

## IMCA Safety Flash 28/17

November 2017

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](mailto: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](http://www.imca-int.com/links). Additional links should be submitted to [info@imca-int.com](mailto:info@imca-int.com)

Any actions, lessons learnt, recommendations and suggestions in IMCA safety flashes are generated by the submitting organisation. IMCA safety flashes provide, in good faith, safety information for the benefit of members and do not necessarily constitute IMCA guidance, nor represent the official view of the Association or its members.

### Summary

This flash covers three separate issues. Firstly, we have prioritised a near miss relating to pull pins in diving helmets. Secondly, several incidents relating to personnel safety, traffic management and traffic separation zones in the yard environment, and thirdly, three hand/finger injuries.

#### 1 KM 37k/ss Helmet Neck Dam Near Miss

##### What happened

During offshore subsea operations, an air diver reported to the surface that his helmet had flooded. The supervisor instructed the diver to return to the basket. He then asked the diver to clarify what had happened. The diver reported his helmet had flooded and he had to reclose the neck dam lower hinged swing catch (locking collar).

During the incident, the supervisor jumped the standby diver to assist. The standby diver had made contact with the diver and confirmed with the supervisor that the neck dam was in place and the helmet was secured correctly. It was clear that the diver had closed the locking collar assembly resealing the helmet.



*Photo indicates the open locking collar assembly in open position, behind diver's shoulders*

## What went wrong

Upon investigation of the dive video and audio recordings, it was identified that at some point during diving operations the knurled end of both helmet locking pull pins, used to secure the locking collar assembly (*see photo*) had caught on top of the R-Vest shoulder harness at the attachment D-ring “where the inspection equipment (CP-UT meter) are secured via a rope lanyard”. This had pulled the locking pins, thus resulting in the locking mechanism coming open. As a result, the locking collar assembly opened and dropped past the diver’s shoulders removing the primary guard that holds the helmet on the diver’s head.

Just before the event the diver is heard to flush the helmet via the free flow. This slight over-pressurisation caused the inner neck dam ring to pop out of the helmet outer neck dam ring. When the free flow was stopped water could flood into the helmet.

## What were the causes?

- ◆ The **direct cause** was found to be:
  - The knurled end of both helmet locking pull pins that secure the hinged locking collar assembly (*see above photo*) had caught on top of the R-Vest shoulder harness and pulled to open position;
- ◆ The underlying **root causes** were found to be:
  - The swing hinged locking collar assembly dropped to an open position whilst the diver was working, without him noticing, and passed the top of his shoulders as he leaned forward to conduct tasks
  - Activation of helmet free flow to help demist the visor caused a slight over-pressurisation inside the helmet resulting in the neck dam O-ring popping open. This allowed water to enter the helmet when free flow was turned off;
- ◆ **Root causal factors** identified were:
  - Design failure of the locking pull pins was not addressed during helmet maintenance which recommended fitting of KM *Pull Pin Sleeve Kit* part #525-112.

## Lessons learnt

- ◆ Helmets should have been maintained and modified to address previously identified findings in the IMCA safety flash 20/16 issued in August 2016;
- ◆ Kirby Morgan Dive Systems Inc have addressed the potential issue by developing a *Pull Pin Sleeve Kit* part #525-112 (*see image to right*). This device helps reduce the possibility of pins been inadvertently operated. They were not fitted to the equipment involved.



## Actions taken

- ◆ All helmets returned to workshop for fitting of KM *Pull Pin Sleeve Kits*;
- ◆ Divers given familiarisation brief of with potential hazard;
- ◆ Dive tenders reminded of the need to follow pre-dive dressing procedures, ensuring the neck dam is locked and secure and recording that this check has taken place;
- ◆ To prevent recurrence, divers and tenders were instructed to be vigilant regarding items that could cause or interfere with the pull pins;
- ◆ The practice of hanging work tools on the upper part of D-ring on recovery harness will be stopped.

Members should refer to:

- ◆ [Diving helmet: Failure of sealed pull pin](#)
- ◆ [Unintentional release of diving helmet – neck dam/helmet securing arrangements](#)

## 2 Two Yard-Based Fatal Road Traffic Accidents (UK HSE)

### Incident 1: Worker fatally crushed between two articulated vehicles

#### What happened

The UK Health & Safety Executive (HSE) has prosecuted a road haulage firm after an employee was crushed between two articulated vehicles and subsequently died from his injuries. A driver suffered fatal injuries when his vehicle rolled forward out of control whilst he was coupling the HGV (heavy goods vehicle) tractor unit to a trailer. See [here](#) for original press release.

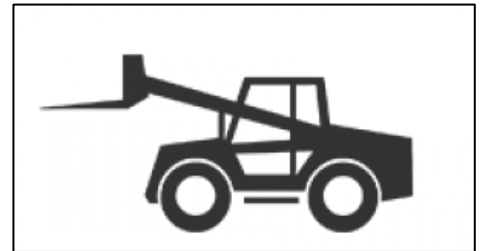


#### What went wrong/causes

UK HSE investigation found that the company had failed to implement safe systems of work or monitoring arrangements to ensure that its drivers were consistently undertaking coupling and uncoupling operations safely, in line with widely available industry guidance. As a result of this, a culture developed whereby its drivers were not always applying trailer parking brakes.

### Incident 2: Worker died after being struck by a reversing telehandler

A worker was struck by a reversing telehandler when crossing the work yard. The worker sustained multiple injuries and later died in hospital. See [here](#) for original press release.



#### What went wrong/causes

UK HSE investigation found that:

- ◆ The company had failed to address the management of large vehicle movements on its site;
- ◆ The company had not carried out an on-site health and safety inspection;
- ◆ The driver of the telehandler involved in the incident had not received any training in operating this vehicle.

The HSE inspector noted:

*This was a wholly avoidable incident, caused by the failure of the company and its director to take simple steps. Vehicle movements...were not controlled even at a basic level at this company's site. The company failed to have adequate pedestrian segregation measures such as walkways or crossing points in areas where pedestrians walked routinely. Reversing of large vehicles near to pedestrians was commonplace. This was a dangerous mix which led to this tragic incident.*

#### Lessons learnt/actions taken

IMCA has highlighted these incidents to members for three reasons:

- ◆ Owing to the importance of safe traffic management in goods yards, shipyards and on docksides;
- ◆ Many members employ haulage companies as sub-contractors;
- ◆ As a timely reminder about workplace safety culture: "... a culture developed whereby its drivers were not..." particularly in sub-contractors or further down the supply chain.

Members may wish to refer to the following incidents

- ◆ [Worker trapped and injured by reversing vehicle](#)
- ◆ [Crewman struck and injured by forklift truck](#)
- ◆ [Fatality: Crew member struck by forklift during quayside operations](#)

### 3 Near Miss: Worker in Dockyard Almost Stuck by a 'Cherry Picker' Crane

#### What happened

A member reports a near miss incident in which a worker was almost hit by a 'cherry picker' mobile crane. Whilst walking to a dry dock, a shipyard visitor was almost struck by the vehicle when it suddenly reversed driving direction.



#### What went wrong/causes

Several safeguards were not implemented causing a chain of errors that resulted in a hazardous occurrence.

- ◆ The cherry picker operator did not look first before reversing;
- ◆ There was inadequate traffic management or separation zones: the pedestrian walkways were not clearly visible as the paint markings had faded away;
- ◆ The traffic separation scheme for equipment and pedestrians had been blocked off with the storage of materials.

Our member notes that in some locations, influencing the workplace safety culture of the shipyard can be a significant challenge. Members may wish to refer to [IMCA SEL 032 – Guidance on safety in shipyards](#).

#### Actions taken

- ◆ Further toolbox talks for all equipment operators to address safe work practices;
- ◆ All materials blocking the pedestrian walkway were removed;
- ◆ Traffic separation scheme marking were refreshed with a new coat of paint.

Members may wish to review the following incidents:

- ◆ [Worker trapped and injured by reversing vehicle](#)
- ◆ [Crewman struck and injured by forklift truck](#)
- ◆ [Fatality: Crew member struck by forklift during quayside operations](#)

## 4 Finger Injury during Work with Rotating Machinery

### What happened

Whilst working with a pillar drilling machine, a crewman got his glove caught in the rotating bit and dislocated his left thumb. The incident happened on an ocean-going cargo vessel. Two engine room crewmen were using a drilling machine in the engine room workshop to fabricate a small part. One of the crewmen put on leather gloves and tried to remove some metal chips that came out during the drilling process. His glove got entangled with the drill bit resulting in him dislocating his left thumb.

Both hand and foot operated emergency stop was immediately activated. The injured person was assisted by other crew members to cut off the glove and he was accompanied to the vessel hospital. After consultation with medical authorities over the radio, treatment was given on board. A splint with bandage was applied to immobilise the thumb and pain killers administered. Ten days later when the vessel came to port, the injured person was sent to the doctor, where he was declared medically unfit and signed off.

### What went wrong/causes

- ◆ There was no evidence of risk assessment, no toolbox talk was conducted;
- ◆ The injured person was wearing gloves while using the drilling machine – there was a warning sign prohibiting wearing of gloves when operating the drill, posted in front of the drilling machine;
- ◆ Lack of safety awareness/habits;
- ◆ The **immediate causes** were:
  - Improper use of PPE – the glove got entangled with the drill bit
  - Carelessness and lack of safety awareness – the warning sign prohibiting wearing of gloves when operating drilling machine was ignored
  - Improper use of equipment – the proper cleaning tools were not available for drilling and machining jobs;
- ◆ **Causal factors** were:
  - Inadequate planning – this potential risk was not identified
  - Inadequate supervision;
- ◆ The **root cause** was, the injured person did not follow instructions: he was not compliant with existing company requirement on personal protective equipment (PPE) when working with rotating equipment.

### Actions taken

- ◆ Suitable and sufficient risk assessment to be carried out for routine and non-routine work;
- ◆ More effective toolbox talks to be held discussing hazards and controls;
- ◆ Reiteration of company policy that gloves are NOT TO BE WORN when working with rotating machinery;
- ◆ Warning signage if posted to be clearly visible;
- ◆ Consider additional supervision for less experienced crew.

Members may wish to refer to the following similar incident

- ◆ [Hand injury whilst using pillar drill](#)

Please refer to IMCA's [short video on hand safety](#).



IMCA Watch your hands 06

**BE PREPARED TO WORK SAFELY**

DISCUSS THE TOPICS ...

- before starting a job
- any time during a job
- after completing a job

KEEP THE PROMPTS ...

in the pocket of your overalls.

ARE YOU PREPARED?

See IMCA's full range of safety cards and videos at [www.imca-int.com](http://www.imca-int.com)

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IMCA Watch your hands 06

**BEFORE STARTING WORK, LOOK FOR THINGS THAT COULD HARM YOUR HANDS**

- Heavy loads
- Over-reaching
- Pinch points
- Sharp edges
- Line of fire
- Corrosive or hazardous substances

**MAKE SURE**

- You are wearing the right protection
- You are using the right tools
- Your hands are always in sight
- If in doubt, STOP! and think again

## 5 Lost Time Injury (LTI): Finger Injury during Main Engine Exhaust Valve Overhaul

### What happened

An engineer suffered a crushed finger when there was an unplanned movement of a main engine exhaust valve during maintenance. The second engineer and a fitter were working together on the overhaul of a main engine exhaust valve. After completion, the valve was tested with compressed air. Once the air was shut off and the seat descended, the second engineer noticed some dirt on the face of the seat. He instructed the fitter to stand clear using hand signals, and attempted to clean the dirt with a rag. At that moment, the fitter opened the air and the seat face moved upwards, crushing the second engineer's finger as he attempted to remove his hand.

The vessel had to deviate from its course to the nearest port to disembark the injured person for further treatment ashore, to substantial cost. The second engineer suffered an LTI and loss of his fingertip.



A risk assessment had been reviewed and a toolbox talk had been carried out prior to the overhaul. It was not clear that communication with hand signals had been discussed at this stage. In the preceding weeks, the same team had undertaken overhaul of three similar exhaust valves;

### What went wrong?

- ◆ Some of the **immediate causes** were found to be:
  - Poor communication: Although in plain sight of each other, the noise of the engine room meant that verbal communication was not possible between the second engineer and the fitter. The fitter didn't see or understand the hand signals from the second engineer, and the reopening of the valve was not communicated to the second engineer
  - Hand placed in dangerous position "in the line of fire"
  - Following the successful test of the overhauled valve, the compressed air was not disconnected prior to second engineer cleaning the face – crew were servicing equipment that was still in operation
  - Inadequate planning – there was a failure to disconnect the compressed air prior to cleaning the face
  - Hazardous environmental condition – noisy engine room;
- ◆ The **root causes** were found to be:
  - There was no adequate system of communication and confirmation during operations in noisy environment was not identified during risk assessment neither discussed in toolbox talk
  - There was no isolation (lockout/tagout)
  - Inadequate compliance – the risk in this routine, recurring task was seen as tolerable.

### Lessons learnt/actions taken

- ◆ Develop method of communications in noisy work environment and ensure this is included in risk assessment;
- ◆ Review/familiarisation of crew on company lockout/tagout procedures.

Members may wish to refer to the following similar incidents. (All are similar to the above though not identical. Poor planning and risk assessment, inadequate communications and inadequate procedures, and hand positioning, have led in all these cases to serious hand injuries.)

- ◆ Serious finger injury: Procedures during engine maintenance
- ◆ Lost time injury (LTI): Loss of end of thumb
- ◆ Lost time injury (LTI): Finger injury whilst working in engine room
- ◆ Lost time injury (LTI): Thumb injury

## 6 Finger Injury: What Happens When you DON'T use the Right Tool for the Right Job

### What happened

A crewman attempted to remove the impeller from a fire pump using a hammer and punching rod. While he was hammering, a steel splinter of the punching rod (3-4 mm) chipped off and punctured his right hand.

The incident happened during corrective maintenance to a fire pump. The injured person was tasked by the Chief Engineer to disassemble the pump, as the Chief was busy with other work. The injured person observed that the impeller was stuck on its shaft due to misaligned splines between impeller and shaft. He started to attempt removal of the impeller by knocking out the shaft using a hammer and a steel punching rod. The punching rod splintered and the splinter went through the injured person's glove and entered the soft tissues between thumb and index finger.



### What went wrong/causes

- ◆ The tools selected for the job were inadequate;
- ◆ An adequate and correct gear puller specially designed for the task was not available on board;
- ◆ Inadequate hand protection equipment was used for the task; cotton gloves were used instead of mechanical impact protection gloves, which were available onboard.

### Lessons learnt

- ◆ Ensure the right tools to do the job are available;
- ◆ Proper PPE, whilst a last line of defence, can minimise consequences or prevent injuries from happening.

Members may wish to refer to the following similar incidents:

- ◆ RWC – Caught between: Finger smashed by tooling [An immediate cause was inappropriate or incorrect tools used for the job]
- ◆ Lost time injury (LTI): Finger injury whilst working in engine room [An immediate cause was improper use of equipment]