IMCA Safety Flash 17/14

October 2014

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 LTI: Fall Overboard/Fall from Height

A member has reported an incident which a member of the crew of a hopper barge fell overboard onto a cylinder fender attached to the quay wall. He sustained serious injuries to his spine (twelfth thoracic vertebrae crushed and splintered). The incident occurred whilst alongside, during refitting a rope connection between the hopper barge and the quay wall. At the time of the accident the empty hopper barge was firmly moored at the quay wall, at one of the berths.

Due to adverse weather conditions (wind force 9, rain showers and swells in the inner harbour) and rising tide, the head line became slack. The injured person was on the foredeck to check the rope connection and to refit the rope. During refitting of the rope he had to bend slightly with his upper body overboard. When re-fixing the head line, the barge struck the berth fenders due to the wave motion in the harbour basin. As a result of this the injured person lost his balance and fell from a height of about 2m overboard onto the cylinder fender on the quay wall. He was rescued, using a ladder from the berth-fender and brought on board for transfer to hospital.

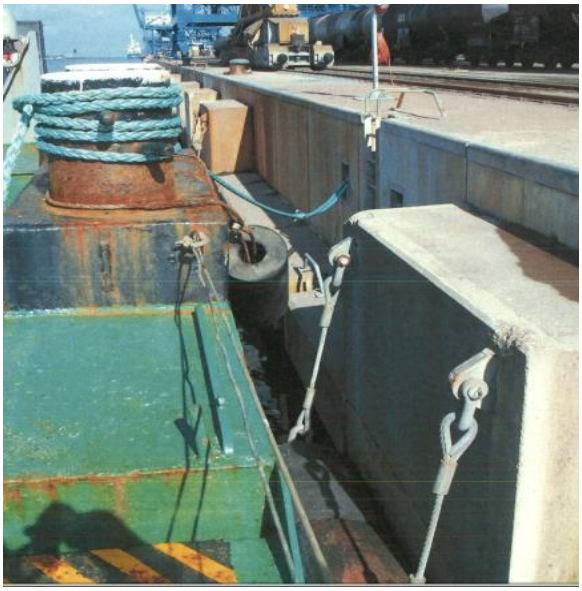

Figure: showing high position of bollard and low position of top hand rail

Figure: showing cylinder fender on quay wall, onto which the casualty fell

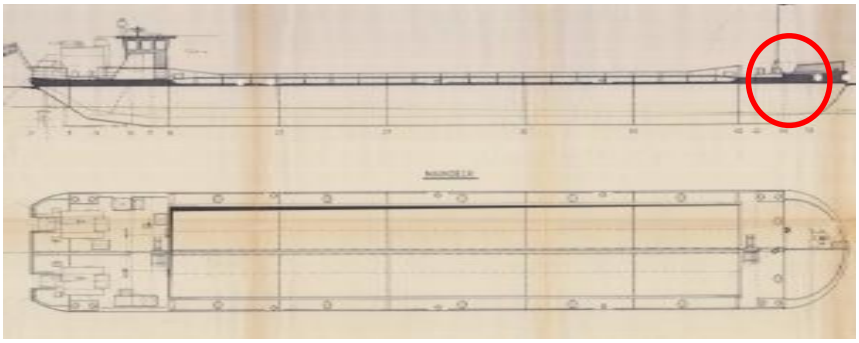

Figure: barge showing where incident occurred

Our member identified the following causes to the incident:

- The injured person was working alone;
- He found it necessary to lean overboard and used no personal protective equipment (PPE) or restraint mechanism;
- There was a mechanical jolt of barge against quay wall fender;
- The relatively high position of the bollard and the low position of the top hand rail;
- Poor weather conditions;
- The working conditions and the weather conditions had not been properly risk assessed.

The following lessons were identified:

- Never lean out overboard without first securing yourself – everyone is responsible for their own safety;
- In poor weather conditions always work on deck in pairs and secure yourself to the deck;
- Crew need to remain aware that they can 'Stop the job' no matter who they are;
- Increase due care level for routine jobs – be better informed about risk and control measures;
- As far as practical, use a capstan head or mooring winch to affix mooring lines;
- Improve the relatively high position of the bollard and the low position of the top hand rail;
- In case of suspected spinal injury do not move the injured person unnecessarily.

In 2013, falls from height formed 10% of recorded LTIs amongst IMCA members. There were clear lessons to reiterate to all members' vessel management and crews with regard to:

- the correct use of fall restraint;
- full and proper risk assessment;
- ensuring a safe system of work.

In this case, attention is drawn to two incidents highlighting the risks of working alone:

- IMCA SF 11/12 – Incident 3. *LTI: Crush injury - arm trapped by movement of crane block*;
- IMCA SF 16/13 – Incident 4 *LTI: Crewman injured foot during offshore renewables mooring operation.*

Members should be aware of the following safety promotional materials:

- Safety Card 06 – *Working at height;*
- Safety Card 10 – *Workplace safety self-assessment;*
- Safety Poster 12 – *Mooring safety.*

2 Lithium Battery Pack Explosion

A member reported an incident which there was an explosion of a lithium battery pack that was supplying power to a corrosion erosion monitor, a non-intrusive method of monitoring wall thickness of pipelines. The incident occurred during installation of a 10" in-field flow line.

As this was the first such device to be installed by the client, there were a number of individuals taking pictures. As a result, there are pictures showing the battery explosion as it happened.

Four persons required medical treatment with one person requiring a number of stiches to the forehead as a result of flying debris. There was significant damage to the surrounding steel work of the Pipe Line End Termination (PLET), and subsequent installation delays while the remaining battery units were made safe and replaced with NiCd type systems.

A formal investigation was on-going, but initial observations were as follows:

- The lithium battery pack exploded. There were no other energy sources in the area;
- The battery pack was thought to contain around 60 cells. A number of the cells were located in the debris field and were undamaged. The explosion was thought to be as a result of only one or two battery cells failing;

- Early indications are that the battery pack overheated triggering a chemical reaction resulting in an explosion. The cause for the overheating is not yet understood although all preservation requirements are thought to have been adhered to i.e. external temperature constraints;
- The manufacturer of the corrosion erosion monitor was informed, and the manufacturer took steps to find out what had happened, and to ensure that the incident could not recur.

Figure: showing Lithium battery explosion as it occurred

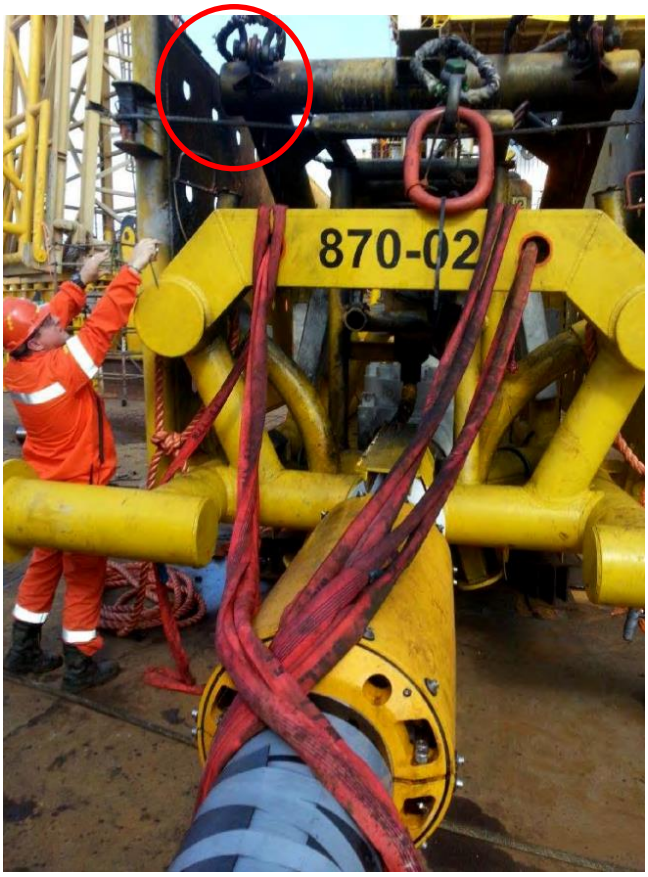

Figure: showing damaged pipeline end termination (PLET) after the explosion (note blackened areas in red circle, and CEM sensor array in foreground)

Figures: showing damage to helmet hit by flying debris from what is believed to be part of an ROV hatch close to the battery unit. The helmet and the person wearing it were 20m away from the area when the explosion happened.

There have been a number of incidents involving explosions and fires of Lithium battery packs where the root cause was discerned to be the way in which batteries were managed. The incidents below also involved Lithium-based batteries, which are potentially more hazardous than other commonly used types.

Members may wish to refer to the following similar incidents (key words: *lithium, battery, and explosion*):

- IMCA SF 05/02 – Incident 6. *Toxic gas emission from transponder*;
- IMCA SF 01/03 – Incident 1. *Follow-up to toxic gas emission from transponder (lithium batteries)*;
- IMCA SF 16/08 – Incident 1. *Laptop battery fire and explosion*.

3 Hydraulic Injection Injuries

The UK Health and Safety Executive (HSE) has published the following safety bulletin regarding an incident in which someone died as a result of a hydraulic injection injury sustained whilst tensioning the track of a piling rig. A grease nipple became detached from the track mechanism permitting the release of grease under high pressure.

As this issue of has been raised as an IMCA safety flash on a number of occasions, we have passed on this alert as a reminder of the potential for such injury when working on any hydraulic machinery or indeed any machinery at all involving high pressure fluids (oils, grease or water) or even compressed air.

The safety bulletin, including further information can be downloaded from www.hse.gov.uk/safetybulletins/hydraulic-injection-injury.htm.

Members may wish to review the following similar incidents (key word: *injection*):

- IMCA SF 06/07 – Incident 1. *Diver injury using cavitation blaster*;
- IMCA SF 16/09 – Incident 3. *Hand injury: injection of hydraulic fluid*;
- IMCA SF 06/14 – Incident 5. *Hand injury - grease injection into small finger*.

4 Uncontrolled Rotation of 9.6m Reel

A member has reported a near-miss incident which a large hydraulic reel started rotating in an uncontrolled way. The incident occurred during onshore preparatory works for a vessel mobilisation. Two 9.6m diameter reels laden with jumpers and pullheads had to be lifted and transported from the storage area to the quayside using a 'Jumbo Reel Carrier' (JRC). The first reel was successfully transported to the quayside with its transport cradles attached as normal. It was then decided to transfer the second reel to the quayside without its cradles as they could land the reel onto the cradles from the first reel once it had been lifted onto the vessel. As the second reel was being lifted, it started rotating in an uncontrolled manner, until a pullhead touched the ground and was damaged.

Figure: showing JRC (blue)

Figure: showing cradle and damaged pullhead

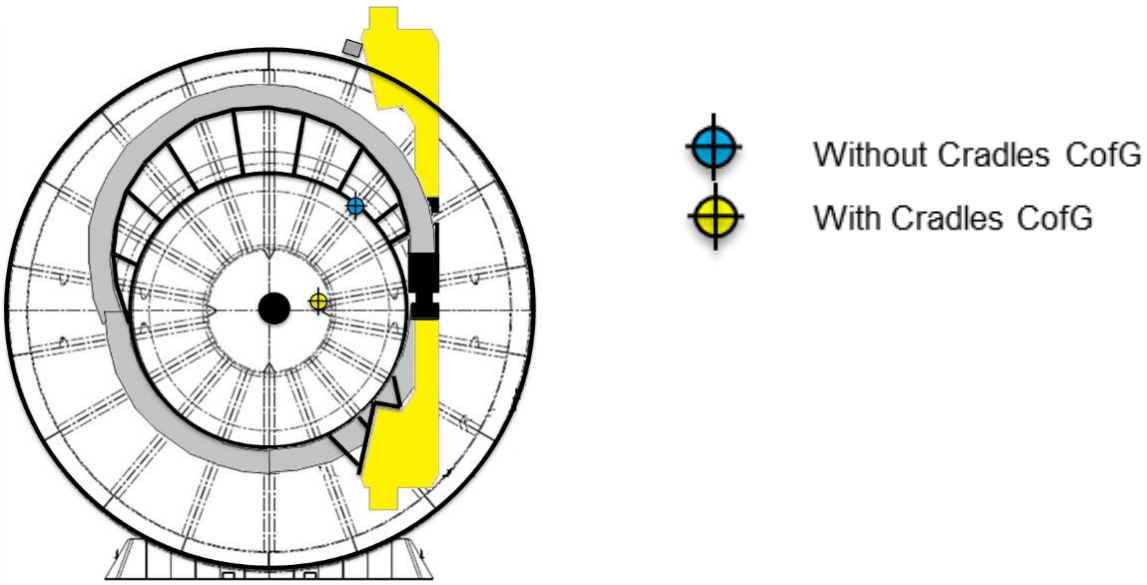

Figure: showing change of Centre of Gravity (CoG) with (yellow dot) and without (blue dot) the cradle

Our members' investigation identified the following:

- The **immediate cause** of the incident was found to be the action of lifting the reels without the cradles (weight circa 3Te each) caused the CoG (Centre of Gravity) to be above the pivot points. This combined with the fact that the reel was already unbalanced owing to the position of pullheads and the snail caused the reel to overcome the friction at lift points and rotate;
- The criticality of the position of the CoG of the loaded reel was not recognised;
- There was a lack of awareness that the JRC was not designed to lift and transport reels that are significantly off-balance;
- Only once the hubs were engaged and the reel lifted was any form of locking mechanism active;
- Procedures and risk assessments for the task were generic and did not account for variations (e.g. lengths/weights of jumper, position of pullheads, orientation of reel and snail);
- In the absence of detailed instructions for the operation and of task specific procedures, the decision to move the reel without cradles was not subject to any consultation or approval;
- Various reels have been moved at site using the JRC since it was delivered to the base three months prior to the incident;
- Although the operators had moved *balanced* reels without cradles during training, it was the first reel to be lifted by the JRC without cradles at this base.

Our member concluded by noting that although the JRC was specifically designed to lift and transport reels, there was a failure to:

- Consider the limitations of the JRC with regard to lifting reels containing additional components;
- Recognise that lifting without cradles was a change;
- Ensure method statements, risk assessments and procedures adequately consider the actual task and loads involved.

Whilst this incident involved a JRC, the points highlighted in the conclusion are equally applicable to everyday operations. When planning a task, ensure limitations of equipment are known, supporting information is suitably specific and change is managed where it occurs.

Members may wish to refer to the following incident (key words: *uncontrolled, winch, rotation*):

- IMCA SF 07/08 – Incident 1. *Fatal accident in connection with the operation of an a-frame based launch and recovery system (LARS) used for ROV operations.*

5 Slips, Trips and Falls – Raising Awareness

A number of our members have seen an increase in the number of slips, trips and falls reported from offshore vessels in the past twelve months. There is a clear need to raise awareness and highlight several serious incidents involving slips and trips.

Slips and trips are one of the most common causes of major injuries at work. The worst kind of these accidents can prove to be fatal but they can also lead to cuts, bruises, head injuries, back injuries and fractures. All slips and trips are preventable if all procedures, processes and risk assessments are followed. Everyone has a personal and shared responsibility to work together cooperatively to prevent workplace injuries.

The following issues in particular may be highlighted:

- Stairs – distraction, rushing, weather conditions etc;
- Contamination of flooring – contamination can be classed as anything that should not end up on a floor, e.g. rainwater, oil, grease, cardboard, product wrapping, dust, etc;
- Walkways – trailing cables, stored items, debris, unsecured mats, changes in levels and slopes etc;
- Obstacles – whether permanent or temporary;
- Housekeeping – a large percentage of trip accidents are caused by poor housekeeping. So improving housekeeping helps eliminate a large number of accidents;
- Environment – weather, noise, humidity, condensation, lighting, vessel movement etc;
- Suitable footwear – can play an important part in preventing slips and trips, choose the appropriate work footwear;
- People or human factors – how people act and behave in their work environment – fatigue, loss of concentration, horseplay and low risk perception etc.

In conclusion:

- The incidents described here were all wholly avoidable. Luckily many of these cases resulted in minor injuries to the individuals. However, the potential was there for a more severe injury to have been sustained;
- For some, safety only becomes an important consideration when they are doing a dangerous job or task. They rationalise that safety procedures can be bypassed or ignored when the task is simple, small, routine and seemingly presents little risk of injury. Unfortunately, this type of thinking is why many routine, and apparently safe tasks or jobs, end up resulting in accidents;
- The habit of working safely should not be limited to those activities or tasks that are the most difficult or dangerous. 'Work safe habits' should be part of your everyday work routine. If safety is not incorporated into every job or task you do, it is really only a matter of time before an accident occurs;
- All worksite areas should be free from hazards through effective planning, procedural controls and risk assessment of tasks;
- Effective toolbox talks, supervision and an ongoing review of working practices are essential to ensure learnings are identified, acted upon and shared.

Members may wish to make further use of the IMCA promotional material on this topic:

- Pocket card IMCA SPC 02 – *Preventing Slips and Trips;*
- Poster IMCA SPP 02 – *Preventing Slips, Trips and Falls;*
- Poster IMCA SPP 07 – *Look Where You Are Going;*
- Poster IMCA SPP 10 – *Take Care on Stairs;*
- DVD *Slips trips and finger nips* – available on-line and for download at http://www.imca-int.com/safety-environment-and-legislation/safety-environment-and-legislation-videos/sel-013.aspx.

Figure: person tripped over Sea Fastening on right and banged his face on Sea Fastening on left resulting in a cut upper lip

Figure: person slipped whilst descending the stairs bruising both his thigh and calf

Figure: person slipped coming out of the door way, injuring his knee

Figure: person tripped over the sea fastening strap on the Fast Rescue Craft bruising his knee

Figure: person slipped while descending the stairs, bruising his knee

Figure: person's foot got caught in the bag handle; he then stumbled and fell twisting his ankle

Figure: here, the injured person was working between the ground level as well as the air skate frame (20cm high); he stepped down and slipped on the silt in the bottom of the dry dock during cleaning operations, and fell to the floor banging his head, he also cut his face and bruised his ribs and hip. Red circles indicate area being cleaned; area where injured person fell, and tools being used.

Figure: injured person tripped over raised black/yellow warning line and fell, chipping one tooth and cracking another tooth when his face came into contact with the gas cylinder trolley