

IMCA Safety Flash 35/16

December 2016

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 Fire in Engine Room

The Marine Safety Forum (MSF) has published the following safety alert regarding an incident in which there was a fire in an engine room. The incident occurred whilst returning to port from offshore. The crew were alerted when three sensors on the fire detection system activated, setting off the fire alarm and the vessel's "flexifog" fixed firefighting system. The chief engineer, who had been close to the engine room, confirmed that smoke was present. The quick closing fuel valves were activated and ventilation to the space shut down whilst the crew mustered and readied the Breathing Apparatus (BA) team. Due to the vessel's proximity to the coast and to other marine traffic, an anchoring party was sent forward and appropriate lights were displayed. A BA team then entered the engine room with a charged hose, but it was subsequently confirmed that the fire had been extinguished by the "flexifog" system. Whilst the vessel was without propulsion for a short time, no crew members were injured and damage was minimal.



The following points were noted:

- ◆ The actions of the crew minimised the risk to their own safety and damage to the vessel;
- ◆ All equipment was operated as required and the fire was dealt with promptly and professionally;
- ◆ The result of effective fire and safety drills and proper maintenance regimes are clear;
- ◆ The fire started as a result of the failure of a low pressure fuel hose on one of the Main Engine generators. This allowed fuel to leak onto the exhaust manifold heat shield – the fuel pooled and ran off the heat shield causing contact with the exhaust, which subsequently ignited the fuel.

Corrective actions/recommendations:

- ◆ Thorough inspection and periodic replacement – regardless of condition – of fuel hoses on generators and main engines. In this case, the company replaced fuel hoses on all similar engine types;
- ◆ Appropriate update of planned maintenance system to increase the frequency of checks on fuel hoses;
- ◆ Review the operation of their fixed firefighting systems and the initial actions that should be taken by the vessel crew in the event of a fire – ensuring that all crew members are fully conversant with both.

In this case, the proper activation of the fixed firefighting system and prompt action of the crew prevented a potentially life threatening scenario.

The full report can be found [here](#). Members may wish to refer to the following IMCA guidance and incidents (search words: *fuel, flash*):

- ◆ [IMCA M 119](#) – Fires in machinery spaces on DP vessels;

- ◆ **IMCA SF 10/14** – Incident 2 – *Fire in engine room on platform supply vessel;*
- ◆ **IMCA SF 08/15** – Incident 4 – *Fatalities: engine room fire caused by fuel spray ignition.*

2 Awareness: CO2 Flooding System Activation Points

A member has highlighted a potential gap in safety awareness which may be of interest to members. One of their vessels has a CO₂ flooding system activation point within the main CO₂ bottle room – however, there are no warnings or procedural guidance on the use of Breathing Apparatus (BA) within the main CO₂ bottle room when operating the system.



Our member drew the following lessons:

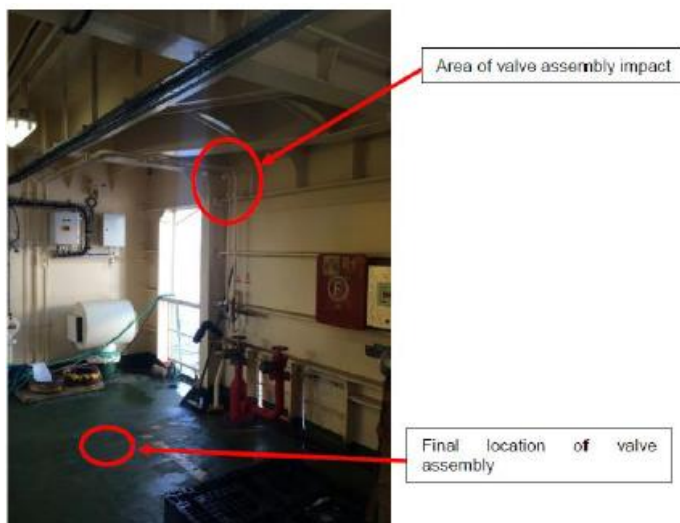
- ◆ When activating flooding systems there is a chance that CO₂ may leak into the space itself, either directly from the cylinders and/or associated piping. As such, the space may quickly fill with CO₂, presenting a hazardous atmosphere to persons inside;
- ◆ Therefore, after seeking guidance from the maritime fire-fighting school, our member recommended the use of BA whenever;
 - entering the CO₂ cylinder space after activating the system from a remote point
 - when activation of the CO₂ system is required from within the CO₂ cylinder space itself, or
 - whenever undertaking drills within the CO₂ cylinder space;
- ◆ Steps were taken to review relevant vessel specific procedures and, where required, update them to include guidance on the use of BA equipment in CO₂ cylinder rooms/spaces.

3 Corrosion Damage – Failed Fire Hydrant

A member has reported an incident in which a fire hydrant valve failed under pressure. The incident occurred during testing of the helideck firefighting system. A hydrant valve assembly on the starboard side of the main deck failed under pressure. The 2kg valve assembly struck the deck head approximately 2 metres above, chipping paint on impact, and then fell to the deck below. No-one was injured. Whilst no-one was in the immediate area, the impact was heard by several people. The force associated with the hydrant valve assembly failure had the potential to cause a significant injury or fatality.



Failed studs



Where the incident occurred

Our members' investigation revealed the following:

- ◆ There was an unexpected failure of the hydrant valve assembly studs. These studs were of type 303 Stainless Steel;
- ◆ Expert analysis reveals that type 303 Stainless Steel is particularly susceptible to stress corrosion cracking (SCC) in a high ambient temperature (tropical environment);
- ◆ The failure of the studs may have been accelerated by the presence of water surge, or water hammer, in the fire-fighting water system when activating the helideck firewater system;
- ◆ Metallurgic analysis examined both "failed" and "non-failed" studs were provided by the vessel. The report stated that the cause of failure was chloride induced SCC, which is a common failure mode for austenitic stainless steels, including types 303, 304, and 316;
- ◆ SCC failures commonly occur in tropical environments at ambient conditions for SS 303 and 304 grades, particularly for items under tensile stress and where the item has been cold worked. The report stated that all type 303 studs, regardless of exposure internally to raw seawater or externally to seawater spray would have eventually experienced complete fracture through SCC;
- ◆ Equipment on vessels operating in tropical environments, exposed to relatively high environmental temperatures, will be exposed to increased risk of SCC. Austenitic stainless steels (grades 303 and 304 in particular) will fail from SCC in relatively short periods of time;
- ◆ A **contributing factor** to the incident was the incorrect operation of the fire-fighting system inducing water surges or hammer into the fire main;
- ◆ The **root cause** of this incident was the incorrect material specification of the studs for the environment and application.

Our member took the following **actions**:

- ◆ Careful consideration given to the increased likelihood of SCC in stainless steel for vessels operating extensively in tropical or high temperature environments, particularly for vessels designed and built in temperate climates;
- ◆ All affected studs on fire hydrants to be replaced.

Members may wish to refer to the following incidents (search word: *corrosion, tropical*):

- ◆ [IMCA SF 09/07](#) – Incident 3 – *Lifting rigging on 'frog' personnel transfer capsule* [**immediate cause**: slings corroded in tropical environment];
- ◆ [IMCA SF 04/14](#) – Incident 1 – *LTI – thumb laceration* [**immediate cause**: aerosol can explode following corrosion in tropical environment];
- ◆ [IMCA SF 22/15](#) – Incident 1 – *Near miss: corrosion-related failure of bolts used to secure lifeboat winches*.

4 Fuel Spill During in Port Bunkering

The MSF has published the following safety alert regarding an incident in which fuel oil was spilt to sea. The incident occurred when a platform supply vessel (PSV) was bunkering in port.

Crew had been using a 'jumper hose' to discharge 'old' fresh water overboard using the aft starboard manifold – the plan was to refresh the water tanks later in the day. As is common with this type of operation while the water pump was running, all water manifolds in the system were under pressure and this included the port mid-ships water manifold. Unfortunately, the port mid-ships manifold had a leaking valve.

As the morning progressed a fuel bunkering check list was completed and the vessel started bunkering fuel through the port mid-ships manifold. An AB was in place to watch the fuel hose and check for any leaks. After approximately an hour bunkering, the AB on watch reported smelling fuel and although he couldn't see where it was leaking from he initiated an **emergency stop** and informed the shore side to stop pumping. He then looked overboard and saw

fuel in the water between the vessel and quayside. SOPEP equipment was deployed and booms put in place around the vessel to contain the fuel.



Port mid-ships fresh water manifold showing water leaking from the cap.



Port mid-ships hose bay & fuel sample/drain cock location

The company investigation revealed that:

- ◆ During the bunkering process fuel had been leaking from the fuel sample/drain cock into the drip tray and draining overboard along with the fresh water originating from the water manifold;
- ◆ The **root cause** and contributing factors were found to be:
 - the leaking fresh water manifold valve
 - failure to fully ensure the requirements of the ‘pre bunkering’ check list were met
 - although a watchman was in place there was a failure to maintain a proper watch on all areas from which fuel could possibly leak.

The full report can be found [here](#). Members may wish to refer to [IMCA SF 18/16](#) – all incidents of which relate to the inappropriate or unplanned release of substances or objects.

5 Incidents in Small Workboats Used in the Offshore Renewables Sector

A member has reported a number of incidents involving the small workboats used in the offshore renewables sector.

Incident 1: Incomplete Engine Service by Vessel Crew Leads to an Auxiliary Power Unit Engine Breakdown

After servicing of a vessel’s electrical generator (auxiliary power unit) it was found that the motor could not be returned to a functioning service.

Initial investigation revealed a lack of coolant movement, causing the motor to overheat which in turn was causing the generator to automatically shut down. Further investigation (not by the crew) found a blockage was located within the coolant line. The blockage was a wooden bung.



When performing a minor repair, a wooden bung had been used to prevent any coolant loss during removal of a pipe. The repair was completed and the pipe was replaced, but without the bung being removed.

- ◆ **Causal factor:** poor mechanical practice;
- ◆ Recommendation: ensure proper record-keeping and logging of events during repairs, particularly when repairs span several shifts, to ensure that what has happened is clearly understood by all involved.

Members may wish to refer to the following incident (search word: *bung*):

- ◆ [IMCA SF 07/15](#) – Incident 2 – *Near miss: unexpected water ingress during fault finding of a cracked water pipe.*

Incident 2: Navigational Near Miss with a Third Party Vessel Whilst Working in a DP 500m Zone

Whilst approaching the boat landing of an accommodation vessel stationed on DP, a Crew Transfer vessel (CTV) had to abandon its manoeuvre as another CTV came into visibility with a direct heading for collision. Both vessels were able to navigate away from a collision at the last moment but it was believed that the distance between the two CTVs came within one boat length. The incident occurred in heavy fog.

After waiting within the 500m zone of the DP stationed accommodation vessel, the CTV received a call from the accommodation vessel to make an approach to the boat landing, and started to do so, following departure of another vessel. In the final approach (two boat lengths out) the Master spotted an unknown CTV approaching fast on the starboard side in the heavy fog. This CTV had not called into the 500m zone (there was no procedure in place to do so). Because the Master of the CTV was concentrating on the boat landing, he was not monitoring his radar, and had not spotted the incoming CTV earlier. Once he made visual contact with the approaching CTV both vessels raised power and engaged reverse thrust. The vessels both stopped in time. Eye witnesses on board the accommodation vessel say they came within one boat length of collision.

Our member concluded that the Master of the unknown incoming CTV was navigating too fast for the localised weather conditions (heavy fog) and local navigable environment (three vessels in 100m). He had not informed any of the other vessel in his proximity of his position, speed or destination.

Our member recommended the following:

- ◆ There should be a formal 500m (safety zone) procedure in place around the DP Accommodation Vessel;
- ◆ Even when there is not an exclusion zone in place, it is good practice when travelling in reduced visibility to maintain communications with localised vessels at all times and reduce speed, as identified in COLREGS.

Members may wish to refer to the following incidents (search word: *collision*):

- ◆ [IMCA SF 12/15](#) – Incident 3 – *Collision between crew boat and anchored barge;*
- ◆ [IMCA SF 25/16](#) – Incident 3 – *Collision between vessels.*

Incident 3: CTV was Left with No-One in Command During Passenger Transfer Via Boat Landing

Whilst performing passenger transfer with a jack-up barge in port, with the bow pushed against a boat landing, the Master of the CTV left the helm and went onto the back deck for a cigarette leaving the vessel “not under command”.

One of the passengers already on board the CTV (the Captain of the jack-up barge) noticed this and ordered the CTV Master to return to the helm. The Master returned and the transfer continued, the crewman (busy with the transfer interface) had been unaware that the Master, after giving him the visual signal to begin transfer, had then left the helm.

Our member concluded that the CTV Master, due to his own complacency, decided that he was able to leave the helm position without a change to the CTV’s position on the boat landing (whilst underway). He knew that by doing so he was knowingly failing to comply with the written safe working procedures of the company.

This was a serious neglect of safety. The Master, in consideration of the potential results of this neglect of safety and his previous record within the company, was relieved of his duties.

An onsite safety meeting was held with the crew and the shore based manager to highlight the correct company procedures and good safety practices.

6 First Aid Injury – Person Scalded by Steam Condensate

A member has reported an incident in which a person was scalded when working in the kitchen/pantry area on-board a vessel. The incident occurred when the injured person was rinsing dishes in the ships pantry, near a boiler. The boiler exhausted steam through a vent pipe, and so a plastic tube was retro-fitted to the vent, allowing any condensate to drain into the sink in which the dishes were rinsed. Steam vented from the boiler and the condensate ran down the tube, exiting the pipe in to the sink and coming in to contact with the injured person's right forearm. He immediately ran cold water over his arm and reported directly to the medic who carried out first aid.



Above – vent tube and exit to sink



The injury



The permanent solution

Our members' investigation noted the following:

- ♦ The immediate response of applying cold water & seeking medical aid was correct & timely, preventing the injury from getting worse and avoiding potential subsequent infection;
- ♦ Following the incident, the water boiler was immediately decommissioned until the correct means of venting steam/condensate had been established;
- ♦ Vessel crew contacted the boiler manufacturer to seek guidance on correct solution. The manufacturer responded and supported installation of a permanent solution, to drain condensate directly into the main plumbing and away from the sink. This actively removed exposure to the hazard of hot steam/condensate.

The lessons learnt:

- ♦ **Be aware of temporary solutions** – the fitting of the plastic pipe should only have been considered as an initial temporary solution and should have been followed up with subsequent action to make a safer, permanent solution;
- ♦ **Ensure control measures don't actually increase risk** – the plastic pipe was installed as a control measure to reduce the risk presented by steam venting directly from the boiler. Whilst this solution was implemented with the best intentions, it reduced one risk but created another – that of draining hot condensate into the sink;
- ♦ **Report hazards & unsafe conditions** – this boiler was installed six months before but no-one had raised any safety observations or reported any concerns until someone got hurt;
- ♦ **STOP WORK** – regardless of your rank or role, or where you work on the vessel, be aware of unsafe acts and/or working conditions and exercise the **STOP WORK** authority to ensure that they are corrected before anyone gets hurt.

Rather than draw members' attention to other scalds or burns, we look here at incidents wherein a causal factor was a temporary or uncertified fix or solution:

- ♦ [IMCA SF 01/11](#) – Incident 6 – *Failure of home-made [lifting] equipment;*
- ♦ [IMCA SF 07/15](#) – Incident 1 – *Second-hand equipment causes engine breakdown.*