

U.S. Department of
Homeland Security

United States
Coast Guard



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16711/Serial No. 1530
CG-CVC Policy Letter 17-07
October 19, 2017

A handwritten signature in blue ink that reads "M. Edwards".

From: M. EDWARDS, CAPT
COMDT (CG-CVC)

To: Distribution

Subj: REQUIRED PLAN REVIEW AND DESIGN VERIFICATION TESTING ON SMALL
PASSENGER VESSELS

Ref: (a) Plan Review Guide E2-23: MSC Guidelines for Electrical Plans – Small Passenger
Vessels, dated 26 July 2017

(b) CG-ENG-3 Memorandum: “Microprocessor and Computer based Propulsion
Engine Control Systems on K and T Vessels”, dated 07 June 2017

1. PURPOSE. This guidance is to assist vessel owners and operators of small passenger vessels (SPV) and Officer(s) in Charge, Marine Inspection (OCMI) with the plan review and testing of propulsion control systems that use microprocessors.
2. DIRECTIVES AFFECTED. None.
3. BACKGROUND. The regulations do not clearly address the appropriate level of review required for the broad array of propulsion control systems found on SPVs, nor is there established guidance identifying which plans are required for the initial design review and subsequent testing under 46 CFR 115.804 or 46 CFR 176.804. The lack of guidance has resulted in OCMI's applying inspection criteria inconsistently between zones and raising concern within the industry.
4. DISCUSSION. There are automated systems, including electronic propulsion control, installed on Subchapter T and Subchapter K vessels that have a critical impact on propulsion and vessel safety, that were not envisioned during the last revision of Subchapter T or the creation of Subchapter K.

Design review and inspection of Subchapter T vessels propulsion controls are based on 46 CFR 184.620, which does not specify details for the use of microprocessors. This limited regulatory requirement does not provide the level of detail needed to address potential concerns for these designs.

While most new Subchapter K vessels readily comply with 46 CFR 121.620 at the time of construction, a growing number of existing vessels are receiving updated control systems.

Reference (a) has been revised to better align with the current technology being installed and submitted for review for both Subchapter T and K vessels, as well as take into account plan review policy guidance provided by CG-ENG-3 in reference (b).

5. ACTION. Owners and operators of small passenger vessels and Coast Guard field units should use this guidance for the plan review and testing criteria of propulsion control systems on small passenger vessels that use microprocessors.
6. POLICY. Small passenger vessel automation has two components, Plan Review and Testing, with each Subchapter having different requirements for the two components in keeping with the tiered regulatory scheme of Subchapters T and K.
 - a. Definitions:
 - i. QFA – Qualitative Failure Analysis. A document identifying the assumed outcomes of individual component failures.
 - ii. DVTP – Design Verification Test Procedure. A detailed test procedure to verify each failure mode identified in the QFA.
 - iii. Cause or “for cause” – An indication or reasonable assumption, based on objective evidence, that the system or device is not working properly or may have been altered from the manufactures’ standard or design. A trend of chronic malfunctions or repeated operator throttle control faults, especially if a failure contributed to a casualty, should be considered cause.
 - iv. Electronic propulsion control – A throttle or other mechanism, using a microprocessor or computer, to control vessel propulsion (i.e. main engine speed or propeller pitch).
 - b. Plan Review: Refer to reference (a) for details on plan review requirements including QFA and DVTP. In general, Subchapter T vessels are required to submit a limited QFA. Subchapter K vessels are required to submit a QFA and DVTP.
 - c. Testing protocols.
 - i. For Subchapter T vessels with electronic propulsion control systems using microprocessors or computers, Automation Testing should be limited to testing the functionality outlined in 46 CFR 184.620, which requires that: “a loss of power to the control system does not result in an increase of shaft speed or propeller pitch.” This testing shall be conducted in accordance with the Marine Safety Center (MSC) accepted and reviewed testing protocol at new construction or when new machinery is installed or substantially upgraded. Subsequent Automation Testing shall be at the discretion of the attending marine inspector as they deem reasonable and necessary. The results of these tests should be entered in Marine Information for Safety and Law Enforcement (MISLE).

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- ii. For Subchapter K vessels with electronic propulsion control systems using microprocessors or computers, Automation Testing should be conducted in accordance with the MSC approved DVTP at commissioning. Subsequent Automation Testing should be in accordance with the MSC approved DVTP at the discretion of the attending marine inspector for cause and at least once every 5 years. The results of these tests should be entered into MISLE.
 - d. Existing Vessels: Some existing SPVs may not have had the level of documented plan review by MSC or testing by the field discussed in this policy letter while other vessels may have MSC approved QFA/DVTP documents. OCMI's may continue with existing operator throttle control testing methods unless vessel systems are upgraded or there is a demonstrated cause to conduct plan review. The MSC is available at the OCMI's request to provide technical assistance if it is determined that the existing documentation is insufficient. It is not intended that previously approved combined QFA/DVTPs be resubmitted for approval as separate documents. It is also not intended that existing SPVs, without a QFA/DVTP on file with MSC, submit those documents unless required by the OCMI for cause as stated above.
7. ENVIRONMENTAL ASPECT AND IMPACT CONSIDERATIONS. Environmental considerations were examined in the development of this Instruction and have been determined to be not applicable.
8. DISCLAIMER. This policy letter guidance is neither a substitute for applicable legal requirements, nor a rule. It is not intended 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. An alternative approach may be used for complying with these requirements if the approach satisfies the requirements of the applicable statutes and regulations. If you want to discuss an alternative approach (you are not required to do so), you may contact the Coast Guard Office of Commercial Vessel Compliance (CG-CVC) who is responsible for implementing this guidance.
9. QUESTIONS. Questions concerning this policy letter and guidance should be directed to the Office of Commercial Vessel Compliance, COMDT (CG-CVC), Domestic Compliance Division at CG-CVC-1@uscg.mil. This policy letter and other domestic vessel policy documents are posted on the CG-CVC website at http://www.uscg.mil/hq/cgevc/cvc/policy/policy_letters.asp.

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