IMCA Safety Flash 18/13

December 2013

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 webmaster@imca-int.com

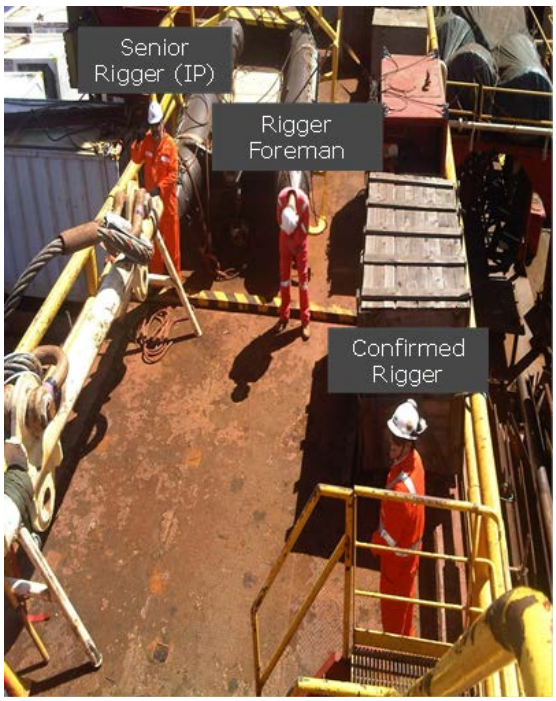
1 Fatality During Lifting Operations

A member has reported an incident in which a crew member suffered fatal crush injuries. This was during lifting operations, on an offshore vessel. The incident occurred whilst rigging equipment was being transferred from one part of the vessel to the spar deck. This operation was conducted by the crane operator and rigger team. One of the loads to be transferred involved a Dyneema sling arrangement that was connected to an ROV reverse hook. The sling weighed approximately 0.7 tonne and the hook 2.3 tonne, giving a combined weight of 3.0 tonne. The rigging assembly was prepared on the main deck by the lead rigger and a rigger.

The rigger foreman, senior rigger (IP) and the certified rigger were located on the spar deck. They had already received and sea-fastened the spreader beam and were awaiting the next load to arrive. As the Heavy Lift Crane boom was located in its rest, the Manitowoc crane boom could not be positioned to allow a plumb lowering of the load onto the spar deck. The senior rigger (IP) was asked to move to a safe position by the rigger foreman.

After confirmation was given to send the load it arrived suddenly at the spar deck; it landed inboard against the spreader. It then slid forward towards the senior rigger, who was struck twice by the suspended load. Due to his height the load made contact with his chest and crushed him against the cargo rail, at his back.

The alarm was raised and a response activated. The vessel doctor found no vital signs, he applied an airway, gave oxygen, fitted a cannula and administered adrenaline to the senior rigger but there was no response. Resuscitation continued but was unsuccessful and the senior rigger was declared dead.



Position of riggers on the spar deck

Dyneema sling and ROV reverse hook

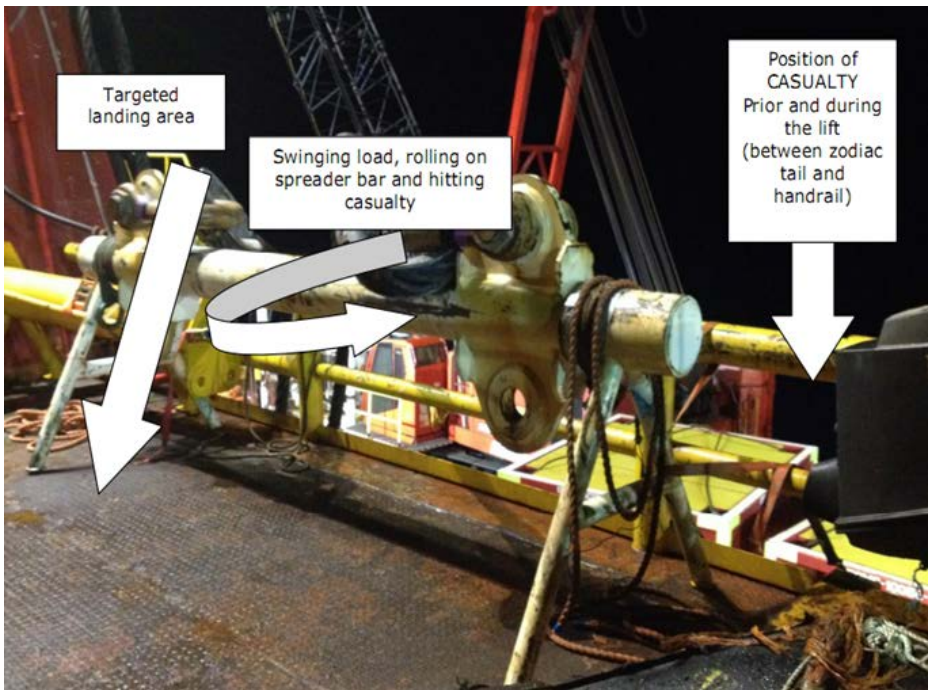


Illustration of load movement towards injured person

Our member's early investigation notes the following:

- Incident occurred in daylight hours;
- Wind was 20-22 knots ESE;
- Significant wave height 2.7m, with maximum wave height of 3.1m;
- The senior rigger may have felt he was already in a safe position, between the end of the spreader bar and the stern of the zodiac, not anticipated he was actually at risk;
- The slide forwards of the heavy load may have been caused by:
  - Induced momentum from crane swing
  - Contact with the parking leg of the spreader beam
  - Contact with the lifting eye, nubbins of spreader beam
  - Induced spin from offset of centre of gravity
  - Vessel motion from sea state;
- Or any combination of the above factors.

Our member reiterates the following vital points with regards to all lifting operations:

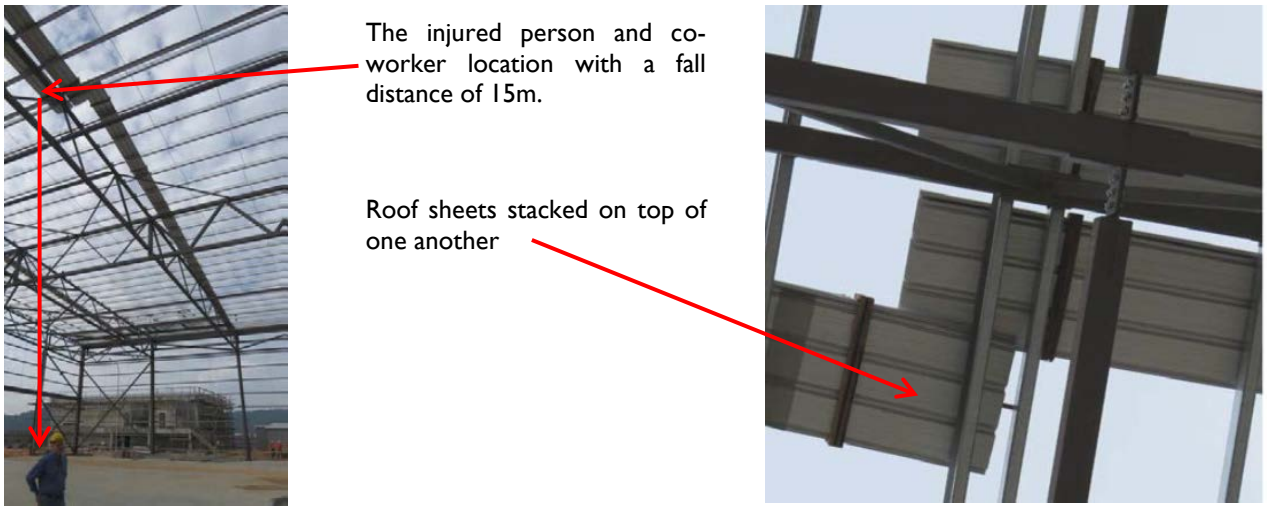
- Careful consideration should be given to all lifting operations. All lifts require planning whether they are routine or non-routine;
- Careful consideration should be given to the positioning of personnel – particularly riggers and banksmen, during lifting operations;
- Members may also wish to refer to IMCA SEL 019 *Guidelines for lifting operations.*

2 Serious Working at Height Incidents

A member has reported a number of serious working at height incidents, resulting in a fatality and five Lost Time Injuries (LTIs). The member would like to raise awareness of the risks associated with working with heights.

Incident 1 - LTI

An employee of a sub-contractor slipped and fell 15m resulting in a brain haemorrhage and leg fracture.



Showing work area from which person fell

Incident 2 - LTI

The injured person stood on a cardboard box to access the racking shelves in the storage area, of an onshore yard. Consequently, the injured person fell from the box and suffered a broken wrist and fractured elbow.

Internal storage area at onshore site

Incident 3 - LTI in Shipyard

The injured person was attempting to transit an unsecured walkway and fell a distance of 1.7m. The person fell onto the scaffold structure below; the fall resulted in four broken ribs.

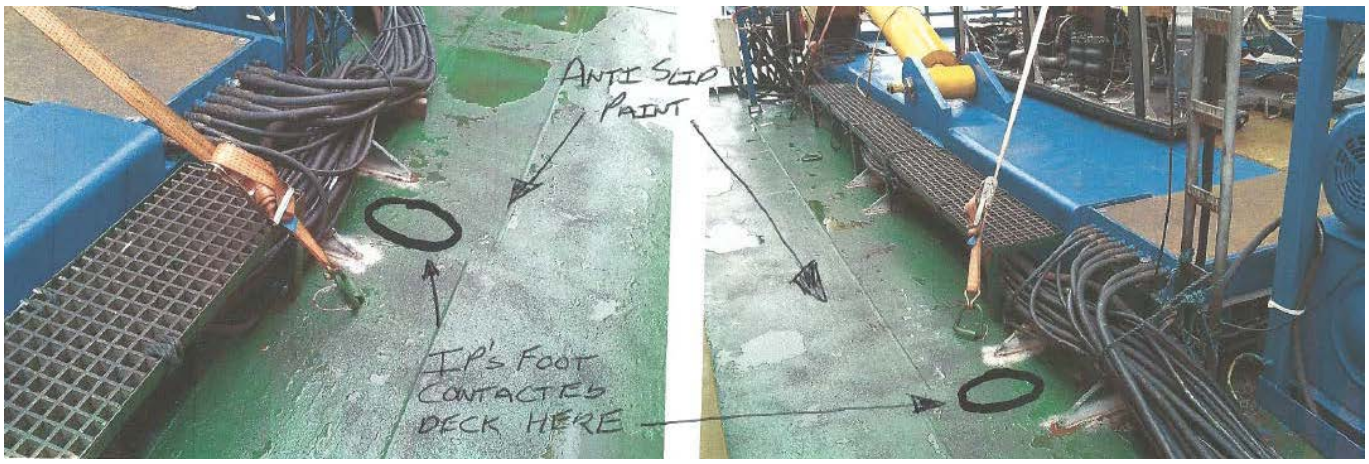
Showing from where and how injured person fell

Incident 4 – LTI on Offshore Vessel

In the fourth incident, a deck hand slipped and fell down a ladder leading from the deck to the paint store. He was found at the foot of the ladder in pain and unable to move, subsequently he required a medevac.

Incident 5 – Fall on the same level: LTI on Offshore Vessel

The injured person stepped down onto exposed hose-work from the ROV launch and recovery system (LARS). The person skidded onto the deck and slipped. The impact resulted in two minor fractures to the bones in right arm.

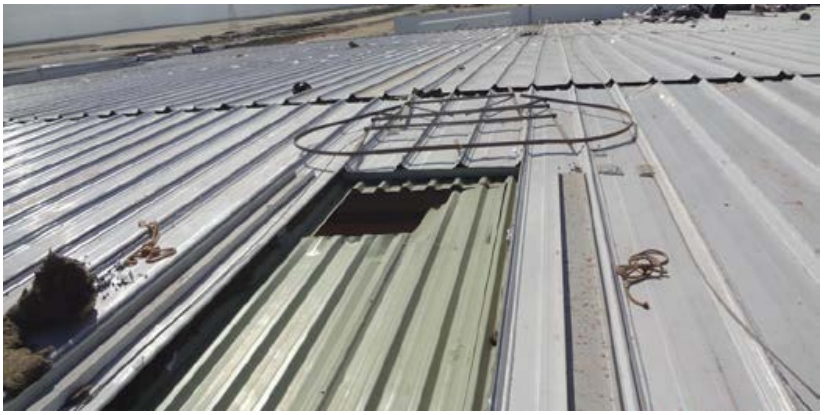


Showing worksite where injury occurred

Incident 6 – Fall from Height Fatality

Whilst installing a ventilation system an employee of a sub-contractor, fell from the roof of a building. The person fell approximately 22m and died as a result. The employee was equipped with a safety harness; neither of the two lanyards had been attached to the adjacent life-lines.

Height from ground: 22m



Showing the hole through which person fell and the distance to ground

Our member summarised that irrespective of the height, the potential consequence of a fall can be extremely severe and the above cases are clear evidence of this. A fall from a height is entirely avoidable if procedures are followed, risk assessments and tool box talks are conducted also suitable and sufficient mitigation is in place.

Our member recommended the following:

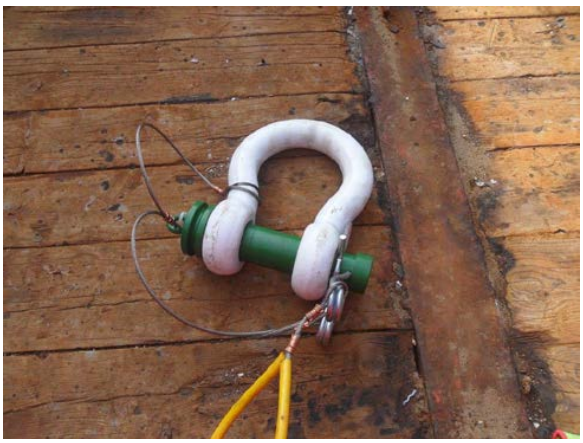
- Implement the conditions of the Permit to Work, consider operations which may be undertaken concurrently with others;
- Ensure personnel are suitably qualified and experienced;
- Provide adequate supervision;
- Use appropriate working at height equipment and tooling;
- Conduct a toolbox talk;
- If in doubt 'stop the job' and re-assess;
- Members' attention is also drawn to the wide range of IMCA safety promotional materials, which will be of use in mitigating risks of this sort, including:
  - Safety Pocket card SPC 02 *Preventing Slips & Trips*
  - Safety Pocket card SPC 03 *Tool Box Talks*
  - Safety Pocket card SPC 06 *Working at height*
  - Safety Pocket card SPC 10 *Workplace safety self-assessment*
  - Safety Pocket card SPC 18 *Permit to Work*
  - Safety Poster SPP 02 *Preventing Slips & Trips*
  - Safety Poster SPP 03 *Working at height*
  - DVD SEL 009 *Working at height*
  - DVD SEL 013 *Slips, trips and finger nips*
  - DVD SEL 021 *Risk assessment*
  - DVD SEL 026 *Toolbox talks*

3 Near Miss – ROV Shackle (potential dropped object)

A member has reported a near miss incident in which an ROV shackle holding a boulder grab became loose and the pin partially disengaged. The incident occurred during a subsea boulder removal, along a pipeline route. A construction vessel had been working continuously for approximately 19 hours, conducting a boulder removal operation. The ROV operator spotted that the ROV shackle on the boulder grab had become loose and the pin was partially disengaged.

The decision was made to lower and land the boulder grab on the seabed. This was done in a safe and controlled manner. Following further toolbox and management of change and risk assessment talks, the boulder grab was recovered and the rigging changed to make it safe.

Showing shackle (white) and pin (green) partially disengaged.



(Left): Shackle, pin and 'R-Clips' shown loose *(Right): Shackle, pin and 'R-Clips' – complete arrangement*

The ROV shackles are designed to allow easy release by the ROV. This incident demonstrates that there is also the potential for snagging risks, particularly during long, repetitive periods of work.

The replacement shackle and rigging arrangement, (25Te ROV shackle for 25Te anchor bow shackle c/w split pin) did not compromise the ability to abandon the boulder grab in any emergency situation.

The preferred option is to remove the requirement for ROV shackles altogether. The 25Te anchor bow shackle should be connected directly to the boulder grab (where possible) and the soft sling rigging arrangement. In an emergency situation, the ROV would cut the soft sling and release the boulder grab.

Our member's investigation revealed the following potential causes of the near miss incident:

- The positioning of the ROV shackle arrangement (just above the boulder grab), there was the potential for the 'R-Clips' securing the wire to become snagged, on other rigging or the boulder grab;
- Every time the boulder grab landed on the sea-bed to move a boulder, the rigging would slacken. This repeated action, over 19 hours continuous use, could have resulted in the 'R-Clips' becoming dislodged and the pin working loose.

Our member took the following action:

- Lowered the boulder grab to seabed;
- Undertook a toolbox talk, management of change and further risk assessment, prior to recovery to deck of boulder grab;
- Altered the rigging: (25Te ROV shackle – 25Te anchor bow shackle c/w split pin);
- Considered (where possible) removal of the ROV shackles and replacing with 25Te anchor bow shackle (c/w split pin), connected straight to soft sling and boulder grab;
- Members are advised to be aware of the potential snagging risks and to re-assess the use of ROV shackles prior to their use.

4 High Potential Near Miss - Incompatible Pillar Valve Assembly

A member has reported a high potential near miss incident, in which there was a failure of a pillar valve in a diver's bailout set. The incident occurred during preparation for diving operations, requiring three twin bailout sets. Upon completion of assembling the three bailout sets, two sets were charged with a gas mix of $He/0_2$ (80/20%) to 300 bar. The first two twin sets were filled with no concerns being noted. Filling was undertaken in accordance with industry standards and company procedures.

The third bailout to be charged was attached to the charging whip, secured and bailout opened. The Haskell supply valve was opened to decant the gas mix into the twin bailout set. The bailout was equalised to approximately 130 bar. The filling process was undertaken to fill the third twin set to the required pressure for diving operations. A small leak was detected at the charging whip connection to the bailout. This resulted in the repositioning of the bailout in the charge tank, so that the twin bailout set was submerged. This action was undertaken to assist in the cooling of the twin bailout and in the detection of leaks. Within less than two minutes there was a loud explosion/release of gas from the charging tank. The gas supplied was immediately isolated. Upon inspection it was identified that the pillar valve failed to hold the content of the cylinder.

Twin bailout after incident

Broken manifold assembly

Broken assembly

Our member's investigation noted the following:

- Different types of cylinders (imperial and metric) were being used on the same job site;
- There was no management of change (MOC) process undertaken, to change pillar valve to twin manifold configuration;
- Additional force was applied to insert new pillar valve (no inspection undertaken as to why there was a resistance).

Our member took the following corrective actions:

- Replacing bailout cylinders with metric only;
- Vessel technicians to be supplied with a precision measuring instrument (for measurement of thread patterns);
- Training to be undertaken by dive team / project department pertaining to the use of MOC;
- Implement system that ensures only metric thread cylinders and components used;
- Marking of all metric and imperial parts and cylinders to be undertaken for ease of identification.