IMCA Safety Flash 16/17

June 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) 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 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.

Hand Injuries, Burns

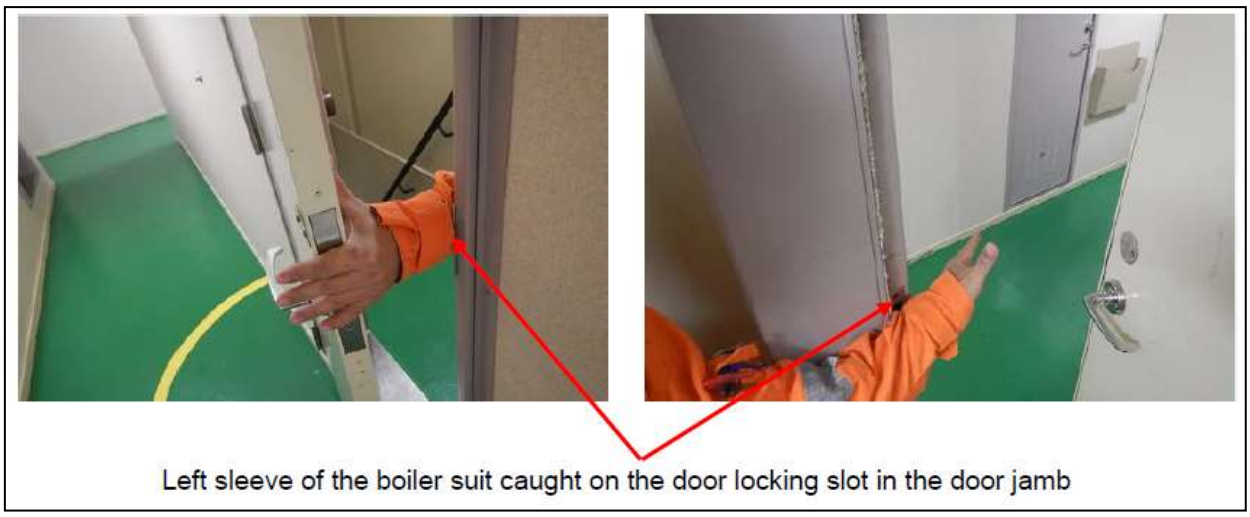
This safety flash covers three lost time injuries (LTIs) in which crew have suffered injury to their fingers or hands. In the first, someone got his fingers trapped in a closing door when his overalls got caught. In the second, there was an unplanned dropping of a heavy object – only a few centimetres but sufficient enough to injure a crewman's fingers. In the third, a crew member put a hand into a dryer to check if the garments were dry, and in doing so, touched a "base layer" type garment that had melted inside the machine.

The fourth incident is an unusual and interesting case of flammable gas being released in a tubular structure, igniting and causing harm. We move from there to news of another fuel spray fire – an area where constant vigilance is called for – and conclude with a report of damage to decks after caustic chemicals were not washed away properly.

1 LTI: Hand Injury Resulting from Clothing Catching on Door

What happened?

Crew were standing down from mooring stations after a vessel left port. One crewman was passing through a heavy door, when the left sleeve of his overalls got caught on the door locking slot in the door jamb. Before he could free the sleeve, the closing door shut hard on his hand, causing injury to the ball of his thumb. First aid was rendered on board immediately. He was referred to the doctor ashore for further treatment and was advised to sign off for further treatment thereafter.



Left sleeve of the boiler suit caught on the door locking slot in the door jamb

What went wrong?

- **Immediate causes** identified were;
  - carelessness and lack of situational awareness – he did not safely pass the door frame resulting in coverall sleeve being snagged by the door jamb
  - the cuff or sleeve of his overall was loose
  - the door closing mechanism was not properly adjusted;
- **Causal factors:**
  - management – inadequate work standards; the weekly inspection did not adequately identify the potential hazards of door closing mechanism and unsafe door jamb;
- The **root cause** identified was that risks were considered tolerable – crew were using the door on a daily basis without observing and reporting the existence of the potential hazards, and wearing overalls with sleeves loose.

Members may wish to review the following incidents:

- Hand injury during retrieval of personal protective equipment (PPE) stored inside a compressor unit
- Near-miss: Drawstring on storm jacket nearly drawn into rotating equipment

2 LTI: Finger Injury During Pilot Ladder Preparation

What happened?

An Ordinary Seaman was injured while rigging the pilot ladder during arrival in port. In preparation before rigging the ladder, a floodlight was being lowered by the crewman. He inadvertently dropped the light bracket while removing the locking pin, and it landed on his other hand, causing injury to the little finger.

What went wrong? What were the causes?

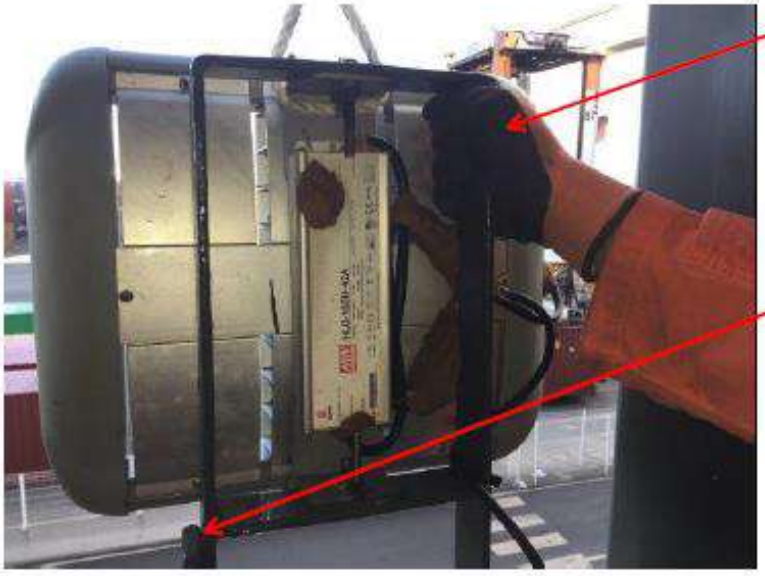
- The **immediate cause** was found to be that the injured person was not in the right position. He misjudged the situation and used an improper technique to adjust the floodlight. He tried to catch the bracket arm from falling, thinking it would damage the lamp;
- The following **causal factors** were identified:
  - no-one foresaw the need for precautions in adjusting the flood light
  - the crewman had limited knowledge the potential risk involved;
- The **root causes** were found to be:
  - risk was considered tolerable – this was a routine recurring task
  - safety systems were inadequate – there was no properly designed handle to hold the light bracket in place while removing the securing pin.

What were the actions?

- Review of specific ship and task risk assessments to include potential risks involved in this operation;
- More effective toolbox talks to be conducted for the crew involved;
- More care to be taken when conducting routine work, especially when less experienced crew are involved.

Members may wish to review the following incidents, all of which cover finger injuries following unplanned movement of heavy equipment:

- Finger injury during maintenance work – restricted work case;
- Lost time injury (LTI): Finger injury whilst working in engine room;
- Line of fire LTI: Finger injury during lifting operations.

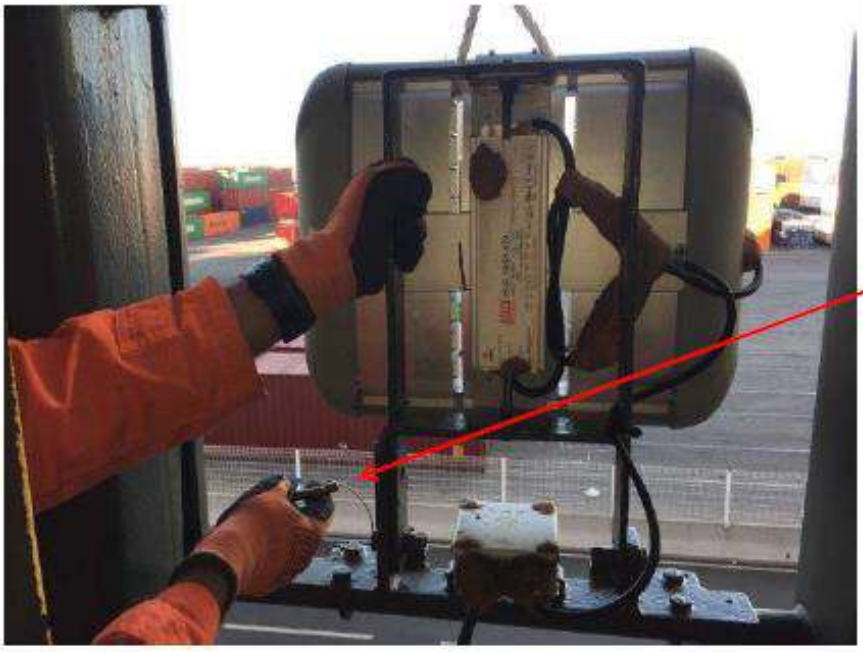


He was holding here with right arm, with gloves, same type as shown, Winter hard protecting gloves

Left hand held here, after removing the pin, the light allowed to swing down, because of severe ambient cold, right hand slipped and lost the hold.

By reflex, used left hand to hold the light from hard hitting down

Left arm finger nail got crushed coming between lamp bracket and ship structure



The Pin securing the light with bracket

3 LTI: Burn to Hand While Working in Laundry

What happened?

UK Step Change in Safety has published an alert in which a member of the crew suffered a burnt hand whilst working in the laundry. The person put a hand into a dryer (prior to running the cooling cycle) to check if the garments were dry. In doing so, that hand touched a "base layer" type garment that had melted inside the machine. The result was a burn that escalated to an LTI.

What lessons were learnt?

Some work activities should be done in sequence to ensure safety (e.g. running the dryer cooling cycle before entering). In such cases, it is necessary not only to know what the control measures are, but also to carry the work out in a particular order. Users of offshore laundry facilities should make sure that clothing is appropriate for machine washing and drying. Certain fabrics can melt under high heat, increasing the risk of injury to laundry workers and the possibility of fire.

See the Step Change "Safety Moment" here. Members may wish to review the following incident:

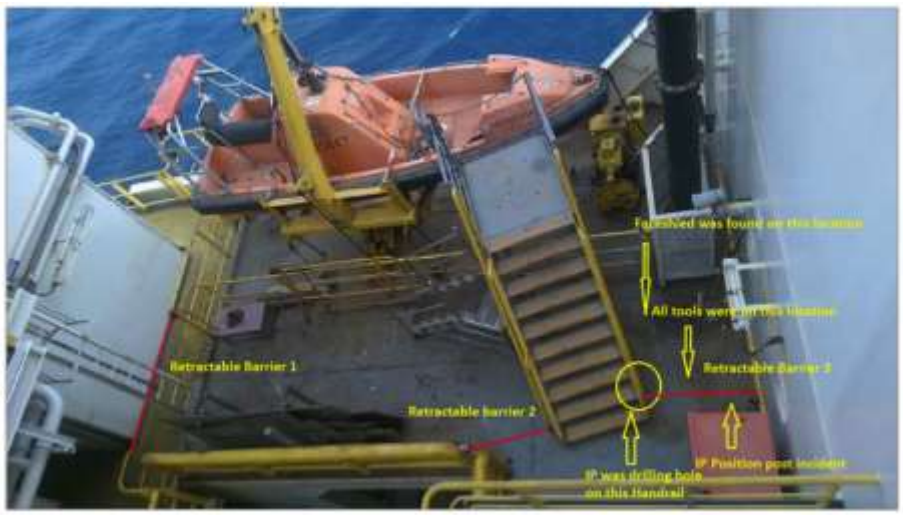
- Near-miss: Laundry fire hazards.

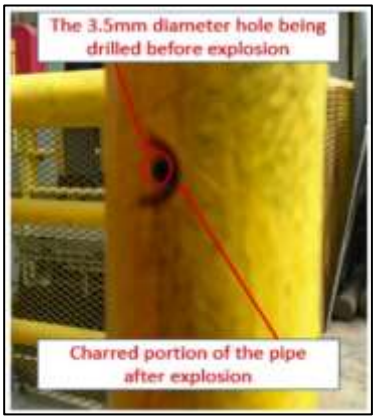
Base layer type garments are usually either a mix of or entirely made from polypropylene. This fabric has qualities which allow moisture to wick away and heat to be retained. Because of its melting factor, air drying is recommended instead of machine drying.

4 LTI: Crewman Burnt in Fire Following Release of Flammable Gas from Hand Rail

What happened?

A mechanic was drilling a 3.5mm hole into the access stair handrail of a rescue craft, in order to install a safety barrier clip. When the drill bit penetrated the wall of the handrail pipe, there was a release of an unknown flammable gas that caused a fire and subsequent injury. He suffered burns which required recovery time in hospital and lost days from work.





What went wrong? What were the causes?

- The design of the handrail, using/creating hollow and enclosed structures, led to the conditions for accumulation of hazardous gas. There were no design features to allow for venting. The construction of the

handrail (of low grade steel) contributed to the accumulation of a combination of hazardous gases in the hollow and enclosed structure;

- The drilling introduced a heat source for ignition of the hazardous gases when released;
- The mechanic was in the path/route of the hazardous gas release (line of fire), and was not wearing his personal protective equipment (PPE) with all fastenings secured, as was required.

The Investigation team believes that the injured person was carrying a paper copy of the risk assessment for the job in – but sticking out of – his right side front pocket at the time of the incident. It is believed that when it burned, an intensified heat spot was created which contributed to the degree of severity of the burns suffered.

What lessons were learnt?

- The injured person and his supervisor were not aware of the presence of the hazardous gas; as such the hazard/risk was not identified nor the risks reduced before starting the job;
- Hazardous gas can be accumulated over time in hollow and enclosed structures. Specific standards/procedures should be in place for work on such structures;
- The risk assessment in place for this task did not address the potential presence of hazardous gas accumulation in a hollow and enclosed structure.

What were the actions?

- Handrail design should consider features/measures to limit or avoid the potential for accumulation of gases inside hollow and enclosed structures. Examples include using angle irons for hand rails, non-metallic tubulars, weep or vent holes in tubulars, etc.;
- Establish procedures to safely tap into a hollow and enclosed structure which potentially has hazardous gas inside;
- PPE to be worn as designed, with all fastenings secured.

The reporter notes that *"alerts from at least 3 known previous incidents of similar nature in the E&P industry had not been seen prior to the incident. Sharing lessons learned is important and necessary for prevention of similar incidents."*

See https://www.cdc.gov/niosh/mining/UserFiles/works/pdfs/473.pdf for an article on *the explosion hazard from hydrogen gas generation inside sealed frames.*

Members may also wish to review the following incidents:

- Near-miss: Release of trapped pressure after ROV dive;
- LTI: Contact with Refrigerant Gas Causing Hand Injury.

5 Fuel Spray Fire - Déjà Vu: Prepare and Prevent it from Happening to You!

The United States Coastguard (USCG) has published Marine Safety Alert 06-17 to bring attention to 'yet another fuel spray fire'. The USCG notes that *"these types of incidents, involving fuel leakages contacting hot surfaces and igniting, happen too frequently and have been a focus of various marine safety organizations such as the IMO for many years."*

What happened?

On a 194 GRT offshore supply vessel with an unmanned engine room, a main engine low fuel pressure alarm occurred on the bridge, and was investigated by the crew.

The crew member on watch entered the engine room and identified a high-pressure fuel leak spraying over and upon the port engine's turbocharger. He also reported a large quantity of diesel fuel in the bilge.

The Master then went down into the engine room and witnessed the ignition of the fire. Using a hand held portable fire extinguisher he quickly attempted to extinguish the fire without success. The Master activated the general alarm, secured the hatches, had crew members secure the ventilation dampers and closed the remote fuel shut-off valves to the engine room. The fire then quickly self-extinguished. No-one was harmed, but this engine room fire led to significant damage, operational down-time of the vessel and lost company revenues.

What went wrong? What were the causes?

The source of the fuel leak was identified to be a rupture on a flexible fuel hose connected to the fuel filter assembly. The USCG recommendations can be summarised thus:

- Avoid an "*out of sight, out of mind mentality*" and regularly inspect unmanned machinery spaces;
- Inspect fuel and lubricating systems closely from source tanks to system end points;
- Examine all heat sources particularly with respect to engine exhausts;
- Minimize the use of non-metallic flexible hoses in systems carrying flammable liquids particularly around engine areas where failures leading to leakage or spray may find hot spots capable of igniting the fluids;

Please refer to the fuller report and recommendations on the USCG website. Members may wish to review the following incidents:

- Fatalities: Engine room fire caused by fuel spray ignition;
- Near miss: Fire hazard arising from failed fuel pipe connection.

6 Chemical Spill Leads to Costly Deck Replacement

What happened?

The USCG has published Marine Safety Alert 01-17 relating to hazards from chemical spills. USCG inspectors found several cracks and parted seams in the aluminium braces of the structure underneath a vessel's cargo deck. They learned that there had been a caustic soda spill on the deck. While it was washed off the vessel with water, a diluted caustic soda and water mix seeped into and settled underneath the wood planking. A chemical reaction then occurred, causing damage and the need for extensive repairs.

Caustic Soda (Sodium Hydroxide, NaOH) is highly reactive with aluminium, causing it to oxidize and corrode quickly. Additionally, when caustic soda is exposed to aluminium under some conditions it can also produce highly flammable hydrogen gas.

As can be seen in this case, in addition to potential health risks to personnel involved with routine handling and clean-up of spills, there is also the potential for adverse chemical reactions with vessel components, construction materials, and other items on-board. The full alert can be found on the USCG website.

IMCA has published a pocket safety card entitled *Hazardous substances safety guide*. Members may wish to refer to the following incidents:

- Aluminium fresh water tanks: Near collapse due to serious corrosion;
- Cargo contamination causing LTIs during clean-up.