# IMCA Safety Flash 31/17

December 2017

These flashes summarise key safety matters and incidents, allowing wider dissemination of lessons learnt from them. The information below has been provided in good faith by members and should be reviewed individually by recipients, who will determine its relevance to their own operations.

The effectiveness of the IMCA safety flash system depends on receiving reports from members in order to pass on information and avoid repeat incidents. Please consider adding the IMCA secretariat (imca@imca-int.com) to your internal distribution list for safety alerts and/or manually submitting information on specific incidents you consider may be relevant. All information will be anonymised or sanitised, as appropriate.

A number of other organisations issue safety flashes and similar documents which may be of interest to IMCA members. Where these are particularly relevant, these may be summarised or highlighted here. Links to known relevant websites are provided at www.imca-int.com/links Additional links should be submitted to info@imca-int.com

Any actions, lessons learnt, recommendations and suggestions in IMCA safety flashes are generated by the submitting organisation. IMCA safety flashes provide, in good faith, safety information for the benefit of members and do not necessarily constitute IMCA guidance, nor represent the official view of the Association or its members.

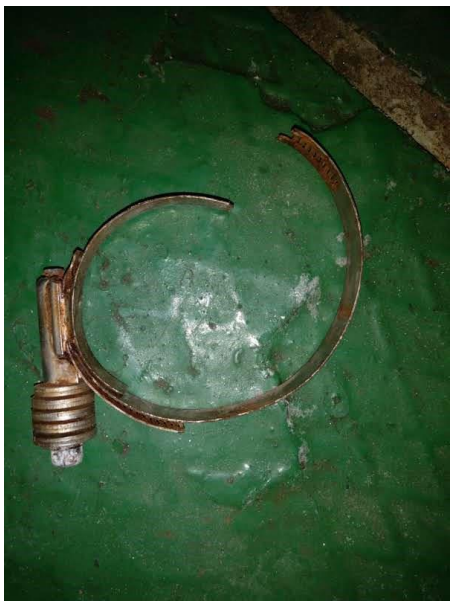
## 1 Potential Engine Room Flooding: Maintenance and Equipment Failure Issues on A Laid-Up Vessel

### What happened?

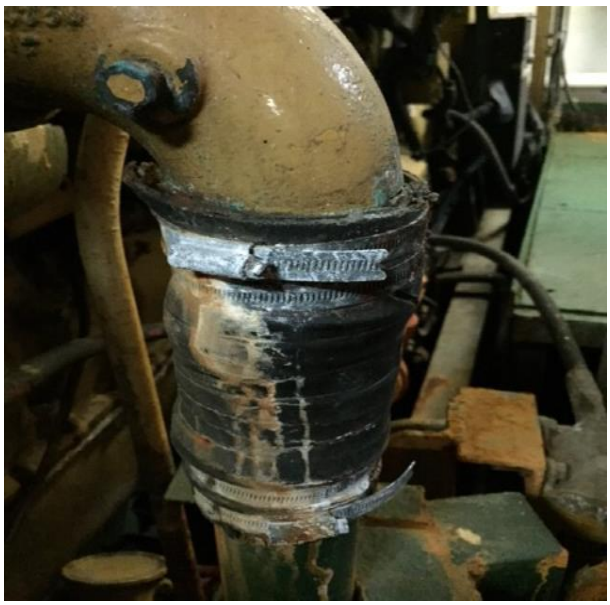
A seawater cooling line failed during planned maintenance on a vessel in “cold” lay-up.

An engineer and an AB were conducting planned maintenance on vessels in “cold” lay-up. The engineer opened a sea chest and necessary cooling lines and started an auxiliary generator. After watching it run for 10 minutes, he left the engine room and carried out visual checks elsewhere on the vessel. Once these visual checks were complete, he left the vessel and went to another cold laid-up vessel to conduct similar checks. An AB was left on the main deck of the vessel with the auxiliary generator running.

After approximately one hour, the engineer returned to the vessel. On reaching the engine room he noticed a strong water spray on the engine from the sea water cooling line. He immediately activated the emergency shut-down. As the shutdown was not enough to reduce the water flow, the engineer attempted to shut off the isolating valve supplying sea water from the main sea chest – but it was seized. Finally, the valves mounted before and after the sea chest were shut off, and the water flow was stopped. Although there was no damage, this near miss had the potential for major equipment damage or loss of the vessel.



*Failed hose clamp, mounted on the discharge side*



*Hose clamp condition - in use on suction side of sea water cooling pump, found on the day of investigation, on the same engine where the failure occurred*

**What went wrong? What were the causes?**

- Equipment failure:
  - The failure on the cooling line was traced to a broken hose clamp with signs of corrosion, which allowed a flexible hose to get disconnected from the rigid connecting pipe
  - The intermediate valves from the crossover sea chest line were found to be seized;
- Procedures:
  - The crew did not have portable radios, so there was no remote communication between the crew members
  - Crew on laid-up vessels did not have access to the company's document management system, and hence no access to the company safety management system (SMS) and other important information
  - Repair and maintenance conducted were not being recorded in the company planned maintenance system
  - Vessel crew were unaware of documented company emergency response plan and procedures
  - Vessel crew were unsure of whom to contact for daily operational needs.

**Actions taken**

- 46,000 litres of oily water were pumped out of the engine room bilges. Due to lack of information, it could not be confirmed whether this amount was all due to the incident or possibly could have been there before that;
- A new hose clamp was installed, the engine tested and all found to be in good order.

**Lessons learnt**

- Advanced deterioration of parts, equipment and emergency batteries on laid-up vessels suggest that there should be more rigorous inspection and control of conditions on such vessels;
- There should be better management of planned maintenance procedures, and of safety management systems on laid-up vessels, including the possibility of setting up temporary alarms as appropriate;
- It is important to ensure that appropriate communications (email etc) are maintained to and from vessels in lay-up.

Members may wish to refer to the following incident:

- Failure Of Pipework In Fuel Tanks

## 2 Bow Thruster Room Flooded During Fresh Water Transfer Operation

**What happened?**

A vessel's bow thruster room was flooded during fresh water transfer operations. The plan was to complete receiving fresh water in Tank No. 2 Centre first before moving to simultaneously fill Tank No. 1 Port & Tank No. 1 Starboard, while ensuring using soundings that neither tank was overfilled.

The Duty Motorman (about to end his shift) stopped receiving water into Tank No. 2 Centre believing that it had filled up, and transferred the supply to tanks No. 1 Port & Tank No. 1 Starboard as per the agreed plan.

The incoming Duty Engine Cadet sounded Tank No.2 Centre and realized that it was not yet full. This prompted him to stop and remove the transfer hose from Tank No.1 Port and returned the supply to Tank No.2 Centre. This tank had its sounding pipe linked to the bow thruster room.

Consequently, fresh water flooded the bow thruster room via the sounding pipe which was not locked, to the extent that the generator in the bow thruster room was submerged to about 2/3 of its height.

**What went wrong?**

- The sounding pipe of Tank No. 2 Centre was not closed (this was the sounding pipe linked to the bow thruster room);

- There was no adequate risk assessment of the fresh water transfer operation. There was no toolbox talk or discussion with the crew of the operation or the risks involved;
- The bilge emergency alarm was neglected by the Duty Engine Cadet;
- The emergency response plan was not followed during this incident.

**What were the causes?**

- Negligent watch-keeping practice;
- Poor supervision of task;
- Poor handover or shift change procedures;

**Lessons learnt**

- Requirement for 24/7 watch-keeping in the engine room;
- Better handling of shift change and handover processes;
- Better supervision required particularly of trainee (Cadet) personnel;
- Deeper crew understanding of emergency response safety drills particularly for bow thruster flooding.

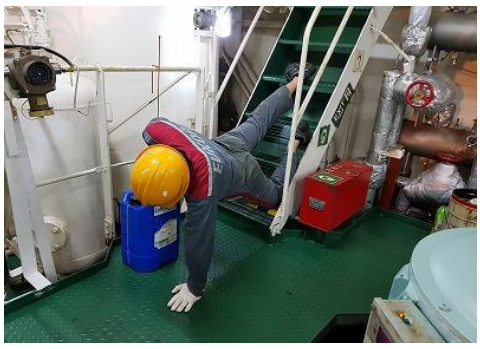
Members may wish to refer to the following incident:

- Water Ingress To Bow Thruster Space
  - July 2010 – very similar incident: Some "Key Issues" highlighted at that time:
    - Failure of basic watch-keeping practices;
    - Lack of understanding of Chief Engineer's Standing Orders;

## 3 Lost Time Injury – Person Slipped on The Stairs and Broke His Arm

**What happened?**

A member of the engine room team suffered a serious injury to his left forearm while carrying a pail of lubrication oil from the steering flat to the engine room. He was carrying the pail on his right shoulder with both arms in support, and descending some stairs. With two steps remaining, he stepped on a slippery step and his right foot became trapped between the steps. He lost his balance, slipped and fell. When he landed on the deck his left arm took most of the impact. First aid was applied with using a splint. The injury and swelling of the affected area did not seem to be severe. However, upon arrival in port, he was referred to hospital for further treatment and it was confirmed that his left arm was broken.



*Showing re-enactment*

**What went wrong? What were the causes?**

**The immediate causes**:

- He was going down the stairs without holding the handrail;
- The stairs were slippery;
- His foot got caught.

The weather was calm; the vessel was neither rolling nor pitching. The crewman involved was well rested and was wearing correct personal protective equipment (PPE).

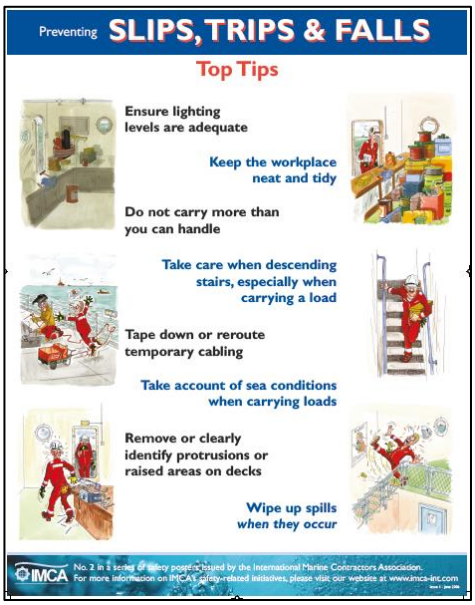
Our member found the **root causes** to be:

- Inadequate compliance with correct lifting and carrying technique – there was a right way and a wrong way to transfer this lubrication oil, and he chose the wrong way;

- Risk seen as tolerable – "complacency" – this was a routine and recurring task.

**Lessons learnt/Actions taken**

- Could there be a better or safer way to transfer this oil?
- All should be more safety conscious when going down the stairs, particularly if carrying things;
- Handrails should be used; correct lifting and carrying procedures should be followed;
- Good house-keeping – ensure stairs, floors, safety shoes etc. are kept free of oil and grease.




Please refer to IMCA's safety promotional materials:

- Short video – Preventing Slips and Trips
- Poster – Take care on the stairs
- Poster – Preventing slips, trips and falls

Members may wish to refer to the following incidents:

- Recent Slips, Trips and Falls Involving Stairs
- Slips, Trips and Falls – Raising Awareness
- Injury After Crewman Fell Downstairs On External Stairway (MSF)

## 4 Fires on Materials Made of Fibre-Reinforced Plastic (FRP)

**What happened?**

A member reports that serious fires have broken out on vessels with fibre-reinforced plastic (FRP) materials. They appear to have been caused by overheating of the FRP from hot exhaust systems. FRP is combustible and introduces several challenges compared to traditional non-combustible materials. It is imperative that safety barriers and fire safety measures are in place.

**Incident 1**

A fire was thought to have originated in FRP panels above the exhaust in an area between the main engine room and the adjacent casing. Maintenance of the engines had previously been carried out, requiring removal of insulation. The fire was contained, but with extensive material damage.

**Incident 2**

A fire had likely started in a compartment with direct access to open air and adjacent to an auxiliary engine room. The engine exhaust was routed through the compartment housing the silencer or muffler. A low-pressure cooling water alarm was experienced followed by a high temperature cooling water alarm, but without activation of the automatic engine shutdown. The vessel had to be evacuated and was declared a total loss

In both cases, there were no reported injuries to any persons.

**Fibre Reinforced Polymer (FRP) materials**

With the appropriate choice of resin, additive and fillers, Fibre Reinforced Polymer (FRP) materials can be used to make structures with clear fire performance benefits over many other materials. In addition, FRP composites generally are good thermal insulators, so they can significantly limit the heat of a fire spreading in the way that can occur with metals. In addition, FRP composites generally are good thermal insulators, so they can significantly limit the heat of a fire spreading in the way that can occur with metals.

Source: Composites UK Trade Association https://compositesuk.co.uk/

**What went wrong? What were the causes?**

The **immediate causes** of the fires were likely to be due to:

- Combination of missing insulation on FRP structural surfaces exposed to heat radiation or direct contact with hot exhaust parts and limited engine room ventilation;
- Overheating of exhausts could also develop suddenly due to insufficient cooling water;
- Issues with temperature sensors or the malfunction of the shutdown system.

The ignition point of FRP materials is typically around 275° to 375°C, which is relatively low compared to metallic materials, i.e. aluminium alloys or steel. The typical operating temperatures of engines and exhausts can be considerably higher and there is an inherent risk of fire if safety measures are not satisfactorily arranged or managed.

**Recommendations**

- Thorough and regular maintenance of machinery and associated parts, with regular check of known or potential hot spots and any signs of overheating;
- When removal of insulation is necessary during modifications or other work, the insulation should be correctly reinstalled and restored to at least the original condition;
- Adequate training of vessel crew for emergency preparedness.

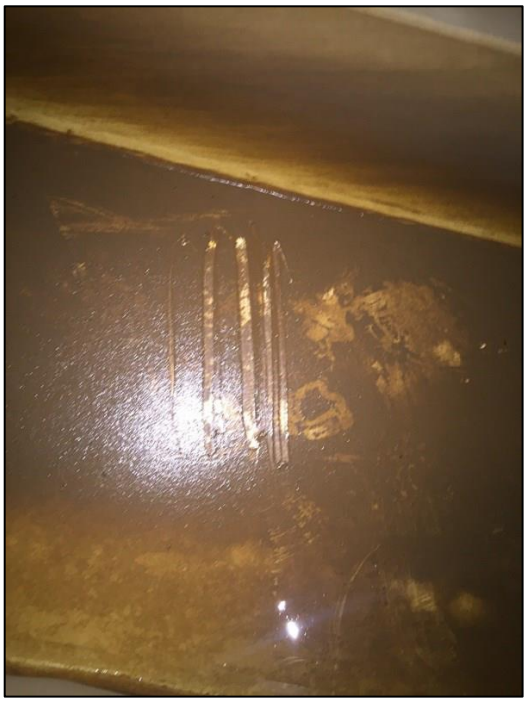
Members may wish to refer to the following incidents:

- Fire In Engine Space On Crew Transfer Vessel (CTV)
- Engine Room Fire
- Engine Room Fires – Appropriate Use Of Insulating Material On Hot Surfaces

## 5 Two Cases of Contaminated Drinking Water

**What happened?**

In the first incident, fresh water analysis carried out by a 3rd party indicated an increase in TVC (total viable count) of bacteria in the fresh water system of some vessels. Inspection of vessels' fresh water tanks revealed that they were dirty and had not been cleaned or maintained for a long time. See image *to the right* of mud in the freshwater tank:



In the second incident, a drinking water quality check was conducted in accordance with the office health assurance plan. Upon sending the water dispenser to a laboratory for an annual "water quality assurance test", the test results showed a high level of bacteria in the water. The water purchasing process from the current supplier was stopped immediately.

Thorough cleaning of the water pumps and dispensers was arranged, and a new supplier of drinking water was approved.

**What went wrong? What were the causes?**

- There was a recurring failure to inspect and maintain vessel fresh water tanks;

- There was no regular or appropriate cleaning of water dispensers & hand pumps. The office water dispensers and water pumps have not been cleaned for a long time. This could have resulted in the contamination of the water and subsequent potential health problems for staff.

**Actions taken**

- Vessel fresh water tanks should be regularly inspected and cleaned;
- Drinking water bottles should not be re-used;
- Arranged for proper and scheduled cleaning of fresh water dispensing equipment;

Members may wish to refer to the following incident:

- Aluminium Fresh Water Tanks: Near Collapse Due To Serious Corrosion