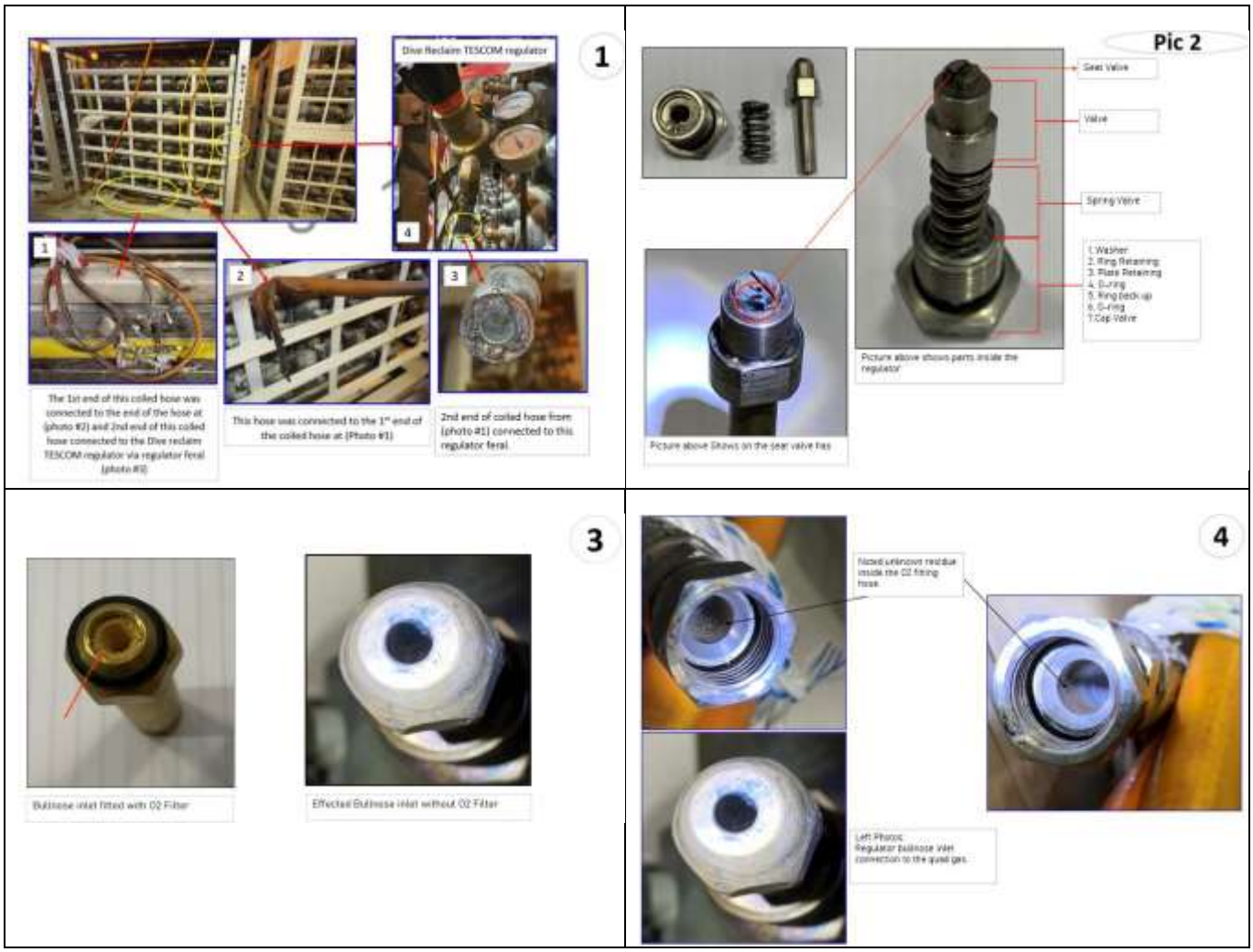
IMCA Safety Flashes summarise key safety matters and incidents, allowing lessons to be more easily learnt for the benefit of all. The effectiveness of the IMCA Safety Flash system depends on members sharing information and so avoiding repeat incidents. Please consider adding **safetyreports@imca-int.com** 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 Flash fire on Oxygen gas quad hose

What happened

There was a flash fire on an Oxygen hose line onboard a DSV. The incident occurred during routine checks, when an LST (Life Support Technician) reported that the Oxygen supply pressure to dive control was low (25 Bar). SAT control informed Dive Control and agreed that a new Oxygen supply was required. The LST went to the appropriate quad (on the main deck), and started by closing the row of eight bottles of Oxygen before opening a new row. Whilst opening the new row of Oxygen supply bottles the LST heard an unfamiliar noise (a flapping sound from the regulator) and immediately closed the cylinder pillar valve and closed the valve on both regulators (SAT control and reclaim regulator valve) and quickly moved away from the Oxygen quad. The LST immediately returned to SAT control and reported to his supervisor.



Shortly afterwards, the Oxygen hose burst followed by an explosion and flash fire at the reclaimed Oxygen hose line. The deck foreman who investigated the source of the explosion immediately extinguished the fire with a dry

powder fire extinguisher. There was no damage found on the nearby gas quads apart from the affected hose and regulator.

What went wrong – investigation findings

Investigation showed that the bullnose inlet (connection to the pillar valve) had no filter to stop rust contaminant from the cylinder going into the regulator. Small particles of rust from inside the cylinder accumulated inside the regulator causing high friction after the Oxygen release, resulting in heat and contributing to the spark, explosion and fire.

Members may wish to refer to:

- Flash fire in gas supply equipment onboard dive support vessel (2006)
- Oxygen regulator explodes causing injury (2011)
- Oxygen and Acetylene hose caught fire
- Near miss: sudden Loss of air from diver bail-out bottle
- Oxygen service regulators

2 Damage to flexible riser

What happened?

Applicable Life Saving Rule(s)

Bypassing Safety Controls

During deployment of a water injection riser from a vessel, damage to the outer coating occurred when it came into contact with the sharp edge of the flare in the moonpool area. A water injection riser was being installed through a project-supplied flare in the moonpool via the vessel's Tiltable Lay System (TLS) at an angle of 6.8°. The flare had been designed to direct and protect the riser at the exit. However, design reviews, subsequent risk assessments and inspections had failed to identify the hazard of the sharp upper lip of the flare with the potential to damage the riser.

Showing damage to the riser

Showing the flexible running through the flare in the moonpool area

What went wrong

- During design the sharp edge of the flare had not been identified as a hazard and therefore, was not chamfered for protection of the product;
- The project risk assessment did not identify proper controls to prevent and mitigate possible damage to the product or its coating due to seabed topography, tilted TLS etc;
- Lessons had not been learned - previous learnings from similar flexible product damage events had not been transferred to the project team prior to design.

Recommendations

- **Learn the lessons!** Learnings from previous or similar flexible product damage events to be reviewed and considered during the full life cycle from design to installation;
- During design reviews and risk assessments specific to flexible products, ensure sharp edges and potential hazards that can cause damage are considered and mitigated;
- Project supplied equipment to be integrated into lay systems should be reviewed by vessel team before fabrication and then again at installation.

Members may wish to refer to:

- Uncontrolled movement of a riser

- Three incidents in which something similar had happened before – in all three incidents a similar incident had happened previously, and lessons were not learned:
  - Crew transfer vessel in collision with anchor wire
  - Failure of bell winch clutch coupling during bell recovery
  - Fatality: Stored pressure release

3 USCG: Unexpected Dangers: Lifeboat Remote Control Wires

The United States Coastguard (USCG) has published Safety Alert 07-22 which addresses the importance of visually inspecting lifeboat and davit installations before testing with crewmembers on board, and ensuring crew familiarity with company policy related to lifesaving equipment testing. In particular, the remote control wire may be overlooked, yet weaknesses within the linkages or poor spooling of the wire itself can lead to catastrophic failures in the lifeboat launching systems.

Lifeboat listing more than 90 degrees w/crew inside

Lifeboat skeg caught on deck edge

What happened

During a recent vessel inspection, a vessel's crew was lowering the lifeboat when the remote control wire arrangement caused two separate failures:

- The remote control wire parted as the lifeboat was being lowered with crew on board. Causal factors included poor winch spooling potentially hidden under the outer spools, which led to a wire kink and winding on itself, creating enough force to part the wire;
- The second failure occurred a day later after the replacement remote control wire was hand spooled from extra wire found on board. During testing with crew on board the boat using the remote control wire to lift the brake, an unexpected pay out of wire led to the winch brake prematurely engaging, which made the lifeboat stop lowering and swing erratically above the embarkation deck. Seconds later, the movement caused the wire to regain tension, which lifted the winch brake arm and caused the lifeboat to lower again. While lowering in a swinging motion, the skeg of the lifeboat caught on the knife-edge of the ship's deck, causing the lifeboat to list more than 90 degrees.

What went wrong

An internal company investigation of these incidents identified the crew did not follow existing company policy which required a test lowering without crew prior to embarking crew. The company's policy is based on recommendations within MSC.1-Circ.1578, *Guidelines on Safety During Abandon Ship Drills Using Lifeboats.*

What went right

Quick action of a crewmember who activated the winch brake lever from the deck – otherwise the lifeboat could have inverted further and led to catastrophic outcomes.

Recommendations

The USCG strongly recommends that ship's crew conduct a thorough visual inspection of lifeboat launching systems and test lowering prior to operation with crew on board, paying special attention to the following inspection points:

- Verify the proper spooling of the remote control wire, expand inspection as necessary;
- Verify the proper position of the remote control wire weight. If the weight is very close to the top of the lifeboat, this may indicate the remote control wire is too long;
- Verify material condition of the shackle that connects the pull cable to the remote control wire within the lifeboat. These steel shackles can corrode and may be overlooked during weekly/monthly/annual inspections.

Members may wish to refer to:

- Lifeboat wire rope failure
- Lifeboat damaged during deployment drill
- Tombarra fall wire fatality: Updated reports
- Lifeboat falls after equipment failure

4 A focus on journey management

Applicable Life Saving Rule(s)

Driving

A member reports two serious vehicle incidents, in Brazil and in the Netherlands, which resulted in only minor injuries but could have had much worse outcomes.

What happened?

Incident 1: In the Netherlands, a contractor was driving on a third-party site when the his car collided with a 30Te forklift truck. The site had poor road markings and the visibility at the junction where the accident occurred was poor, due to stacked steel coils. Neither driver had stopped at the junction to check whether the route was clear. The car sustained significant damage, but the driver and the forklift driver did not suffer any injuries.

Incident 2: In Brazil, two employees were being driven by a third-party transport driver. Due to a medical issue, the driver lost the ability to control the car and it continued, at speed, for 400m across a tram line and a pedestrian walkway, before striking a lamp post. The driver and both passengers sustained minor injuries.

What went wrong

Incident 1:

- Visibility was restricted at the junction but neither vehicle stopped to check the way before proceeding;

- The known hazards on site associated with movements of heavy machinery had not been communicated to the team on site, nor had relevant actions from risk assessments been closed out.

Incident 2:

- The third-party driver was not fit to drive. However, there was no process in place within the third-party transport provider to manage fitness for work checks or training validity of drivers;
- The company had no oversight of the drivers being provided by the third party, and so a list of approved drivers had fallen out of date;
- There were unclear lines of responsibility for the ongoing management of the third-party transport provider.

Recommendations

- Be willing to intervene and stop unsafe behaviours during journeys;
- Ensure everyone who is driving on work business is aware of their personal responsibilities and have defensive driving techniques in mind when they step into the vehicle;
- Use Journey Management techniques. Like any task we undertake, proper planning for Journey Management should be undertaken, especially when traveling on journeys that are not familiar - remember the 7 T's *"Take The Time To Think Things Through";*
- When mobilizing personnel to third-party sites, known hazards such as moving machinery, ongoing hazardous work, pedestrian safety, and security should be clearly communicated by the site during the induction and/or prior to travel;
- Third party vehicles (hire cars, taxis, private transport providers) should have basic safety features as standard for example air bags, ABS brakes, 3-point seatbelts and crash protection;
- When contracting third-party transportation services, the contract language should be clear on licensing, training, and fitness to drive;
- Oversight should be in place for approving drivers and monitoring of Journey Management Plans as determined by local regulatory requirements.

Members may wish to refer to:

- Fatal Traffic Accident on Board a Large Vessel
- Two yard-based fatal road traffic accidents (UK HSE)

5 Mixing of cleaning chemicals

What happened?

A worker mixed bleach and toilet cleaner whilst working in the confines of a toilet area onboard a tug. The two chemicals mixed and there was a chemical reaction. As a result the worker was exposed to chemical vapours which resulted in breathing discomfort. Onboard medical treatment was required, followed by onshore cautionary medical assessment. The worker was diagnosed with Chemical Bronchitis.

What went right?

- Use of Ship Captains Medical Guide for guidance on treatment onboard;
- Promptly contacting emergency medical contact for medical advice;
- Promptly sending the employee for cautionary medical assessment ashore;
- Full support provided by shore-based management.

What went wrong?

Investigation revealed that the employee involved had no awareness of the consequences of mixing these chemicals.

What were the causes?

- Routine activity without thought;
- Lack of training, lack of knowledge.

Lessons learned and actions taken in this case

It was realised that the company focus on chemicals awareness was directed more on industrial chemicals with a limited focus on domestic chemicals. Actions were taken:

- Training materials were provided regarding domestic chemicals;
- Risk assessments were updated with regard to the mixing of chemicals;
- There was a review of domestic and industrial chemical stocks, ensuring stock management and seeking to minimise the number of chemicals held onboard;
- Access to all chemicals (industrial and domestic) should be controlled.

Members may wish to refer to:

- Chemical reaction: person injured during grouting operations *[water mixed with grouting dust to make a corrosive solution. The consequence of this mixing was not clear in the Safety Data Sheet]*
- HSE: Allergic reaction at work *[a company failed to carry out a suitable and sufficient risk assessment to identify the potential for exposure to the hazardous chemicals]*
- Inhalation of toxic fumes during hot work *[There was a lack of awareness of chemicals being used]*