
Safe Handling of Condemned Fire Extinguishers

1. Purpose

- 1.1. This Safety Alert is issued by the Bahamas Maritime Authority to highlight the risks associated with handling condemned fire extinguishers. It is based on the preliminary findings of a Marine Safety Investigation into a Very Serious Marine Casualty.

2. Introduction

- 2.1. A Bahamas flagged tanker was alongside conducting repairs to the shaft bearing and several scheduled maintenance tasks.
- 2.2. During the late morning, junior officers from the deck department were preparing to dispose of several condemned fire extinguishers to garbage facilities ashore. Preparation of the portable (9 litre) foam extinguishers involved removing the CO₂ charge cartridge.
- 2.3. Having successfully removed the cartridge from one extinguisher, the officers could not remove the valve assembly from the second. The senior of the two officers involved decided to discharge the contents of the extinguisher into some waste rags.
- 2.4. During discharge, the body of the extinguisher ruptured at the base, causing the extinguisher to strike the officer in the chest. Despite immediate first aid from the crew and paramedics the officer died from the injuries sustained.



Ruptured extinguisher

3. Safety Factors

- 3.1. The vessel's fire extinguishers had recently undergone an annual inspection by an approved firefighting equipment service provider. All extinguishers had been passed without comment but, post-inspection, eight fire extinguishers were identified as being in an unacceptable condition during shipboard planned maintenance checks and were removed from service.
- 3.2. The officers were decommissioning the fire extinguishers in order to leave them in a 'safe' condition once disposed of. However, they were not fully aware of the risks associated with handling fire extinguishers where the material integrity was compromised.
- 3.3. The Company's generic risk assessment for shipboard operations highlighted the requirement to follow the guidelines contained within its cold and pressurised systems work permit and onboard work instructions. When the officer could not remove the valve assembly as planned, an opportunity was missed to stop and reassess the plan.
- 3.4. The investigation is ongoing, but ineffective barriers have been identified in work processes and planning.

4. Lessons to be learned

- 4.1. Servicing by shoreside personnel may not be sufficient to control risks.
- 4.2. Pressure vessel failure can be catastrophic. Crew should be made aware of the potentially fatal risks associated with handling compromised pressure vessels and systems.
- 4.3. Fire extinguishers should be mounted on brackets off the deck to reduce the chance of water being trapped under the base. Fire extinguishers that are exposed to the elements require particular attention, where possible they should be rotated with those stored in a controlled atmosphere to reduce the likelihood of corrosion.
- 4.4. Where possible, decommissioning and disposal of fire extinguishers should be conducted by suitably qualified contractors.
- 4.5. When discharging any fire extinguisher, the manufacturer's guidelines on the correct operation should be followed. Where guidelines have not been provided, crew are advised to place the extinguisher on the deck away from the body when operating the trigger.

5. Further Reading

- 5.1. IMCA Safety Alert on fatal injuries due to fire extinguisher rupture www.imca-int.com/safety-events/fatality-explosive-failure-of-corroded-fire-extinguisher/
- 5.2. BMA Safety Alert on gas cylinder corrosion: www.bahamasmaritime.com/wp-content/uploads/2020/10/BMA-Safety-Alert-20-02-Gas-Cylinders.pdf
- 5.3. CHIRP report on failure of air cylinder in lifeboat: www.chirpmaritime.org/air-bottle-explosion/
- 5.4. Fire Fighting- Portable Fire Extinguishers Performance and Construction www.iso.org/standard/65987.html
- 5.5. Improved Guidelines for Marine Portable Fire Extinguishers www.imorules.com/IMORES_A951.23.html

6. Validity

- 6.1. This Safety Alert is valid until further notice and may be updated as the investigation progresses.