IMCA Safety Flash 15/18

July 2018

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 Vessel Collision with Fixed Structure on Wind Farm

What happened?

A vessel collided with the working platform on a wind turbine Transition Piece. The incident occurred during worsening weather conditions. The vessel was on DP, when it was decided to pull off. Whilst moving away from the tower, a switch was made from DP to independent joystick control. Once the switch was made, the thrusters returned to zero pitch, effectively leaving the vessel without drive, approximately 120m from the Transition Piece.

The wind was 28 knots. The action of the weather and sea had already started to turn the vessel back towards the Transition Piece. The crew attempted to regain control of the vessel using the joystick. They were ultimately successful in regaining control of the vessel but were unable to prevent two collisions; one between the Transition Piece external working platform and the upper bulkhead of the vessel, and a second between the vessel's crane platform and the Transition Piece external working platform.

Note: after the incident the vessels DP systems, joystick systems and manual control systems were extensively tested. An additional failure modes and effects analysis (FMEA) test was carried out. All systems were found in good working order without any technical defects.

What went wrong?

The following points were noted:

- The officer of the watch handover procedure was unclear to those involved;
- The decision to change over in a position in close proximity to the Transition Piece was inconsiderate;
- The Master misjudged how the systems would perform during the transition from DP to independent control.

What were the causes?

- Poor judgement of situation by the vessel Master;
- The vessel was already moving against an increasing wind and was still within the wind farm boundary;
- Insufficient awareness of DP system handover procedures and the adverse effects in the actual situation.

What actions were taken?

- Revision of DP operations manual to fully cover changeover procedures;
- Revision of DP familiarisation process to include better verification;
- Introduction of a recordable in field passage planning.

What lessons were learned?

- Full understanding on changeover procedures and relationship between (DP) systems;
- Full understanding of vessels DP systems and verification thereof (no DP system is the same despite naming);
- Bridge resource planning, especially transiting between work areas should be improved.

IMCA seeks to raise awareness of the importance of detailed operational activity planning, both in the offshore renewables sector and in the offshore oil and gas sector. Within an offshore wind farm there are a large number of fixed assets which present a high risk to the navigator. It is considered that detailed planning and care is required to ensure safe operations.

Members should refer to Guidance on operational activity planning (IMCA M 220).

2 Crewman Received 415v Electric Shock

What happened?

A crewman received a serious electric shock when his hand brushed two loose wires hanging from the bottom cable entry pop-out of a distribution board. The incident occurred while he was assessing cable routing from the distribution board during a mobilisation. He was preparing to run a power supply from the dive system machinery van (MAV) to an ROV LARS. The MAV had 415v three-phase power supplied and was switched on. The crewman ran the LARS cable to the distribution board (DB) located at the back wall of the MAV. He looked at the bottom cable entry pop-out on the DB for a suitable entry point prior to any installation of the wire. This was before the DB was isolated and opened; he was only assessing the cable routing. He noticed what appeared to be two disconnected wires hanging down from the bottom pop-out and proceeded to push them out of the way with his left hand to provide a better view of the bottom pop-out. Upon contact with the two wires, he received an electric shock to his hand. He was able to make the DB safe by opening the main breaker. He then went to the diving office and reported the injury. First aid was given, and he returned to work some 90 minutes after the shock.

What went wrong?

The two wires hanging down were determined to be wires that were normally attached to a stepdown transformer connected to a volt meter. The transformer had been removed sometime prior to mobilization. It was unclear why the transformer was removed. Though some maintenance records were available, there was no documentation of this particular maintenance in the system.

The person involved was not wearing gloves at the time of the incident, as he was working with small wires in confined spaces and had removed them to improve manual dexterity. He was known to be competent and qualified for this type of work.

What were the causes?

- The immediate cause was that the crewman was not wearing personal protective equipment (PPE) and was able to make contact with live wiring which had been left exposed. No records had been made of the unfinished or sub-standard work which left the wires exposed;
- The root causes were human procedural errors:
  - the exposed live wires were not proven dead before touching;
  - the crewman was not properly informed about these wires possibly being live and assumed they were dead.

What actions were taken? What lessons were learned?

- Keeping and maintaining a maintenance log;
- Better communication and hand-over.

Members may wish to refer to the following incidents:

- Crewman received 440v electric shock
- Near miss: Exposed live electrical cable
- Near miss: live electrical cable

3 USCG: Bollard Failures at Marine Facilities

The United States Coast Guard (USCG) has published Safety Alert 06-18 entitled *Don't Let Your Vessel Get Underway Unexpectedly,* regarding bollard failures at marine facilities.

The alert covers recent shore side marine bollard failures whereby moored vessels were cast adrift. In some cases, this resulted in damage to the involved vessel, as well as other nearby vessels and shore side structures. Thankfully, there were no related injuries or deaths.


Deteriorated Base of Bollard

What went wrong? What were the causes?

Amongst other issues highlighted were:

- Rotted pilings;
- Possible pre-existing fractures;
- Failure of base castings;
- Deterioration of base of bollards.

What actions were taken? What lessons were learned?

The USCG strongly recommended "*that facility owners and operators take steps to develop a routine inspection program for bollards and other mooring equipment. Furthermore, vessel personnel should report discoveries of apparently deficient shore side mooring equipment to facility managers*."

The alert can be found on the USCG website.

Members may wish to review the following incidents:

- Incident as a result of failure of a bollard (2001)
- Near miss: corrosion-related failure of bolts used to secure lifeboat winches

4 Fuel Spray Fire

What happened?

The Marine Safety Forum (MSF) have released Safety Alert 18-16, in which a vessel experienced machinery failure which could have resulted in a far more serious outcome. The vessel had been forced to stop operations due to foggy weather. A high-level alarm was sounded on the forward bilge. Investigation of the alarm showed that the forward bilge was full of fuel oil; the fuel was spraying from the port main engine onto the engine room plates.

Failed connection as found by duty engineer

What were the causes?

Upon further inspection, it was found that the fuel oil secondary filter differential pressure sensor isolating valve on the port main engine had cracked, and this was causing the fuel spray. Approximately 1m3 of fuel was lost.

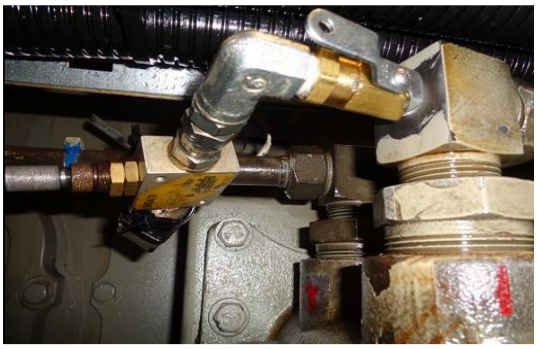
- The failure of the valve was caused by a combination of engine vibrations and the weight of assembly acting on the male threaded section of the brass valve;
- The pipe arrangement had been altered from the original set up because of pressure fluctuations – this interfered with the proper functioning of the sensor; the MSF notes that the long-term effect of this alteration was perhaps not properly assessed by the manufacturer prior to this alteration.

What actions were taken?

- Replacement of the brass valve fitting with s stainless-steel equivalent;
- Addition of a deflector plate above the valve to prevent future failure and prevent fuel spray from reaching the hot engine.

What lessons were learned?

- Always apply the management of change (MoC) process when implementing changes on board;
- Discussions of the long and short-term consequences of any changes should be had, assessing any potential risks.



Connection after initial temporary repair

Deflector plate fitted to prevent fuel being sprayed onto the hot areas of the engine

The full safety alert can be found on the MSF website.

Members may wish to refer to the following incidents:

- Fuel spray fire – déjà vu: prepare and prevent it from happening to you!
- Fatalities: engine room fire caused by fuel spray ignition

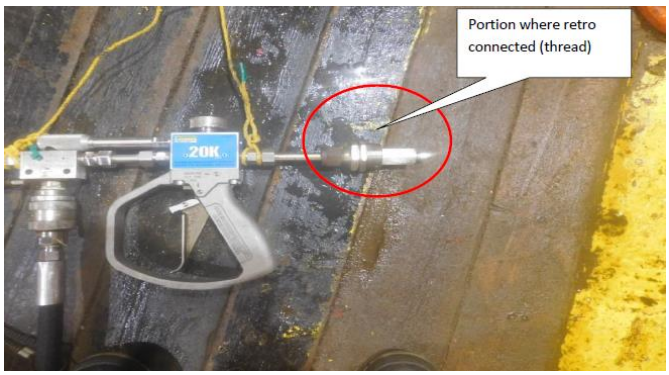
5 LTI: Diver Injured During Water Jetting Operations

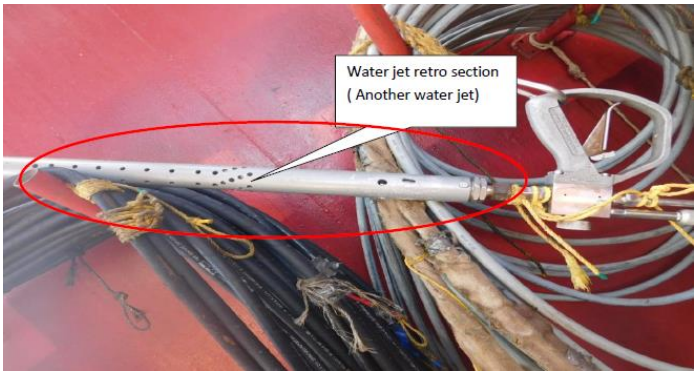
What happened?

A saturation diver suffered a lost time injury (LTI) to his left arm during subsea high-pressure water jetting operations. The incident occurred when the water jet gun failed, and a part came off the gun. The diver was recovered to the bell and the water jet gun to the surface. The diver received first aid in the bell and further treatment later in the chamber. He was subsequently decompressed and transferred to hospital. Though an LTI, the injury was not severe, and it was expected that the diver would return to his duties within months.

What went wrong? What were the causes?

- Equipment failure: locking bolts on the water jet retro came loose;
- Unsafe design or construction: locking nuts did not have a holding mechanism besides the threads available;
- Improper worker training/familiarization: manufacturer manuals provided were not available at worksite. There was no awareness of the need for a planned maintenance system (PMS) for high pressure equipment of this sort;
- Improper maintenance: it was observed during investigation that maintenance was not carried out in accordance to manufacturer's recommendations.





What actions were taken? What lessons were learned?

- Management of change (MoC) prepared for required changes;
- Ensure equipment is maintained in accordance with Code of practice for the use of high pressure jetting equipment by divers (IMCA D 049) and any manufacturer's recommendations;
- Additional controls put in place to ensure the water jetting equipment is in safe condition, including checking condition of diffuser and locking nuts;
- Further awareness briefing given to dive team regarding checks of the equipment as per the manufacturer's recommendations.

Members may wish to look at the following incidents:

- Injury: Failure of subsea HP water jetting gun (relating to Diver Safety – High Pressure Water Jetting)
- Diver Sustains Water Jetting Injury
- LTI: Leg injury caused during HP water jetting

6 USCG: Two Alerts Relating to Gas Releases

What happened?

The United States Coast Guard (USCG) has published two recent Safety Alerts relating to unplanned releases of different and unrelated gases. These are:

- 07/18 entitled *Ethylene vapors activate Carbon Monoxide alarm. Take action, retreat, and avoid harm!* and
- 10/#18 entitled *We've all experienced bad gas, but how about IFO 380? U.S. Gulf Coast Bunker Contamination*

USCG Safety Alert 07/18

During an examination of a liquefied natural gas (LNG) carrier whose cargo tanks contained ethylene vapors, CO (Carbon Monoxide) gas alarms were received which were traced to an eight-inch crack on a cargo vapor line.

It was noted that the molecular weight of Ethylene (28 g/mol) was identical to the molecular weight of CO, which accounted for the CO PPM readings. Coast Guard personnel contacted the manufacturer who confirmed that gases such as methane, propane, ethylene and mercaptan, could actuate the CO sensor without ever coming into the range of the LEL limits.

As a result of these events the Coast Guard *"strongly reminds all surveyors, marine inspectors, port state control examiners, and any other persons utilizing portable gas monitors and detectors while working onboard on Liquefied Gas Carriers to remain acutely aware that the ethylene gas vapors can exhibit cross-sensitivity. This issue is not limited to the monitors that the Coast Guard uses but also those made by other manufacturers. Everyone using a monitor must be aware that if the CO alarm goes off it may be an indication of dangerous gases or chemical vapors and not the presence of CO. When the alarm sounds users must take corrective action to minimize exposure risks."*

Members may wish to review the following incident:

- Bell Contamination [findings related to how gas analysers work]

USCG Safety Alert 10/18

The USCG writes: "*this safety alert raises awareness of a significant emerging problem in the U.S. Gulf Coast region regarding contaminated vessel fuel oil bunkers. This involves blended fuels oil such as Intermediate Fuel Oil (IFO 380) and has caused fouled fuel pump plungers, fuel pump seizures and other fuel system related failures. Furthermore, the fuel may increase sediment levels at separators and fuel filters and, in some cases, may completely clog filters. The standard fuel oil test methods found in the ISO 8217 specification will not detect these underlying problems."*

Fuel oil contamination could lead to engine failures and associated losses of propulsion potentially having catastrophic and wide-ranging consequences.

The Coast Guard *"recommends that vessel owners and managers ensure vessel operators are made aware of this potential hazardous condition, closely monitor fuel oil system components and consult their bunker suppliers and other technical service providers regarding this issue."*

Members may wish to review the following incident:

- Workboat failed during transfer operations due to fuel contamination