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 Bailout manifold failure

What happened

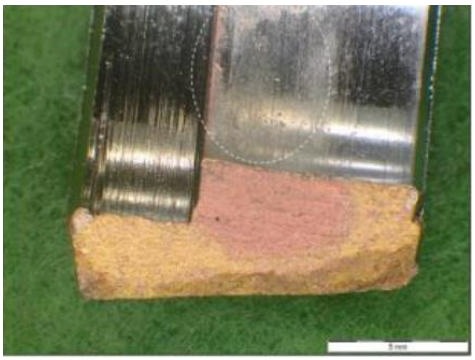
A diving bell bailout manifold failed under pressure. No divers were in the bell at the time. The bell was being prepared for diving operations whilst the DSV was waiting on tides and bell checks successfully completed. The bell man had left the bell and was back in the chamber, and the bell trunk had been isolated from the system at 31msw, with the system itself at 32msw.

A little over an hour after the bell checks, the dive supervisor heard a sudden rush of gas over the comms. A check of the bell internal camera showed visible misting (as from a gas leak). Initial investigation lead to the discovery of four pieces of a failed nut from the bailout manifold assembly.

Diving operations were immediately suspended. The decision was taken to surface both bells and remove all bailouts for inspection.

Bailout manifold assembly example showing location of failed nut

Bailout set standing upright in uneven boots



Failed nut showing some signs of coating removal and corrosion at point of a stress fracture (pink area)

What went wrong?

Our member notes:

- The rubber boots of each cylinder were uneven, which would likely have led to stress being placed on one side when moved around;
- The securing strap holding the bottles together was found to be loose;
- The design of *this particular* bailout manifold was less robust than other systems used elsewhere by the company.

What was the cause?

Later forensic testing of the nuts from the manifold assembly supported the original root cause analysis which suggested that lateral force had likely been introduced due to inappropriate securing mechanisms. This led to stress corrosion cracking in the nut and allowed material ingress which caused internal corrosion over time.

Actions

- Replaced these particular bailout manifold assemblies with a more robust version currently in use elsewhere in the fleet;
- Ensure familiarity with planned maintenance tasks relating to bailout alignment, integrity and boots;
- Circulate to industry: the forensic analysis report indicates the nuts used are manufactured from copper alloy CW614N which is susceptible to stress corrosion cracking and dezincification. It is known that these are widely used on manifold assemblies in the industry.

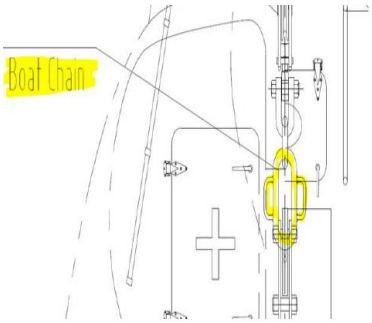
Members may wish to refer to:

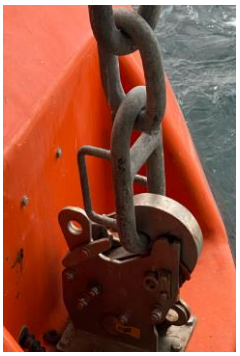
- Failure of in-service saturation bailout bottle
- COBRA bailout system – guidance note
- High potential near miss: failure of valve on gas bottle
- IMCA D 018 *Code of practice for the initial and periodic examination, testing and certification of diving plant and equipment*

2 Master links came free from lifeboat release hooks, releasing the lifeboat

What happened

A vessel was alongside waiting on weather when the decision was taken to use the opportunity to complete annual checks, including lifeboat and davit annual inspections. This included a launch and trial of the lifeboat. The launch, as per company procedure, was conducted unmanned to the water. While the boat was in the water, the fore and then the aft master links, connecting the lifeboat to its falls, became disconnected in an uncontrolled way. There were no injuries but there was slight damage to the lifeboat.





What went wrong?

Sequence of events:

- The lifeboat was lowered to the water, the weight taken on the water and the falls slacked as expected.
- A few seconds later the forward master link become disconnected from the lifeboat. Crew in the attending rescue boat started monitoring the lifeboat movements;
- As the rescue boat approached to assess what could be done to reconnect the forward link, the same occurred to the aft master link;

- At this point the lifeboat was only tethered by the forward and aft painters;
- The forward painter was connected to the painter release mechanism and the aft one to the bitt used for stowage position;
- A few seconds later the forward painter became disconnected. Crew saw the forward master link hit the painter release system which led to the release of the painter;
- As the lifeboat started swinging 180 degrees to starboard, the aft painter connected to the bitt became loose and released. At that point the lifeboat was free to drift away;
- The rescue boat in attendance and crew on the quayside were able to recover the lifeboat.

What was the cause?

The location of the master link handles was incorrectly orientated with the handles facing inboard towards the hook latch and lifeboat. The movement of the master link handles therefore impacted and released the hook safety latch, releasing the hooks.

Actions

- Replacement master links with handles orientated to the sides to be installed.

Members may wish to refer to:

- Unplanned deployment of free fall lifeboat
- Near miss: Incorrectly set lifeboat hook
- Routine test of lifeboat launch results in fatalities
- Two incidents relating to life-rafts/life boats

3 Three bolts sheared on a lifting trunnion

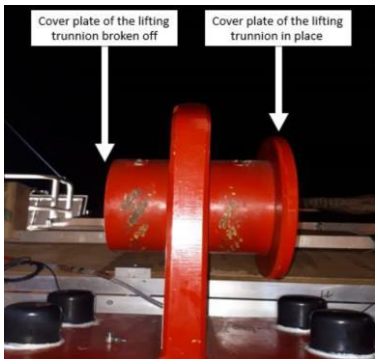
What happened

Applicable Life Saving Rule(s)

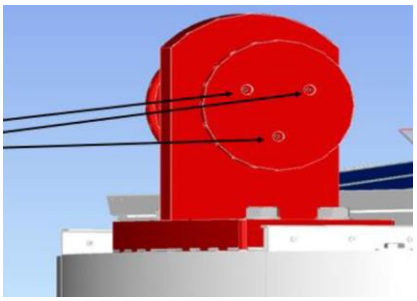
Safe Mechanical Lifting

After successful installation of a offshore renewables Transition Piece (TP), crew accessed the TP and discovered that the cover plate of the lifting trunnion had fallen off and was on the hatch cover of the TP with its three securing screws close by. The securing screws had sheared. The cover plate weighed 44kg and fell approximately 0.5m from the lifting trunnion to the hatch cover.

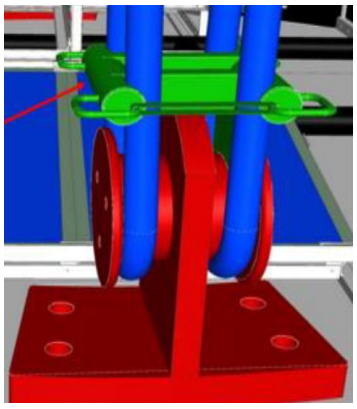
Further inspection followed and it was observed that there had been some damage to a survey beam and an antenna of GNSS positioning equipment. The damage caused to the antenna was fixed onboard. The survey lifting beamA had to be replaced, but there was a spare onboard and a replacement beam was ordered.



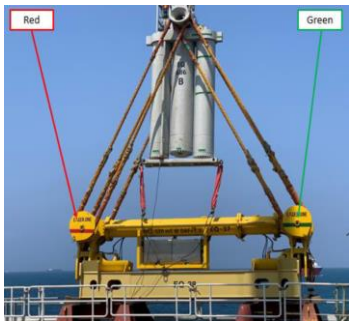
Lifting trunnion



Showing location of bolts



Showing sling retainer



Similar lifting beam

Sheared bolts

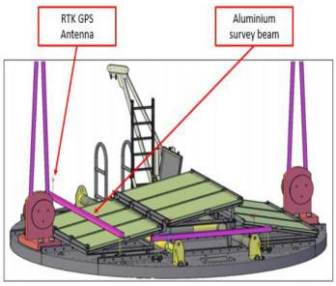


Diagram of damaged equipment

What went wrong

It was considered that the method of verifying the suitability of the screws attaching the cover plate to the lifting trunnions was incorrect. It was assumed that the sideway forces experienced by the cover plate were exactly introduced in the centre of the lug cover. However, this was not case. This assumption resulted in the inadequate method of securing the cover plate to the lifting trunnion.

What went right

- A permit to work was in use for the task, a toolbox talk was held where the Job hazard analysis was referenced and a Last-minute risk assessment was used. The task plan was adhered to throughout the installation.

What were the causes

- The side forces experienced by the cover plate were greater than the screws could withstand; this could have been foreseen. Our member considers the root cause to be human error.

Actions

- Weld the cover plates to the lifting trunnions.

Members may wish to refer to:

- High potential near miss: tensioner pad dropped to under deck carousel
- Dropped Object – Steel deck plate falls from pipelay tower

4 Hose management and chemicals: crew person felt ill

What happened

Whilst filling a bucket from a hose, someone was adversely affected by the contents of the hose. The incident happened whilst two engineers were in the process of flushing non-potable water through a hose (to get all of the air out) before filling a cooling water system. One engineer started coughing as the contents of the hose started to fill up the bottom of the bucket. The individual was approached by a colleague and asked if they were OK. The individual continued to cough and so was asked to go and wash their hands and get some fresh air. On returning to the area the individual still didn't feel right and so was escorted to the bridge. The individual was advised to rest and get plenty of fresh air and in due course felt better. There were no long-term ill-effects.

What went wrong

- The two engineers both noticed that there was some yellow/brown liquid in the bottom of the bucket which obviously wasn't water. They started thinking that there was something wrong with this water.

- The person who felt ill had also come into contact with the fluid; gloves were not worn as the assumption had been made that it was only water that was being dealt with;
- It was considered that the hose contained mostly stagnant water and some of the cooling medium liquid. The hose has been sat in a cupboard coiled up for *nearly two years* and was unlikely to have been allowed to drip dry at any point, leaving remnants of non-potable water and cooling medium inside;

Our member considered the root cause of the incident to be poor hose management. After investigation it was found that this hose had been previously used to fill up the system with Antifrogen, a cooling agent, in July 2019. It had not been properly flushed afterwards and some of the previous liquid had remained in the hose. The hose had not been used since.

Actions

- The old hose was disposed of. Two new hoses were prepared, one for cooling agent, the other for non-potable water;
- All such hoses to be flushed clean after use and left to dry before storage;
- Avoid touching a substance if you are not sure exactly what it is!

Members may wish to refer to:

- Fuel oil hose burst during bunkering *[possible cause was the fuel oil hose had been damaged over long periods of time by being stowed improperly]*
- Inhalation of toxic fumes during hot work
- Bell contamination *[2007: divers felt faint after a hazardous substance was released from a hose under pressure]*

5 Chemical reaction: person injured during grouting operations

What happened

After completion of the grouting operation for an offshore wind farm transition piece, the sub-contract grouting team began cleaning their equipment using high pressure water jets. During this cleaning operation, one member of the team received first degree burns to his two knees and left calf. The team member suffered burns in three places and minor irritation spots elsewhere. The burns were treatable on board and had completely healed after three weeks.

Grouting plant on vessel

What went wrong?

The investigation discovered that the person who was affected, had grouting dust on his coveralls when he started working with the water jet. Whilst he was using the water jet he got soaked to the skin with the water, and this water mixed with the grouting dust to make a corrosive solution which burnt his skin.

What was the cause?

Our member considers that the root cause of this unfortunate incident was that the Safety Data Sheet for the grout lacked any information regarding the hazard of the grout dust *mixing with water* and becoming corrosive. This lack of hazard identification resulted in no risk mitigation measures being introduced to the risk assessment.

Members may wish to refer to:

- Inhalation of toxic fumes during hot work
- HSE: Allergic reaction at work
- Near miss fire – epoxy overheating