IMCA Safety Flash 15/14

September 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 Dropped Object Near Miss – Unsecured Plastic Box fell from Load being Lifted by Mobile Crane

A member has reported an incident in which an unsecured plastic box detached from the load and fell to the bottom of the dry dock. The incident occurred when a vessel was on the fourth day of a fast-track dry docking to investigate and repair oil leaks (and possible damage) to the vessel azimuth thrusters. Additional maintenance tasks and repairs were being carried out at the same time.

Dockyard personnel were lifting a piston from one of the vessels thrusters to the top of the dry dock, using their mobile crane. In order to contain residual oil remaining on the piston, the lifting team attached a plastic box to the piston. The piston was securely slung. However, the plastic box was insecurely slung, using pallet wrap. Wind speed was gusting to approximately 40mph. As the load reached the top of the dry dock (height 11-12m), a gust of wind blew the plastic box off the piston, which resulted in the plastic box falling back to the bottom of the dry dock. There was no one working on the floor of the dry dock where the box landed. There were no injuries and no damage.

Figure 1: vessel in dry dock with mobile crane

Figure 2: plastic box

Our members' investigation revealed the following:

- The job was promptly stopped by the banksman;
- There was insufficient oversight, management and control of dockyard personnel, particularly during lifting operations;
- Incorrect tools were used for the job.

A number of further factors were identified:

- The dry docking was unplanned and sudden or 'fast tracked';
- There were adverse weather conditions which, in addition to being a contributory factor to this particular incident, nearly prevented the vessel getting in to dry dock which could have delayed the entire project;

- Forecasted adverse weather further affected the work schedule that day. Dockyard personnel used an incorrect tool (a plastic box) and an insecure method for attaching the box, in order to mitigate possible delays, believing the onset of more severe weather – possibly preventing the use of the crane - may have been imminent.

In this case, the dropped objects prevention scheme (DROPS) calculator provides only an indication of possible outcomes. The box in question had a relatively large surface area which wind resistance would have slowed during descent. Notwithstanding this, it still had the potential to cause serious injury or even a fatality.

Our member noted that in a 'normally planned' dry docking, personnel visit dockyards, well in advance of the vessels, to ensure the dockyard is ready to receive the vessel and that systems and procedures, including those related to health and safety, are in place and in compliance with company requirements. However, it is of the greatest importance that even where a docking is 'fast-tracked' or unplanned and at very short notice, that all personnel, including dockyard personnel, follow safe working practices and procedures.

Our member took the following actions:

- Reiterated to all personnel that the vessel must have oversight of all lifts (including risk assessment, methods of work, times, locations, projected environmental conditions (wind, fog etc) even if vessel personnel have no direct involvement in the lift;
- Ensured that correct tools and lifting methods are always used, even where the vessel has no direct involvement in the lift;
- Reiterated to both crew and dockyard staff, during all dockings, that there is not only a right, but an obligation to 'stop the job' if they see anything that they think is unsafe.

Members may wish to refer to the following similar incidents (key words: *dropped, object):*

- IMCA SF 08/11 – Incident 2: *Recent near miss incidents involving potential dropped objects* (Marine Safety Forum);
- IMCA SF 06/13 – Incident 4: *Near miss: dropped objects during lifting operations;*

Members may wish to refer to IMCA SEL 032 – *Guidance on safety in shipyards*.

2 440V Electrical Shock Incident

A member has reported an incident which a technician received a 440V electric shock. The incident occurred during an investigation of a power distribution unit (PDU) located in the ROV control room onboard a vessel. The purpose of the investigation into the PDU unit was to conclude whether the observation ROV being powered from this PDU was able to provide output data of a certain quality. The person who was shocked was not harmed and did not require any medical follow up.

Our members' investigation revealed the following:

- The task was not a planned operation and it was performed by personnel with inadequate training/knowledge of the dangers associated with this work;
- The PDU was not properly labelled with warning signs, and had no top cover;
- There were two separate power supplies to the PDU; this was not identified due to the low level of familiarisation of involved personnel;
- The ROV supervisor was not notified about the operation;
- There was no job-specific permit to work (PTW) or any management of change. However, a generic PTW was made;
- There was a risk assessment but it was neither suitable nor sufficient – not according to requirements in regards to details, attendees and quality.

Our member noted the causes:

- The **direct** cause of the incident was that the technician touched or came near equipment that was powered to 440 V;
- The **root** causes identified were as follows:
  - Rescheduling of work tasks caused personnel to carry out *ad-hoc* investigations inside the PDU unit
  - There was poor safety awareness related to ongoing work
  - The PDU was inadequately labelled as being a place where there was danger of electrical shock

- There was no detailed PTW completed
- There was inadequate risk assessment underpinning the work on the PDU unit. The risk assessment was not performed to such a level of detail that it allowed actual risks to be disclosed
- The persons doing the work were inadequately trained on this particular ROV system
- There was inadequate quality and safety verification of equipment received onboard
- It was not clear to personnel how the organization works offshore.

The following lessons were identified:

- Stop the job if you feel unsafe;
- Follow the requirements as defined in management system;
- Always inform supervisor;
- Always complete familiarisation;
- Always make a detailed risk assessment and be compliant with the control of work system;
- There should be thorough verification and site acceptance of new equipment, particularly with regard to quality, labelling, design and location on board.

Our member took steps to:

- Revise bridging document with focus on clear communication lines;
- Ensure control of work system was understood by all crew on board;
- Revise risk assessment, training matrix and amended procedures to avoid repetition.

Members may wish to refer to the following similar incidents (key words: *electric, shock*):

- IMCA SF 15/08 – Incident 2: *Risk of electrocution during routine work*;
- IMCA SF 07/09 – Incident 1: *Fatal electrocution;*
- IMCA SF 02/10 – Incident 1: *Crewman received 440V electric shock;*
- IMCA SF 08/11 – Incident 3: *Electrician received electric shock.*

3 Diver Injured after being Trapped Underwater

A member reported an incident which a diver became trapped underwater when the seabed gave way under him during a sheet pile cutting/removal operations. The incident occurred during the removal of an abandoned sheet pile quay. Two divers were in the water involved in cutting operations on underwater piles in very shallow (less than 10m) water. One of the divers was doing the horizontal cut to remove the piles when he reported to the supervisor that he could not move his legs as they were covered in sand to his calves and subsequently to his chest level.

The second diver working close by was directed to assist the fist diver, and a third, rescue, diver was deployed. The crane, which was slung with piles, ready to be recovered from the seabed, was made ready to recover the trapped diver as he was situated too far from the recovery davit. The two divers attempted to aerate the seabed using a caviblaster to free the trapped diver but without success.

Attempts to use the crane to lift the trapped diver to safety by connecting the crane hook to his safety harness resulted in damage to his harness and loss of his surface air supply and bailout. As a matter of extreme urgency the diver was lifted clear using the crane and slings around his armpits. He lost consciousness; and sustained injuries. Once recovered from the sea, he was successfully resuscitated and subsequently transferred to hospital.

Our members' on-going investigation noted the following initial conditional findings:

- Before this incident, over one hundred similar piles at this location had been safely dismantled by the contractor's divers;
- Instabilities and underwater anomalies in this area had occurred before, but at the time of the operation no one was aware of this;
- There had been a simulation or drill of unconscious diver recovery made before the job started;
- A minuted 'tool box' meeting had been held before the start of the job, attended by the crane operators, divers and vessel crew;

- Weather conditions were good, with no waves or current;
- Cutting operations were being conducted according to IMCA guidance and following the rules laid down by the client;
- Communication between the dive supervisor and the divers during the emergency proved difficult owing to the noise of the caviblaster;
- The crane hook was too large to pass through the diver's lifting harness 'D' ring so the standby diver attempted to pass the hook through the harness directly below the 'D' ring resulting in damage to the harness;
- The diver was recovered and resuscitated efficiently and professionally, and the dive team were able to properly use the tools and techniques required;
- Vital medical information (blood group) for the injured diver was not immediately available and was only found with some difficulty.

Members may wish to refer to the following similar incidents (key words: *Trapped, diver*):

- IMCA SF 15/09 – Incident 1: *Trapped diver umbilical incident resulting in diver fatality*;
- IMCA SF 03/09 – Incident 1: *Diver entrapment.*

4 Alternator Bearing Collapse caused Small Fire

A member has reported an incident on a workboat used in the offshore wind farm industry, in which there was a serious failure of an alternator bearing, leading to a small engine room fire. The vessel crew noticed a sound change from the engines and a reduction in revs (dropped by about 100 rpm) followed immediately by the fire alarm. The crew shut the fire flaps, and the fuel and ventilation shut off using the emergency stops. The engine room was checked, and smoke and small flames or glowing were observed from the alternator. The fire was extinguished, the safety of crew, passengers and vessel was confirmed, and the vessel returned to port on one engine.

Figure: showing damaged alternator with shaft out of alignment due to bearing collapse

Our members' investigation noted the following:

- The crew were trained to respond to a fire alarm in a certain way and did so in a swift and professional manner;
- The problem was found to have been caused by a bearing collapse in one of the alternators.

Our member took the following actions:

- All alternators should be checked regularly for signs of damage which may manifest itself as 'Black fluff' in the windings;
- When the engines are shut down the alternators should be checked for overheating.

Members may wish to refer to the following similar incidents (key words*: bearing*):

- IMCA SF 09/01 – Incident 3: *ROV winch [bearing] failure;*
- IMCA SF 10/14 – All incidents on engine room fires.

5 Confined Space Entry – Multiple Fatalities

The UK Marine Accident Investigation Branch (MAIB) has published the following report regarding an incident in which three persons were killed as a result of confined space entry on a cargo vessel in dock.

Three crew members on board the cargo vessel were found unconscious in the main cargo hold forward access compartment, which was sited in the vessel's forecastle (f'ocsle). The crew members were recovered from the compartment but, despite intensive resuscitation efforts by their rescuers, they did not survive. The vessel was carrying a cargo of sawn timber and, at the time of the incident, shore stevedores were discharging the timber loaded on top of the forward hatch cover. Two of the ship's crew were standing by to clear away the deck cargo's protective tarpaulins as the timber discharge progressed aft. During this time, the two crewmen entered the forward main hold access compartment. The chief officer, who was looking for the two crewmen, found the compartment hatch cover open and shouted down to them before climbing into the space. A third crewman saw the chief officer enter the compartment. When he looked down the hatch, he saw the chief officer collapse.

The alarm was raised and an initially frantic rescue operation was undertaken by the vessel's two remaining crew, and two stevedores. One of the two crewmen started the hold ventilation fan, and brought a breathing apparatus (BA) set and an emergency escape breathing device (EEBD) to the f'ocsle. He donned the BA set, which did not have a face mask fitted, and entered the compartment. Despite having the breathing regulator in his mouth, it was not supplying him with sufficient air. Two stevedores also entered the compartment during the rescue: one using the EEBD and another without any breathing apparatus whatsoever. While there, they were able to pass lifting slings around the fallen crew so they could be recovered to the deck. The crewman and stevedores suffered severe breathing problems when they returned to deck.

Ambulance paramedics, fire and rescue services and the police subsequently attended. Despite the best efforts of all involved, none of the three crewmen who were recovered from the compartment survived.

The full report can be downloaded from: www.maib.gov.uk/cms_resources.cfm?file=/Safety%20Bulletin3_2014.pdf.

6 Marine Safe Australia – Hand Injuries

The Marine Safety Forum has published the following safety flash from Marine Safe Australia covering a number of hand injuries including the following:

- Hand injury when folding aluminium ladder

  While folding a four part hinged folding ladder to place it back to its stowage position, a person got his hand squeezed at the hinge part;

- Severe hand injury – rotating machinery

  A newly installed generator was started without belt guards in place. A person's finger got caught by the V-belt which resulted in fracture and deep laceration to the index finger. The potential could have been loss of finger/hand;

- Serious injury - top of thumb amputated

  The V-belts of an air compressor were found to be slack after it was installed the previous day. A crewman decided to tension/reposition them again. While trying to check the tension of the V-belts, by manually rotating the assembly, his thumb got stuck between the V-belt and pulley wheel. This resulted in the top of his thumb being amputated.

The same safety flash also covers the following incidents:

- Broken ankle due to poorly rigged walkway;
- Man overboard;
- Personal Flotation Device failed to automatically inflate;
- Person struck by tugger wire assembly;
- Person's leg severed following entanglement.

The safety flash can be downloaded from www.marinesafetyforum.org/upload-files//safetyalerts/marinesafe-australasia-july-safety-flashes.pdf.