MSC Guidelines for Review of Foam Systems

Procedure Number: E1-11 Revision Date: 01/12/00

References

a. Except as provided by this procedure, all CFR references will be from Title 46-Shipping.

b. Tank Vessels (Subchapter D) must meet 34.17 Fixed Foam Extinguishing Systems and 34.20 Deck Foam System, when applicable.

c. Passenger Vessels (Subchapter H) must meet 76.17 Foam Extinguishing Systems, when applicable.

d. Cargo ships (Subchapters I and I-A) must meet 95.17 Foam Extinguishing Systems, when applicable.

e. Navigation and Vessel Inspection Circular (NVIC) 6-72 Guide to Fixed Fire-Fighting Equipment Aboard Merchant Vessels can be used as a guide to supplement the engineering design process of above systems and other vessels which are not addressed above.

f. Equipment Lists – (COMDINST M16714.3 Series)

g. Safety of Life at Sea (SOLAS) Chapter II-2, Regulations 8, 9, and 61, when applicable.

Disclaimer

These guidelines were developed by the Marine Safety Center staff as an aid in the preparation and review of vessel plans and submissions. They were developed to supplement existing guidance. They are not intended to substitute or replace laws, regulations, or other official Coast Guard policy documents. The responsibility to demonstrate compliance with all applicable laws and regulations still rests with the plan submitter. The Coast Guard and the U. S. Department of Transportation expressly disclaim liability resulting from the use of this document.

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Fixed Foam Extinguishing System

Materials

- All piping, valves, and fittings shall meet the applicable requirements of Subchapter F. (34.17-15(a), 76.17-15(a) and 95.17-15(a))

- All piping, valves, and fittings of ferrous materials shall be protected inside and outside against corrosion. (34.17-15(b), 76.17-15(b) and 95.17-15(b))

- Piping shall not be used for any other purpose than firefighting, drills and testing. (34.17-15(e), 76.17-15(e) and 95.17-15(e))

Application

- For machinery spaces and pumprooms, the system shall be so arranged as to spread a blanket of foam over the entire tank top or bilge of the space protected. Where an installation is made to protect an oil-fired boiler installation on a flat which is open to or can drain to the lower engineroom or other space, both the flat and the lower space shall be fitted with suitable coamings on all openings. (34.17-5(a), 76.17-5(a) and 95.17-5(a))

- The rate of discharge to foam outlets protecting the hazard shall be at least 1.6 gallons per minute for each 10 square feet of protected area for at least three minutes. The total available supply shall be at least sufficient for the space requiring the greatest amount. (34.17-5(b) through (d), 76.17-5(b) and (c), and 95.17(b) through (d))

- The water supply shall be from outside and completely independent of the space protected. (34.17-5(e), 76.17-5(c)(3) and 95.17(e))

- The foam agent, its container, measuring devices, and other items shall be of an approved type. (34.17-10(a), 76.17-10(a) and 95.17-10(a))

- The foam-producing material container and all controls and valves for the operation of the system shall not be located in a space which might be made inaccessible in the event of a fire in any protected space. (34.17-10(b), 76.17-10(b) and 95.17-10(b))

Additional Requirements

- At least 2 fire hydrants shall be installed outside the machinery space entrance with approved combination nozzle, applicator, and self-cleaning strainer such that any part of the machinery space may be reached with at least 2 streams of water. This is in addition to the fire hydrants required by

MSC Work Instruction E1-9 Firemain Systems. (34.17-25, 76.17-25 and 95.17-25)

- Existing Tank Vessels (Subchapter D) prior to 1962 have exceptions listed in 34.17-90. Existing Passenger Vessels (Subchapter H) prior to 1952 have exceptions listed in 76.17-90. Existing Cargo Vessels (Subchapter I and I-A) prior to 1952 have exceptions listed in 95.17-90

Additional Requirements for Passenger and Cargo Vessels

- In addition to the above requirements, where a system is installed to protect a tank, the rate of discharge shall be at least 1 gallon per minute for each 10 square feet of protected area for at least five minutes (76.17-5 and 95.17-5)

Deck Foam System

Systems of this type are designed to give primary protection to cargo tanks.

Materials

- All piping, valves, and fittings shall meet the applicable requirements of Subchapter F. (34.20-15(a))

- All piping, valves, and fittings of ferrous materials shall be protected inside and outside against corrosion. (34.20-15(b))

- At least 50 percent of the required rate of application shall be from the mounted appliances. One or more hose outlets for hand-held appliances shall be provided at each foam station. For enclosed spaces, application of at least 1.6 gpm water rate for each 10 square feet of the enclosed area for at least 5 minutes is acceptable. (34.20-15(c))

- Piping shall not be used for any other purpose than firefighting, drills and testing. (34.20-15(f))

Application

- The water rate of the foam production equipment shall be determined as follows (34.20-5(b)):

    - For usual petroleum products the rate of supply of foam solution shall be not less than the greatest of the following (for the purpose of this section, the term cargo deck area is defined as the maximum beam of the vessel times the total longitudinal extent of the cargo spaces):

a. 0.6 lpm (liters/min)/square meter (0.015 gpm/square feet) of cargo tanks deck area;
b. 6.0 lpm/square meter (0.147 gpm/square feet) of the horizontal sectional area of the single tank having the largest such area; or
c. 3.0 lpm/square meter (0.073 gpm/square feet) of the area protected by the largest monitor, such area being entirely forward of the monitor, but not less than 1250 lpm (330 gpm).

- For polar solvent products the water rate shall be determined by the approved manufacturers 'design manuals.

- For vessels that have a keel laying date on or after January 1, 1975, each deck foam system must have a supply of foam-producing material sufficient to operate the system at the above water rate for at least 20 minutes without recharging. (34.20-5(c))

- Where the same foam-producing material may be used for this system as well as a fixed foam system, separate supplies need not be provided for each space protected. The total available supply shall be at least sufficient for the space requiring the greatest amount. (34.20-5(d))

- Fire pumps may be used for the deck foam system as long as simultaneous operation will not interfere with the use of the fire main system. (34.20-5(e))

- The foam agent, its container, measuring devices, and other items shall be of an approved type. (34.20-10(a))

- The foam-agent container and the main controls for operating this system shall not be located in a space which might be made inaccessible in the event of a fire in any protected space. (34.20-10(b))

- The capacity of each foam monitor must be at least 3.0 lpm/square meter (0.073 gpm/square feet) of cargo area protected by that monitor. (34.20-25)

- Installations contracted for prior to 1970 have exceptions listed in 34.20-90.