IMCA Safety Flash 01/00

January 2000

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 Diving Helmet Locking Collars

One of our members has brought to our attention that certain Kirby Morgan diving helmets, type KMB 601, neck dam locking collars have been subjected to pitting during oxy-arc cutting due to electrolysis. These particular locking collars were all made of cadmium-plated aluminium alloy.

On investigating this matter with the supplier and manufacturer, the contractor has been advised that only a small quantity of cadmium-plated aluminium alloy locking collars were manufactured. The supplier has not been able to quantify the number of such collars sold, nor identify to whom they were sold.

Because of the electrolysis action, the manufacturer has now reverted to traditional brass or stainless steel locking collars.

It is not thought that the aluminium alloy locking collars will represent a safety hazard if regularly inspected before use. However, as deterioration has been observed, the contractor involved has decided that it would be prudent to replace all their aluminium alloy locking collars.

2 Metrex M3610 Multimeter Incident

We have recently learned of an incident using a multimeter whilst a technician was investigating the 440 volt supply to an ROV. When he placed the instrument test lead across the 440v terminals, the instrument immediately short-circuited, causing him burns and eye-flash.

The 440v supply to the ROV shut down and interrupted the electrical supply to the drilling operation, since the main fuse blew in the control room.

The technician was testing for a 440v supply on the control circuit of the supply alternator for the ROV. The instrument arced between the terminal inputs of the meter. The probes of the instrument were placed approximately 4cm apart when the instrument flashed over. There was no damage to the probes and the instrument was set on the correct scale.

On investigation it was found that the instrument had been contaminated internally with seawater and an oily substance.

3 Thruster Feedback Incident

A drive-off position loss was experienced by one of our members' vessels whilst it was operating in Class 2 alongside a platform. Upon investigation, the cause of the incident was found to be a mechanical failure in the azimuth feedback unit of one of the thrusters. More specifically, a gear wheel driving the feedback potentiometers was found to be severely worn.

The effect of the failure was that, from the information available to the DPO, the affected thruster was functioning correctly, whilst it was actually delivering thrust in a completely false direction. This was sufficient to cause position instability and made it very difficult to determine the correct course of action.

A complicating factor was the fact that the alarm for mismatch between thruster set point and feedback, which had recently been tested and adjusted, did not activate since throughout the incident the thruster appeared to follow the set points.

Fortunately this particular incident did not result in any damage or injury. The company involved has advised vessels using azimuthing thrusters that have a single mechanical drive for the azimuth feedback potentiometer to assess the situation on the vessel and to take preventative measures.

This information was notified to IMCA by Global Maritime BV. Should you require additional information please do not hesitate to contact Jan Frumau of Global Maritime (Tel: +31 (0) 10 2806900 / e-mail: jcf@globalmaritime.nl).

4 Lifeboat Winch Failure

A report of the UK's Marine Accident Investigation Branch (MAIB) into the failure of a lifeboat winch on a cruise ship has concluded that the winch failed because the lubricating oil used for the freewheel sprag couplings was too viscous and did not match the type of oil specified by the manufacturer.

The incident occurred during a routine lifeboat drill. As one of the ship's lifeboats was being recovered after the exercise, it lowered uncontrollably into the water, still attached to the fall wires. The ship's electrical engineer sustained injury when, as a result of the incident, the winch hand crank handle, that had been left attached to the winch drive, hit him on the head when the winch started.

On investigation, the MAIB discovered that the inside surface of the outer face of the freewheel clutch had severe wear and scuffing with signs of overheating. The freewheel coupling and oil had been changed on the winch about four months before the incident.

The manufacturer reported that the davit winch failed because the oil used was too viscous, preventing the coupling locking mechanism from operating. Slipping of the coupling caused the oil to overheat. Lubricating properties would then be lost, causing a damage to running surfaces.

5 Microwaving Water

This domestic incident has recently been reported to us and may be of interest to all who use a microwave. The person involved in the incident decided to have a cup of instant coffee. To do this, he took a cup of water and put it in the microwave to heat up – something he had done numerous times before. We do not know how long he had set the timer for, but we understand that he said afterwards that he had wanted to bring the water to boil. When the timer shut the oven off, he removed the cup. As he looked into the cup, he noted that the water was not boiling, but instantly the water in the cup 'blew up' into his face. The cup remained intact until he threw it out of his hand, but all of the water had gone up into his face due to the build-up in energy. His whole face was blistered and he had first and second degree burns to his face which may leave scars. He may also loose partial sight in his left eye.

The doctor who attended him in hospital stated that this is a fairly common occurrence and that water alone should never be heated in a microwave oven. If water is to be heated in this manner, something should be placed in the cup to diffuse the energy, such as a wooden stirring stick/spoon, teabag, etc. It is, however, a much safer choice to boil the water in a kettle.

Subsequently a safety officer reviewed a set of microwave operating instructions where under the heading 'liquids' it states:

"Liquids that have been heated by microwave can erupt suddenly. This is due to layers heated to higher levels being trapped under the surface. To avoid this happening to any liquid, e.g. coffee, custard, gravy, etc.:

1. Stir the liquid thoroughly before heating in the microwave;

2. Stir the liquid at least twice during the heating time;

3. Stir the liquid again at the end.

Never overheat liquids. Always use a suitable sized contained at least one third larger than the volume of liquid being heated."

6 Swivel Ring Flange Failures

We have recently received the following information from one of our members.

All diving personnel should exercise extreme caution when tightening a leaking swivel ring flange. Application of additional bolt load to certain lightweight swivel ring flanges can cause leakage to worsen. In extreme cases, these flanges have failed catastrophically, causing a hazard to personnel and the environment.

There have been several recent failures of lightweight swivel ring flanges. In these cases the rotating ring and/or the hub portions of these flanges did not comply with the appropriate strength requirements. The failures occurred either during the bolt tightening sequence or at a later date, when additional external loads (thermal or mechanical) were applied to the pipeline.

The contractor has issued the following advice to its divers. A swivel ring flange is unlikely to comply with appropriate standard specifications if the thickness of the rotating ring is identical to that of a standard weld neck flange. In general, the rotating ring should be about twice the thickness of the mating weld neck flange to provide sufficient strength.

7 Commissioning and Verification of Newly Installed Modified Diving System Equipment

One of our members has recently experienced a very serious near-miss when the recovery of a diving bell was started accidentally and unintentionally prior to the bell door being closed and secured.

On investigating the near-miss, it was found that a modification to the bell winch hydraulic and electrical systems had taken place on this newly-installed diving system and that vital parts of both the primary and emergency systems, including the emergency stops, were not functioning correctly.

Although the dive system had been installed and verified in accordance with the principles and checklist contained in IMCA guidance note AODC 052 - DESIGN. – no test protocol had been developed or used in this instance during the final acceptance test of the modified winch hydraulics and control system. The acceptance test could thus not be verified or documented.

To avoid a similar situation occurring in future, the following instructions have been issued by the contractor and applies to installation, commissioning and testing of newly installed or modified diving system equipment:

- Equipment which is to be installed or has been modified thereafter should meet the principles of DESIGN and/or any other applicable industry standards, codes of practice, etc.;
- Responsibility for the installation or modification and testing of the equipment should be clearly defined;
- Any changes to the dive system configuration should be assessed for the implications of the changes before any work is carried out;
- A test protocol for the testing and verification of the system - and its individual sub-systems - should be developed and should include 'as-built' drawings/schematics of all vital sub-systems. Relevant equipment operating procedures should also be developed;
- The test protocol and associated 'as-built' drawing/schematics should be used as a tool during final acceptance test and hand over to the operations team. The test should be conducted by a competent person and witnessed by an appropriate supervisor. Both parties should normally sign the test protocol and any unexpected findings recorded. The test protocol should, once signed, form part of the system documentation and be kept in the dive system certification file