

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](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 [webmaster@imca-int.com](mailto:webmaster@imca-int.com)

## I Failure of High Pressure Fitting

A member has reported an incident wherein a half inch HP fitting failed at 200 bar. Whilst no damage was sustained other than to the fitting and the whip check and no injury was sustained, the incident is believed to have had the potential for more serious consequences and was investigated as a high potential event.

A dive vessel had been heading for port after completing a phase of work. Both diving bells had been surfaced to allow access for maintenance work. The gas from the bells had been reclaimed into storage in the gas hold of the vessel. The dirty reclaim tubes were full after this exercise, so it was decided to clean this gas for use later as a dive mix.

The on-shift life support supervisor (LSS) entered the gas hold to set up the gas supplies for cleaning, which included putting the dirty gas tubes on-line to the cleaner at a supply pressure of 200 bar gauge. Having opened the supply to the cleaner, he was walking towards it when he heard a loud bang and a continuous rush of gas. On turning round, he could see that the supply hose from the dirty gas had blown off and gas was venting into the gas hold from the tubes. He closed off the dirty reclaim tubes and isolated the escaping gas.

On examination, it was noted that the Comex spin fitting that connected the gas whip to the supply manifold had blown off. The whip was undamaged. There was clear evidence of the track the female connection had made across the male connection as it parted. On examination of the fitting to ascertain the cause of the failure, it was noted that the gas whip fitting had blown off the supply connection.

Since there was no clear way of establishing if the other spin-fit fittings could be subjected to the same failure and since new fittings of the same type were not immediately available, the only safe course of action was to temporarily replace all the Comex spin-fit connections on the gas supply lines with JIC fittings. During the shift handover meetings immediately after the incident, all personnel were reminded to check that HP fittings and whip check cords were in good condition and correctly aligned.

It was concluded that the failure was likely caused by worn threads and daily use exerted on a 20-year old fitting that had been subjected to stretch as a normal part of daily use. It is believed the whip check cord failed due to the kinetic energy generated as the fitting blew, coupled with the fact that the whip check was not fully extended against the whip and had some slack in it. Corrosion may also have been a contributory cause of the failure.

The root causes were identified as being that:

- ◆ there had been no planned maintenance/inspection routine for checking wear on the Comex spin-fit fittings;
- ◆ there had been uncertainty regarding how best to position whip check cords on the gas manifolds and how they should be rated to ensure they could cope with the energy that may be exerted upon them.

The following conclusions were drawn by the company involved:

- ◆ Wear on the male/female thread of the Comex spin-fitting had been allowed to occur over a protracted period unchecked by any formal planned maintenance or inspection routines;
- ◆ Suitable replacement spin-fit fittings have been sourced and fitted on the gas manifolds in the gas hold and in saturation control. Planned maintenance instructions covering the inspection of the HP whips were revised to include inspection and testing of spin-fit connectors;
- ◆ It proposes that high pressure fittings which are subject to wear be changed out every five years;

- ◆ Increased awareness is required on how to fit whip checks correctly and more information is required on what size whip check to use on what application, i.e. diameter of hose and pressure within the hose both affect the amount of stored energy that could be released.

## 2 Lifting Fatality

A member has reported a fatality during crane operations. The accident occurred alongside in port during the hours of darkness. A vessel was engaged in lifting operations involving the use of a mobile crane (positioned on the quayside) to remove a deck mounted generator and to load a replacement. The experienced lifting crew had been trained in crane operations and had worked together before.

The generator was located on the port side of the aft deck of the vessel. Nevertheless, because of the presence of potentially fragile bulwark-mounted survey equipment on the port side of the vessel, she came alongside starboard side-to. This meant that the crane operator had to extend the crane boom to 18m to complete the lift.

The deck mounted generator was successfully lifted off the vessel and placed on the quay. The replacement generator was then connected to the crane and the second lift commenced. The two generator housings, whilst slightly different in dimensions, were considerably different in weight, but this was not detected. The first generator weighed 3.6T, whereas the replacement unit weighed 4.9T. The safe working load of the crane at 18m boom extension was between 2.35T and 2.85T. Both lifts exceeded the safe working load of the crane.

Whilst attempting to position the replacement generator, the crane was required to 'jib-out'. As a result of the combined boom extension and excessive load, the mobile crane's outriggers lifted off the quayside. This compromised the stability of the crane, causing the load to move unexpectedly downwards and across the deck simultaneously at considerable speed. The two tagline operators were unable to control this sudden movement. One crane worker was unable to get clear in time and was struck by the load, suffering severe crush injuries to his right leg and torso. He was transferred immediately to hospital but was pronounced dead on arrival.

The company conducted an investigation into the accident, which reported the following causes:

- ◆ Failure to adhere to specific areas of the safety management system, in particular:
  - vessel mobilisation procedure
  - management of change procedure
  - risk assessment
  - supply chain management
- ◆ The mobile crane had been working with a load over and above its safe working limits.
- ◆ Company safety rules had not been followed
- ◆ There was also:
  - no lift plan
  - no documented toolbox talk
  - no identification/verification of the load weight
  - a lack of basic safety awareness

The company noted the following lessons learnt and recommendations, some of which have wider application:

- ◆ Safety management system procedures should be followed at all times.
- ◆ Efficient and effective supply chain management is particularly important for safety-critical suppliers
- ◆ Ensure lifting procedures are up to date and followed, including
  - lifting risk assessment
  - lift plans
  - lifting toolbox talks
  - lifting checklists
  - management of change procedures
- ◆ Re-assess roles and responsibilities of supervisory staff at mobilizations and during lifting operations
- ◆ Identify through audit specialist lifting companies and establish an 'approved vendors list' for safety-critical suppliers.



Photo 1: Accident Scene Pan 1 :



Photo 2: Accident Scene Pan 2 :



Photo 3: Accident Scene Pan 3 :

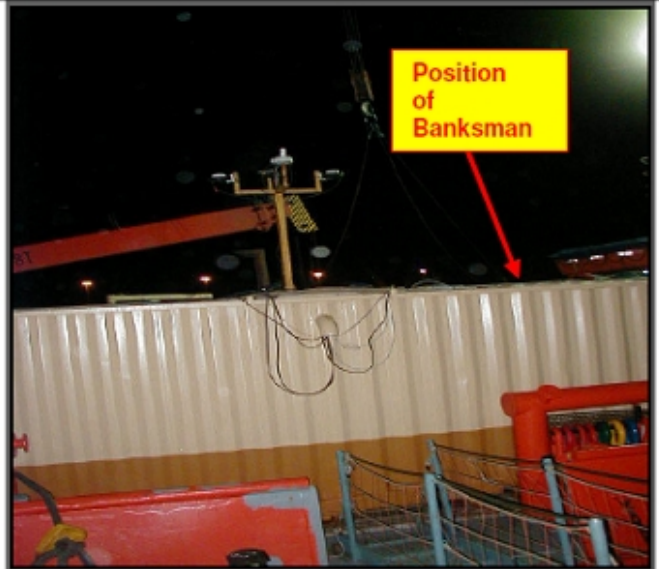


Photo 4: Crane Drivers View :