Safety Flash

10/21 – April 2021

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.

1 Near miss: vessel approach to wind turbine tower

A member reports two near miss incidents within two weeks of one another, in which during the approach of a vessel to a wind turbine tower, the nacelle started moving, with the risk of the vessel being hit or gangway being knocked off by the wind turbine blades. No harm was done in either incident.

The incidents occurred during the use of walk-to-work vessels for shipping and transferring personnel to and from wind turbine towers offshore, a procedure that occurs frequently every day, requiring close co-operation between bridge crew and the client's personnel.

The turbine blades at this particular windfarm reach to within 23m of sea level at their lowest point. Thus, when the blades or the nacelle are turning, a ship within the turbine's safety zone could be struck. Therefore, safe docking and transfer of personnel requires a total STOP of the turbine. In STOP mode, the electric system is switched off, preventing any movement of the nacelle and/or the blades.

What happened - Incident 1

A vessel approached a turbine to carry out transfer of personnel and cargo. Before the approach, the responsible person on the turbine tower used software control to lock the nacelle at a safe heading, and communicated this to the vessel bridge. Personnel had just been transferred by the gangway to the turbine, when the vessel crane operator noticed that the nacelle heading was changing. This was also observed by the bridge team. The lower blade was very close to the forward part of the vessel. The vessel, in emergency mode, immediately moved out to a safe distance of 100m and the client was informed.

What happened - Incident 2

This was a similar situation less than one month later. There was a yawing turbine during docking. The turbine had stopped automatically because of a software error. The arriving crew initially reset the alarms before putting the turbine in STOP mode manually. However, directly after the reset, the turbine went to autonomous mode and started yawing before the vessel had moved out to the safe zone. The imminent danger was that the vessel could have been hit by the blades, which fortunately did not happen.

What went wrong?

Investigations by the crew directly after the first incident event disclosed that the responsible person, working the software onboard the vessel, had not put the turbine in full STOP mode, but inadvertently put it in autonomous mode. It was suggested that the responsible person "*seemed a bit pressed that morning"*, causing him to forget to click the (second) tickbox in the software to not only put the turbine in autonomous mode but also in STOP-mode.

In addition, the turbine's internal cables were at maximum twisted status, which occurs after a turbine has wound the maximum of 5 turns around the tower. A turbine in autonomous mode will automatically start yawing to unwind the cables. This was the initial cause of the near miss.

What were the causes?

Our members' investigation and analysis of these incidents revealed the following direct causes:

- **Danger and risk were inadequately identified**. The root cause our member identified was human error;
- **The warning systems in place were inadequate**. The control software gave no warning about the turbine generator electrical system not being in STOP mode, and the bridge crew were unable to verify this, so the vessel started to approach;
- **Procedures and instructions were inadequate**.
  - The details of vessel approach and the subsequent steps of the turbine electrical STOP procedure were not discussed in project preparation;
  - It was not identified that the responsible person was in effect working alone and that there was no means of verifying the reponsible person's work or actions;
  - In addition, there was insuficient communication between client and contractor and insufficient understanding of each other's procedures. The procedures for approach and necessary turbine electrical system STOP of the wind turbine generator were not discussed thoroughly during kick-off nor in daily toolbox talks.

The vessel was prevented from being hit by the turbine blades by the quick reaction of the bridge personnel. After the turbine was put into STOP mode correctly, the vessel made a second, successful approach without further incident.

Members may wish to refer to:

- IMCA M 254 *Guidelines for Walk to Work Operations*
- IMCA HSSE 025 *Guidance on the transfer of personnel to and from offshore vessels and structures*

2 Dropped Object – Crane auxiliary block dropped from crane boom

Applicable Life Saving Rule(s)

Safe Mechanical Lifting

What happened

Two sub-contracted crane technicians were mobilised to the vessel to inspect the pipelay system 15Te crane before a load and rock test of the crane took place. Following completion of the inspection, which included a function test of all equipment and interlocks, no issues were detected and the pipelay team then began preparations for the testing utilising water weight bags.

The crane operator was instructed by the banksman, who was situated on the main deck to extend the boom so it was positioned over the basket containing the water bags, sited on the main deck. It was during the extension of the boom that the auxiliary crane wire failed and the block, weighing 30kg dropped from crane boom to main deck (approximately 30 metres). The block landed directly into a steel container that was used for storing tensioner pads.

What was the cause?

The cause of the failure was due to the double blocking of the auxiliary block and chandelier, also the interlock overload protection failed to activate.

Lessons and actions

This incident is currently under investigation and further information may be available at a later time.

- The following good practices were noted:
  - The operation was being controlled under a Permit to Work;
  - A task specific risk assessment had been developed which clearly identified potential dropped objects, the need for barriers and sentries and restricted access to the deck.
- The following immediate improvement was identified:
  - Although a banksman was in place for this task, he was too far away to effectively monitor the full movement of the crane. An additional spotter should have been used.


Area aux block landed on main deck

- Further discussion points:
  - Ensure crane checks are carried out daily;
  - Ensure crane operators do not rely solely on their crane limits to stop a movement;
  - The banksman should at all times direct the crane operator when the crane is on the move, from start up when removing the crane from the rest, through to until it is parked and made secure.
  - Where applicable, additional spotters should be used to monitor positions of crane blocks.

Members may wish to refer to

- HSSE 019 *Guidelines for lifting operations*
- Lifting operations (safety promotional video '*Be prepared to work safely'*)
- Lifting equipment (safety promotional video '*Be prepared to work safely'*)

3 Shipyard worker receives electrical shock

What happened

Applicable Life Saving Rule(s): Energy Isolation

A shipyard worker received a serious electrical shock onboard a vessel in dry dock. The incident occurred when a shipyard welding team were setting up equipment outside on the main deck.

A welder was uncoiling a 380v extension lead which would be used to provide power to his welding plant. One end of the extension cable was connected to the shipyard electrical distribution box located on the main deck and the other was coiled up and suspended on a nearby cable pole.


Power supply extension cable


Welding plant


Damaged section of three-phase cable


Shipyard electrical distribution box

As he routed the cable the welder had to walk through the pools of water which had gathered due to the inclement weather, to get the cable positioned correctly near his welding machine. Whilst carrying out this task, his hand came into contact with a damaged section of the extension cable which resulted in him receiving an electric shock.

As a result of the electric current passing through his body he was unable to release his grip on the cable. A nearby colleague heard him cry out and took decisive action to kick him clear of the cable. This was enough to release the cable from his hand. He reported to the local hospital for cautionary checks and no abnormalities were noted, and was released that evening.

What went wrong/what were the causes?

The following findings were identified:

- The electric cable outer sheathing was damaged with the inner cores exposed. The plug socket end cap was also broken off;
- The equipment was not visually inspected prior to use
- No RCD's (residual current breaker) were installed in the electrical distribution boxes. (The shipyard was unaware of the availability of RCD's that wouldn't 'trip' all the time during welding operations).
- The welders gloves were wet as a result of the inclement weather.

Actions taken

- Ensure daily pre-use inspections are performed on all work equipment;
- Ensure any defective equipment is immediately removed from site and quarantined;
- Ensure appropriate protection devices are fitted to electrical circuits;
- Emphasise the importance of knowing how to isolate equipment in the event of an emergency;
- Ensure risk assessments consider the effects of inclement weather and that suitable controls are identified and implemented.

Members may wish to refer to:

- Electrical shock from containerised portable office
- Electrician received electric shock from a bare cable
- Use of 220V AC power tools and equipment
- IMCA HSSE 032 *Guidance on safety in shipyards*
- Short video: *Electrical hazards*

4 SIMOPS - Smoke from hot work task enters confined space

Applicable Life Saving Rule(s)

Bypassing Safety Controls

What happened

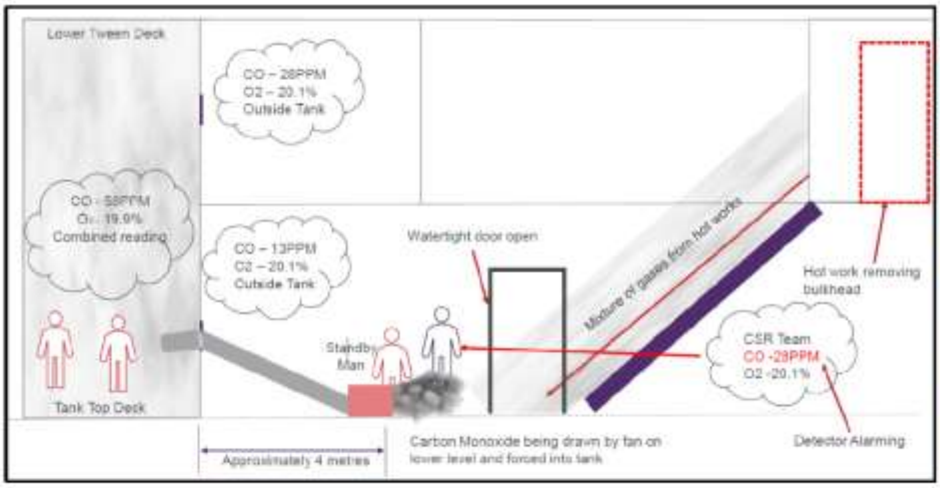
On a vessel in dry dock, confined space entry was required for the cleaning of the vessel sewage tanks. Nearby, shipyard workers were removing a section of bulkhead using oxy-propane cutting equipment. The smoke generated from this activity was being drawn down a stairway to the deck below by a portable ventilation fan. The fan had been set up to provide clean air for the sewage tank cleaning operation. The smoke was then sucked into the portable ventilation and forced into the confined space.

The two workers who entered the confined space were equipped with gas detectors capable of monitoring Oxygen, H_2S and Methane as detailed in the risk assessment. Due to the nature of task, monitoring of Carbon Monoxide was not required.

A member of the confined space rescue team was performing a routine site inspection of the area and observed high levels of smoke. As he entered the hotwork area his carbon monoxide low alarm activated on his gas detector. He also noticed the smoke being sucked into the portable ventilation system and immediately called an **All Stop.** The workers inside the confined space were instructed to immediately vacate the tank. No-one was harmed.

What went wrong?

- The sub-contracted tank cleaning work party were wearing their gas monitors inside their protective oversuits potentially preventing them from functioning correctly;
- The work party was also unaware of the requirement to perform daily "bump tests" on their gas detectors, and the calibration for all their detectors was out of date.
- The hotwork work party and the tank sentry did not recognise the smoke to be a hazardous condition and therefore did not intervene.



Worksite layout indicating the different detector readings at various locations

Confined space portable ventilation system

Lessons and actions

The following good practice was noted:

- The confined space rescue team recognised the unsafe condition and stopped the job.

The following immediate improvements were identified:

- Additional focus to be placed on SIMOPS during the daily planning meeting;
- Onsite checks of all sub-contractor equipment and worksite layout to be performed by confined space entry rescue team before work starts in a confined space;
- More effective fume extraction should be used during hotwork activities;
- Ensure all tank sentries fully understand their role and responsibilities and the hazards associated with confined space entry;
- The sub-contracted cleaning company made the following changes:
  – Correct calibration and bump testing of gas detectors as per manufacturer's instructions;
  – Required wearing of gas detectors outside of protective suits.

Members may wish to refer to

- LTI: Stored energy – rigger injured leg working on quayside *[causal factor: There were simultaneous activities occuring in the area which were not properly controlled]*
- Welder at work injured during close SIMOPS
- IMCA M 203 *Guidance on simultaneous operations (SIMOPS)*

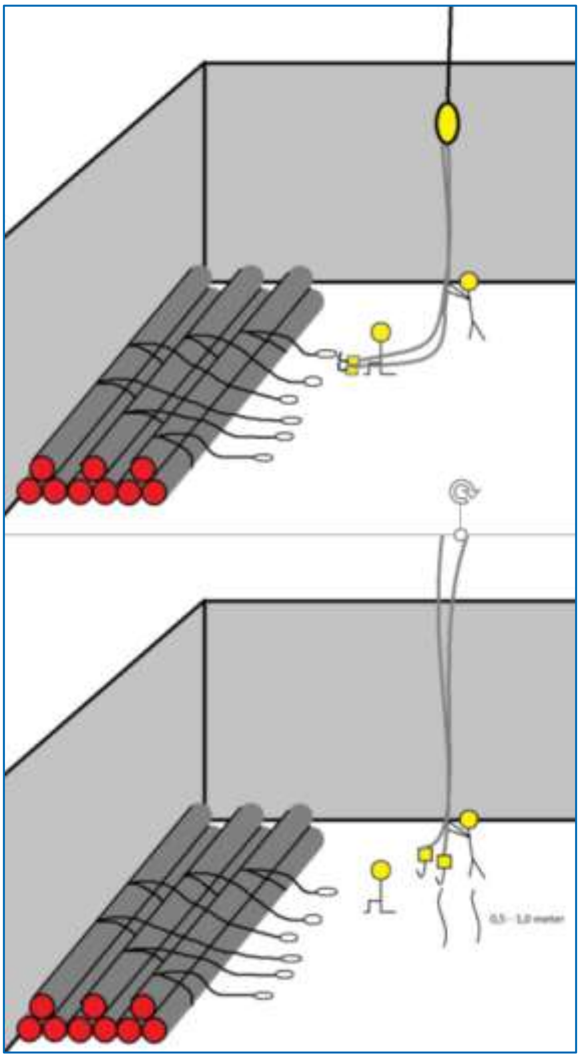
5 LTI during deck cargo operations

Applicable Life Saving Rule(s)

Line of Fire

What happened

A crewman was seriously injured during lifting operations. The incident occurred while lifting pipe bundles from the vessel onto a fixed structure. Two crewmen were ready to hook on the first pipe bundle after starting their shift at the stern of the vessel. The crane hook came down and one person secured the wires, and the other was getting the slings ready to hook onto the two hooks. A sudden heaving of the vessel caused the distance from the crane to deck to increase. The injured person saw the hooks moving away and automatically tried to secure the wire whilst at the same time checking to if his colleague was clear of the hooks. It only took a second and he found himself around almost a meter up in the air before letting go of the wire. Unfortunately he landed badly and injured his right foot.



What went wrong?

The investigation uncovered no breach of procedure nor clear unsafe indicators that caused or led up to the incident. The crew were well aware of the weather but did not specifically discuss the risk of holding onto the wires should something go wrong.

What caused the incident?

Sea conditions caused movement of the vessel relative to the crane on the fixed installation. The injured person automatically held onto the wires.

Lessons learned

- Expect the unexpected: The toolbox talk and risk assessment process can be used to discuss mental preparation – how do we respond to an unplanned occurrence?
- Consider what our automatic or "instinctive" responses are. Are they the safest responses?

Members may wish to refer to:

- LTI: Leg Fractured While Loading Tubulars
- Basket snagged on ship's structure