IMCA Safety Flash 27/19

November 2019

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 info@imca-int.com

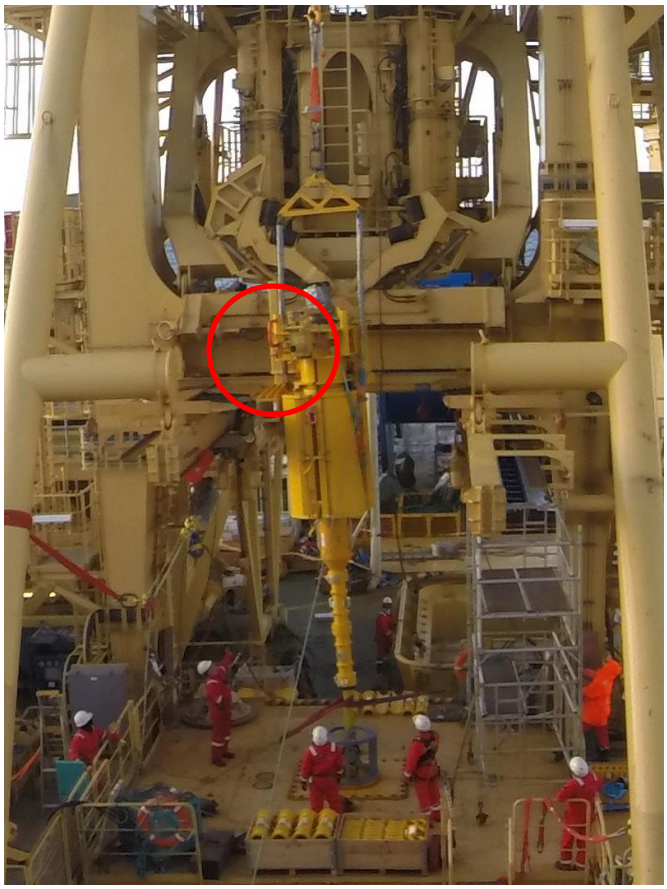
Any actions, lessons learnt, recommendations and suggestions in IMCA safety flashes are generated by the submitting organisation. IMCA safety flashes provide, in good faith, safety information for the benefit of members and do not necessarily constitute IMCA guidance, nor represent the official view of the Association or its members.

1 High Potential Near Miss Guide Cone Funnel Dropped

What happened?

An umbilical termination head (UTH) guide cone funnel fell from its sleeve connected to the UTH body. The UTH was the 2nd end of the umbilical. It had been lifted over the vertical lay system (VLS) tower and was being prepared for deployment when the incident occurred. The UTH guide cone funnel weighed approx. 500kg and fell more than 4m towards the moonpool doors.

The next step prior to deployment was to fit the bend restrictors under the UTH. While lifting the UTH from the hang-off collar to fit bend restrictors the guide cone funnel fell off.



What were the causes of the incident?

The triggering cause was:

- The guide funnel locking mechanism failed to secure the guide funnel in vertical orientation, due to too small locking protrusion.

The underlaying causes for the triggering cause were;

- Design:
  - the locking mechanism on guide funnel was not suitable for the vertical orientation. The locking mechanism was secured with a cable tie, and there was no designed-in secondary securing for the locking mechanism or the guide funnel
  - the outboard connection c/w guide funnel was an existing design used for installation in horizontal orientation
  - supplier design review may not have covered change in use in a proper way. This is being investigated by the supplier
  - design review/risk assessment between client and supplier did not cover use of existing design in a new way;
- Contractor management:
  - during the risk assessment process onshore, it was left to the client to determine which of their contractors should attend the risk assessment sessions. As a result of this, the UTH supplier had not been invited to attend the HAZID and HAZOP held by the installation contractor. The client did not appear to have guidelines or requirements with regards to which contractor should attend what design/risk session
  - there was room for improvement in the liaison between the different contractors. This is a typical issue with the type of contract set-up as on this specific project (SPS and installation in separate contracts). Better interaction and cooperation between the parties will introduce additional barriers that may detect issues with design or installation method.

What actions were taken?

It was recommended that:

- Risk assessment and/or design review or re-assessment highlighting using an existing design in a new way;
- All guide funnels from this supplier with this design should be modified with a secondary securing/locking mechanism designed to withstand installation forces;
- Revision of umbilical termination head manual to further highlight risk factors (e.g. loose items and locking system etc);
- All parties involved in engineering, fabrication and installation should be included in design reviews, HAZOP, HAZIDs etc.

Members may wish to refer to:

- Near Miss: unplanned deployment of PLET outrigger

2 Main ROV Lift Wire Umbilical and Bullet Parted

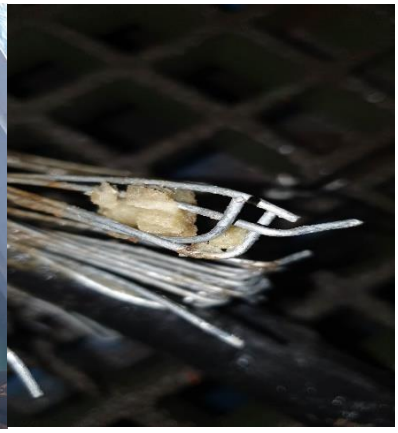
What happened?

An ROV vessel was engaged in subsea operation undertaking routine inspection, repair and maintenance (IRM) work. While an inspection class ROV was being recovered to deck within its tether management system (TMS) via an over-the-side hydraulic LARS system, the main lift wire parted and both the ROV and TMS fell to the seabed. The winch operator immediately informed the ROV supervisor, who isolated the ROV system and went down to the

ROV deck to find the bare main lift wire hanging, no longer over the sheave, but in the water from the LARS skid without the ROV attached. The incident occurred in calm conditions.

The TMS containing the ROV was recovered with the aid of vessel's divers. All operations were suspended to investigate the incident, and the system and failed components quarantined to prevent misdirection or incorrect analysis.

During investigation it was identified that no direct imposed load or snagging occurred during the recovery of the ROV TMS system prior to the failure. This was confirmed by review of CCTV footage.



Initial findings

- The TMS main lift wire and bullet parted. Further inspection identified a failure in the armour wire shield which was found to be dry with no signs of grease or any oil contaminations;
- It was noted that the 'Wirelock®' potting compound inside the socket was scattered into small pieces. The armour wire end bends appeared to be existing and no deformation noticed. Exposed armour wire length was 89cm.

What went wrong?

- The evidence presented post-incident indicated a failure of the system main lift umbilical at the connecting bullet termination point which was secured via a chemical potting compound (Wirelock®);
- The main lift umbilical connection to the TMS had been recently re-terminated. A review of the procedures and certification test records for this work confirmed that:
  - procedures in line with the manufacturer's instructions were followed by certified competent personnel
  - the Wirelock® used was within use-by date
  - the system passed an imposed load testing witnessed by third party surveyors;
- A review of the events surrounding the re-termination raised several questions relating to the ambient temperature at the time. Discussion with the manufacturer of the potting compound revealed the following:
  - confirmation that there was no 'product batch' issue with this Wirelock® and that this was an isolated failure
  - clarification that this product could be affected by changes in temperature either during storage or at the time of use
  - the manufacturer commented that past experience showed that in high temperature environments it is good practice to refrigerate the chemical compound for two hours prior to mixing the two-part compound for use. **Their procedures do not record or state this action on the user's documentation, and it is not addressed during technician training** (IMCA bold for emphasis);
- The technician who conducted the re-termination commented that the volume of product used was approximately 30% less than he had anticipated, and the compound did appear to be slightly more glutinous or viscous than usual. This is believed to be due to higher than normal ambient temperatures. The inspection

team did consider this to be a factor regarding exposed surface area of the main lift umbilical wire mantel within the bullet, however, the connection did successfully pass an overload test on completion.

What were the causes?

- The **immediate cause** of the parting of the main lift umbilical from the TMS connection bullet, was seen to be failure to follow correct procedures;
- The **root causes** were
  - failure of the potting compound inside the TMS bullet
  - failure to take into account high ambient temperatures when working with the potting compound.

What actions were taken?

- Amend procedure for potting sockets whilst in high temperature environment and where possible conduct work only within set temperature guidelines given by manufacturers;
- Consider alternative supplier for better temperature range product;
- Changes in procedures to indicate:
  - temperature of environment in which work is conducted
  - volume by weight or volume of compound used
  - compound batch number and storage details.

Members may wish to refer to:

- Wirelock® Technical Data Manual
- Loss of ROV after umbilical termination failure and damage to ROV during recovery
- Loss of ROV: dropped object
- Guidance for the safe and efficient operation of remotely operated vehicles (IMCA R 004)
- The initial and periodic examination, testing and certification of ROV launch and recovery systems (IMCA LR 011, IMCA R 011)

3 Cabling in ROV Hanger Inadvertently Severed by the ROV Launch and Recovery Frame

What happened?

During weekly testing of the vessel emergency firefighting pump, the engineer discovered that he could not start the pump.

What went wrong?

Initial investigations identified that the electrical cables and hydraulic hoses serving the equipment had been severed. Further investigation established that the cables and hoses in the ROV hanger had been inadvertently severed by the ROV launch and recovery (LARS) frame which had come into contact with the bulkhead cable tray (yellow structure in second photo).

The impact between the LARS and the bulkhead cable tray was not reported immediately after it happened, possibly because it was not noticed by those involved in the operation of the launch and recovery system.

What lessons were learned?

- When installing and/or operating powered mechanical equipment ensure that the possibility of contact between it, other equipment and fixed structures is identified and mitigated during the project planning phase and thoroughly checked during mobilisation;
- The risk of collision was in fact documented in the task risk assessment; however, this was not translated into actual change to the operating procedures and work instructions, nor to the task itself.

What actions were taken?

- Review of launch and recovery operations and documented risk assessments/operating procedures:
  - documents amended where necessary
  - one of the ROV crew assigned to monitor the ROV recovery process with particular reference to the proximity of the launch and recovery system frame to the vessel structure;
- Incident and required actions discussed with those involved in the ROV operations. Employees reminded of their responsibility to speak up if they identify an unsafe act or condition, e.g. damaged equipment and/or services;
- Installation is in progress of a permanent engineered solution to prevent contact between the LARS frame and the vessel structure.

Members may also wish to refer to:

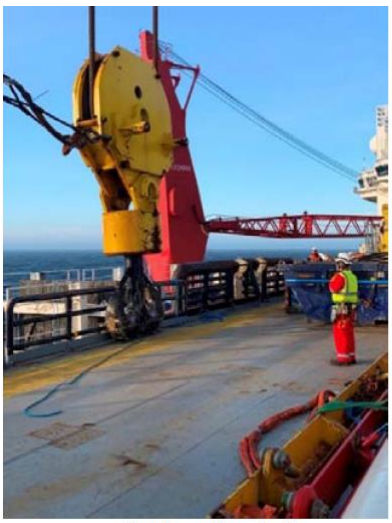
- Near Miss: Bell Umbilical Damage Incident *[umbilical damaged after it was trapped between cursor and bell.]*
- High Potential Near Miss Incident: 440v Cable Damaged By Grinder
- Near Miss: Personnel Almost Caught Between Crane House And Scaffold Pipe

4 Crush Injury to Hand While Attempting to Secure Crane Hook

What happened?

While attempting to secure a crane hook to the deck handrail with a polypropylene rope, a rigger's right hand was caught between the hook shank and the handrail. He sustained a severe crush injury to hand and wrist, which required medical evacuation and multiple surgery.

The task involved moving the auxiliary block (weight: 26Te) of the main crane to a location on deck where it could be handled for rigging purposes. The team decided to secure the block to the handrail. The auxiliary block was banked into a position above the deck, before being lowered and slewed left to touch the hand railing. Once the block was looking steady, the rigger moved in to secure the hook to the hand railing with a polypropylene rope. This brought his right hand, which was now behind the shank, in the line of fire of the hook, which slowly moved towards the railing due to vessel rolling motion. His hand was then entrapped between the handrail and the hook shank. At the time of the incident environmental conditions were marginal but within operating limits.



Hook and handrail

Close up of hook with intended position of rope indicated with red line

Pinch point between hook shank and handrail

What went wrong?

- The method chosen to stabilise the hook was not correctly evaluated or safely engineered and the hook was still moving; this placed the rigger **in the line of fire**.
- The crane block was not sufficiently stabilised;
- The rigger moved in to secure the block before a clear signal was given from the Banksman;
- The banksman did not stop or call back the rigger when he approached the load prior to clear signal.

What actions were taken?

- Ensure all high-risk sub-activities are risk assessed prior to start of work;
- Ensure that loads are stabilised before starting to work on them;
- Ensure rigging team members comply with their roles and responsibilities.

What lessons were learnt?

- Risk management:
  - ensure that all high-risk activities are risk assessed and properly controlled. In particular, generic worksite task risk assessments should be reviewed, to evaluate if relevant sub-activities are adequately assessed
  - **stop the job** if you believe a job cannot be executed safely – do not assume that others will do so;
- Team performance:
  - ensure all team members understand their roles and responsibilities
  - follow the instructions you have been given
  - exercise the authority that you have been given.

Members may wish to refer to:

- Lack of Safety Awareness: crush injury during lifting operations
- Lost Time Injury (LTI): Serious Hand injury during subsea lifting operations
- Line of Fire LTI: Finger Injury during lifting operations
- Finger Injury During Loading Operations

Members may also wish to refer to Guidelines for lifting operations (IMCA LR 006, IMCA SEL 019, IMCA M 187, IMCA D 060).

IMCA publishes a wide range of safety promotional material which is applicable in this instance, including videos, pocket cards and safety posters.

5 Hand Injury During Lifting Operations

What happened?

During a mechanical lifting operation using a mobile crane, the crane was required to move and set up at a new location. The crane outrigger stabiliser pads (1.2T x 4) used to distribute the load from the outriggers were repositioned one at a time using a counterbalance forklift truck (FLT) and placed onto timber blocks to allow the removal of the forks.

To remove the timber block from beneath the outrigger pad, the pad was attached to the elevated FLT forks/tines using two webbing slings. As the pad was being raised off the timber block, it caught on the front left tyre (FLT) causing the pad to jerk/swing. This resulted in one of the two slings releasing, enabling the pad to drop back onto the timber block. The employee who was in the process of retrieving the timber block from underneath the suspended pad sustained hand injuries when the pad fell.

What went wrong?

The investigation established that the activity was not adequately planned, assessed or supervised, and this resulted in the improper use of a forklift truck.

What actions were taken?

- Banned the practice 'free rigging' – that is, attaching ropes, chains or slings to FLT forks/tines for the purpose of below tine lifting and moving;
- **In progress/pending**:
  - can a removable attachment be used when there is the need to move a suspended load using an FLT? Is the FLT itself appropriate?
  - review the existing processes, procedures, risk assessments and operator competency to ensure the safety of FLT and lifting operations
  - re-evaluate the behavioural safety aspects of routine operations, including individual responsibilities to work safely and speak up to identify an unsafe act or condition.

Members may wish to refer to:

- LTI: Crush Injury to middle and index finger
- forklift truck incident
- High potential near miss – storage box dropped from forklift

6 Finger Trapped and Injured Whilst Moving Hatch Covers

What happened?

An AB sustained a serious finger injury when his finger was trapped while attempting to secure a forecastle hatch whilst securing the area following a mooring operation.

What went wrong?

The hatch being secured was heavy and in such a position that it required the AB to reach or climb up to open, close and secure it; this awkward arrangement resulted in finger entrapment.

The task was a common one using equipment from the vessel's original design and build, and therefore the arrangement had not been questioned. The hazard had not been adequately covered in the task risk assessment, and not reported to vessel management as a safety concern.

What actions were taken?

Our member made the decision that due to the weight, arrangement and position of the hatch being unsafe for handling, it would not be used for mooring operations and a temporary alternative arrangement put in place for running lines. Engineering solutions available:

- Fitting a motion damping strut, such as a fluid-filled gas strut;
- Or, fitting a hatch in a different position that allows for safer handling and improved safety and ergonomics for passing lines.

In addition, hazard hunts conducted to identify other similar issues that may be present around the vessel.

Members may wish to refer to:

- Lost Time Incident (LTI): laceration to finger
- Hand Injury during closing of hatch
- Finger Injury: Pinch Point
- Finger injury: diver caught finger in bell door