IMCA Safety Flashes summarise key safety matters and incidents, allowing lessons to be more easily learnt for the benefit of all. The effectiveness of the IMCA Safety Flash system depends on Members sharing information and so avoiding repeat incidents. Please consider adding safetyreports@imca-int.com to your internal distribution list for safety alerts or manually submitting information on incidents you consider may be relevant. All information is anonymised or sanitised, as appropriate.

1 LTI: Hand injury during diving operations

Applicable Life Saving Rule(s)

Line of Fire

What happened

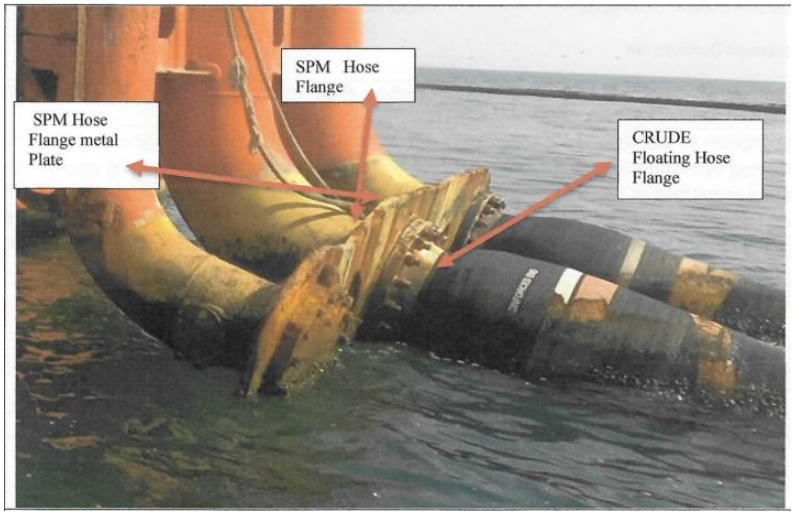
A member reports a serious hand injury suffered by a diver working in the water on floating hoses at an SPM (single point mooring). Two divers were working on unbolting the flange on a floating hose on an SPM, one on either side of the hose. They were working together on the same bolts, one using a pneumatic impact wrench, the other, a flogging spanner. One of the divers started to loosen a bolt using the air tool, before the other diver was braced and ready. The flogging spanner held by the other diver jerked rapidly and trapped three fingers of his left hand between the metal plate and flogging spanner, causing a serious injury.

The injured diver was evacuated by small boat and taken to hospital. There were no broken bones but some stitches were needed, following which he was 14 days off work.

What were the causes?

Our member noted the following causal factors:

- poor communication;
- inattentiveness and lack of awareness;
- Procedures not clear/procedures not followed;
- Being in an unsafe position or “in the line of fire”;
- Feeling time pressure to finish the job.



Lesson learned

- Stop and think before you start – hold a toolbox meeting, make sure the task is properly risk assessed;
- Take care how tools are held, and keep yourself out of your own and others’ line of fire;
- Consider the use of extensions to tools or different tools, or different ways of doing the job, if that keeps you out of the line if fire.

Members may wish to refer to

- Hand injury during diving operations;
- Lost time injury (LTI) following stored energy release and subsequent serious infection of wound

2 Learning outcomes from a real time diver recovery

What happened

During a saturation diving operation a dive team became involved in the recovery of an incapacitated diver into their bell. Whilst diver recovery drills are practiced frequently, this Safety Flash concentrates on the feedback and lessons learnt by the team during a real incident. The dive system had a bottom mating bell with a 6m vertical trunking going from the diving bell to the floor of the Entry Lock. In order to transfer a casualty a diver recovery hoist was used. The diver recovery hoist in the bell was to be used for both diver recovery and also to be used to transfer the incapacitated injured diver to the entry lock 6m below.

As this was a medical incident, the root causes are not relevant here.

What lessons were learnt?

- Equipment:
  - Diver Recovery System – During the recovery of the incapacitated diver, it became apparent that due to the fact that the diver recovery lift was capable of reaching the bottom of the entry lock, not just the bell stage, it could have become difficult to manage the consequent large amounts of loose rope during the lift. It was felt by the bell team that this had the potential to cause difficulties inside the bell for both deployment and use, especially when an incapacitated diver was recovered. A proposal was made for 2 x shorter diver recovery lifts in the bell sufficient to recover a diver from the stage into the bell and a second set of longer diver recovery lifts available at the moonpool and to be put in the trunking to allow for transfer of an incapacitated casualty from the bell to the entry lock. This would significantly reduce the amount of loose rope within the bell during a diver recovery, as well as reduce the risk of entanglement.
  - Chamber Medical Kit - On examination of the chamber medical kit it was found that the Pocket Mask had a gas-filled seal. At depth the seal had compressed to the point of being useless. A different bag valve mask was used, thus was not an issue, but it highlights the need to check the chamber medical kit and that the pocket mask has a silicon face seal is not a gas-filled faced seal type.
- Procedures:
  - Use of Visual Observation - Close ROV observation of the diver allowed immediate recognition that "something was wrong". The ROV picture clearly showed that there was an serious incident and not just a comms issue. It is essential that a diver is monitored, either by ROV or remotely, when entering and exiting a bell during the hydrostatic change which occurs during this period.
- Training:
  - Realistic Drills – The dive team considered themselves fit but were surprised at the effort involved during the rescue, which reinforces the need for good diver fitness. This brought the importance of "realistic drills" into focus and the dive team requested use of a weighted mannequin when conducting the following drills:
    - Recovery of the mannequin (150kg) from the bell stage into the bell prior to blowdown;
    - Transfer of a mannequin (100kg) from chamber to Self-propelled Hyperbaric lifeboat.

    It is also important that all diving supervisors are routinely exercised in the management of a diving emergencies."
  - Medical Personnel Involvement – The vessel medic also felt that it is appropriate to be more involved in the diver drills to provide a better general understanding and a chance to observe and feedback as well as gain a better understanding of the capabilities and limitations of the divers' medical skills. In addition, it was felt that all divers going into sat would benefit from a brief CPR refresher to ensure that their skills were up to date.

3 UK HSE: Employee in a port suffers life changing injuries in clamp truck incident

Applicable Life Saving Rule(s)

Line of Fire

The UK Health and Safety Executive (HSE) fined a port following an incident in which an employee was seriously injured by a clamp truck. [Similar to a forklift, but instead of forks, a clamp truck has a hydraulic clamp attachment for handling rolls of paper.]

What happened

An employee was hit by a five tonne clamp truck in a paper reel shed. The employee sustained an open leg fracture and was knocked unconscious. He was subsequently airlifted to hospital and had to have his leg amputated.

What went wrong?

- There was a failure to ensure pedestrians and vehicles could circulate and operate safely, which put the employee and others at significant risk;
- Supervisors were frequently working amongst five to six clamp trucks whilst undertaking the supervision of the paper reel unloads;
- It was found that there had been previous incidents where supervisors had been in close proximity of the vehicle operations on the port and had been hit by vehicles or product. Investigation found that there had been a review only of the immediate work relating to these incidents.

The HSE inspector noted: *"This incident has resulted in life changing injuries in a wholly avoidable incident, caused by the failure of the company to identify the roles of the supervisors in the reel sheds and how the work was actually being undertaken.*

They did not learn from the previous incidents involving supervisors and lift trucks to review supervisory activities across the port.

Pedestrians, whether they are employees or not, should be kept separate from these types of vehicles through physical barriers or safe systems of work that are clear and well supervised.

Every year many people are killed or seriously injured in incidents involving workplace transport, and there are significant risks associated with operating vehicles on ports, particularly when, as in this case, the vehicles have restricted visibility due to the lifting of large paper reels. These risks can be easily controlled using reasonably practicable precautions."

Press release here.

Members may wish to refer to:

- UK HSE: employee foot crushed by forklift at maritime freight logistics company
- Two yard-based fatal road traffic accidents (UK HSE)
- Near miss: Worker in dockyard almost struck by a 'cherry picker' crane
- Two industrial vehicle incidents
- Fatal Traffic Accident on Board a Large Vessel

4 Inhalation of toxic fumes during hot work

Applicable Life Saving Rule(s)

Hot Work

What happened

Two crew members were exposed to toxic fumes resulting in dizziness, headaches, difficulty in breathing, and low blood oxygen levels. The incident occurred during hot work when thruster couplings were being replaced. This was on a vessel experiencing problems with Tunnel Thruster (TT) couplings due to installation/commissioning issues during a new build.

It was decided to replace the thruster couplings, and a detailed step by step work plan was executed, including Permit to Work, work planning meeting, risk assessment, and emphasis on "stop work authority" during the toolbox talk.

Coupling hub during heating process

SECTION 2: HAZARDS IDENTIFICATION.

2.1 Classification of the mixture.

In accordance with Regulation (EU) No 1272/2008:
Aquatic Chronic 2 : Toxic to aquatic life with long lasting effects.
Asp. Tox. 1 : May be fatal if swallowed and enters airways.
Flam. Liq. 3 : Flammable liquid and vapour.
Skin Sens. 1 : May cause an allergic skin reaction.
STOT RE 2 : May cause damage to organs through prolonged or repeated exposure.
STOT SE 3 : May cause respiratory irritation.
STOT SE 3 : May cause drowsiness or dizziness.

2.2 Label elements.

Labelling in accordance with Regulation (EU) No 1272/2008:

Pictograms:

Signal Word:
Danger

H statements:

H226	Flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H317	May cause an allergic skin reaction.
H336	May cause drowsiness or dizziness.
H373	May cause damage to organs through prolonged or repeated exposure.
H411	Toxic to aquatic life with long lasting effects.

Section 2 of MSDS Sheet for anti-rust chemical used, which was identified subsequently as "Rust Keeper 555 (ADR)"

In order to change out the thruster coupling, the component had to be heated to 120-150 °C. The temperature in the bow thruster room (not a confined space area) was 32-35 °C and the ventilation set up assessed in the planning was to mitigate the heat and provide some cool airflow through the room. The coupling was heated up and when it reached the required temperature, this led to a release of toxic fumes from the anti-rust chemical used on it.

The chemical used as anti-rust was unknown to the crew and no MSDS had ever been provided by the supplier of the coupling. The supplier's service engineer, who was required to be onboard supervising the task, appeared to be unaware of the type of anti-rust chemical on the coupling.

The exposure to the chemical was felt later in the day. Two of the crew members experienced a heavy chest, dizziness, headache, difficulty in breathing, and low blood oxygen levels. Based on consultation with topside medical support, the two crew members were sent ashore for medical evaluation and treatment.

What went wrong

- Lack of awareness of anti-rust chemical agent, leading to intoxication of two crew members;
- No MSDS was available for the anti-rust chemical agent and the service engineer was unaware of chemical toxicity;
- A work instruction included a requirement for the component to be clean before installation (wiped); however, the installation instruction/procedure did not mention any chemical, nor any special product to be used, nor a requirement for a thorough clean of the component before installation.

What went right

There was a detailed step by step work plan, including:

- Permit to Work;

- Work planning meeting;
- Risk assessment;
- Emphasis on “stop work authority” during the toolbox talk.

What was the cause?

Our member noted that a lack of knowledge of the spare part (thruster coupling) being coated with the toxic anti-rust agent, and subsequently lack of removal before heating and installation, lead to the intoxication of crew members. Ventilation was used for air cooling rather than toxic air extraction

Actions/lessons learned

Be aware of the possibility of toxic anti-rust agents and therefore ventilation should always follow a risk assessment process where identification of potential risks such as intoxication should be considered first.

Members may wish to refer to:

- Exposure to CO_2 release from dry ice storage
- Crew member fainted after working in water ballast tank
- Near-miss: Suspected high levels of CO_2 in diver breathing gas

5 UK HSE: worker fatally injured in oil drum explosion

Applicable Life Saving Rule(s)

Hot Work

What happened

The UK Health and Safety Executive (HSE) prosecuted a company after a worker was killed when an oil drum exploded during hot work. The incident occurred when an engineer was converting old oil drums, sourced from elsewhere, into something else. He was cutting open the lids of the drums using a plasma torch. While cutting open the third drum it violently exploded, causing him fatal injuries.

What went wrong?

Investigation revealed that the empty drums, labelled as having contained motor oil, were found to have also previously contained highly flammable gasoline, but had not been labelled correctly. The residual gasoline vapour present within the drums violently ignited upon the action of the hot cutting process, causing fatal injuries. There was a failure to provide any labelling to show that the empty motor oil drums had been repurposed to store gasoline and this created a risk of fire and or explosion.

Lessons learned

- Ensure that adequate information and labelling is provided for all used containers, drums or bottles;
- Ensure containers or drums are properly cleaned and de-gassed before conducting hot work on them.

UK HSE press release here.

Members may wish to refer to:

- Accidental drinking of thinners stored in mineral water bottle
- Unlabelled containers: Chemicals stored in drinking water bottles
- Near miss: Water bottles reused for fuel storage