IMCA Safety Flash 02/12

February 2012

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 Equipment at Height not Properly Secured

A member has reported an incident in which tools were found inappropriately secured above a pedestrian walkway. A slip-in spade was found tied to a hand rail with a badly chafed rope. A piece of thin copper wire had been used to compensate for the poor condition of the rope. At the time of the observation, the copper wire had started to corrode and did not appear to be a sufficient method for securing the spade.

The location of the handrail was outside the outer boundary of the decking. This overhang meant that the decking would have provided no protection had the spade become unsecured and had fallen. Directly below the spade was a pedestrian walkway as indicated by yellow markings.

The spade was removed immediately and the observation was reported. There were no injuries.

Showing spade secured to handrail

Showing spade secured to handrail and view to deck below

This observation and subsequent action to eliminate the hazard undoubtedly prevented a near miss or injury to personnel had the spade fallen.

Members are encouraged to forward this information to offshore personnel as a reminder to properly secure equipment and tools when working at height.

Further information on safe working at height can be found in the following IMCA safety promotional material:

- IMCA SPC 06 – *Working at height*;
- IMCA SPC 12 – *Avoiding dropped objects*;
- IMCA SPP 04 – *Avoiding dropped objects;*
- IMCA SEL 009 – *Working at height* including subtitles in Arabic, Filipino, French, Indonesian, Italian, Malay, Portuguese and Spanish.

2 Near Miss: Serious Subsea Burning Incident

A member has reported an incident in which a saturation diver caused an underwater explosion during subsea burning operations. The incident occurred when the diver was in the process of burning drain holes in a toppled three-story quarters building. The diver was burning drain holes to allow water to escape more quickly when the structure was lifted to the surface, which would facilitate a safer recovery. The safety precautions taken during this procedure included flushing work areas with air, and ensuring that vent holes designed to remove all combustible gases were placed above the work areas. The explosion occurred when the diver changed locations to 'enlarge a vent hole'.

The intent of this safety flash is to raise awareness of the safe work practices that should be employed during underwater burning operations. Failure to follow basic safe work practices can result in a serious incident with severe or even fatal consequences.

An investigation revealed the following:

- The immediate cause of the incident was that subsea burning operations introduced or encountered an explosive mixture of gases in a complex submerged structure (containing numerous interior walls and baffles) where it became entrapped. The explosive mixture was subsequently ignited by the underwater cutting operations;
- Contributory causes included the following:
  - It was assumed that flushing the structure with air through vent holes placed above the hot work areas would reliably remove all combustible gases produced by underwater burning operations. In reality, not all explosive gases were removed from the complex interior of the toppled building by this method. Once burning operations began sufficient accumulation of explosive gases must have occurred to create the potential for an explosion despite the flushing that was underway;
  - As water depth increases so must the volume and pressure of oxygen delivered to oxy-arc cutting gear. At saturation diving depths even apparently small pockets of entrapped gas have the potential to produce large explosive forces;
  - The decision to select underwater burning as the preferred method for cutting drain holes in the structure, rather than consider alternative suitable cold cutting techniques;
  - By moving to enlarge a vent hole the diver moved closer to the entrapped explosive mixture of gases and increased the risk of ignition.

The following lessons were learnt:

- Special attention and consideration is to be given to operations that involve underwater cutting into enclosed spaces where gas entrapment can occur;
- Complex enclosed spaces may be particularly difficult to vent completely of explosive gases prior to and during underwater burning operations. If the configuration of the underwater structure is such that the complete absence of entrapped or accumulated explosive gases cannot be verified at all stages of the job then a suitable alternative to thermal cutting methods should be selected;
- Appropriate verbal communications and use of video monitoring should be employed to ensure the diving supervisor knows the precise position of the diver on the structure and to ensure the area is safe for burning;
- Avoid burning into an area containing anything but water. While it is prudent to use 'pneumo' or tool air as a method of verification that a vent hole is working as intended, or to flush unknown substances from an area, the air supply should be secured to allow water to fill the area before burning;

- Clear terminology and communications: Before beginning an operation, all personnel involved should understand the difference between a vent hole and a drain hole:
  - A vent hole is intended to allow pressure, suction, gas and/or hydrocarbons to escape from an area. A vent hole is **never burned**; it is always created using cold-cutting methods such as a reduced RPM drill;
  - A drain hole is what is created to allow water to escape from a structure when it is lifted and thus, should be in an area containing water. A drain hole should only be burned if the configuration of the underwater structure is such that the complete absence of entrapped or accumulated explosive gases around or above the area to be burned can be verified at all stages of the job. If the complete absence of explosive gases cannot be so verified a suitable alternative to thermal cutting methods should be selected to make the drain hole cut;
  - The two terms should not be used interchangeably, as it may create confusion in the communications between the diver and the dive supervisor;
- A risk assessment should always be used to determine if burning is the preferred method for the task at hand.

Members may also refer to IMCA D 003 – *Guidelines for oxy-arc cutting*.

3 Major Injury Suffered in Confined Space Incident

An incident has been brought to IMCA's attention in which a person suffered severe brain damage as a result of entering a confined space to read a water meter. He had not used his equipment to check whether the atmosphere in the chamber was safe, which was later measured as containing six percent oxygen.

Two water meter readers attended a water meter chamber some 1.8 metres deep to carry out a routine meter reading. They had carried out an atmosphere check using a single channel oxygen gas monitor of the previous chamber and as the atmosphere for this was found to be ok, they assumed that the existing chamber was also suitable for entry and did not carry out a gas check. The first meter reader entered the chamber and the second meter reader was distracted for approximately ten seconds and when he next looked into the chamber he observed his colleague slumped unconscious at the bottom.

Entrance to confined space and view into confined space showing water meter

The second meter reader then immediately entered the chamber to rescue his colleague, but had to exit quickly as he was unable to breathe. After failing to rescue him a second time he raised the alarm at a nearby farm. The emergency services arrived after 15 minutes and pulled the meter reader out. They attempted to resuscitate him at the scene and en route to hospital. Despite this and specialist re-oxygenation therapy in a hyperbaric chamber, the employee suffered severe brain damage which is likely to prevent him from working for the rest of his life. He had been unconscious for approximately 15 minutes in what was later measured as an atmosphere containing six percent oxygen.

Investigations into the circumstances of this tragic incident are still on-going and any further learning will be shared. This safety alert highlights the dangers associated with confined spaces and the critical importance of following appropriate confined space entry and rescue procedures and to always use relevant equipment.

Members are reminded of IMCA safety promotional materials as follows:

- IMCA SPC 09 – *Confined spaces can be deadly*

4 Man drowned After Falling into Dock when Disembarking through Pilot-gate

The Marine Safety Forum (MSF) has published the following Safety Flash 12-06 regarding an incident in which a crewmember fell into the dock in port and was drowned. The crewman disembarked the vessel through the pilot-gate at the side of the vessel instead of using the designated and secure gangway, which was located at the aft end of the vessel, and lost his footing whilst doing so.

Further information can be found from www.marinesafetyforum.org/upload-files/safetyalerts/msf-safety-flash-12.06.pdf

5 Snagged Cargo Carrying Unit during Offshore Discharge

The MSF has published the following Safety Flash 12-07 regarding an incident in which, during a routine cargo discharge operation, the corner stacking point on a skip snagged on the top of one of the vessels safe haven openings. This resulted in a 21 tonne overload on the platform's crane and damage to the skips lifting bridle and stacking point.

Further information can be found from www.marinesafetyforum.org/upload-files/safetyalerts/msf-safety-flash-12.07.pdf