Safety Flash

14/23 – June 2023

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** 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.

The UK Marine Accident Investigation Branch has published Safety Digest 1/2023, consisting of lessons from recent Marine Accident Reports. IMCA has reviewed the digest and here passes on for members interest, some but not all of the incidents in it.

The incidents passed on in this Safety Flash are:

- High pressure oil leak causes a fire in the engine room
- Gantry crane wire parted causing injury
- A heavy sheave fell over causing an LTI
- Who is in control? (A failure of bridge control)
- Lithium-ion battery fire

1 MAIB: High pressure oil leak causes a fire in the engine room

What happened

A recently built vessel was on passage when a gearbox temperature probe was ejected from its fitting by oil at 25 bar. A jet of gearbox oil sprayed a major part of the engine room including one of the running main engines.

The gearbox low oil pressure alarm sounded on the bridge; the vessel's engineers stopped the engines. The Master was informed, and the vessel went to emergency stations; the designated firefighting prepared to fight the fire.

The oil had saturated the main engine exhaust lagging, which had started to smoke. The oil-soaked lagging ignited but was quickly smothered in fire-fighting foam; subsequent small fires were similarly dealt with. The vessel was able to make its way safely back to port for repairs and cleaning.

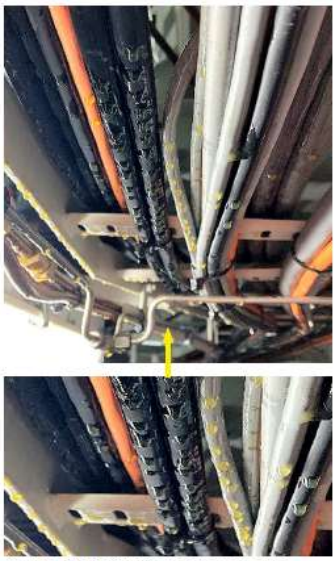


Figure 1: Oil dripping from engine room cables

Figure 2: The original temperature probe fitting

Figure 3: The new temperature probe fitting

What went wrong

Investigation identified that the temperature probe was held in place by a pipe compression fitting that had not been fully tightened during the vessel build. Once the fitting slackened further, there was nothing to stop the oil pressure forcing the probe out of the gearbox.

What went right

The crew responded in a professional way to an unexpected event that could easily have resulted in a major fire. Not only did they quickly go to emergency stations but they placed foam extinguishers near the oil-soaked engine so that lagging fires could be quickly dealt with. Knowing your emergency procedures and equipment pays dividends when a real situation occurs.

Lessons

- There's always a "snag list" in a new vessel or after a dry dock. Some faults will only appear later. Monitor equipment much more closely at such times;
- Safety by design: the design of the probe fitting was insubstantial in terms of the operating environment and the consequences of it coming loose. Poorly designed equipment increases the risk of injury to the crew and can force them into undesirable workarounds. In this case, the manufacturer produced a redesigned fitting and probe housing that would prevent reoccurrence and allow the probe to be changed while the propulsion system was working.

Members may wish to refer to

- NTSB: Dangerous engine failure – improper torquing
- Stored pressure release – hydraulic oil
- Fire in engine room on platform supply vessel

2 MAIB: Gantry crane wire parted causing injury

Applicable Life Saving Rule(s)

Line of Fire

Safe Mechanical Lifting

A gantry crane hoist wire parted causing a load to drop, causing injury and damage to equipment.

What happened

Engineers were overhauling a large diesel generator, using the engine room's overhead gantry crane to lift a 1200kg cylinder liner into position above the engine. This required the electric winch motor to raise the crane hook to its maximum lift height, at which point the crane's hoisting wire suddenly parted. The suspended cylinder liner fell onto the engine, causing damage to both pieces of equipment, and struck the left foot of an engine room fitter who was standing nearby. The crew member was treated in hospital for a broken toe.

Left: cylinder liner after wire parted. Above: parted hoisting wire

What went wrong

- The crew member was in the line of fire, near or under a suspended load;
- The failed hoisting wire had been recently renewed but was found to be 7m shorter than the wire length specified by the crane manufacturer. The shorter length wire affected the operation of the crane's hoist limit switch and prevented it from cutting power to the winch electric motor when the hook was raised to the maximum lift height; the winch motor was therefore able to overload the wire and cause it to fail;

- It was found that the same potential fault was extant on the other engine room cranes. The wire length recorded in the ship's planned maintenance system (PMS) computer was found to be incorrect when compared with the manufacturer's specification.

Actions

- The cranes were all taken out of service for repair. Engineers conducted a full inspection of engine room hoisting devices and take necessary steps to ensure that all equipment meets manufacturer specifications;
- Test hoist limit switches before operating cranes.

Members may wish to refer to:

- Fire-fighting water jet hits antenna – Failure of limits, stops and safeties
- Near miss: dropped clump weight
- Reliance on crane limits caused crane damage and dropped objects

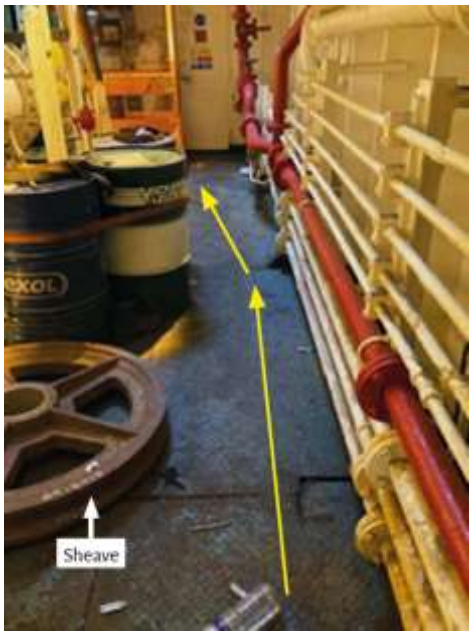
3 MAIB: A heavy sheave fell over causing an LTI

Applicable Life Saving Rule(s)

Bypassing Safety Controls | Line of Fire

What happened

A bosun suffered a broken leg when a heavy sheave he was trying to manoeuvre, fell against him. On a vessel going into port, crew were preparing to offload equipment. Very early in the morning, the bosun decided to prepare a 0.5t sheave, which was due to be lifted ashore. He removed the lashings that were securing the sheave vertically against some pipework and started to roll it toward the port side hatch in readiness for offload. The bosun was manoeuvring the sheave past some oil drums when he lost control and the sheave toppled over, struck his thigh and then trapped him under its weight. With difficulty he managed to raise the alarm using his handheld radio. The crew mustered quickly, lifted the sheave off his leg and administered first aid. Once in port the bosun was taken to hospital with multiple fractures to his leg and was unable to return to work for several months.



What went wrong

- The bosun worked alone;
- The sheave, half a ton and over 1m in diameter was not stowed in an authorised location;
- The crew had no lifting plan in place to move it across the space. The sheave was unwieldy and careful planning and thought would have been required before it could be moved safely, despite it being easy to roll;
- The bosun was unaware of the weight of the sheave and had underestimated the risks and hazards involved in both its removal and relocation.

Lessons

- Don't just "crack on" with a task rather than bother other people to get help – **STOP and THINK**;
- Have a clear, communicated and fully understood plan for moving an object of this size and weight.

Members may wish to refer to

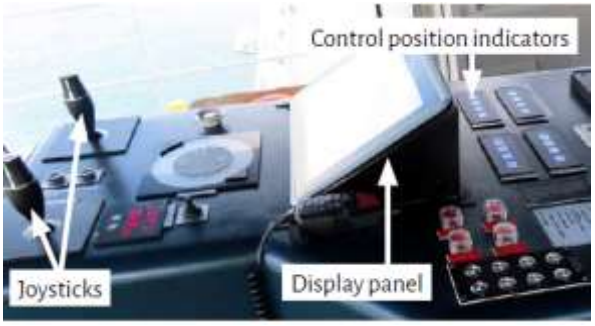
- Serious leg injury from falling winch sheave *[2020: a very similar incident, arising from very similar causes – this is why IMCA has passed on the above incident]*

- Fatality: person crushed when secured material fell on him
- Update to SF 08/21: fatality – person crushed when secured material fell on him

4 MAIB: Who is in control?

What happened

Control was lost of a vessel and it almost ran aground as a result. Fortunately, the crew were able to regain control before the vessel (a ferry) grounded, and the voyage continued safely.



The vessel was fitted with a Voith Schneider Propeller. The system could be controlled from joysticks on one of three consoles on the port, starboard or centre of the bridge. Control was exchanged by pressing a command button at one of the consoles and confirmed by pressing the button a second time. An audible tone would indicate when there was misalignment between the joysticks of the two consoles and the transfer would not take place.

The Master was using the starboard console to manoeuvre the ferry out of port on the morning of the incident. The helmsman pressed the command button on the centre console to request control as normal and the audible tone sounded. The master, believing control had been passed, set the starboard console's joystick to the zero position. However, the audible tone continued. This was confusing. Neither the Master nor helmsman knew who was in control. The ferry slowed and swung to port. The bridge team attempted to take control at each console station and in doing so the control passed backwards and forwards many times.

The audible tone stopped shortly afterwards, indicating that the transfer process had timed out. The bridge team then zeroed all the joysticks and successfully transferred control to the centre console after pressing the command button at that station twice. The ferry was able to pull back from the beach and resume its passage.

What went wrong

- The angle of the control display panels made it difficult to see which console was in control - previous modifications to the position of the display panels had inadvertently made it harder to see them;
- Confusion arose and neither the Master nor helmsman knew who was in control.

Lessons

- Equipment:
  - With dual or other complex control systems, ensure there is a robust system for identifying which console has control at any time;
  - Control indications should be unambiguous and any modifications need to be carefully considered so that the fixing of one problem does not create another.
- Training and competence: When the equipment did not operate as expected it took time for the bridge team to regain control. This circumstance was in the manual – greater familiarity with procedure may have quickened the bridge team's response to the loss of control.

Members may wish to refer to

- MSF: Contact between Vessel and Offshore Installation
- Near miss: emergency stop pressed accidentally
- Accidental activation of emergency stop during saturation diving operations

5 MAIB: Lithium-ion battery fire

What happened

Sea water got into Lithium-ion batteries in equipment for use subsea, causing an explosion. Inspection of the equipment after a successful deployment identified a potential leak from one of the metal tubes. However, other work priorities meant that the technician in charge of the equipment decided to leave it in its storage area and delay the removal and further examination of the battery. Seven hours later, the vessel's bridge team heard a loud bang followed by a fire detection system warning for the deepwater equipment storage area. The attending crew members discovered a scorched and damaged metal battery tube lying on the deck. There were no injuries.

Examination of the battery tube indicated that sea water had leaked into the battery compartment and contaminated the Li-ion battery, which caused pressurised gasses to build up and self-combust and resulted in a brief explosion. The remaining battery tubes were removed to a secure storage area for further checks.

Lessons

- Lithium-ion batteries are widely used in IMCA members' operations, and they are potentially very hazardous. A 1kg Li-ion battery can store the same amount of energy as a 6kg NiMH (Nickel metal hydride) or lead acid battery.
- Lithium-ion battery failures do occur; fires in Lithium-ion batteries can be difficult to extinguish.
- Lithium reacts intensely with water, which can corrode or damage the internal battery safety devices and cause it to overheat, ignite, rupture or leak. Some of the chemicals produced by burning Lithium-ion batteries can be very dangerous.
- A Li-ion battery that is found to be damaged or affected by water should not be used or charged. Remove the battery to a secure place where it can be monitored and potential spontaneous combustion can occur safely. In the event of a fire, use an appropriate fire extinguisher to put it out.

Members may wish to refer to

- USB power bank (Lithium battery) fire
- Battery fire with subsequent gas explosion: Warning about lithium-ion power following ferry fire
- Lithium battery pack explosion