.0 ppm, and $\pm 25\%$ over 1.0 ppm;
 - Cargo transfer operation is discontinued or corrective action is initiated by the person in charge to minimize exposure to personnel whenever a vinyl chloride vapor concentration in excess of 1 ppm is detected. If the vinyl chloride vapor concentration exceeds 5 ppm for over 15 minutes, action to reduce the leak can be continued only if the respiratory protection requirements of 29 CFR 1910.1017 are met by all personnel in the area of the leak;
 - Those portions of cargo lines which will be open to the atmosphere after piping is disconnected are free of vinyl chloride liquid and the vinyl chloride vapor concentration in the area of the cargo piping disconnect points is not greater than 5 ppm;
 - Any restricted gauge fitted on a tank containing vinyl chloride is locked or sealed so that it cannot be used and a restricted gauge is not used as a check on the required closed gauge, nor as a means of sampling;
 - The words “CANCER-SUSPECT AGENT” are added to the warning signs required by 46 CFR 154.1830, and signs bearing the legend: “CANCER-SUSPECT AGENT IN THIS AREA, PROTECTIVE EQUIPMENT REQUIRED, AUTHORIZED PERSONNEL ONLY” are posted whenever hazardous operations, such as tank cleaning, are in progress;
 - A vessel undergoing cargo transfer operations be designated a “regulated area” having access limited to authorized persons and requiring a daily roster of authorized persons who may board, and;
 - Employees engaged in hazardous operations, such as tank cleaning, be required to wear and use respiratory protection in accordance with the provisions of 29 CFR 1910.1017 and protective garments, provided clean and dry for each use, to prevent skin contact with liquid vinyl chloride.

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- ❑ Based on the ambient design temperatures listed in the vessel's IMO Certificate of Fitness, the cargoes authorized for carriage in Paragraph 4 may not be carried in Alaskan waters.
- ❑ Discharge of a Moss-Rosenberg model Independent Type B cargo tank by over-pressurization is only authorized with the approval of the cognizant Captain of the Port. Otherwise, the "In Harbour" MARVS listed on the vessel's IMO Certificate of Fitness are not permitted in US waters.
- ❑ The following cargoes, listed on the IMO Certificate of Fitness, may not be carried in US waters because they are not regulated under the US Code of Federal Regulations:

C3/C4 (except under the conditions listed in the SOE)

Crude C4 Product (except under the conditions listed in the SOE)

Natural Gas Liquids

- ❑ The The following cargoes are subject to the provisions of MARPOL 73/78 Annex II. Their carriage is contingent on the vessel having on board an approved Procedures & Arrangements Manual and a valid International Pollution Prevention Certificate for the Carriage of Noxious Liquid Substances in Bulk which lists these cargoes:

Diethyl ether

Ethylene oxide/propylene oxide mixtures (containing a maximum of 30% ethylene oxide)

Isoprene

Isopropylamine

Monoethylamine

Pentanes (all isomers)

Pentenes (all isomers)

Propylene oxide

Vinyl ethyl ether

Vinylidene chloride

Attachments:

- ❑ SOE Checklist
 - ❑ Cargo Containment Concept Approvals Issued by CG-5215
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Disclaimer:

This guidance is not a substitute for applicable legal requirements, nor is it itself a rule. It is not intended to nor does it impose legally-binding requirements on any party. It represents the Coast Guard's current thinking on this topic and may assist industry, mariners, the general public, and the Coast Guard, as well as other federal and state regulators, in applying statutory and regulatory requirements. You can use an alternative approach for complying with these requirements if the approach satisfies the requirements of the applicable statutes and regulations. If you want to discuss an alternative, you may contact the MSC, the unit responsible for implementing this guidance.