

**Section A: Marine Inspection Administration**

**CHAPTER 4: APPROVAL OF PLANS AND SPECIFICATIONS**

**A. INTRODUCTION**

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, or 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.

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**B. SUBMITTAL PROCEDURES**

Plans may be submitted to the OCMI, the Marine Safety Center (MSC), Commandant (G-MOC), or to the American Bureau of Shipping (ABS) in accordance with NVIC 3-84 or the Memorandum of Understanding between the Coast Guard and ABS as discussed in NVIC 10-82, CH-2.

- 1. Submittal to the OCMI** When the OCMI receives a set of plans, he should determine the extent of the new construction or conversion project and decide whether he or the MSC will review the plans. In many cases, the OCMI may determine that he does not have either the personnel or the technical resources to conduct plan review. In such instances, the plans should be examined for the presence of any items that warrant special attention, and then forwarded to the MSC for review. When plans are reviewed by the OCMI, they should be stamped "Approved," "Disapproved," "Return for Revision" or "Examined." The stamp should include the date and the OCMI's signature. At least one set of the plans should then be returned to the originator with a cover letter that includes any outstanding comments. At least one set of the plans should be retained on file by the OCMI.

- 2. Submittal to the MSC** Plans may be submitted directly to the MSC. Whenever this is done, the MSC normally will not begin plan review until receipt of an application for Inspection for Certification by the cognizant OCMI has been confirmed. Three copies of each plan should be submitted to the MSC for review. Upon completion of plan review, one set of the plans with the comment letter will be returned directly to the originator, one set will be retained by the MSC, and a third set will be forwarded to the OCMI having jurisdiction over the vessel. In view of the proximity to and personal knowledge which the OCMI may have of the vessel and its intended service or operating area, the OCMI may determine that certain items do not comply with applicable regulations or do not provide the degree of safety required. In these cases, the MSC should be notified promptly of any items that the OCMI considers worthy of special consideration or reconsideration. OCMI's are encouraged to communicate with the MSC or Commandant (G-MOC), as appropriate, when requests are received for inspection of new construction, major repairs, or conversions for which approved plans and related correspondence are not held.

- 3. Submittal to ABS** The provisions of NVIC's 10-82, Change 2, and 3-84 apply.

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**C. PLANS AND SPECIFICATION DESIGNATIONS**

Whenever plans of inspected vessels are submitted, they must be identified by vessel name and official number whenever known. In the case of a new vessel, designation by shipyard work order number or hull number is sufficient until the vessel name is known; then the vessel's name shall also be given. In the conversion of an existing vessel, the new name shall be given whenever known, as well as the former name and type designation. Tank vessel plans shall be accompanied with information concerning the grades of liquid cargo the vessel will carry and its proposed service. Tank barges shall also be designated as manned or unmanned.

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**D. SPECIAL SUBMITTAL PROCEDURES**

**1. Submittal of Electrical Plans**

Submittal to the OCMI

- a. When electrical plans required by 46 CFR 110.25 are submitted to the OCMI, the following plans are to be forwarded to the MSC for action:
  - (1) Switchboard wiring diagram;
  - (2) Switchboard material and nameplate list;
  - (3) Elementary wiring diagram of metering and automatic switch gear;
  - (4) Description of operation of propulsion control and bus transfer switch gear;
  - (5) Elementary one-line wiring diagram of power system;
  - (6) Electric plant summary showing connected loads and calculated operating loads for various conditions of operation;
  - (7) Elementary wiring diagram of steering gear alarm circuits and ventilation shutdown control general alarm system and fire protection system;
  - (8) Elementary wiring diagram and isometric or deck wiring diagrams of electric watertight door system and power operated lifeboat winches; and
  - (9) Hazardous locations drawing.

Review by either OCMI or MSC

- b. Other plans listed in 46 CFR 110.25 not listed above may be acted upon directly by the OCMI, or they may be transmitted to the MSC for action.

Revisions to Plans

- c. Subsequent revisions of the plans listed above may be acted upon directly by the OCMI, or they may be submitted to the MSC for action. When major changes or revisions are made on these plans, they must be forwarded to the MSC for action.

**2. Submittal of Cargo Gear Plans**

Plans for cargo gear that have been reviewed and approved by ABS or the International Cargo Gear Bureau, Inc. (ICGB) need not be submitted to the Coast Guard for further review and approval.

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**3. Submittal of Boiler Plans** Boilers must be designed in accordance with 46 CFR Parts 52 or 53. These parts adopt section I and section IV of the American Society of Mechanical Engineers (ASME) Code with modifications to account for the marine environment. It is imperative that the additional requirements in parts 52 or 53 be identified and met in the design stage to avoid possible rejection of the boiler during installation. For boilers constructed in accordance with 46 CFR Part 52, plans and calculations must be certified by a registered professional engineer (RPE) licensed by one of the fifty states of the United States, the District of Columbia, or U.S. Territories. The RPE's license should be current at the time he certifies any plans or calculations. The RPE's certification must appear on each design drawing and on the front page of the design calculations. In addition, the professional engineer should provide a signed statement that the boiler meets the applicable Coast Guard design requirements. The plans must be submitted as early as possible to the MSC for review prior to installation of the boilers. The plans will be reviewed only to the extent necessary to establish that the correct procedures for design certification are being followed. For boilers constructed in accordance with 46 CFR Part 53, plans and calculations are not required to be submitted. Boilers which are automatically controlled must have their control plans approved (see 46 CFR Part 63).

**4. Submittal of Pressure Vessel Plans**

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| Requirements               | a. Plans and calculations for Class I-L and II-L pressure vessels, and for those pressure vessels that contain hazardous materials, must be submitted to the MSC for approval. For other pressure vessels, see 46 CFR 54.01-5 and 54.01-15 for the applicable guidance. Plans required to be made available to the inspector under 46 CFR 54-01-5(e) need only be requested for pressure vessels of unusual design, service or pressure.  |
| Certification by a RPE     | b. A RPE may certify a sepia or original drawing, provided the date of certification is also included. Blueprints made from a certified sepia or original drawing are acceptable provided the copy of the RPE's certification is legible. Some RPEs certify a plan by stamping it; others by signing and dating a plan and then embossing the signature with a raised seal. If the certification is done with a raised seal on the original plan (sepia, etc.), then the information contained thereon must be reproducible on all copies.  |
| Method of Certifying Plans | c. All plans shall be certified by the RPE that they are in compliance with section VIII, division 1 of the ASME Code as modified by 46 CFR Part 54. There are no requirements as to the specific wording that must be used by the RPE in making this certification. The certification may appear on the original plan, from which copies may be made, or the RPE may place an original signature and certification on copies of each plan. It may also appear on each page of the calculations, or there may be one certification for the entire set of calculations. The method of certification should be to the satisfaction of the OCMI, but it is recommended that a consistent method be used that either provides for each plan being notated, or a certification statement be made on a cover letter that includes a list of all applicable plans by number, title and revision or alteration. |

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Alterations

d. Alterations and revisions to plans are to be dated. Those revisions which are made to a plan after it is certified by a RPE, but before the pressure vessel is installed, must be checked and again certified by the RPE as being in compliance with the Code and part 54. Alterations or repairs to pressure vessels which have been put into service need not be certified by a RPE, but are to be approved and inspected by the cognizant OCMI.

**5. Submittal of Structural Fire Protection Plans for Certain Small Passenger Vessels**

Structural fire protection plans for new construction small passenger vessels that will either carry more than 150 passengers or which have overnight accommodations for more than 49 passengers are to be submitted to the MSC for action.

Plans Returned for Revision

a. In cases where the MSC finds major or numerous minor structural fire protection deficiencies, the plans are returned to the owner or designer by the MSC for revision. This is equivalent to a requirement issued by the CO, MSC, to the effect that he is not satisfied with the existing design and changes must be made to meet compliance with the regulations. Appeals or questions concerning the extent of design changes required are to be directed to the MSC. The MSC should consult with the OCMI when resolving appeals or considering requests for equivalency.

Plans Approved, with Comments

b. When numerous minor deficiencies exist or areas remain that are unclear to the plan reviewer, but can be resolved more readily by the OCMI, the plans are marked "Approved with Comments" and forwarded to the cognizant OCMI. At this point the CO, MSC has completed action on the plan and the responsibility for assuring compliance and resolving comments shifts to the OCMI. The OCMI then has the discretion to either require compliance with the MSC's comments, or to accept alternate arrangements that satisfy the intent of the regulations. Questions of compliance with comments forwarded with an approved plan, and appeals of inspection issues are properly addressed to the OCMI.

Resolving Outstanding Deficiencies.

c. During the final inspection for certification, the status of all structural fire protection plan submissions should be verified by the responsible inspector. If any plans remain that are still marked "Return for Revision," it is incumbent upon the OCMI and the MSC to work closely together to determine the status of any outstanding deficiency, and the necessary corrective action to be taken. Serious deficiencies should result in either a delay in certification until the plans are revised and approved and the deficiency corrected, or the issuance of a CG-835 to complete the plan review process and make any necessary modifications within a specified period of time. Restrictions on the number of passengers authorized may also be appropriate.

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**6. Submittal of Plans for SOLAS Foreign Passenger Vessels**

Vessels Over 100 Gross Tons

a. Plan review is considered a matter of routine for those foreign flag vessels over 100 gross tons having berth or stateroom accommodations for at least 50 passengers. 46 USC 3505 prevents a foreign vessel from departing a U.S. port with passengers embarked if the Secretary determines that the vessel does not comply with SOLAS. NVIC 1-85 addresses the procedures for plan submittal in verification of a vessel's compliance with the applicable fire safety standards. This plan review, although not required by law or regulation, is essential to the timely conduct of the initial examination. If the owner/operator/builder fails to take advantage of this opportunity, it is likely that a full and thorough inspection cannot be performed without significant delay. When an OCMI has advance knowledge of an initial U.S. voyage of a vessel in this category, he should make known to the appropriate vessel representatives the importance of plan submission. See chapter 20 for additional information on foreign passenger vessels.

Lead Time

b. Plans should be submitted to the MSC at least 45 days prior to arrival of the vessel at its first U.S. port of call. Earlier submission is encouraged, but should not be more than 90 days.

Verification

c. The plan review conducted by the MSC is to verify, not approve, compliance with the applicable standards and to facilitate the initial examination. Thus, plans submitted to the MSC should indicate Flag Administration approval. Upon completion of both fire safety and stability plan review, the MSC will forward the results to the OCMI with the plans. The submitter will also be advised of the results, particularly if deficiencies are noted or more information is required.

Conceptual Review

d. If, in the design stage or early in the construction stage, an owner or builder wants to discuss design to ensure acceptance, they should be directed to G-MOC for conceptual review. Where vessels have employed novel design features based on interpretation of SOLAS, even timely plan review under NVIC 1-85 may not ensure the vessel will be acceptable for U.S. operations. Thus, the OCMI should encourage contact with G-MOC early in the design or construction phases, if known to him/her, unless deemed clearly unnecessary.

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**E. SEQUENCE OF PLAN SUBMITTALS**

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**1. General Requirements** For the proper evaluation of construction plans for a vessel, it is essential that the following basic plans for all vessels, except those inspected under 46 CFR, Subchapter T, be forwarded prior to submittal of the other plans listed in 46 CFR:

- a. Specifications (hull, machinery, and electrical);
  - b. General arrangement plans;
  - c. Midship section;
  - d. Lines;
  - e. Curves of form;
  - f. Calculation of intact stability;
  - g. Capacity plan; and
  - h. One-line wiring diagram of electrical system.
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**2. Passenger Vessels** In the case of passenger vessels inspected under Subchapter H, the following additional plans shall also be submitted:

- a. Floodable length curves;
  - b. Calculations of stability in intact and final flooding conditions; and
  - c. Fire control plan.
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**F. PLANS FOR IDENTICAL TANK BARGES**

Construction of a barge is sometimes identical in structure and piping to that of a previously approved barge. To avoid duplication and unnecessary submittal of plans, the following procedures should be followed:

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- 1. Proposed Barges** Only general design, hull structure, electrical, and piping plans need be submitted to the MSC for approval.

**NOTE:** The barge must be built in the same yard as the first one.

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- 2. Extensions of Approvals** When a barge is identical in construction to one previously approved, it is not necessary to submit plans for it. Extension of the existing barge's approval can be given for the new barge by letter from the cognizant OCMI. The MSC should be informed of the new barge's hull and contract numbers so that its records can be kept current.

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- 3. Non-structural Details** The details of construction of any barge, such as connections or deck fittings, that do not involve the vessel structure need not be submitted to the MSC for action, but may be approved by the OCMI.

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- 4. Alterations** When construction previously approved is changed by a significant alteration, the plans referred to in subparagraph F.1 above should be resubmitted to the MSC for consideration. The significance of the alteration is to be determined by the OCMI on the merits of the particular case.
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**G. APPROVAL PROCEDURES**

The information provided below is in addition to the requirements for these plans contained in the applicable subchapters of 46 CFR and various sections of 33 CFR. These standards are suitable for typical vessels. When reviewing plans for a vessel of unusual form, arrangement, or construction, the same degree of safety as established in these standards must be maintained.

**1. Passenger Vessel Plans**

General Standards

- a. The ABS Rules for Building and Classing Steel Vessels will generally be accepted as a standard for the review of structural plans for the construction, alteration, or repair of typical passenger vessels.

Uses of Insulation and Covering Materials

- b. Approved structural insulation, bulkhead panels, and deck coverings may be used to achieve various structural fire protection classifications for steel bulkheads and decks required by 46 CFR 72.05. To provide information for shipbuilders and others concerned, a "Guide to Structural Fire Protection Aboard Merchant Vessels," has been published. The sketches accompanying this NVIC show the types, thicknesses, and relative positions of materials necessary to meet Class A-60, A-30, or A-15 requirements. Class A-0 construction is not included because no insulation is required on structural steel bulkheads or decks to meet Class A-0 requirements. Since it is obviously impossible to anticipate all combinations of materials which might be used, approval will be given to arrangements differing from these sketches if equivalent integrity and heat transmission qualities are provided. Approved insulation, bulkhead panels, and incombustible materials are listed in the Equipment Lists, Commandant Instruction (COMDTINST M16714.3, previously CG-190). Current changes are published in the Federal Register and the Federal Register reprint

**2. Cargo and Misc. Vessel Plans**

The ABS Rules for Building and Classing Steel Vessels or Rules for Building and Classing Steel Vessels under 61 Meters (200 Feet) in Length will generally be accepted as a standard for the review of structural plans for the construction, alteration, or repair of cargo and miscellaneous vessels.

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**3. Mobile Offshore Drilling Units (MODU's)** The ABS Rules for Building and Classing Mobile Offshore Drilling Units (MODU's) and Det Norske Veritas Rules for Classification of Mobile Offshore Units will generally be accepted as standards for the review of structural plans for the construction, alteration, or repair of MODU's.

**4. Tank Vessel Plans**

Plan Approval a. The ABS Rules for Building and Classing Steel Vessels will generally be accepted as a standard for the review of structural plans for the construction, alteration, or repair of tank ships. The ABS Rules for Building and Classing Steel Vessels for Service on Rivers and Intracoastal Waterways and the Rules for Building and Classing Steel Barges for Offshore Service are accepted as standards for the determination of scantlings for tank barges.

Construction Details Affecting Cleaning/Gas-Freeing of Cargo Tanks b. Particular care must be taken to avoid any arrangement of the structural members that would prevent effective cleaning or gas-freeing of a liquid cargo tank. Adequate provisions should be shown for drainage in all longitudinal and transverse members within a tank. Any arrangement of longitudinals, stiffeners, skegs, bilge keels, fenders, or other members that results in the creation of a possible gas pocket, either in the cargo tanks or in areas contiguous to these tanks, may not be approved.

**5. Plans for Scuppers, Sanitary Discharges, Tank Overflows, Overboard Discharges, Etc.** Explanatory discussions and sketches of installations that will be approved are set forth in various NVIC's. Proposed methods other than those specifically illustrated in these NVIC's may be approved if they meet the applicable requirements of 46 CFR 56.50-95.