

IMCA Safety Flash 10/07

December 2007

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

I Small Fire Caused by Portable Fan Heater

A member has reported an incident in which a small fan heater caused a fire in a cabin. A crew member, on retiring to his bunk, switched on a portable electric fan heater to warm up the inside of his cabin. It appears that he then went to sleep with the heater still switched on. The crew member awoke to find smoke in the cabin and the smell of burning, and small flames were observed coming from the heater. The heater was immediately unplugged and placed in the cabin sink and the water turned on to extinguish the flames. At this point the vessel fire alarm sounded.



Damaged fan heater following fire

The company notes the following:

The Code of Safe Working Practices for Merchant Seamen Chapter 9.3.10 states that “*Personal portable space heating appliances of any sort should not be used at sea and notices to this effect should be displayed.*”

This was a high potential incident which could have resulted in a major fire within the accommodation of the vessel.

The company has made the following suggestions:

- ◆ Vessel masters should ensure that no ‘personal portable space heating appliances’ are currently in use onboard their vessel;
- ◆ Any such appliances that are discovered should be removed;
- ◆ Only approved and fully integrated means of supplying heat to cabin areas should be used.

2 Bell Contamination

A member has reported that during a recent diving project, a subsea fitting failure caused divers to become contaminated with a hazardous substance released from a hose under pressure. Diver 1 subsequently returned to the bell and entered the bell and was allowed to enter without taking the necessary precautions to ensure that he was free from contamination. On removal of his diving helmet, he reported to the bellman that he felt faint. The diver was put on to the built-in breathing system (BIBS) and the bell was flushed through. Decontamination measures were then taken and diver 2 was subsequently recovered to the bell. During this incident a Hyper-Gas II analyser situated in the bell did not alarm and the bellman said he was unaffected.

A review of the incident was carried out by the member company, noting the following points:

- ◆ The analyser in use was an infra-red analyser that looks at the specific band of light related to crude oil and condensate and cannot necessarily be relied upon when vapour from only one or two specific hydrocarbons are present, as these may fall outside the band of infra red light being analysed;
- ◆ Where the analyser is to be used in an environment where vapour from other hydrocarbons could be present, it may be advisable to reset the analyser specifically to respond to these hydrocarbons;
- ◆ While the Hyper-Gas II analyser is capable of seeing specific fractions of hydrocarbons as part of crude or condensate mix, such fractions need to be at a relatively high concentration before the unit will alarm, e.g. 10% of the anaesthetic requirement. Concentrations of other chemical substances may also be at levels well above the occupational exposure standard (OES) and be well on the way to a level that will incapacitate the bell occupants, with potentially fatal consequences, before an alarm is given;
- ◆ The levels of individual hydrocarbons which cause anaesthesia are several orders of magnitude higher than the allowed occupational exposure standard for each compound. This being so the Hyper-Gas II cannot be, and has never been presented as, a first line warning of hydrocarbon contamination in the bell;
- ◆ Human sensory awareness can, in some circumstances, detect (but not quantify) substances before electronic devices. However, this must never be relied upon as a means of detection;
- ◆ Although the bell is small, contamination may occur in one area of the bell but not in others. This will depend on gas flows within the bell, composition/molecular weight of the contaminant chemicals and also how the contaminant is introduced into the bell, e.g. by the umbilical, contaminated clothing or gaseous ingress into the bell trunk. In two- and three-man bells mixing would naturally occur due to the restricted volume.

Members are reminded of the following:

- ◆ Analysers can usually only warn of an event once it is occurring and they should not be relied upon as the primary warning of bell contamination. Prevention of contamination and the use of enhanced diving techniques should be the primary defence against bell contamination;
- ◆ Where contamination is possible, enhanced diving procedures should be used. These include: correct bell positioning, the use of BIBS by the bellman prior to diver recovery and prior to assisting the diver when contamination is suspected, decontamination of umbilical, removal of protective coveralls and thorough diver decontamination prior to bell entry, testing of the bell atmosphere using the appropriate Draeger tubes to confirm bell conditions;
- ◆ At the planning stage of an operation, the project engineer should ensure any chemicals/hazardous substance used during the operation, or contained within the system to be worked on, are identified and a material safety data sheet (MSDS) is obtained;
- ◆ The MSDS for each substance should be presented to the project safety adviser, who will arrange for a safety assessment to be completed, including a diving assessment;
- ◆ A review of the chemical/hazardous substance will consider the need for any additional specific Draeger tubes to identify contamination/quantify bell atmospheric conditions.

A video showing the effects of an anaesthetic chemical within a contaminated bell is available from Analox.

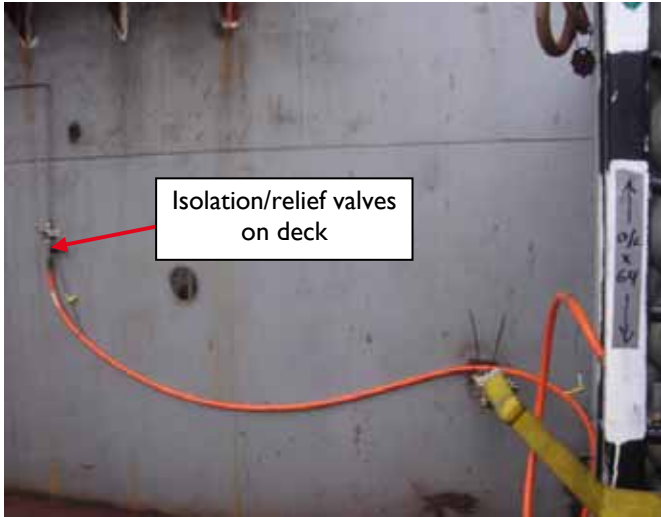
3 Failure of a High Pressure Gas Charging Hose

A member has reported the failure of a high pressure (HP) gas charging hose during routine gas decanting to top up the gas banks of a mobile surface supplied diving system which had been installed into a small craft used for remote diving operations.

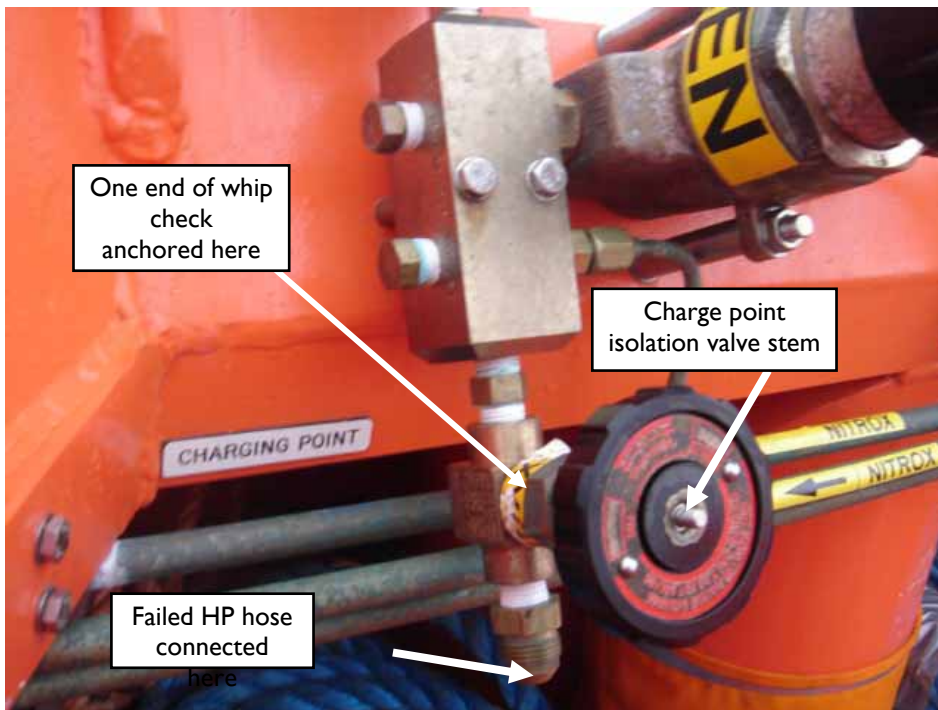
During the gas bank decanting, an HP gas charging hose ruptured and its recoil force caused shear failure of an isolation valve fitting which was serving as an anchor for the HP hose whip check.

The resulting failure of the valve fitting connection caused a restrained flailing of the hose and valve fitting which became entangled on the structure of the small craft.

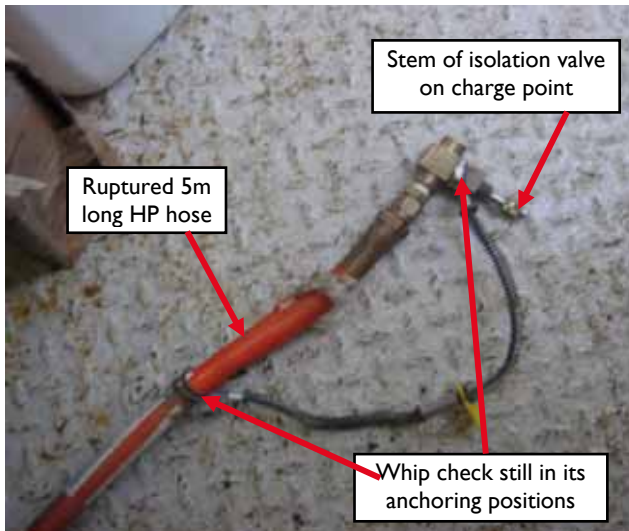
All gas banks were immediately isolated, which prevented any personnel injury or further equipment damage.



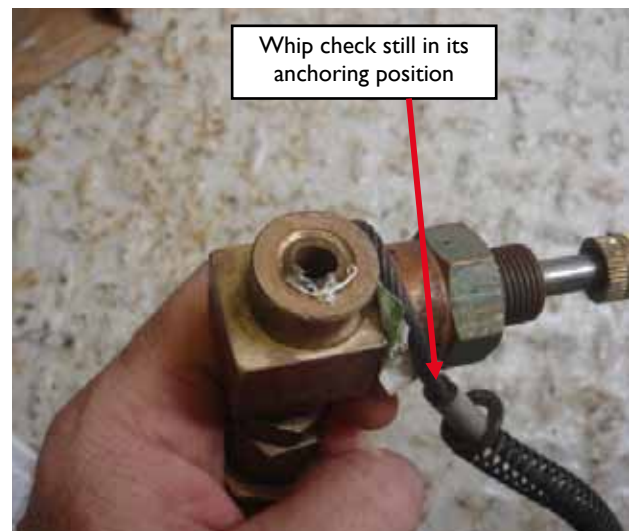
HP charging hose from supply quad used for decanting



Charging point assembly in small craft



Ruptured hose with sheared fitting/valve attached



1/4" NPT Nipple snapped off from diver charging manifold

After investigation by the company involved, the following points were highlighted:

- ◆ The whip check was anchored on a pressurised valve;
- ◆ There was a failure to recognise the force of recoil and effect on the whip check anchor point;
- ◆ The safe positioning of personnel performing the operation was inadequate.

Members are urged to consider the following:

- ◆ A review of whip check anchoring methods on all HP hoses;
- ◆ An inspection of all hoses for any indication of defect;
- ◆ The use of dedicated anchor connection points for whip checks;
- ◆ An alternative design of whip check that ensures the whip is held at the very end of its length i.e. Chinese finger style;
- ◆ A review of the service life for high pressure flexible hoses looking at the original date of whip manufacture and how many pressurisation cycles the whip has had.

4 Divex HSE Alert HSE003-2007 – ‘Helinaut’ Sacrificial Hose Whips

Divex has asked IMCA to circulate the attached Divex HSE Alert.

5 Divex HSE Alert HSE001-2007 – Valve Seat Retainer

Divex has asked IMCA to recirculate the attached Divex HSE Alert, first issued in IMCA Safety Flash 02/07, in order to ensure companies and their worksites around the world are aware of this issue.

DIVEX HSE ALERT



HSE Alert No. HSE003-2007

“Helinaut” Sacrificial Hose whips

Part No: C1506B

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DATE	7 th December 2007	COUNTRY:		LOCATION:	
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Product safety notice 003/2007

Divex part # **C1506B** - "Helinaut" sacrificial reclaim whips

A potential problem has been identified with the **C1506B "Helinaut" reclaim hose sacrificial whips**, which are used between the Diver's reclaim/exhaust helmet connection and the divers excursion umbilical reclaim hose itself.

The problem which has been identified is:-

Some end fittings/hose barbs are not sufficiently crimped to ensure security!

We have had an incident reported where a Diver in the water had an end fitting coming out of the crimped hose thus losing reclaim.

Whilst not, we believe, life threatening as the Diver will merely lose reclaim and go on "open circuit", this is obviously unacceptable and Divex have put in place measures to address future production and ensure all stock is fully fit for purpose.

These hoses are now made using a Cortland Fibron hose (shiny black smooth hose- with the hose braid "almost visible through the outer jacket").

This hose has an OD of **21mm** which results in a finished crimp dia. of 21.3mm - **21.6mm**.

Older hoses were made from a **JDR hose** which had a hose dia. of 22mm - **23 mm** and resulted in a finished crimp size of **23.5mm - 23.7mm**.

We would advise ALL users of C1506B "Helinaut" sacrificial whips purchased since January 2006 to, as a matter of urgency:-

Check all your base stock and worksite inventory for integrity & security of both end fittings.

Users must for each hose end fitting - check the following:-

- Measure the crimp diameter and ensure they are within the tolerances above.
- The crimp itself is not free to turn.
- Pressure test the hose to 10 Bar and check for leaks
- Perform a pull test on each end by applying a load of 100N (10 kilo's)

Should you find any hoses which:-

- Are out with the crimp tolerance shown above
- Have end fittings or crimps which are or appear to be loose
- Leak.
- Give concern in any way

Divex will rework/replace any faulty hoses without charge.

The returned goods should be sent to your nearest Divex office, carriage charges paid.

For Europe based customers pls return to Divex Ltd. Aberdeen Office, stating the authorised RGA number which our sales/operations dept. shall give you.

Please contact Divex Aberdeen Sales dept. via:-

E-mail sales@divexglobal.com

Phone + 44 - 1224 - 746500

Fax +44 - 1224 - 740172

Please mention Divex Safety notice xx/2007 and the qty of hoses you are going to return & you will be given an RGA # for the authorised return.

Divex shall replace/re-work all returned hoses which are found to be faulty.

Divex have amended the work instructions to ensure the correct crimp diameters are now clearly stated & understood plus we have added a 10 kilo "pull test" in addition to 10 Bar leak testing which every hose is subject to.

In addition Divex have re-trained all our Production Staff in the updated process and **re-emphasised the criticality of production & quality control of "Life Support Equipment"**.

Any queries on this issue should be addressed to:-

James Massie - Product Engineer- jmassie@divexglobal.com

Malcolm Cattanach - Commercial Product & Projects Manager - mcattanach@divexglobal.com

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DIVEX HSE ALERT



HSE Alert No. HSE001-2007

Valve Seat Retainer

Part No: D1998

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DATE	21/02/07	COUNTRY:		LOCATION:	
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Divex has been advised of some problems which customers have experienced when using Ultraflow "balanced demand valve helmets" at the top end of the acceptable supply pressure range i.e 15-20 bar.

Symptoms reported include :-

- 1) technicians experiencing difficulty in setting up the regulators correctly,
- 2) the valve stem entering too far into the seat / seat retainer and sticking,
- 3) a reduction in flow from the regulator as the supply pressure was increased.

We have investigated the cause and have concluded that a batch of seat material which was at the bottom end of the acceptable hardness range is responsible for symptom 2.

It was found that a less than perfect glue joint was allowing supply gas behind the seat and causing the seat material to part company with the retainer adjacent to the bore. The seat then pushed the valve stem forward causing the roller lever to drop while maintaining a gas tight seal and is responsible for symptom 3.

Divex recommend that all valve seat retainers are tested as a matter of urgency as described below:-

- 1) Remove the regulator cover and diaphragm,
- 2) Connect a variable pressure breathing gas supply,
- 3) Adjust the supply pressure gradually from zero to 10 bar and note the amount of free play at the roller end of the roller lever.
- 4) Increase the supply pressure gradually to 20 bar and monitor the free play. An increase in the free play of up to 2mm indicates that the seat retainer is acceptable. If the increase is greater than 2mm then the seat retainer should be replaced with a new unit.

If, for operational reasons, it is not possible to conduct the above tests immediately then Divex recommends that the maximum supply pressure is limited to 12 bar until tests are completed.

