# IMCA Safety Flash 12/11

October 2011

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 webmaster@imca-int.com

## 1 Offshore Tank Container Rigging Failure

A member has reported two incidents in which the rigging of an offshore tank container failed as a result of a cold fracture. In both cases a tank container was rearranged on deck and damage was observed prior to actually lifting the container. There was no other damage than to the link itself.

An approved offshore container is outfitted with an associated rigging set that stays attached for handling. The container and sling are re-certified on an annual basis. For both sets of failed rigging the certification was found to be in order.

- Both containers were lifted in static conditions (deck to deck) in good weather conditions;
- Both containers were full at the time of lifting and the weight of the container did not exceed the safe working load;
- There was no deformation in the link or chain observed in either case; they were so-called cold fractures;
- In both cases it was the master link in a corner fitting of the container that failed.

Following the first incident, the chain link was sent to a laboratory to establish the cause of the failure. It was, at the time, concluded that the most likely scenario that caused the fast sudden fracture was a forging defect in the master link.

Following the second incident some seven months later, the similarities between the two incidents were apparent and it was established that both rigging sets were purchased from a single batch. With reference to similar incidents in the industry, hydrogen induced cracking or manufacturing process errors could not be ruled out. As this failure mechanism could not be determined by non-destructive examination methods, it was decided to replace all rigging sets from this batch (32 of) with new rigging sets.

Laboratory results are awaited on these quarantined rigging sets and the broken link for further action as appropriate.


*Failed chain link*

## 2 Near Miss: Dropped Object: 6kg Sledge Hammer Head

A member has reported an incident in which a 6kg hammer head fell 5m (metre) to an unmanned deck. Whilst using the sledge hammer to dislodge a 600Te shackle connecting a 340Te wire, the hammer head came free of the wooden shaft when it was struck against the shackle pin, and it fell 5m to the unmanned area below which had no barriers in place. There were no injuries.

On closer inspection, it was noted that there were a number of small indentations around the head and along the shaft, two hairline cracks at the head end of the hammer and a large open split at the user end of the handle. It was also noted that the lanyard used to secure the handle was an inadequate solution for the retention of tools used at height.

*Closer inspection of handle and hammer head*

Following investigation, it was identified that there had been numerous other occasions where hammer heads had either been found loose or had come off during use. In addition, several cases reported damaged shafts.

The following lessons were learnt:

- The inspection for damage of all hand tools should always be carried out prior to use and before returning to storage location;
- Hammer heads should be checked for security prior to use, ensuring heads are securely fixed to handle;
- Defective tooling should be removed from service and quarantined;
- Appropriate tool retention methods should be used when working at height with tools; different methods may be appropriate for tools of different weight;
- The tool lanyard connection point should either be supplied with the hammer, recommended by the tool manufacturer or be a recommended and approved lanyard manufacturer's modification.

*Some suggested tool lanyard arrangements*

## 3 Near Miss: Crane Winch Wire Damaged Crane Cab During Heavy Seas

A member has reported an incident in which, owing to the sudden movement of the vessel, a crane winch wire hit the crane cab with the operator inside, causing damage to the cab structure. The operator was unharmed. The incident occurred after completing the wet storing of a spool using the single fall main block. The crane boom, complete with suspended spool lift rigging, was recovered to the main deck. Whilst the block was over the deck, the vessel pitched and rolled heavily thus causing the crane block to swing adversely. The crane operator attempted to recover the situation. As he attempted to recover the block, the wire immediately above the block hit the crane cab damaging the cab structure and breaking glass. The impact showered the crane operator with glass.

This routine operation had the potential to be a fatality. There was no designated landing area for which to land the crane block and its attached rigging safely. This had been considered a routine operation yet the risks had not been fully captured during the planning stage.

*Crane cab showing damage*

*Landing area seen from above (circled)*

*Crane block*

Subsequent to an investigation, the following were noted:

- The landing area on the aft deck for the block and rigging was very restricted due to a tall subsea structure being in the same area;
- The crane boom position had to be at a 12m radius and the block had to be lifted high in order for the block and attached rigging to be lifted over the subsea structure. This position left the block at the same height as the crane cab.

The following recommendations were made:

- A safe landing area on the main deck should be identified and clearly marked both on the deck itself and on the General Arrangement (GA) drawings;
- If it becomes necessary to use this area, a specific risk assessment should be required and an alternative, temporary safe landing area identified;
- Lift planning should cover crane operations from start to finish, including the initial movement of the crane and also recovery of rigging to deck.

## 4 Near Miss: Diver Working Under Suspended Load

A member has reported an incident in which a diver found himself working under a suspended load.

Whilst conducting diving operations around a subsea manifold, a subsea work basket weighing 375kg in water was landed without proper warning very close to a diver standing on the subsea manifold. Tools and equipment were being deployed to the divers using a cherry picker crane without heave compensation. Part of the lift planning was a 'short mark' established prior to subsea deployment of the load. The length of winch wire deployed was then closely monitored on the crane line out meter to ensure that loads were stopped at a safe distance from the divers working on the seabed. Additionally, the crane wire had a transponder attached which allowed the depth to be monitored by the dive control department. Once the load was at the required short mark it was standard practice to have the remotely operated vehicle (ROV), in conjunction with a diver, spot the load and then monitor the final stage of the deployment to the seabed.

Dive control had requested that tools and equipment be deployed using a 1m x 1m work basket. The basket was prepared with a beacon, strobe and light sticks attached to help improve its visibility subsea. On previous dives the short mark had been set at 95m with a working depth of 108m but, as the divers were having difficulty seeing the loads due to poor visibility, the short mark was altered to 100m to allow the load closer and make it easier to spot. The work basket was deployed and the line out meter zeroed at the splash zone to ensure the load could be stopped at the required mark.

Dive control requested that diver 1 make his way to the top of the manifold to prepare for the basket being landed. When he arrived at the manifold he could not see the load and was told it was on its way down. While he was waiting for the load to arrive he started to inspect the landing zone to ensure it was clear to land the work basket. As he was doing so, the deployed work basket suddenly landed behind him on top of the manifold.

Diver 1 called an immediate 'all stop!' and at the same time the crane driver informed dive control that as per his line out meter he had reached the required short mark. During this operation the ROV had not been requested to spot the load at any point during the deployment.


*Typical 1m x 1m work basket for deployment subsea*

An investigation was conducted, noting the following:

- There was no written and agreed procedure for this operation with lifts being completed using usual practice;
- There had been no risk assessment for deploying subsea loads from the crane;
- There was no lift plan in place for the work basket and hence no discussion of the work basket during toolbox talks, which might have highlighted potential hazards and considerations for personnel involved;

- Though trained in using the picker crane, the crew using it may not have been fully aware that movement of the boom and knuckle could result in the load being at a different position with no change on the line out meter reading;
- The crane crew may not have closely monitored the reading from the transponder and instead used the line out meter reading as the primary source of monitoring the depth of the load;
- Several previous faults had been reported on the crane line out meter with the meter returning to zero during subsea operations; these reports had been investigated but no permanent fault had been identified;
- Diver 1 should have been informed to inspect the landing zone for the work basket prior to the load being deployed overboard and then instructed to move out of the landing zone until the load had reached the short mark and was being monitored by dive control using the ROV. In this way, he would have been protected from working underneath a suspended load.

The following actions were taken:

- Develop and circulate vessel-specific procedures for deployment of loads with picker cranes or winches, including safe over-boarding areas, communication protocols and illustration of roles and responsibilities of departments;
- Develop specific lift plans for all working baskets and equipment in use subsea, including reference to any job risk assessment (JRA) where divers or ROVs are present subsea;
- Ensure all personnel operating picker cranes or winches have completed a suitable level of competency training for that piece of equipment.

## 5 Fast Rescue Boat Dropped 18m Into Sea – Injuring Crew

The Australian Transport Safety Board (ASTB) has published a report into a fast rescue boat incident on board a natural gas tanker. The incident occurred in 2010. A crew member was medically evacuated using the ship's fast rescue boat for the transfer. The crew of the fast rescue boat and the person being evacuated were injured when, during the launch, the ship's fast rescue boat dropped 18m and impacted the water below.

Further information can be found at www.atsb.gov.au/media/2494088/mo2010004.pdf

## 6 Dynamic Positioning (DP) System Failure

IMCA has received information from a member about an incident involving the DP system aboard one of its vessels. Because of the resulting inherent failure possibility, the company has identified the need to modify the software installed in the DP systems on several vessels within its fleet. The DP manufacturer has issued a technical bulletin relating to this (attached). It is felt that the serious nature of this incident made it important to share this information as a safety flash and also as information note IMCA M 19/11 – *Dynamic positioning system failure*.

## 7 Engine Room $CO_2$ Isolating Valve

The Marine Safety Forum (MSF) has published Safety Flash 11-31 (attached) regarding a routine inspection of a vessel's $CO_2$ fire fighting system. It was noticed that the engine room $CO_2$ isolating valve remained in the closed position when the valve handle was manually operated.

Further information can be found from: www.marinesafetyforum.org/upload-files//safetyalerts/msf-safety-flash-11.31.pdf

## 8 Engine Room Fire on Offshore Vessel

The Marine Safety Forum (MSF) has published Safety Flash 11-32 (attached) regarding a fire reported in the main engine room of an offshore support vessel which was under tow at the time. The source of the fire was identified as being fuel oil leaking from the flange on a fuel injector pump onto an engine.

Further information can be found from: www.marinesafetyforum.org/upload-files//safetyalerts/msf-safety-flash-11.32.pdf

# Technical Bulletin Nº DP-03/2011

Kongsberg September 20 2011

This bulletin is relevant for, and distributed to clients having a Kongsberg Maritime redundant K-Pos system with the software versions in the range 7.0.0 - 7.0.9.

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## K-Pos –master/slave automatic switchover incident

**Description and background**

An incident has been reported where the master computer stopped on a dual redundant K-Pos system and the switchover was not performed as expected.

The investigation has revealed that the master computer stopped due to a hardware failure. The sequence of events made the slave computer enter into a temporary error state (alarm "PS Incapable" reported) that prevented it to become online.

The existing procedure is to manually unlock the error state.
Reference made to DP operators manual, Chapter 7.2 "Redundant systems".

**Permanent solution**

A solution has been developed to automatically unlock the error state (PS Incapable) when the error no longer is present.
This software update must be installed and tested by a Kongsberg Maritime representative.
The update will be performed on a first come first serve basis, and the cost of the software update will be covered under KM standard warranty conditions.

For further information please contact Kongsberg Maritime, Customer Support:

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|---|---|
| Tel: | + 47 815 35 355 |
| E-mail: | km.support.dp@kongsberg.com |

Yours faithfully,
Jørn Mastervik

General Manager,
Global Customer Support Offshore
KONGSBERG MARITIME AS

# Marine Safety Forum – Safety Flash 11-31

## Issued: 23rd August 2011

## Subject: Engine Room CO2 Isolating Valve

During routine inspection of a vessel's CO2 fire fighting system it was noticed that the engine room CO2 isolating valve remained in the closed position when the valve handle was manually operated. This was evident by the position of the valve spindle which remained in the closed position whilst the handle showed that the valve was open.


Spindle remained in the closed position whilst the handle was in the open

The isolating valve was removed, freed up and the handle was repaired and tightened. During this repair process the safety pins for the $CO^2$ bottles were put in place and removed once the repair was completed.

In the event of a fire and the need for $CO^2$ flooding, the isolating valve handle would have been forced to the open position, whilst the valve itself would have remained shut, thereby disabling $CO^2$ flooding.

All vessels must ensure that these $CO^2$ isolating valves open and that it is not just the handles turning on the valve spindles. All vessels are instructed to add a line of instruction to the TM job for checking that this valve is operating correctly when the inspection is done on the CO2 system.

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# Marine Safety Forum – Safety Flash 11-32

## Issued: 23rd August 2011

## Subject: FIRE IN ENGINE ROOM OF OFFSHORE SUPPORT VESSEL

An Offshore Support Vessel was being towed astern of a rig during a rig move transit operation when a fire was reported from the main engine room of the vessel. The engine room fire suppression system (Hi-Fog Water Mist) was automatically activated, emergency fuel shut-off valves closed to shut off fuel supply to the affected engine and vessel emergency response procedures initiated. The fire was effectively extinguished within 10 minutes by the vessel's Emergency Response Team (ERT) personnel using portable extinguishers. Following checks on the main engine(s) and safety equipment, vessel was able to continue operations safely with remaining 3 engines.
The source of the fire was subsequently identified as due to fuel oil leaking from the flange on a Fuel Injector Pump on main engine No.2. The fuel return line had come loose at the flange due to one of two securing bolts shearing and the other working loose. Fuel sprayed from the leaking flange and impinged upon the adjacent hot lagging of the main engine exhaust and turbo charger resulting in ignition and subsequent fire.

• Return Fuel line on the injector pump for main engine No.2 had come loose at the connection flange resulting in fuel spray to leak and impinge hot lagging on adjacent exhaust and turbocharger lagging. This subsequently resulted in ignition and fire
• The flange for the Fuel Injector Pump had only 2 securing bolts. One of which had sheared off and the other had worked loose which led to the fuel leak
• The Fuel Injector Pump was serviced every 15,000 running hours as per PMS. However no guidelines were available from the main engine manufacturer-MAK-on specific checks, torqueing requirements and replacement programme for the securing bolts

### LESSONS LEARNED

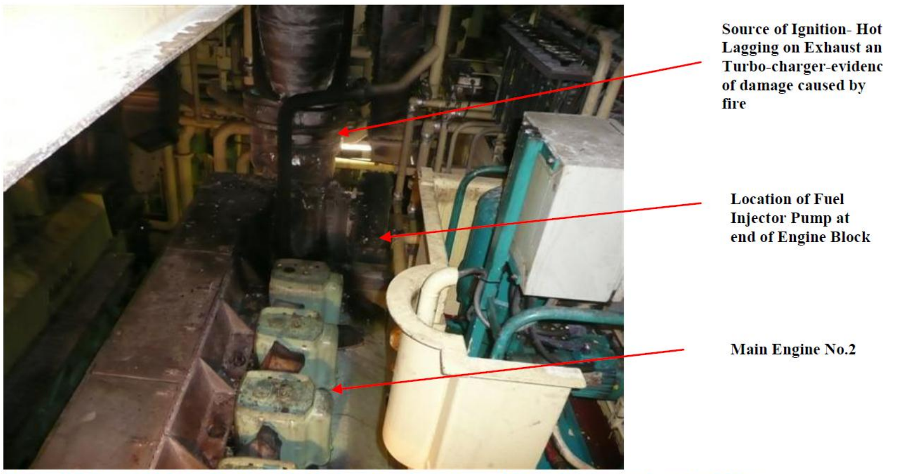
• Upon checking on other vessels in the fleet following the incident, vessel operator discovered loose flange securing bolts on similar main engine configuration and fuel lines with a potential for failure and loss of containment
• Current design of the flange securing bolts (2 bolts instead of 4) was not ideal in ensuring that the integrity of the flange connection was maintained
• For safety critical connections bolt torqueing guidelines should be communicated by the manufacturer and enforced / monitored as part of the periodic preventative maintenance system for the asset
• Importance of maintaining and testing emergency fire fighting systems and ERT training through regular emergency drills on board vessels

### RECOMMENDATIONS

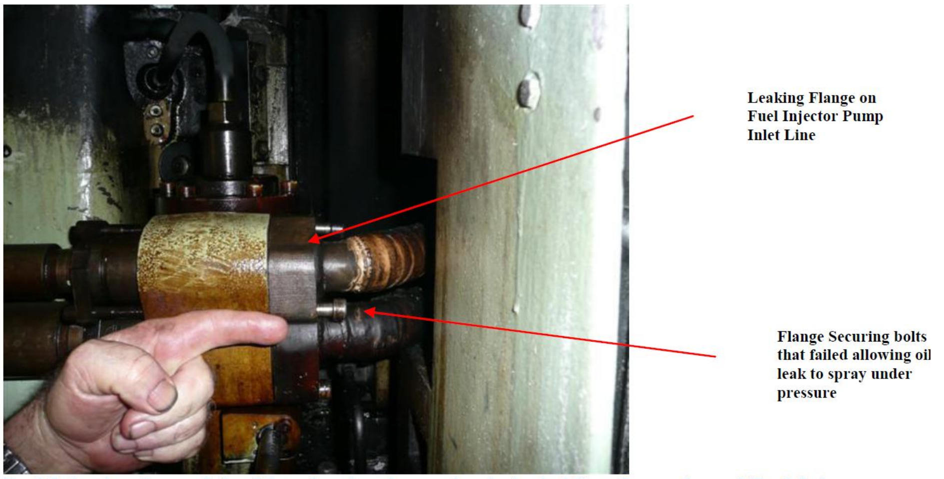
• Include 3 monthly checks on fuel line flange bolts into contractor's Planned Maintenance System (PMS). This to include physical checks on the torque and condition of the fuel flange bolts as per Original Equipment Manufacturer (OEM) guidelines.
• Request information from engine manufacturer (MAK) on bolt composition and torqueing requirements on securing bolts for the Fuel Injector Pump. Information to be disseminated to vessel operators and marine community via subsequent Information/Safety Flash

• Vessel operators to initiate checks on similar fittings on Fuel Injector Pumps and other high pressure pumps to check on condition and integrity of securing bolts. Checks and monitoring are especially critical after maintenance and reinstatement of high pressure lines to check for steady state operation

**Photographs:**




Overall View of Main Engine No.2 showing location of Fuel Pump and seat of Fire




Fuel Injection Pump Inlet Line showing 2 securing bolts holding flange face of Fuel Injector Pump


Close View of Securing Bolts that failed holding flange face of Fuel Injector Pump