IMCA Safety Flash 06/11

July 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 Person Fell after Safety Lanyard Failed

Information has been passed to IMCA regarding the possible failure of a certain kind of safety lanyard owing to manufacturing defects.

The working at height equipment manufacturer, Petzl, reported that a climber fell to the ground while recreational climbing in France. According to the latest information available, the accident appears to have been the result of a manufacturing defect of the Petzl SCORPIO lanyard. The defect consisted of a missing safety stitch (bar tack) on the attachment loop.

Equipment of this sort is used by some IMCA members. All members are encouraged to pass this information to the appropriate personnel and instigate appropriate checks of any similar equipment.

Further information is available from:

www.petzl.com/en/security-alert-0/2011/05/19/request-immediate-self-inspection-all-absorbica-energy-absorbers

An inspection procedure has been developed by the manufacturer and can be found from:

www.petzl.com/files/fckfiles/image/news/sport/produits/scorpio/ABSORBICA-VERIFICATION-PROCESS-EN.pdf

2 Confined Space – Multiple Fatalities

IMCA has received information about a confined space incident in there were multiple fatalities. The incident occurred at an oil well on land. A workman entered a water tank that contained water mixed with nitrogen, and collapsed. A co-worker entered after him in an attempt to rescue him, and likewise collapsed. He was followed by two further workers who also collapsed.

Water tank where incident occurred

The supervisor realised that four workers were inside the tank, gave orders to drain the tank and then asked two further personnel to enter the tank for rescue purposes using safety lines.

Three of the rescued personnel were found unconscious and one semi-conscious. All four were evacuated to a nearby clinic for first aid and then to hospital for further treatment. The three men found unconscious did not recover and were declared dead by a local doctor.

Investigation revealed the following:

- Procedures were not followed
  - There was no permit to work for confined space entry arranged in this case;
  - There were no multi-gas tests conducted (LEL, O_2, CO_2 and H_2S) before confined space entry.
  - Personnel did not wear appropriate personal protective equipment (PPE) for task;
  - The rescue attempt was not properly planned or thought through.

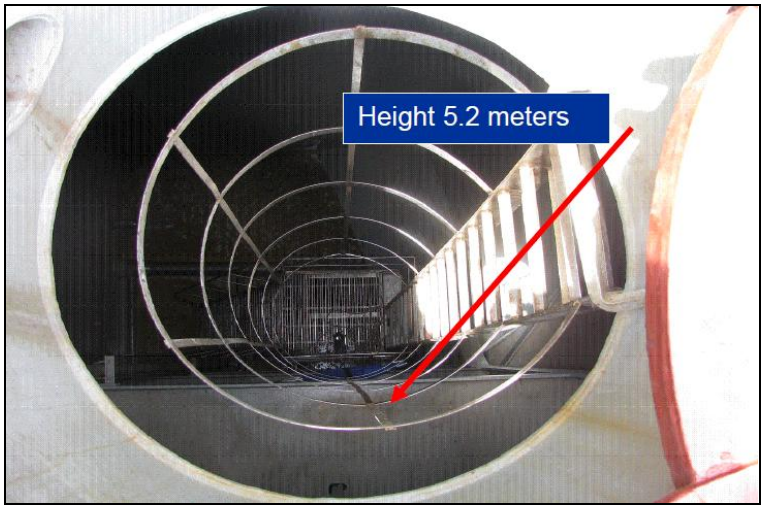
Members are reminded that IMCA has dealt with both confined spaces and permits to work in the following pocket safety cards;

- IMCA SPC 09 – *Confined spaces can be deadly*;
- IMCA SPC 18 – *Permit to work*.

3 Confined Space – Multiple Fatality

An incident has been drawn to IMCA's attention in which one man died and two men had to be hospitalised following entry into a confined space. The incident occurred when the chief officer had decided to control the valves of the slop tanks on the following day, and required the bosun to open the access hatches in order to start ventilation of the slop tanks to prepare for 'gas free'. Shortly afterwards, personnel heard a noise as if an object had fallen into the tank. The chief officer came to the starboard slop tank and saw the bosun lying unconscious on the middle platform, 5.2 meters below the main deck. The chief officer immediately entered the tank with the intention of helping him. Further crew members arrived at the slop tank and saw the chief officer trying to wake the bosun up. Assistance and a stretcher was called for, and one crewman remained and then entered into the tank in order to help the chief officer.

All three persons became unconscious in the tank. Shortly thereafter the second officer started preparations for entering safely into the starboard slop tank. A portable fan was fitted to the slop tank in order to accelerate the ventilation. In the meantime the atmosphere inside the tank was measured by a portable gas analyser. The device went off to indicate the existence of the H_2S in the tank. The read values were O_2: 20, CO: 0, H_2S: 60 and LEL: 0. Then the second officer put on a BA set and entered the slop tank. Afterwards the crewman, the chief officer and the bosun were all lifted out of the tank. The crewman and the chief officer were hospitalised and made a full recovery. Unfortunately the bosun could not be resuscitated and died.



Entrance to slop tank in which incident occurred

Following investigation, the following points were noted:

- The bosun had fallen into the slop tank for unknown reasons;
- The chief officer entered into the tank impulsively ignoring the safety rules completely and acting emotionally to help his colleague;
- The crewman also reacted emotionally rather than logically and entered the tank to assist the chief officer to rescue the bosun;
- The recovery operation, including identified the danger caused by the accumulated gas in the tank, the rescue of the victims from the tank, the application of the first aid treatment and the helicopter medevac was carried out successfully and professionally in accordance with company procedures;
- There was inadequate understanding of how this lethal concentration of H_2S had been produced in the slop tanks.

4 Failed Chain Link – Catastrophic Failures in Mooring System

The Bureau of Ocean Energy Management Regulations & Enforcement (BOEMRE) has published Safety Alert No. 296 (attached) regarding the catastrophic failure of a chain link in a mooring system, which could have put a floating structure at risk.

In the incident, a single point mooring system failed at the tether chain for a free-standing hybrid riser, allowing the buoyancy air can and the free-standing flow line riser to separate. The 440-ton buoyancy air can rose suddenly to the surface while the free standing riser collapsed.

Further information can be found at www.gomr.boemre.gov/homepg/offshore/safety/safealt/SA_296.pdf

Safety Alert

BOEMRE U.S. Department of the Interior
Bureau of Ocean Energy Management,
Regulation and Enforcement
Gulf of Mexico OCS Region

Safety Alert No. 296
12 May 2011

Contact: Russell Hoshman
(504) 736-2627

Catastrophic Failures in Mooring Systems Possibly Put Floating Structures at Risk

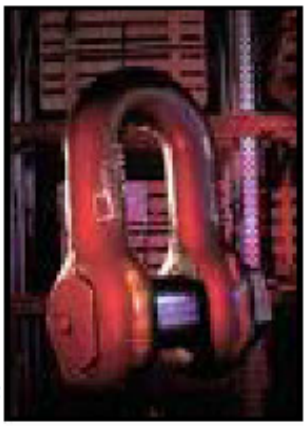
In early 2011, a single point mooring system for a deepwater Gulf of Mexico (GOM) project failed at the tether chain for a free-standing hybrid riser, allowing the buoyancy air can and the free-standing flowline riser to separate. The 440-ton buoyancy air can rose suddenly to the surface while the free standing riser collapsed. Based on the investigation of this event and a review of historical events, BOEMRE is revising and re-issuing Safety Alert #259.

Failed Chain Link

The investigation determined that a 6 ¾-inch diameter, 862-pound chain link in the tether chain had fractured and separated near its butt weld. Analysis of the fracture indicated that the chain link had a weld repair and the fracture initiated in the middle of the weld. Three links of the 24-link tether chain were found to have weld repairs. After the chain had been heat treated, the non-US based manufacturer had made weld repairs to the chain by grinding defects and filling the void with weld material. The chain was being built in accordance with Det Norske Veritas (DNV) Offshore Mooring Chain standard. Post heat treat weld repairs are disallowed per DNV's Offshore Mooring Chain standard. The post heat treat weld repairs made the chain susceptible to hydrogen induced stress cracking due to the extreme hardness

of the weld material and the residual stress within the weld.

As indicated in Safety Alert #259, issued January 16, 2008, catastrophic failure occurred in a portion of an anchoring system in two other separate incidents. One component failed on a system in the GOM. The other was found during installation to be defective after a similar component failed overseas.



Example: Mooring Shackle

Incident No. 1: A one-ton, 8+ inch-diameter shackle connecting a mooring system to anchoring pilings failed on an overseas floating production facility. Subsequently, an identical shackle scheduled to be used in a deepwater GOM production facility also failed catastrophically under test loads below specifications. Operator reviews of the manufacturing and testing procedure and additional material testing indicated that all of the shackles were possibly defective.

Because anchor pilings with shackles attached had already been driven, the GOM test failure required new shackles to be manufactured, new pilings installed and the replacement of portions of the mooring systems that could not be recovered. Production start-up of the facility has been delayed by at least one year.

Incident No. 2: Two sockets in a mooring system for a MODU failed under moderate loading. Testing of the remaining sockets found that others were also defective and a number of them failed catastrophically at less than specification loading.

Failed Mooring Socket

The BOEMRE and the USCG 8th District concluded the following:

- In both cases the manufacturing procedures are thought to have been defective. Heat treating after casting apparently resulted in a metal unable to meet "Charpy" standards for material "toughness."
- In both cases, the Operator's and/or manufacturer's specifications for the items were either out of date or inadequate.
- In both cases the Operator's material testing requirements were either not followed, or were not adequate to insure specifications were met.
- Material handling during installation may have exposed the equipment to potential critical damage.

The BOEMRE recommends the following:

- **Operators** should review their specifications requirements to insure testing and manufacturing produces a product that will meet the usage demands.
- **Operators** should include sufficient *Charpy testing requirements* in the specifications to insure the materials and manufacturing process will produce a product of sufficient toughness.
- **Operators** should review their requirements for both destructive and non-destructive testing of critical elements. Operators should insure their test coupons are properly representative.
- **Operators** should review their requirements for equipment inspection and handling to insure no damaging techniques are employed in transportation or installation.

Subsequent to the 2011 incident, the following recommendations are added:

- **Operators** should monitor and inspect critical mooring components 100% of the time during the manufacturing process.
- **Operators** should ensure that the personnel and companies contracted to perform inspections and quality assurance of critical mooring components are qualified to do so.
- **Operators** should treat the area above a buoyancy air can for a free-standing hybrid riser as potentially hazardous. No floating production facility or support vessel should be allowed to pass over a free-standing hybrid riser.

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www.gomr.boemre.gov

A **Safety Alert** is a tool used by BOEMRE to inform the offshore oil and gas industry of the circumstances surrounding an accident or a near miss. It also contains recommendations that should help prevent the recurrence of such an incident on the Outer Continental Shelf.