IMCA Safety Flash 10/05

October 2005

These flashes summarise key safety matters and incidents, allowing wider dissemination of lessons learned 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

1 Crane Wire Failure

A member has reported a serious crane wire failure. A night-time recovery of a work-class ROV (weight 4.75 Te) was taking place onto a Class 2 DP survey vessel using the ship's 5 Te crane. Weather conditions were fair with an estimated 0.5 m significant wave height on top of a 1.5 m swell. During the recovery of the ROV, the supervisor could hear the crane hydraulics bypassing the pressure relief valves – indicating a

n overload. On trying to lift again, the crane wire parted and the ROV was released to sea.

The company's investigation revealed:

- scuffing/gouging of the spelter socket;
- recent and historical damage on the inside face of the swivel sheave cheek plates – indicative of a wire scraping along the plates;
- that the cheek plates had been distorted outwards by approximately 30 mm;
- damage to the outer face of the sheave wheel;
- crushing and mechanical damage to the broken ends of the crane wire.

The company has concluded that the crane wire had been over-recovered in the past, to the extent where the conical end of the spelter socket had forced itself between the sheave assembly cheek plates, wedging them apart by circa 30 mm. This, in turn, allowed the wire rope to come off the sheave and jam between the wheel and the cheek plates, causing crushing damage to the wire. The additional impact load on the already damaged wire during the recovery of the ROV through the splash zone ultimately led to the failure of the wire.

The root causes of the failure were noted as:

- inadequate crane inspection routines;
- no action had been taken when the existing damage had previously been noted;
- the crane had been previously modified without recourse to a management-of-change procedure or consultation with the manufacturer;
- there was no limit switch fitted to restrict the spelter socket from entering between the cheek plates.

The company has implemented the following corrective actions:

- checklists have been modified to include visual inspections of the crane wire and sheave assembly and communication of findings to management and crane manufacturer as appropriate;
- the importance of the management of change procedure has been re-emphasised;
- risk assessment reports have been reviewed and updated as required, highlighting the risks of damaged crane parts.

2 Engine Room Fire

IMCA has received a report of an engine room fire. The master and crew handled the critical situation swiftly by releasing carbon dioxide. The fire was brought under control, but the ship lost power. The ship was towed to port for investigation and repairs.

The fire caused damage to machinery components, piping, cables and bulkhead and the engine room was partially flooded.

The probable cause of the fire was spraying of leaking hydraulic oil onto an exhaust flange which was not properly insulated (see pictures 1A and 1B). The exposed flange must apparently have reached a temperature above 220°C.

The information received reiterates the importance of identifying hot spots in the engine room, noting typical trouble areas such as:

- indicator valves;
- exhaust pipes from each cylinder;
- exhaust manifold, in particular overlaps between steel sheets and laggings;
- turbochargers, in particular flanges to such;
- cut-outs for pressure and temperature sensors;
- exposed areas on boilers and incinerators.

After maintenance and repairs, attention should be paid to satisfactory reinstallation of the insulation.

SOLAS regulations require proper insulation of all surfaces[1] with temperatures above 220°C. See picture 2 for an example of satisfactory insulation of a flange. SOLAS also includes requirements for jacketed piping of high pressure fuel lines and screening of pipe connections on flammable oil systems.

Pictures 1A and 1B – Main exhaust pipe

Such an arrangement may have caused the fire. Note the exposed flange of the expansion joint without insulation.

The flange has a temperature normally above 220 °C. Hydraulic oil may hit this flange and start a fire.

Picture 2 – Exhaust pipe

One example on how the flange can be properly insulated. The insulation and the metal sheath cover the flange completely.

The metal sheath protects and ensures proper geometry and location of the insulation material.

The sheath cover is only fixed on the upper side since it covers the expansion joint.

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[1] "For all ships above 500 gross tonnes, SOLAS requires insulation of surfaces with temperature above 220 °C, which may be impinged upon as a result of fuel system failure. For ships built after 1st July 1998 this also applies for system failure of lubricating oil, hydraulic oil and thermal oil.

3 Explosion in a Ballast Tank Causing Loss of Life

IMCA has received a report of an incident wherein during a repair job in a pre-load tank (ballast tank) onboard an oil rig at a repair yard, an explosion occurred in the tank. The oil rig was undergoing extensive repairs.

Repair workers using oxy-acetylene torches inside the pre-load tank, had shut the gas torch valves down and left the tank for their break. After their break, when they entered the tank again to continue the job, there was an explosion as soon as they ignited the gas torch.

Two workers were seriously burned and hospitalized. One of them subsequently died in hospital.

The most probable cause of the explosion was ignition of gas coming from the gas torch. On investigation, it was found that the valve on the gas torch was not tight, hence gas had accumulated inside the tank during the break, as there was no proper ventilation of the tank.

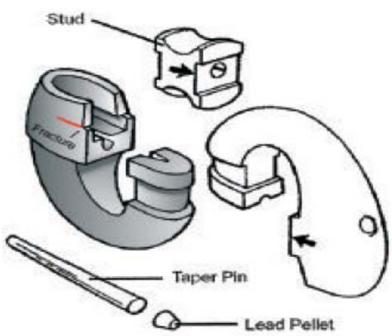
The following lessons may be drawn from the incident:

- The conditions for the validity of the issued hot work certificate may change quickly during a work shift and need frequent follow-up;
- Continuous proper ventilation is vital for work carried out in any enclosed space. In this case this would have avoided or reduced the accumulation of gas causing the explosion;
- Gas equipment, including hoses, should be well maintained, so as to perform as desired;
- While temporarily leaving a work place, appropriate precautions should be taken. In this case, the main gas cylinder valves should have been closed and/or equipment removed from the tank.

4 Lost Anchor Chain

IMCA has received a report of a vessel losing one anchor and four lengths of chain cable during anchor handling. During the vessel's previous dry docking, a number of chain cable lengths had been renewed on both port and starboard sides, including a number of Kenter shackles (joining shackles) as found necessary, due to wastage in excess of allowable limits. The remaining part of the anchor chain cable lengths and Kenter shackles were at that time found to be in satisfactory condition.

It was discovered on investigation that the probable cause of the damage was the fracture of a Kenter shackle that had not been renewed in the previous dry dock.



Note that the intricate shape of the various parts of a Kenter shackle means that large forces are transferred through relatively small contact areas. Proper design and well machined faces and corners are very important for the durability of such shackles.

In the above case the failure may be attributed to mishandling of the Kenter shackle during the opening/ fitting operation. Since in most cases Kenter shackles on old anchor chains are rusty/frozen, and opening up and reassembly requires the use of heating or mechanical force, cracks are likely to develop and should result in replacement rather than re-use.

The lesson to be learnt from this incident is, when a chain cable length is replaced due to wear and tear, the Kenter shackle(s) are normally worn as well and should generally be replaced.

5 Near-Miss During Heavy Lift Operations

A member has reported a near-miss incident that occurred during a dual crane lift of a stinger being offloaded from a barge.

Two cranes were required to unload a stinger from a barge. Since the lift was a multiple crane lift and more than 100 T, a critical lift method statement (CLMS) was required prior to the lifting operation. The HS&E supervisor was asked to inspect and arrange for sign-off of the CLMS checklist and verification sheet. The HS&E supervisor then requested a control and compliance verification as indicated in the CLMS. After inspecting the area and verifying that everything appeared to be okay, the rigging superintendent/crane operator signed-off on the CLMS and the lift commenced.

While the lift was in progress, the yard fabrication superintendent arrived and asked to review the CLMS. A check with the rigging superintendent revealed that the actual weights being lifted exceeded the weights listed on the CLMS and that, as a result, the cranes were procedurally inappropriate for the lift, having inappropriate counterweights. Subsequent to this, it was discovered that no critical lift meeting had taken place prior to the lift, as required by procedures, and that the weight of the stinger was incorrectly estimated as 140 T rather than 160 T.

The rigging superintendent then instructed the rigging supervisor and crane operator to manoeuvre each end of the boom load closer to acquire and maintain the proper boom angle for a safe lift. The lift continued until completed using this method.

The company involved has noted a number of key factors leading to this potential incident, including:

- lack of judgment and improper examples set on the part of supervisor level staff;
- inadequate review of work instructions, procedures and standards before the job;
- improper loading of cranes.

The company has reiterated that the failure to follow clearly established procedures during complex heavy lifts has the potential for serious incidents to occur.