

IMCA Safety Flash 14/11

December 2011

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.

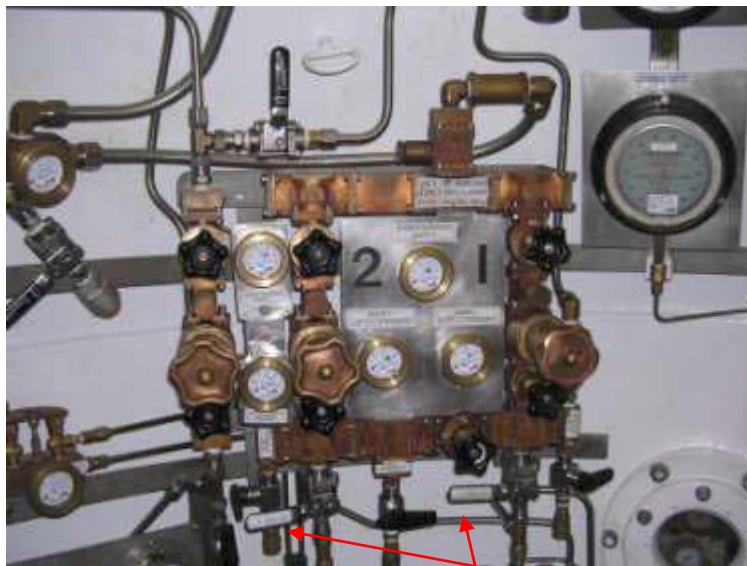
The effectiveness of the IMCA safety flash system depends on receiving reports from members in order to pass on information and avoid repeat incidents. Please consider adding the IMCA secretariat (imca@imca-int.com) to your internal distribution list for safety alerts and/or manually submitting information 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

I Near Miss – Diver Loss of Gas

A member has reported a near miss incident in which a diver very nearly lost his gas supply. The incident occurred when a vessel was engaged in flushing operations, and was assisting with barrier testing flushing/flooding and positive isolation. The bellman reported that the diving bell was snatching heavily and the decision was made to abort the dive. Both divers returned to under the bell. Diver 1 was recovered into the bell while diver 2 waited on the seabed. Diver 1 entered the bell just as the vessel heaved; both diver 1 and the bellman were unbalanced.

At this point diver 2 reported to the dive supervisor that his 'gas had gone tight' and opened his bailout supply. The dive supervisor immediately informed the bellman who saw that the gas supply valve was half closed. The bellman opened the gas supply valve fully and main gas supply was restored to diver 2. Diver 2 secured his bailout supply, then left the seabed and was safely recovered into the bell. There were no injuries or ill effects.



*Dive bell panel with valves in original closed position
(Note: valves turn anti-clockwise to open)*

After the divers returned to the chambers the bell was vented to surface to allow for checks and any modifications to be carried out on the valve in question, to prevent recurrence.

The valve control handle was reconfigured and turned 180 degrees from its original closed position, which will ensure that when the valve is in the open position, that it cannot be accidentally knocked to closed.



Dive bell panel showing modifications to the valve handles

An investigation revealed the following:

- ◆ The main cause of the incident was that when the bellman lost his footing as the bell heaved during marginal weather conditions, he fell against the diver's gas supply valve and knocked it toward the closed position. The design and positioning of this valve arrangement, in the context of the confined space within the bell, was a potential hazard that had been overlooked.

The following corrective actions were taken:

- ◆ Diving operations were suspended until corrective actions taken, and the black box hard disk recording was copied;
- ◆ The bell was surfaced for investigation and repositioning of the valve/valve handle to prevent a recurrence;
- ◆ The dive team were fully briefed on the incident and actions taken to prevent recurrence.

The following lessons were learnt:

- ◆ Diving bells are confined spaces packed with complex equipment. The ergonomics of bell diving operations brings the risk of equipment being inadvertently moved or operated. Changing the way key components function can reduce the risk of inadvertent operation;
- ◆ The actions of the supervisor, bellman and diver were correctly and quickly undertaken as soon as the gas went 'tight', showing the benefit of undertaking regular diving emergency drills.

2 Identification of Differential Pressures Subsea during Diving Operations

A member has reported an incident in which, during diver intervention work on a subsea pipeline, considerable suction was encountered when the diver attempted to separate a pair of flanges. The diver noted the suction before the flange was completely separated and called a stop to operations before any injury occurred or damage resulted.

An investigation revealed that there was confusion and lack of understanding regarding the difference between the internal pipeline pressure and the subsea ambient pressure caused by the water depth.

Although negative pressure (suction) is something that divers are especially concerned about and aware of, it is not always a generally understood hazard that is readily comprehended or identified by persons not normally involved in diving operations i.e. the concept of standing in and working in a space where the ambient pressure is greater than that contained in a void which is being opened, for example, when a diver opens a bolted flange on a pipeline.

The following example was given:

- ◆ *If a pipeline from a platform extends to the seabed at 150msw, the absolute pressures and differential pressure effects are considerably different for a surface worker on an installation and the diver on the seabed. If the installation pressurises a pipeline to 10 Bar gauge (11 Bar absolute), this shows itself as a net positive pressure of 10 Bar to the person on the installation and a net negative pressure of 5 Bar to the diver at 150msw (16 Bar absolute).*

Because of the opportunity for confusion and the potential for two completely different hazards (retained pressure and suction) it is important that any pressures noted in project procedures, permits, risk assessments, dive plans etc. are done so in a clear, concise and objective way ensuring that there is no room for misinterpretation or misunderstanding.

When recording or stating pressures in documents where there is scope for misinterpretation due to differential pressures during diver intervention works, all pressures should be noted as the actual pressure value, such as *Pressurise pipeline to 12 bar gauge* rather than (as is often the case) relative or referenced pressure values such as *Pressurise pipeline to 2 bar greater than seabed ambient*. If not completely unambiguous, instructions should also state where the pressure is measured e.g. whether on the installation, or subsea.

Further information is available in the following IMCA guidance:

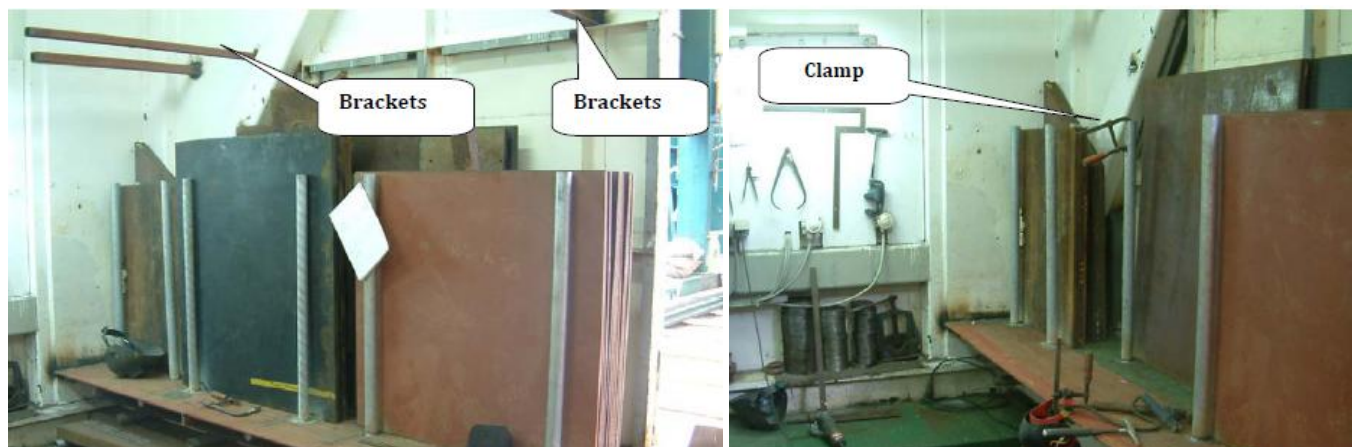
- ◆ [IMCA D 014](#) – *IMCA International Code of Practice for Offshore Diving*
- ◆ [IMCA D 044](#) – *Guidelines for isolation and intervention: Diver access to subsea systems*

3 Crewman Injured when Steel Plates fell against Him

A member has reported an incident in which a crewman was injured by steel plates falling whilst being placed in storage. The incident happened on a vessel when four crew members were moving steel plates (each weighing 250 kg) from the bosun's store to the welding shop. Their intent was to create a new storage area in the welding shop for these steel plates. The new storage area was to be at a slight elevation of approximately 75 cm off the deck.

The plates were moved by overhead hoisting equipment from the bosun's store to the welding shop. Because there were some brackets welded on the bulkhead, the steel plates had to be pushed into place manually once they were lifted onto the elevated storage area. Because several plates were to be stored in the storage area they were temporarily secured with clamps. When all plates were in their final position, steel poles were welded on the deck to secure them in place.

During the job a securing clamp was inadvertently knocked off while crewmembers manually moved one of the plates into its final position. As a result the plates fell over towards one of the crew members. He saw them coming, but owing to the weight of the plates he was unable to push them back and instead tried to jump out of the way. He was not successful; the plates came into contact with his body and he hit his head on a nearby column, resulting in small fractures to the skull and shoulder.



Showing welding bay storage area

Showing securing clamp

An investigation revealed the following:

- ◆ The job was considered routine and no Job Hazard Analysis was conducted. Though the handling of steel plates is a routine activity on board this vessel, the creation of a new storage area was not routine;
- ◆ Manual handling of steel plates weighing 250kg is inherently risky;
- ◆ A workplace inspection prior to the activity would have revealed the risks posed by the obstructing brackets on the bulkhead;
- ◆ The clamps used to secure the steel plates temporarily were not adequate or safe for the activity being conducted;
- ◆ There were too many people in too small a work space.

4 Lifeboat Falls after Equipment Failure

A member has reported an incident in which equipment failure allowed a lifeboat to fall free from one side of a vessel. The incident occurred during periodical function tests performed on the vessel lifeboats. When the port side lifeboat was recovered, one of the wire rerouting sheaves from the launching/recovery system buckled and broke off allowing the lifeboat to free fall from one side. The lifeboat and launching system were seriously damaged. No personnel were on board the lifeboat at the time, and there were no injuries.



A thorough investigation was conducted and the following was noted:

- ◆ When the incident occurred, one davit arm was in its rest position, while the other one was still under recovery;
- ◆ Severe deformation of the sheaves and their support plate indicated an 'out of plane' loading;
- ◆ The sheave had signs of groove wear and corrosion of the bottom side;
- ◆ Though the functioning of the entire lifeboat launch and recovery system was tested periodically, there was no preventive maintenance programme for separate pieces of equipment within the system.

The following remedial actions were put in place:

- ◆ Replaced lifeboat lift wire with particular attention to the length adjustment;
- ◆ Replaced damaged (bent) support plate;
- ◆ Thorough cleaning and removing old paint from boom guide and sheaves, replacing as necessary;
- ◆ Non-destructive testing on pin from sheaves.

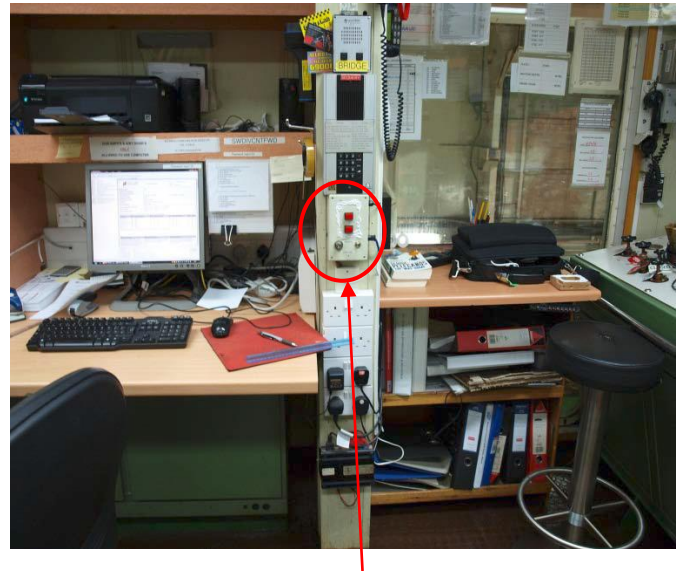
It was also noted that owing to the work environment and equipment criticality, a preventative maintenance schedule for individual parts on the lifeboat launch and recovery system should be developed, as this would reduce the likelihood of this type of equipment failure.

5 Diver Helmet Hat Light

A member has reported an incident in which an overheating diver helmet hat light nearly caused a fire inside a diving bell onboard a dive support vessel. The diving bell was not under pressure and the bottom doors were open to atmosphere. A report was made of a strong smell of smoke within the dive control area. This was investigated and smoke was observed coming from the forward diving bell, situated within the bell garage. The dedicated emergency teams were mustered and the appropriate emergency response actions instigated. The fire in the diving bell was successfully extinguished. There were no injuries. The fire resulted in extensive damage sustained to a Kirby Morgan I7B helmet, light, camera and associated umbilicals.



Damaged Kirby Morgan I7B helmet



Location of helmet light control switch

An investigation established that the source of the fire was a dive helmet hat light which overheated to the point that the outer casing caught fire. The light overheated because it was inadvertently switched on whilst the equipment was on the surface and without any type of cooling in place, such as seawater.

The helmet light is operated via a surface mounted push button located in dive control forward of the dive control panel. Some twenty-five minutes before the incident occurred, the dive crew had held a short meeting in the immediate vicinity of the push button switch box that controls the helmet lights in the forward bell for both diver 1 & 2. It was surmised that during this meeting an attendee inadvertently leaned against the push button switch and turned on the helmet light. Nearly half an hour elapsed before the first smell of smoke was reported.

The lessons learnt were as follows:

- ◆ There were no safeguards to prevent the activation of the push button controlling the helmet hat light. Temporary protection was put in place on the switch box, and the control boxes replaced with guarded switches to prevent inadvertent activation;
- ◆ The hat light would overheat without seawater cooling, and consequently should not be used for long periods in air. A new design for this model of light incorporates a positive temperature coefficient (PTC) thermistor device which prevents the unit from overheating.

6 Failure of Pallet Lifters

A member has reported two incidents involving the failure of pallet lifters. The first incident resulted in the failure of a wire rope for a fork pallet lifter which parted following the lifting of a load of chemical drums onto a vessel deck. The second incident resulted in a pallet lifter fork being twisted due to overloading during a lifting operation to load a pallet of steel plate onto a vessel deck.

Incident I

A pallet lifter with a 2.5T safe working load (SWL) had lifted a 400kg load of 16 chemical drums onto the working deck of a vessel. The chemical drums being lifted had also been cargo strapped to the lifter as a means of secondary securing. The pallet lifter in use had recently undergone a thorough inspection and had been correctly colour-coded by a 3rd party inspection company to verify its fitness for purpose. As the load was landed on the deck, a rigger removed the lifter forks from the pallet. At this point the wire rope (which attaches to the lifting eye and the tensioning springs on this particular model) parted and the wire struck the rigger across the back of his hand. There were no injuries as the rigger was wearing Kevlar gloves which provided adequate protection for this type of operation. The rigger notified the vessel supervision and the pallet lifter was taken out of use immediately.



Pallet lifter after parting of wire rope

After investigation, the following was:

- ◆ On further inspection, the general condition of the pallet lifter, and the wire rope in particular were found to be in poor condition and showing signs of corrosion and poor maintenance. This should have been noticed;
- ◆ The 3rd party inspection company which had completed a thorough inspection of the lifter to allow its updated colour-code and continued use had clearly not provided a sufficient standard of inspection to ensure this piece of equipment was safe for work on this vessel;
- ◆ All lifting equipment should be given a full visual inspection by the user prior to any lifts, with all defects or concerns being raised immediately. The condition of this lifter should have been noticed and highlighted by the onboard team;
- ◆ There was no on-going maintenance on this kind of equipment and they are used until failure;
- ◆ Had the pallet lifter been entered into the vessel planned maintenance system this would allow for regular inspections to take place, with paint and greasing regimes to be implemented as necessary;
- ◆ When purchasing lifting equipment for vessel use, full consideration should be given by a competent person as to whether or not the item is suitable for the operations and environment in which it will be used onboard.

Incident 2

A pallet lifter with a 2.0T SWL was being used to transfer pallets of steel plate on to the main working deck of a vessel. The plate being loaded was delivered on pallets and wrapped with plastic covers. The weight of the load had not been provided by the supplier and was not known to the lifting team prior to the lift.

This lifting operation involved inserting the pallet lifter forks, and the load being raised slightly to allow a secondary cargo strap to be positioned around the load and prevent any movement during the lift. However, as the load was raised approximately six inches off the quayside to attach the cargo straps, the plates moved, sliding forward and to the left of the forks. The pallet lifter and load was then returned to the quay and the forks removed from the pallet. Once the pallet lifter had been removed from the pallet it was evident that the left fork had been twisted due to the load moving and overloading the pallet lifter fork.



Pallet of steel plate for loading

After investigation, the following was noted:

- ◆ A permit to work and lift plan had been completed for this operation but no consideration was given to the lack of information about the load to be moved or the limitations of the pallet lifter. This should have been highlighted in the lift plan risk assessment and the toolbox talk prior to moving the pallets. Hazard awareness and correct lifting procedures were not applied during this lifting operation;
- ◆ As the steel plate loads had no clear indication of the weights contained on each pallet, a lifter which has a SWL of 2.0T should not have been used without confirmation that the working limits would not be exceeded by the load;
- ◆ Good practice for transporting of plate onto vessels should be to transfer the load into a certified lifting basket ensuring the lifting of all plates in a contained and controlled manner.

7 Near Miss during Anchor Line Recovery

The Marine Safety Forum (MSF) has published the following Safety Flash 11-38 regarding a near miss incident during anchor line recovery. A large anchor chain snapped and the inboard end came back onto the deck out of control, almost hitting some of the crew.

Further information can be found from www.marinesafetyforum.org/upload-files//safetyalerts/msf-safety-flash-11.38.pdf

8 Poor Condition of Lifting Strops

The MSF has published the following Safety Flash 11-39 regarding lifting strops found in poor condition. Recent audits/inspections have highlighted deficiencies with regards the state of lifting strops which were found to be in a severely deteriorated condition, unfit for purpose and still in service onboard.

Further information can be found from www.marinesafetyforum.org/upload-files//safetyalerts/msf-safety-flash-11.39.pdf

Members are also referred to [IMCA SEL 019 – Guidelines for lifting operations](#)

9 Leak of Oil-based Mud from Drain Valve

The MSF has published the following Safety Flash 11-40 regarding leakage of oil-based mud from a drain valve. This incident had the potential to cause a significant pollution incident and highlights the need for pre-loading checklists to be carried out thoroughly.

Further information can be found from www.marinesafetyforum.org/upload-files//safetyalerts/msf-safety-flash-11.40.pdf

10 Biocide Incident

The MSF has published the following Safety Flash 11-41 regarding a biocide pollution incident. During the treatment of ships fuel tanks with a biocide chemical an incident in which someone was sprayed around the face and upper body with the biocide chemical. This resulted in eye abrasion and skin irritation and led to the injured person being evacuated from the vessel for further medical examination and treatment.

Further information can be found from www.marinesafetyforum.org/upload-files//notices/msf-safety-flash-11.41.pdf