

IMCA Safety Flashes summarise key safety matters and incidents, allowing lessons to be more easily learnt for the benefit of all. The effectiveness of the IMCA Safety Flash system depends on Members sharing information and so avoiding repeat incidents. Please consider adding [safetyreports@imca-int.com](mailto:safetyreports@imca-int.com) to your internal distribution list for safety alerts or manually submitting information on incidents you consider may be relevant. All information is anonymised or sanitised, as appropriate.

## 1 Fatality - explosive failure of corroded fire extinguisher

### What happened?

A person was killed when there was a catastrophic explosive failure of a corroded fire extinguisher. The incident occurred when the person was discharging a corroded handheld cartridge-type, dry chemical powder fire extinguisher which had been condemned during an annual third party inspection.

When the internal CO<sub>2</sub> cylinder was activated (225psi/17 bar) to energise the fire extinguisher, the unit ruptured at the corroded base, exploded and struck the person causing critical and fatal head injuries.

### What went wrong? What were the causes?

A condemned fire extinguisher was discharged. Those discharging the extinguisher did not appreciate the danger involved and did not adequately plan the job.

The base of the extinguisher was badly corroded. Although condemned during a third party inspection and moved to an isolated storage area, a decision was made to discharge the extinguisher to 'make it safe' before transporting it to shore.

### Lessons and actions

The following points were made by the company involved:

- Minimise Corrosion
  - Regular monthly inspection of fire extinguishers, particularly if exposed to the elements;
  - Mount fire extinguishers off the deck/floor in manufacturer-approved mounting devices that reduce the chance of moisture from being trapped under the fire extinguisher base.
- Third-party inspections and condemnations
  - Ensure that fire extinguisher disposal is managed and conducted by qualified third party personnel as per the manufacturer's specifications, or any local regulatory requirements;
  - Condemned fire extinguishers should not be discharged by crew.
- Fire extinguishers using a cartridge to charge the main fire extinguisher cylinder should be handled with care
  - The fire extinguisher should be placed on the deck at arm's length from the body;
  - Point the top of the extinguisher away from the body while holding the handle and hose in one hand;
  - Trigger the CO<sub>2</sub> charging cylinder with the other hand;

Applicable  
Life Saving  
Rule(s)



Line of Fire



Work  
Authorisation



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- Do not energise these types of fire extinguishers near the body.
- Consideration may be given to using stored pressure type extinguishers rather than the CO<sub>2</sub> cartridge type.

Members may wish to refer to

- Failure of fire extinguishers owing to corrosion
- MSF: Air cylinder failure in lifeboat
- Lost time injury (LTI) caused by inadvertent activation of expired line throwing device
- Accidental activation of expired pyrotechnics (hand flare)

## 2 MSF: Tank corrosion

The Marine Safety Forum has published [Safety Alert 21-07](#) relating to the discovery of a leak in a tank caused by corrosion.

### What happened

During daily tank sounding routines in the engine room on a vessel, there was an unexpected rise in liquid level in the tank. A close check was made which confirmed this finding, and it was decided to open the tank for investigation.

A pinhole leak was discovered in the structure beneath the sounding pipe. This allowed salt water to enter the space from outside the tank. The vessel was sent for repairs.

### What was the cause?

Initial investigation by the ship's engineers concluded that the striking plate at the bottom of the sounding pipe was missing. This allowed the brass weight to repeatedly strike the steelwork, damaging the paint coating and exposing the steelwork to corrosion.



Further investigation revealed the following:

- The tank had been inspected and maintained in accordance with company procedure;
- The brass weight of the sounding tape had damaged the paint coating on the striking plate and steelwork below;
- A corrosive chemical had been incorrectly disposed of and introduced to the tank, accelerating the corrosion process;
- The acid may have become trapped under bubbles of damaged paint, allowing concentrated corrosion over the short time;
- The combination of exposed steelwork and caustic solution destroyed the striking plate and steelwork below.



### Actions taken

- Effective repairs were carried out onboard in collaboration with third party welders and divers;
- All crew were reminded of the importance of correct chemical handling – including safe disposal. On board a vessel, there are many different chemicals used; some of these chemicals pose a serious health risk with some being extremely caustic. These chemicals should be used in the appropriate and prescribed way and not misused;

- MSDS (Material Safety Data Sheet) sheets are provided for safety and information and contain all relevant information about the chemical, such as the physical and chemical properties, hazard identification, handling and storage and disposal considerations;
- Caustic or otherwise dangerous chemicals, and their containers, should be disposed of to an authorized hazardous or special waste collection point in accordance with any local regulation.

Members may wish to refer to:

- IMCA pocket safety card *Hazardous substances safety guide*.
- [Failure of pipework in fuel tanks](#)
- [Aluminium fresh water tanks: Near collapse due to serious corrosion](#)
- [Chemical spill leads to costly deck replacement](#)

### 3 NTSB: Fire on laid up Dive Support Vessel

#### What happened

The National Transportation Safety Board (NTSB) of the USA has published [report MAB 21/11](#) into a fire on board a DSV which was laid up alongside. The fire occurred in April 2020 while the vessel was docked at a shipyard in the United States. It started during the hours of darkness and was extinguished by local firefighters. No one was aboard the vessel at the time of the fire. No pollution or injuries were reported. Damage to the vessel was estimated at greater than US\$900,000.

Simultaneous operations including various hot work had been conducted on the vessel on the day before the fire. All personnel had left the vessel by 1800 hrs, but shore-side power remained connected. The fire was reported at 0110 that night. The shore-based firefighters boarded the vessel and fought the fire with water hoses. At 0225, the fire was extinguished with no injuries. About 0900 the next morning, shipyard personnel found an area still emitting smoke behind the fuel tank on the starboard side of the generator room, but it was quickly extinguished.



**Fire damage to living quarters (left) and generator room (right). (Source: Coast Guard)**

#### What went wrong?

- There were no personnel on the vessel overnight;
- The vessel's fire detection system had been secured (switched out or off) while work was being conducted within the vessel to prevent false alarms from smoke and dust;

- In addition, there was no shipyard policy or vessel owner policy in place to have shipyard personnel or vessel crewmembers conduct safety rounds after hours when there was no work being done on the vessels at the shipyard.

### What was the cause?

The NTSB noted that the *fire started in the generator room on the wall area common to the mess area*, and that the investigators *could not rule out the possibility of an electrical short as the potential source of the fire*

The NTSB notes that based on the location of the hot work and the initial location of the fire within the generator room (as determined by the investigator’s report), the hot work conducted on board the vessel was **not** the source of the fire.

The National Transportation Safety Board determines that the probable cause of the fire aboard the DSV was an electrical short from an unidentified source located on the forward bulkhead within the generator room. Contributing to the undetected propagation of the fire was the lack of continuous monitoring of the vessel while it was docked at the shipyard.

Members may wish to refer to:

- USCG: [For want of a watchman the ship was lost](#)
- [Potential engine room flooding: maintenance and equipment failure issues on a laid-up vessel](#)

## 4 Inadvertently drinking hazardous substances

### What happened

Someone unintentionally drank a hazardous substance out of a drinking water bottle. The incident occurred when crew members were painting on deck. During the work, one member of the crew went for a drink from the galley. He found a plastic bottle that seemed to be filled with water. However, this bottle was filled with paint thinners, and he unavoidably ingested about 20ml of the substance. The thinners entered his throat and stomach. The person involved drank milk and water afterwards and already felt a bit better. He felt it was not necessary to see a doctor at that time.

However, throughout the subsequent night, he vomited multiple times. In the morning he was sent to hospital. After consultation in the hospital, he received medication and was able to return to work the next day.

### What went wrong

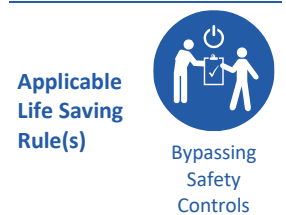
An empty drinking water bottle was used for thinners to mix paint. However, the person involved thought he was drinking from a standard plastic water bottle.

### Lessons learned

Our member notes that incidents like this happen more and more frequently and could potentially cause severe injuries.

- Ensure that all bottles or containers used to store hazardous substances are **correctly labelled and clearly identified**;
- Ensure that **chemicals and hazardous substances are stored appropriately** and not left in the mess or galley;
- Check and ensure that no hazardous substances are ever stored in drinking bottles.

For information, additional lessons from a similar previous incident are reiterated here:



- If it is necessary to decant chemicals from their original containers:
  - Always decant the chemicals in the chemical storage area
  - Use a container in good condition, of type appropriate for the chemical
  - Ensure that containers are clearly labelled. The labels should be clean and legible and should include:
    - full product name
    - Manufacturer name
    - Material safety data sheet (MSDS) reference



**Do not use bottles normally used for, or associated with, drinking water**

IMCA notes that this is an area that perhaps needs more focus. Please review the following similar incidents:

- Person accidentally drank hazardous substance (2016)
- Unlabelled containers: Chemicals stored in drinking water bottles (2017)
- Near miss: Water bottles reused for fuel storage (2017)
- Person accidentally drank hazardous substance: Unmarked bottle (2017)
- Accidental drinking of thinners stored in mineral water bottle (2018)

## 5 MSF: Engine damage after routine maintenance

The Marine Safety Forum (MSF) has published [Safety Alert 21-09](#) relating to engine damage following routine maintenance.

### What happened

On an offshore platform supply it became necessary to stop one of the engines due to a high temperature alarm. The vessel was alongside a platform in DP mode at the time. Cargo operations were stopped, and the vessel moved to a safe location before the engine was stopped.



*showing rocker arm adjusting screw with locking nut removed / dismantled*



*showing partial destruction of the exhaust valve tappet tip, showing also the valve roto cap*

### What was the cause?

Upon inspection, damage was found in a valve gear assembly of a cylinder. Investigation showed that 86 running hours before the incident, valve adjustments had been carried out. When removing the cylinder cover, small metal particles and partial destruction of the exhaust valve tappet tip was found. The evidence available indicated that

the locking nut of the adjusting screw from the exhaust rocker arm (that regulates the clearance of the exhaust valve) had become loose. The most likely cause of this is that when reassembling, the locking nut had not been tightened as per the manufacturer's requirements.

#### **Actions/lessons learned**

- Ensure that maintenance is conducted according to the manufacturer's requirements;
- After maintenance always carefully (double) check that all parts are properly (re-)assembled;
- Always check torque using a torque wrench as per manufacturers manual.

Members may wish to refer to:

- [Vessel engine block blown open in and around cylinder](#)