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## MEMORANDUM

From: [REDACTED] LCDR  
CG MSC, Machinery Branch Chief

Reply to [REDACTED]  
Attn of: [REDACTED]

To: CWO [REDACTED]  
USCG Sector New York, Prevention Department

Subj: MARINE SAFETY CENTER RESPONSE TO SECTOR NEW YORK FOR THE  
SANDY GROUND (O.N. 1299657) FERRY FIRE INVESTIGATION

Ref: (a) U.S. Coast Guard Sector New York Document, "Questions for Marine Safety  
Center," 1 sheet, undated

This is a response to reference (a), submitted by your email dated May 9, 2023 (MSC Project No. P019233, Document No. 2313718). Below is our response to the 8 questions you posed regarding the plan review process for fuel oil systems on Subchapter H vessels. Your questions are provided in italics for ease of reference. Please contact LT [REDACTED] with questions concerning our response.

*What are the engineering design considerations taken into account during review of fuel oil service and transfer systems for passenger ferry vessels in order to meet compliance with 46 Subchapter H?*

1. Plan review is conducted to determine compliance with the requirements outlined in 46 CFR Subchapter H. As per 46 CFR 77.03-1(a), systems of a marine engineering nature are to meet the requirements of Subchapter F. Subchapter F predominantly regulates the design standards and system integration of piping, tanks, valves, deck/bulkhead penetrations, vents, fills, sounds, and filters. The Plan Review Guide on MSC's website, E1-10 Fuel Oil Systems, gives a detailed account of what is reviewed for these systems, applicable regulations, and required design standards.

*Does the Marine Safety Center examine engine room fuel oil service and transfer system plan review drawings for the incorporation and installation of fuel oil return isolation valves on the return piping to the fuel oil service (day) tanks? If so, what are the requirements for these components?*

2. There is no regulation preventing or requiring the use of a valve in the fuel return line. Generally, return line pipes penetrate fuel tank tops and are not subject to head pressure from the tank. However, while rare, when a fuel return line pipe penetrates the side or bottom of a tank, the independent tank requirements listed in 46 CFR 58.50 and requirements for pipes penetrating

tanks of 46 CFR 56.50-60 apply. Any valves in the fuel oil system are reviewed for material and pressure applications in accordance with 46 CFR 56.60. The most common arrangement is a check valve installed at the tank on the fuel return line to prevent the backflow of fuel. The installation, as with all MSC plan review, is subject to the satisfaction of the cognizant OCMI. We review the intended plans on a technical basis for regulatory compliance. Any modifications or changes during construction of a vessel are outside our purview unless updated drawings are submitted to our office.

*Does the Marine Safety Center examine engine room fuel oil service and transfer system plan review drawings for the incorporation and installation of pressure relief valves in the fuel oil return piping to the fuel oil service (day) tanks? If so, what are the requirements for these components?*

3. There is no direct regulation for pressure relief valves in fuel oil systems, any pressure relief device would be reviewed to the associated regulation. Current staff engineers do not have any knowledge of a fuel return line review incorporating a pressure relief valve as return lines are normally low-pressure systems, draining into a tank at ambient pressure. Virtually all fuel return lines are designed such that the piping has a higher design pressure than the system's maximum allowable working pressure as required by 46 CFR 56.07-10(a)(1). Therefore, relief valves would not be required nor are they needed to safeguard the system from higher pressures as noted in 46 CFR 56.07-10(b). Conversely, there is no specific guidance prohibiting their use; however, it must meet all fuel oil piping requirements outlined in 46 CFR Subchapter F. Actuation of a pressure relief valve must not release excess fuel oil directly into the space.

*What comments/recommendations, if any, does the Marine Safety Center have on the design, configuration, and use of two-fuel service (day) tanks and fuel storage tanks versus the use of full day tanks onboard the vessel?*

4. Our understanding is the intent of this question is to evaluate the use of two day tanks versus one day tank filled fully. MSC does not have any design input on the use of two tanks versus using a single day tank assuming all of the tanks and associated transfer piping comply with the applicable requirements. Either configuration is evaluated the same to the independent tank and fuel oil system requirements. Potential operational considerations are outside MSC's purview.

*Does the Marine Safety Center have any documentation that outlined the review of additional ball isolation valves (one per day tank) in the fuel oil service return piping that returns fuel oil back to the two-fuel oil service (day) tanks? If so, could you provide this documentation?*

5. MSC did not receive and has not conducted any plan reviews reflecting additional ball isolation valves for the day tanks in the fuel oil service return piping on the subject vessel. In the initial submission, one isolation ball valve is located in the return piping to separate the two day tanks. As designed, even when closed, all engines have the ability to return fuel to at least one of the two-day tanks. If they had submitted additional plans, the ball valves in the return piping would have been reviewed as stated in questions 1 and 2 above.

*Does the Marine Safety Center have any requirements for the installation of pressure relief valves in fuel oil return systems of vessels with manned engine rooms?*

6. As mentioned above, there is no direct requirements for pressure relief devices in fuel oil return systems; there is no change in the review process for a manned versus unmanned space.

*Does the Marine Safety Center have any requirements for the installation of pressure relief valves in fuel oil return systems of vessels classed as "ACCU" Automatic Control System Certified?*

7. Vessel class has no impact on our scope of review. All plans are reviewed to be in compliance with 46 CFR and the associated subchapters. There are times where the CFR may point to an accepted industry standard, but we do not have any impact on whether a vessel is classed as "ACCU". More broadly, review of automated systems is handled by the Electrical Branch and not covered in a machinery piping system review. Further, the Electrical Branch would only review pressure relief valves within the context of automation if they had the potential to impact the PSTP and/or QFA/DVTPs.

*What percentage of Subchapter H vessels that have been examined by MSC are constructed with pressure relief valves in the fuel oil return system?*

8. MSC is not capable of determining the number of vessels that have been constructed with pressure relief valves in the fuel oil return system. The current staff engineers do not have any recollection of having seen a return line with a pressure relief valve.

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