IMCA Safety Flash 12/17

May 2017

Theme: Fires

All of the below incidents involve fires or potential fires. In the first, we see vividly illustrated the desired consequence of the use of personal protective equipment (PPE). The next three relate broadly to fires or potential fires arising from procedures or instructions not followed, inappropriate modifications to equipment, and failure to secure equipment properly. The fifth incident covers a near miss from a leaking fuel line, and the sixth relates to a fire and explosion which occurred recently on a vessel moored near to a members' vessel.

1 How PPE Works: Fire and Thermal Protection

What happened?

The US Bureau of Safety and Environmental Enforcement (BSEE) has published a report of a fire on an offshore production platform in the Gulf of Mexico, resulting in burn injuries to three workers.

All three individuals were reported to have been wearing safety glasses, hard hats and flame resistant clothing (FRC), although at least one was believed to have rolled up his sleeves. Their injuries were described as a combination of first and second degree burns to their hands, forearms, neck and face. The BSEE considers that the proper use of appropriate PPE likely prevented additional injuries. The initial report can be found here.

Lessons learnt

- Are YOU and your personnel all wearing proper PPE where the potential exists for thermal exposure from fire?
- Ensure that the PPE selected for the job reflects the probable and possible hazards of the job. **Are you wearing the correct PPE?**

BSEE recommend reference to:

- NFPA 2113, *Standard on Selection, Care, Use and Maintenance of Flame- Resistant Garments for Protection of Industrial Personnel Against Short-Duration Thermal Exposures from Fire;*
- Occupational Safety and Health Standard (OSHA) 1910.132 for Personal Protective Equipment.

Other standards and guidance will be applicable outside the United States.

Members may wish to refer to the following incidents, both cases in which PPE prevented things being much worse:

- Crewman suffers cut to hand – but gloves prevented it being much worse;
- Serious finger injury: procedures during engine maintenance.

2 Galley Fire: Failure to Follow Stove/Oven Installation Instructions

What happened?

The United States Coastguard (USCG) has published Marine Safety Alert 02-17, relating to a fire on an offshore platform. A manufacturer had improperly installed a commercial grade electric stove. As a result, the platforms crew was awakened by the sound of smoke alarms from a galley fire. They acted quickly to isolate and fight the fire and were assisted by another vessel. The crews' rapid response limited the damage, which could have been much worse.

Members should be reminded of the importance of following instructions when installing or indeed operating galley cooking equipment, and in particular may wish to ensure that all commercial grade stoves and ovens are installed with the proper clearances to prevent ignition of combustible materials.

The full Safety Alert can be found here. Members may wish to refer to the following incident:

- Fire in the deep fat fryer.

3 Dangerous Modifications Found Within a Gas Valve Unit Room

Don't allow corrective actions to create additional hazardous conditions!

The USCG has issued Safety Alert 05-17 to warn of a potentially dangerous situation involving modifications within gas valve unit (GVU) rooms aboard a liquefied natural gas (LNG) carrier.

This room is located within the machinery space of the dual fuel, diesel-electric propelled vessel. These engines can burn petroleum oil or LNG in gaseous form. The GVU is a multi-component device which manages the liquefied natural gas pressure supplied to the propulsion engines. The GVU room has an air intake and exhaust system designed to continuously ventilate and exchange the air within the space to reduce fire, explosion, and hazardous atmosphere risks from developing if gas leaks should occur from the equipment. The atmosphere of the room is monitored by a catalytic methane sensor located near the

inlet to the room's ventilation exhaust trunk. The GVU room's ventilation creates a vacuum within the room when the two access doors are shut.

During a repair on one cylinder of a main engine vessel, engineers had to remove an expansion bellows. Upon replacement of the bellows an O-ring, separating its inner and outer sections, was damaged. This error went unnoticed until a crew member was making a round in the enclosed GVU room while the engine had been operating on gas. After entering the GVU room he was overcome by methane gas and nearly lost consciousness. Fortunately, he was able to exit the space into a safe atmosphere. After the incident, the GVU room atmosphere was measured to be 22 percent methane and 17 percent oxygen by volume. Methane is an asphyxiant which displaces oxygen and is extremely flammable. The installed methane sensor failed to detect the accumulation of gas despite not having malfunctioned.

Engineers had rigged a hose from the outlet of the gas evacuation fan, across the GVU room to the sensor at the entrance exhaust duct. This unauthorized arrangement, which was identified during a Coast Guard examination, could have likely disabled the sensor's ability to detect methane leakages from other components within the GVU room.

The US Coast Guard **strongly recommends** to Flag States, classification societies, underwriters and insurers that respective examiners, surveyors, and inspection personnel maintain an acute awareness regarding any system modifications, whether deemed potentially hazardous or not, to ensure such modifications have received the proper engineering reviews, approvals, and supporting documentation.

The full USCG Safety Alert 05/17 can be found here.

4 Battery Fire

What happened?

The Marine Safety Forum (MSF) reports an incident in which, during the early hours of the morning during a period of adverse weather, the fire alarm in the vessel battery locker was activated. The crew mustered and the fire team assembled and upon investigation it was discovered that there was a small flame and sparks being emitted from a spare battery that was stored in the battery locker on the top shelf.

What were the causes of the incident?

The battery had been delivered during the previous port call and stored within the battery locker. Unfortunately, it had been placed on a storage shelf with no attempt to secure it in place. During a period of heavy weather, the battery tipped onto its side and slid against the steel lining of the bulkhead.

As the battery terminals were not covered, this caused the battery to short circuit and led to it overheating. Once the battery had reached ignition temperature, the casing melted, setting off the fire alarm.

What lessons were learnt? And what were the actions?

- Everything loose on a vessel should be secured in place to prevent movement. Assume nothing; secure everything;
- All spare batteries should have the terminals covered with insulating material to prevent accidental shorting.

The incident is available on MSF's website here. Members may wish to refer to the following incidents:

- Loading and securing of containers;
- 'Routine' task, non-routine result: Batteries stored sideways leak battery acid.

5 Near Miss: Fire Hazard from Leaking Fuel Supply Line

What happened?

A potential fire hazard was discovered, caused by a failed fuel pipe connection on the supply line to the main engines. The Chief Engineer was called to engine room with a report of a leak on a low pressure fuel supply line supplying both main engines. Upon arriving in the engine room and assessing the situation, a temporary repair was effected, due to being unable to isolate the pipe. Self-amalgamating tape was used to reduce the leak to a weep and then fibre-glass resin and bandage was applied, to try and seal the weep.

At the time, both main engines were running with the starboard engine on load, although the port propeller was declutched. Three auxiliary engines and all the thrusters were on load.

Temporary repairs to the pipe

Complex shape and fitting of pipe

What were the causes?

The **immediate cause** was found to be a failed weld on a T-piece of the pipe. The **root cause** is believed to be the age of the pipe, an original fit from the vessel's construction, incurring natural degradation over time.

Actions taken and lessons learnt

- The leak was discovered early as a result of due diligence and good watchkeeping, which allowed for a controlled temporary repair;
- The vessel notified shore management as soon as possible after the incident, providing detailed Incident reports, supporting information and photographs;

- Vibration, owing to the proximity of the main engines, is going to be an issue with equipment of this sort. Engineers should maintain awareness of equipment shortcomings and manufacturing design weaknesses;
- As such failures cannot always be predicted and vessels should always carry appropriate pipe repair solutions such as plastic steel, fibre glass resin, pipe repair clamps etc.;
- In this case, a trend in the failure of fuel supply piping was noticed; this was the 4th failure within 4 months.

Members may wish to refer to the following incidents:

- Cracked Fuel Line Results in an Engine Fire;
- Fatal Engine Room Fire on Suction Dredger Arco Avon [cause of death: *t*he third engineer was attempting to repair a failed fuel pipe when fuel, under pressure in the pipe, ignited];
- Near Miss: Fire Hazard arising from Failed Fuel Pipe Connection.

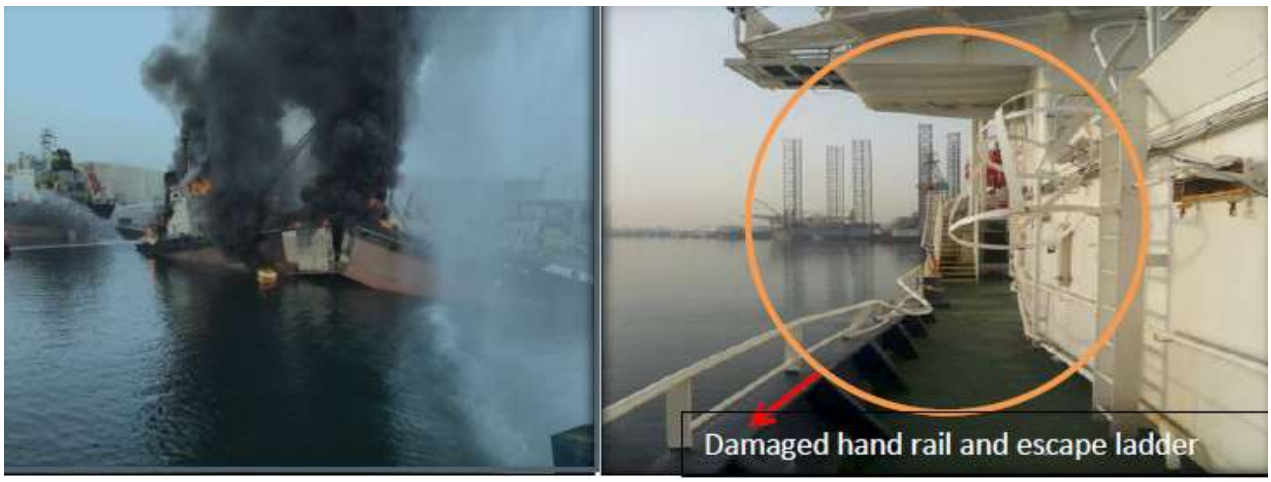
6 Catastrophic Fire and Explosion on Nearby Vessel

What happened?

A vessel was double-banked alongside engaged with routine maintenance jobs, when a fire broke out on a vessel transporting a petroleum product which was berthed alongside at a berth 130 m away. There was a massive explosion and the tanker broke in to two. The Port emergency operation room was alerted immediately and the firefighters prevented the blaze from spreading to adjacent ships, and prevented oil spillage.

Unfortunately, one crew member on the burning vessel was killed, four others suffered burns, and sixteen sailors were evacuated safely.

Our members' vessel sustained damage on the starboard side escape ladder and 5m of railings due to flying debris following the explosion. An emergency muster took place for head count, damage was reported to Port control, and engines were started immediately for emergency cast off to a safe location.



What lessons were learnt?

- Immediate action or response should be in place to cast off the vessel from the area in case of an emergency;
- All should be vigilant to what is happening on surrounding vessels.

This incident took place in Sharjah on 13 May and was reported in local news media.