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 Differential pressure: dummy choke ejected close to divers

Applicable Life Saving Rule(s)

Energy Isolation

What happened?

A dummy choke insert was ejected from a water injection (WI) tree by force of differential pressure, while divers were working nearby. A Dive team was removing a dummy choke insert and replacing it with a choke valve insert. The WI tree had been subject to hydrate remediation works. With no hydrates evident, limited trapped or pressurised gas was expected and tested barriers and isolations were in place. During the removal of the half shell clamps that retained the dummy choke insert, unexpected differential pressure from the flowline forced the dummy choke insert (85kg in water) out of the choke valve body at significant force. The two divers were loosening the clamp bolts around the dummy choke and were therefore close by when it ejected. Neither diver was in the direct line of fire; both were unharmed.

Image 1 – Initial gas release

Image 2 – Diver loosening bolts

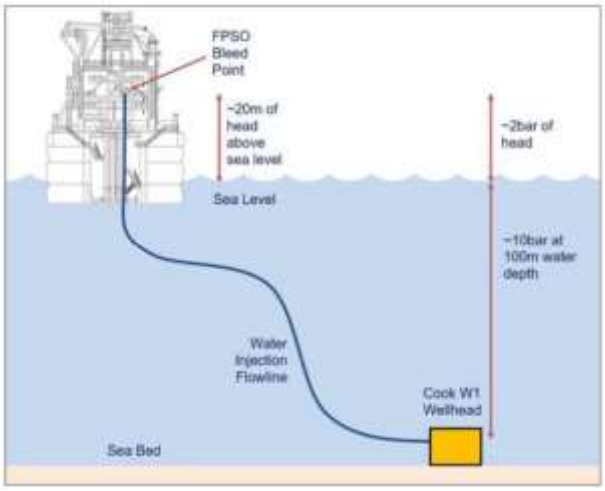
Image 3 – Dummy choke ejection

What went wrong

- During the design of the dummy choke insert, the decision was made not to include a test port, which would have allowed venting of any pressure built up in the flowline. The port was not part of the supplier's standard design, and there was not enough time to approve a design change to include the port;
- The project procedure instructed that the Subsea Pressure and Monitoring Manifold (SPAMM) should be left closed, so there was no local vent path from the flowline;
- When pressure differentials in the system were noted prior to the dummy choke removal, there was no recognition that readings were not as expected, and no discussions within the team relating to venting off the remaining pressure;
- Based on previous experience at the tree, gas/fluid release had been identified as a hazard in the procedure and in the HIRA (Hazard Identification and Risk Assessment), however no parameters had been set as to the expected volume or duration of the release;
- Divers continued to work to loosen the clamp while gas/fluid was escaping from the choke, as the team had assumed that previous venting had been successful, and that they were safe to proceed;
- Our member notes that "*the key point throughout was the failure to understand the exact pressure within the flowline, which was the residual 2 bar head of pressure from the riser after Floating Production Storage and Offloading (FPSO) venting*".

Actions suggested

- Design safety in at the early engineering phase of a project – in this case, inclusion of a test port;
- Ensure procedures and risk assessments are clear, unambiguous, and explicit in their requirements (rather than leaving things vague, ambiguous and implicit). This is particularly important when dealing with a pressurised system and/or with stored energy;
- When using subsea pressure gauges, ensure any reading anomalies are well understood, communicated to the full team, and recorded. If the gauge is behaving in an anomalous way, swap it out;
- When 'line of fire' or 'stored energy' is identified as a hazard, ensure that control measures are specific in how these hazards will be managed so that personnel are in a safe position. Relevant control measures may include: hard barriers, safe havens, extended hand tools or use of rigging;
- When carrying out diver intervention works involving barriers and isolations, ensure all relevant parties have had comprehensive training in isolations and barriers;
- Divers and Dive Supervisors should confirm a local vent is open before starting any work on pressurised systems;
- If any step in a procedure doesn't look right (e.g., local vent to be left closed when working on a pressurised system), **STOP the JOB**: Call an all stop and seek clarification.



Members may wish to refer to (focus here on differential pressure):

- Near miss: Unidentified differential pressure led to diver's umbilical getting trapped
- Fatal diver incident due to uncontrolled differential pressure
- Identification of differential pressures subsea during diving operations

2 Crane boom stopper fell to main deck

What happened

A knuckle boom stopper pad fell to the main deck directly below the knuckle boom. No personnel were injured, however there was potential for serious or fatal injury. The incident occurred when a crane operator started moving the crane boom in prepration for use. Once the crane was clear of all obstructions the crane operator started slewing it outboard. The rigging supervisor acting as banksman was in attendance, located on the inboard dedicated walkway. As the crane boom was slewing, the crane operator saw the boom stopper sliding down the knuckle boom and then falling to the deck. The crane operator immediately sounded the crane horn. The boom stopper weighed 15.5kg and fell 35m. There were no personnel near where it dropped/landed.

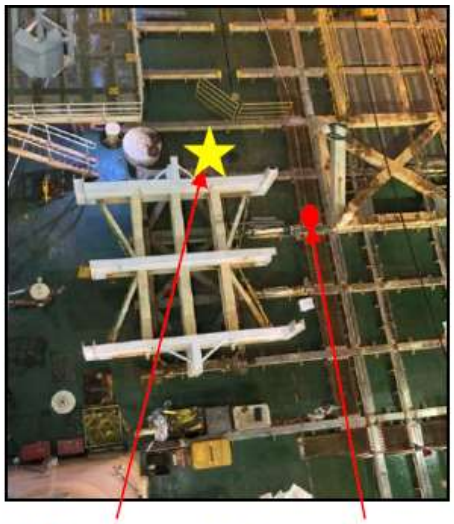
Investigation

- The area where the knuckle boom stopper pad landed was not a restricted area, access up and down the deck was via a dedicated walkway, inboard of the boom, 5m away from where the boom stopper landed;
- The knuckle boom stopper pad was only attached to the backing plate by adhesive and then the backing plate bolted to the boom stopper frame structure.

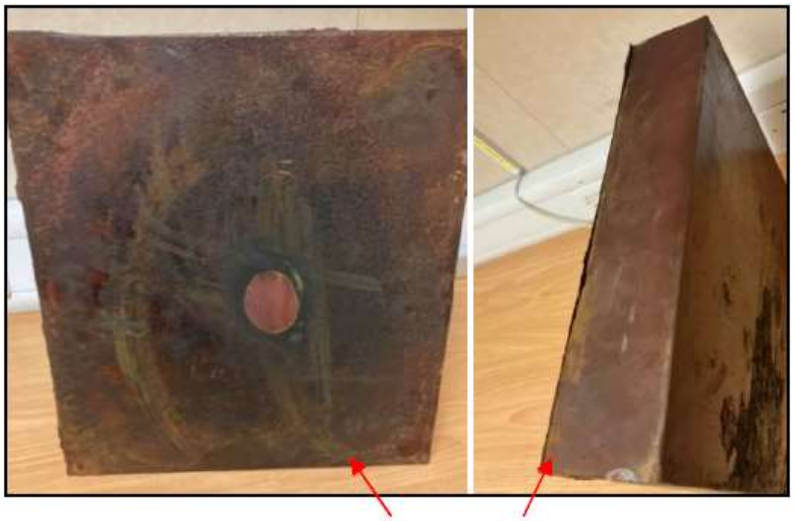
Actions taken

- Vessel technicians modified the backing plate by securing the boom stopper pad with 8 x M16 countersunk cap screws, Loctite and centre dab, and then it was reinstalled by a rope access team. The metal backing plate was

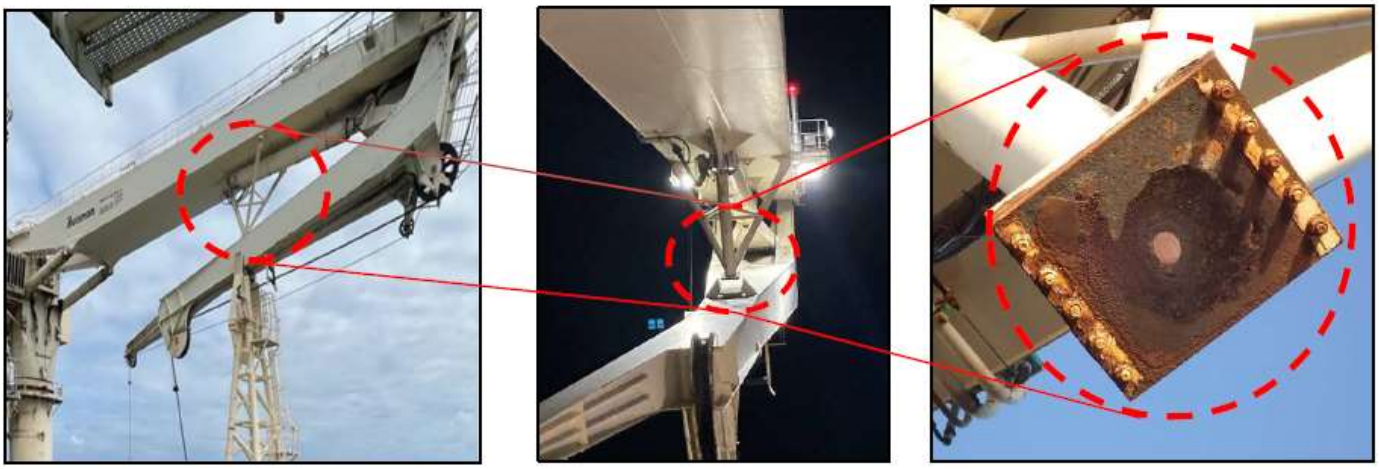
secured with M20 bolts using nyloc and Loctite, preventing any repeat of the boom stopper becoming detached.



Pad landing point - Banksman Position



Knuckle boom pad



- There is potential for similar incidents to happen on other vessels, in areas where access to potential dropped objects is difficult. Check and see:
  - If any other cranes use the same or similar type pads and if so, ensure alternative or additional fixings are applied to any connections solely reliant on adhesive compound bonding;

- Identify equipment and structures that present a risk of dropped objects and cannot be easily accessed for inspection and determine the best means of safe access and an appropriate frequency of inspection;
- Verify if there is an existing work order or dropped object check list to cover these items and add/update as necessary.

Members may wish to refer to:

- Dropped object near miss – crane boom bumper stop falls off
- Crane boom dropped object
- Dropped Object – Crane auxiliary block dropped from crane boom
- Dropped object: Signage dropped from crane boom
- Near-miss: Dropped object fell from crane boom

3 Fire alarm activation in engine room

Applicable Life Saving Rule(s)

Bypassing Safety Controls

What happened

There was a small fire in a vessel engine room. There was little damage and no-one was harmed. The incident occurred while a supply vessel was operating within the 500m Safety Zone of an offshore platform. An alarm appeared on the vessel's fire alarm control panel, indicating a fire in the starboard side Engine Room cement compartment. Engineers investigated, observed white smoke and reported this to the Bridge. The Master decided to take the vessel out of the 500m zone, changed propulsion control mode to manual and then shut down the starboard main engine. The crew proceeded to muster stations. After consulting with the Master and confirming that all personnel were mustered, the fixed CO_2 system was activated by the Chief Engineer. The vessel returned to port for further investigation and repairs.

Smoke detector over the affected Shaft Generator

Rotor of Shaft generator/ failed bearing part caused overheating and smoke

What went wrong

- The temperature sensor installed in the Starboard Shaft Generator was providing inconsistent readings since the most recent overhaul; this had not been reported by the engine crew;
- Our member highlighted two particular concerns:

- The firefighting CO_2 suppression system remote activation failed. Further investigation revealed there was an issue with an empty pilot cylinder, potentially due to leakage in the piping between pilot and CO_2 cylinders.
- Crew released CO_2 system while trying to tackle the fire in cement compartment. However, the cement compartment appeared not to have a CO_2 discharge point, as per vessel design, and this was not reflected in the vessel fire training manual.

What was the cause

The smoke was caused by a failed diesel generator bearing. After disassembling the starboard shaft generator it was observed that grease in the bearing had overheated; this had generated dense white smoke.

Lessons

- Ensure crew regularly practice their knowledge on fire emergency including the activation of the fixed CO_2 fire suppression system;
- Ensure crew are familiar with the vessel fire training manual and fire response system design;
- Review the vessel fire manual to ensure it provides an accurate overview of the vessel's firefighting equipment functionality *and relevant limitations*. Any discrepancies should be reported and addressed as a priority.

Members may wish to refer to:

- Alternator bearing collapse caused small fire
- Fire in the engine room
- Incidents and events relating to C02 systems

4 BSEE: Swing rope transfers

The United States Bureau of Safety and Environmental Enforcement (BSEE) has published Safety Alert 456 relating to the dangers inherent to swing rope transfers. The BSEE notes that *"personnel transfers using swing ropes and baskets present a considerable risk for offshore workers."* The use of swing ropes is not permitted in some parts of the world.

This is passed on as of interest to members, while noting clearly that **IMCA does not recommend the use of swing ropes.** (Section 4.4.4, *Guidance on the transfer of personnel to and from offshore vessels and structures*).

What happened

A recent example of an injury incurred during a swing rope transfer, is a fractured foot sustained by a worker attempting to use a swing rope to board a satellite platform from a work boat. As the Captain manoeuvered the boat, the worker placed his foot on a bumper tire to position himself for the swing. The worker's foot slipped between the tyre and the boat when the tyre hit the platform, resulting in injury.

View of Boat Stern Where Swing Rope Injury Has Occurred.

BSEE notes two further injuries in the last five years:

- An employee lacerated his shin after it struck the rear of a vessel as he was completing a swing;
- An employee fell into the water between a workboat and a platform when he misjudged the distance between the boat's deck and the top of a swell during a swing rope transfer. As he made his swing, the wave shifted the boat, moving the landing area. When the employee let go of the swing rope, he fell into the water. He was quickly retrieved from the water and did not sustain injuries.

BSEE recommends that:

- All offshore personnel transfers are treated as stand-alone operations;
- Formal risk assessment is conducted before a transfer occurs;
- There is “Stop work authority” for all persons involved.

Because of the inherent risks involved, BSEE also recommends that alternative methods are used where practicable and that there is routine assessment of the training and competence of everyone who has responsibilities for, and is involved with, personnel transfer.

As noted above, **IMCA does not recommend the use of swing ropes.**

Members should refer to IMCA HSSE 025 *Guidance on the transfer of personnel to and from offshore vessels and structures*.

5 Close approach of AHTS vessel to offshore rig

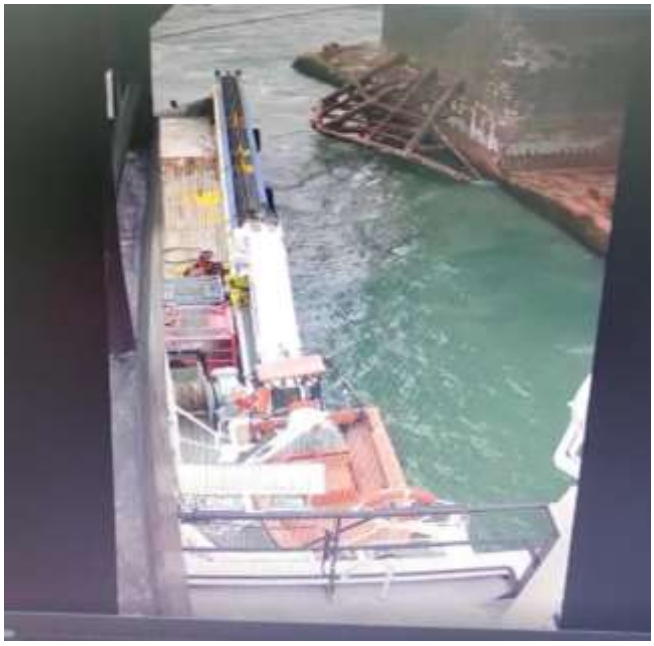
Applicable Life Saving Rule(s)

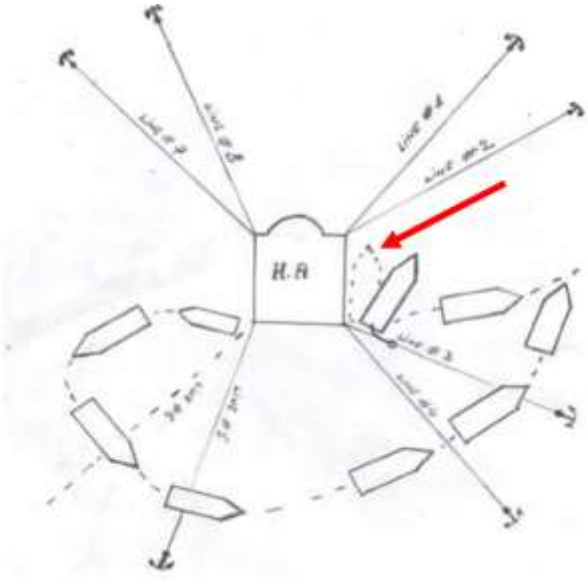
Bypassing Safety Controls

What happened

An AHTS vessel made a close approach to the mooring lines for an offshore rig. The AHTS was involved in anchor handling operations for the rig. The vessel passed anchor line #6 to the rig and started to move towards anchor line #3. Control of the vessel was transferred from forward to aft console. Once in position, the vessel received the PCP (Permanent Chasing Pennant) of anchor line #3 by rig crane and it was secured on the Karm fork. The rig’s crane was released, but the chaser’s collar slid on the anchor line towards anchor #3 and pulled the stern of the vessel to starboard, resulting in a bow side close approach to mooring line #2.

To stop this movement the Master activated the bow tunnel thruster, but the thruster did not start. As a result, the vessel bow had a close approach to mooring line #2. The Master immediately switched on all thrusters, obtained full manoeuvrability of the vessel, and the vessel pulled away safely.





A line drawing showing the AHTS vessel’s movement from anchor line #6 to anchor line #3

What was the cause?

- Further review identified that the bow thruster electromotor was off. Machinery required for safe manoeuvring of the vessel had been disabled. The electromotors for the tunnel thrusters had been switched off by the chief officer to rest the machinery as the vessel was leaving the 500m zone. This fact had not been communicated to the Master;

- The fact that the servo pumps were running gave a false assurance of full operability of the thrusters;
- There was no check of full operability after transfer of vessel control from forward to aft control stations.

Actions taken

- Ensured that critical vessel equipment is not switched off or its operational mode changed without the approval of the person in charge on the bridge;
- Manual transfer of vessel control to be followed by mandatory thorough checks of all propulsion relevant to the operation;
- Developed comprehensive work instructions for bridge transfer control.

Members may wish to refer to:

- Vessel activities near platforms – two incidents
- Near miss: vessel approach to wind turbine tower
- MSF: Contact between Vessel and Offshore Installation