# IMCA Safety Flash 12/09

August 2009

These flashes summarise key safety matters and incidents, allowing wider dissemination of lessons learned 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 Pillar Valve Failure

A member has reported an incident in which a pillar valve from an emergency gas cylinder separated from the bottle while under pressure, rapidly releasing 50 cu ft of air to atmosphere and hitting a diver's helmet. A trial run dive was planned in an anchorage prior to mobilisation to a job site. Dive checks were carried out as per standard procedures and the diver was cleared to enter the dive basket, ready for the water. As the diver turned upon entering the basket a loud bang was heard and there followed an escape of gas. The diver collapsed to the stage grating and suffered multiple contusions and a dental insult. He was evacuated to shore for further evaluation and treatment but made a full recovery.

It was discovered subsequently that the bottles had been sent by a subcontractor to a third party for hydrostatic testing. On their return the bottles were delivered to the dive support vessel. The bottles had been charged to full working pressure of 2800 psi and had held pressure for several days prior to the incident. Investigation revealed that the cylinder (Luxfur S50 brand) had an imperial thread and the pillar valve (MDE 232 bar) which failed had a metric thread. It is considered that the most likely cause of the incident is that the valves were mixed up at the third party testing agency after the hydrostatic test.

The following actions were taken:

- Subcontractor to initiate further investigation and auditing of the receiving, testing and dispatching process at the third party testing agency;
- Remove from circulation the cylinders from the recent hydrostatic test; test and condemn failed or damaged equipment;
- Ensure all cylinders and pillar valves held and in use at company sites are of the approved thread combination;
- Review acceptance criteria for third party hired equipment to ensure quality remains of the highest standard.

*Diver's hat with the indentation where valve hit the hat*

*Pillar valve with metric threads*

*Imperial threads on the bottle*

## 2 Dropped Object Near-Miss

A member has reported an incident in which an object was dropped whilst being lowered to divers on the seabed. The vessel was working in waters over 100m depth when a stainless steel toolbox was being routinely deployed to divers on the seabed. The deployment of the toolbox was stopped at 98m (the short mark) and the divers were advised to retrieve it. However, on arrival at the pennant hook they reported the toolbox missing.

A search for the toolbox was made using an ROV and it was found on the seabed directly below the initial deployment point, from where it was recovered to deck. No one was injured and no equipment was damaged.

The incident was immediately reported to the offshore construction manager, who temporarily suspended operations. Initial inspection of the toolbox, the deployment pennant and hook onboard the vessel rigger did not identify any defects. However, the toolbox had been deployed by attaching it to the crane pennant hook by a section of long link chain bolted to the toolbox.

Investigation revealed that the small diameter long link chain had passed through the wear gap in the hook when the toolbox was transiting through the splash zone, allowing the toolbox to drop. The hook was certified and the wear was within design and wear specification limits.

*Toolbox, chain and crane pennant hook*

*Detail of small diameter chain used*

The company noted the following:

- The incident had the potential to cause serious injury to divers and was reportable to local regulatory authorities;
- The incident happened during a routine task where 'custom and practice' methods were accepted without challenge;
- The toolboxes were manufactured in-house and not fabricated to any design criteria or control processes. No engineering drawings were available;
- Important factors not considered during the fabrication of the toolboxes included:
  - lifting accessory requirements
  - effects of splash zone dynamics;
- There was no certification or safe working load of the lifting points or chain;
- The type of long link chain being used was unsuitable for deployment;
- Laying the chain over the throat of a hook was improper rigging practice;
- Neither the requirements of an existing risk assessment nor company control processes were complied with;
- Perception and awareness of the potential risks involved in this task was low:
  - failure to recognise the toolbox as a lifting accessory
  - failure to recognise that part of the lifting equipment was uncertified, not properly designed or fit for the purpose of lifting operations;
- Worksite safety culture was not fully effective:
  - improper rigging practices employed
  - deployment method not challenged by rigging team or worksite supervisors.

## 3 Lift Bag Lost When Rigging Parted

A member has reported an incident in which a lift bag was released to surface upon parting of the rigging attachment point straps. The lift bag was of the open bottomed parachute type. In order to provide additional buoyancy to a pipeline, two five-ton lift bags were secured to the pipe in between pre-installed foam buoys. The buoys were secured by the traditional method of steel straps and bandit clamps. A 'strip-out' wire was in place and was run underneath the straps along the length of the pipe to assist removal of the foam buoys once the pipe was in position. The lift bags were rigged and secured to the pipe with appropriately selected and certified rigging. It was determined that the additional ten tons of lift was not sufficient force to cause a loss of control of the pipe. The inverter line was secured to the pipeline and 'snugged-up' to avoid a snatch load in the event of failure or an unplanned release of the rigging. Later, upon up-hauling of the strip-out wire to remove the buoys, one of the two bags was found to have parted and was floating on the surface.

Further inspection revealed that the webbing strops of the bag had been cut through when the strip-out wire was pulled at an acute angle across the plane of the pipe relative to the bag. It was also discovered that the inversion line had pulled the attachment points away from the crown of the bag. These strops remained secured to the inverter line which in turn remained attached to the pipeline. It was further determined that the strops at the top of the bags used for attaching the inversion lines were intended for handling purposes only and were not designed as inversion line attachment points.

The following lessons were drawn from the incident:

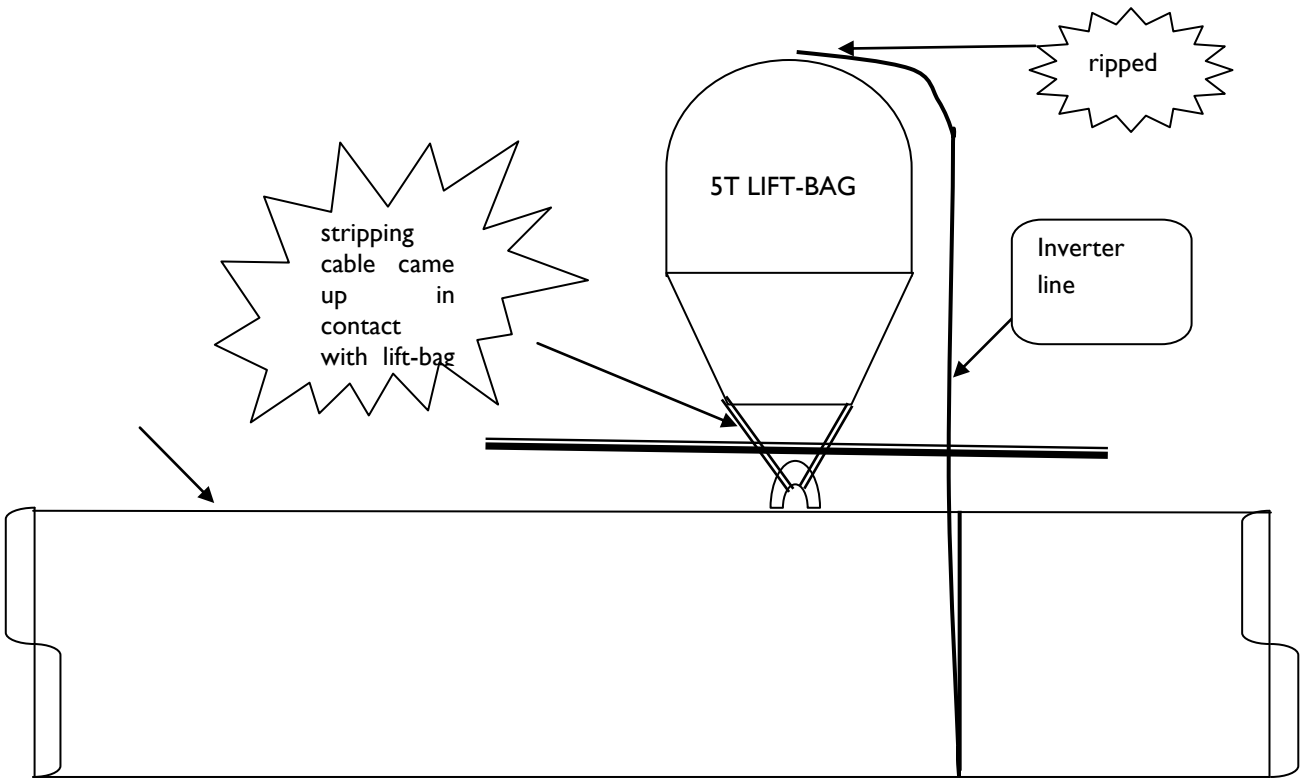
- Dive supervisor should be informed prior to stripping out the flotation buoys when lift-bags are attached to the pipeline;
- Work plans should be better communicated at toolbox talks and pre-shift meetings;
- Existing safety recommendations regarding the incorrect use of handling strops had not been fully implemented (see item 5 of IMCA safety flash 07/07).

The company recommended the following:

- When feasible remove lift bags in advance of potentially conflicting tasks;
- Re-circulate existing safety recommendations, including IMCA safety flash 07/07;
- Check identification and marking of dedicated inversion point attachments and lift bags;
- Amend work instructions to include a reference to the inclusion of purpose-built and labelled inversion line attachment points for all future rentals/procurement of this equipment;
- Consider retrofitting inversion attachment points to bags not currently having this feature.

*Incorrect attachment of inversion line to handling strops*


*Sample inversion line attachment points and label*




*Schematic diagram of pipeline and lift bags illustrating incident*