IMCA Safety Flash 08/05

July 2005

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 Jellyfish Incident

A member has reported an incident that occurred during surface diving operations offshore of Western Australia, whereby a diver was apparently stung by a Carukia barnesi jellyfish, which led the diver to develop Irukandji syndrome.

The incident was attributed to the following basic causes;

- the diver was stung and evenomated by Irukandji jellyfish;
- loose overalls had allowed jellyfish to enter at the back of the neck during surface swimming – the Irukandji jellyfish is typically between 1-2.5cm across the body and is therefore able to enter through small areas.

The company involved has recommended the following actions for the geographical area concerned:

- use of correct PPE for surface swimming, air diving and saturation diving;
- stinger suits to be worn under all coveralls whilst diving unless wearing a wetsuit;
- diving hoods to be used at all times whilst surface swimming.

For those members who are not familiar with the syndrome, the following provides a brief description:

The Irukandji syndrome is a group of delayed (between 10 and 40 minutes) severe systemic symptoms occurring after an initial mild skin sting by small carybdeid (box) jellyfish including Carukia barnesi, known colloquially as the 'Irukandji'. The syndrome is well known in tropical Australian waters. About 5-45 (usually 30) minutes after being stung, the person starts to develop 'Irukandji syndrome' – a set of symptoms that often include severe lower back pain, muscle cramps, vomiting, restlessness and anxiety. In rare cases, the victim can suffer pulmonary oedema (fluid on the lungs), hypertension or toxic heart failure that could be fatal if not treated.

2 Caution Notice: Electric Gasmizer Gas Booster

IMCA has received the attached caution notice from Divex, which refers to modifications made to the "Electric Gasmizer" divers gas recovery systems.

3 Diving Bell Clamp Mating Screws

A member has reported the following issue discovered during a routine inspection prior to the commencement of saturation diving activities using a bottom-mating system.

The bell mating screws and clamp nuts were found to be badly worn – one set to such an extent that the nut could actually be slid along the screw without rotating the screw.

Both the screws and nuts were inspected and appeared, visually, to be in a reasonable condition, with both sets of threads looking acceptable.

With the weight of the clamp laying on the nuts and threads, the clamp appeared to operate as it should, giving a false sense of security.

The company involved has noted the need to strip down the clamping system, take the weight off the nuts and screws and undertake thorough checks of these components on a regular basis.

Divex Ltd.
Enterprise Drive
Westhill, Aberdeen
AB32 6TQ, United Kingdom

Telephone +44 (0)1224 740145
Facsimile +44 (0)1224 740172
e-mail info@divex.co.uk

DIVEX CAUTION NOTICE

Caution Notice No. DVX003/2005

Electric Gasmizer Gas Booster
Part No. B10510

Distribution list:

All Purchasers of Divex / Gas Services manufactured -"Electric Gasmizer" Divers Gas recovery systems utilising the Williams & James / Hamworthy K651 gas booster.

Background:

The Divex / Gas Services 651 "Electric Gasmizer" Gas Booster was designed specifically to meet the technical demands of a diver's breathing gas recovery system typically using heliox gas mixtures. It is fitted with a high flow Tescom bypass regulator Divex Part No GE040 – (Hamworthy part # 43120) to ensure the pump is constantly supplied with gas at the inlet side.

The booster, when running, pumps a constant volume per minute, and to satisfy the pump's requirement if there is no return flow from the divers, the bypass regulator will supply this volume from the high pressure (outlet side) of the booster. This ensures the booster inlet pressure does not drop towards a VACUUM.

The compressor piston/cross head assembly's (items 2A-2K of section 7-2 of the manual) and the pressure packing seals (contained within item 7) are designed to only work one way and if subjected to "vacuum / reverse pressure" may permit AIR to enter the cylinders. See attached drawing and parts listing from manual for information showing 2nd stage as example.

If this happens then this "air" will be pumped into the diver's gas mixture within the reclaim systems active volume / volume tank and will alter the breathing gas mixture! Additional unplanned amounts of Oxygen or Nitrogen being introduced to gas mixtures/systems have potentially significant effects. **

Problem:

It has been identified that a number of worksites have made unauthorised modifications to the by pass regulator circuit and Divex caution that these modifications have unacceptable consequences.

These worksites have modified the pipe work by installing a filter on the inlet side of the Booster Bypass regulator.

Divex believe the reason for this modification is an attempt to extend the life of the bypass regulator valve seat. (Divex Part# RK210)

If this filter becomes clogged/blocked the gas flow though the bypass regulator is reduced and as a result the booster inlet pressure can drop to a VACUUM if there is no return gas from diver's on line. The piston/cross head assembly's pressure packing seals are then possibly subjected to reverse

pressurisation thus permitting "air" to be sucked into the cylinders past these seals and this air is then pumped into the system! (see paragraph 4)**

As trained in the Electric Gasmizer technical training courses and as shall be highlighted in the next release of the Divex Electric Gasmizer Booster manual, the valve seat (Divex Part # RK210) requires to be inspected regularly, as a minimum every 1000 hours booster running time, and if showing any signs of damage must be replaced. This shall effectively deal with the expected wear caused by the graphite dust from the booster piston rings entering the regulator. This dust ingress is a known factor which Divex have considered and is covered **by recommending these regular valve seat inspection/ replacement intervals.**

Note : In the event of leakage past the valve seat the bypass regulator "is fail safe" by "leaking gas" from the high pressure side to the booster inlet and preventing any possibility of a suction developing. The pump itself has the capacity to cope with these initial leakages in addition to any reclaim gas returning to the surface from 2 working divers at depths of up to 450msw.

Recommended Actions:

i) **All work sites need to survey their installations and determine if such a modification has been made.**

ii) **If any booster is found to be fitted with an inline filter assembly on the bypass regulator inlet pipe work then it ought be removed immediately and replaced with the original pipe work and fittings.**

The original fittings may not be available on site, in which case an interim solution would be to remove the filter element from the installed filter assembly whilst the correct components are procured to complete a full reinstatement.

Divex shall be pleased to assist with any queries users may have with this notice and users should contact in the first instance:-

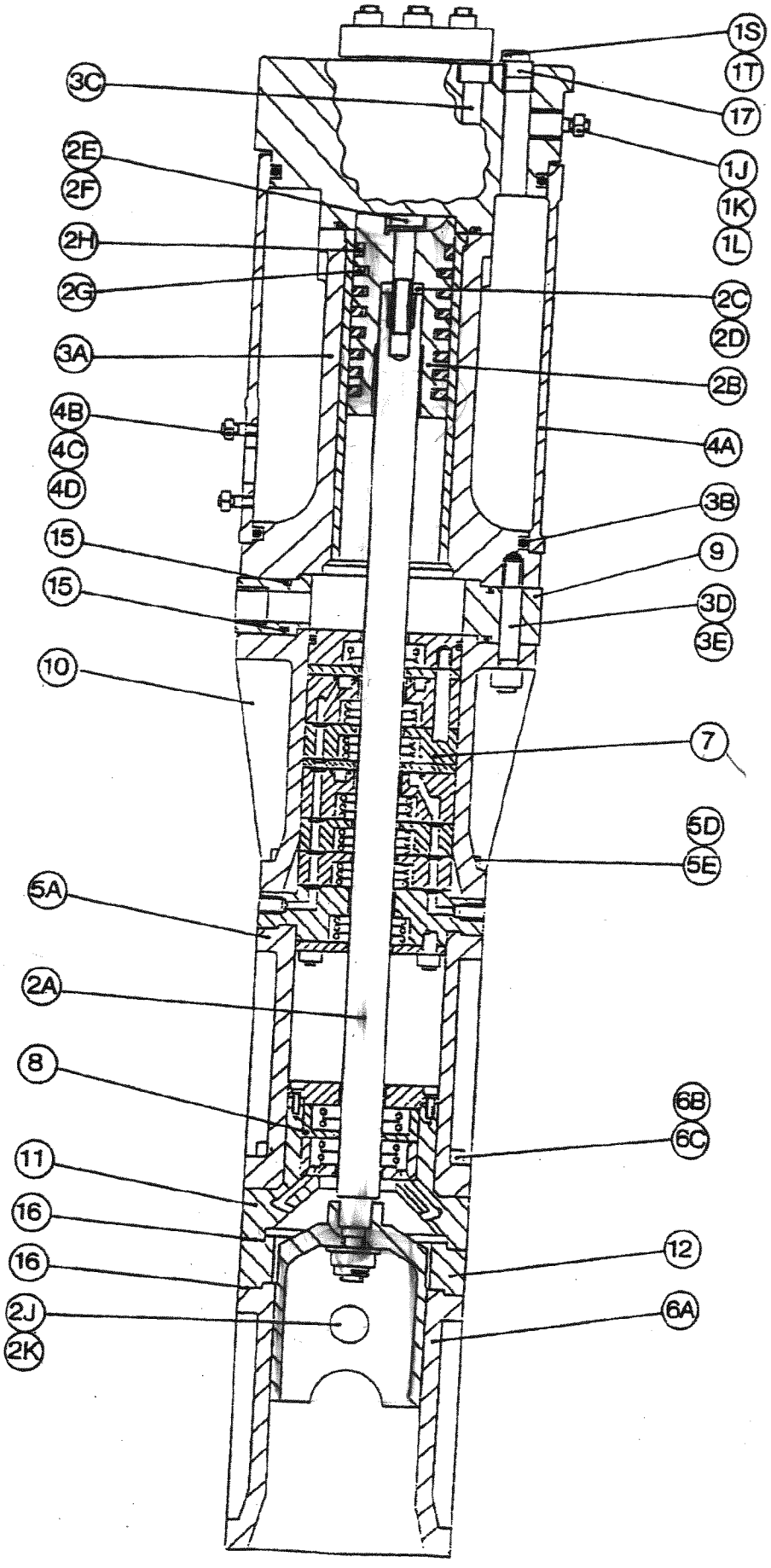
Signed:..... Date: 16 June 2005

Malcolm Cattanach
Commercial Projects & Products Manager

Divex Ltd.
Enterprise Drive,
Westhill Industrial Estate, Westhill,
Aberdeen, Scotland, UK. AB32 6TQ
Tel: +44 (0) 1224 740145
Fax: +44 (0) 1224 740172
E-Mail: mcattanach@divex.co.uk

Attachment: 3 pages extract from manual showing a typical 2nd stage cylinder assembly detail. The 1st stage cylinder assembly has same general configuration.

CYLINDER LINE 2 5/8" DIAMETER - GR612 71



CYLINDER LINE 2 5/8" DIAMETER - GR612 71

PART NO.	DESCRIPTION	QTY	REF
A60241	Cylinder Head Assy	1	
	Comprising Ref Nos 1A - 1R		
42849	Cylinder Head	1	1A
42850	Valve Cover - Suction	1	1B
42851	Valve Cover - Delivery	1	1C
9655/3	'O' Ring Seal	1	1D
9017/14/75S	'O' Ring Seal	1	1E
9017/62/90S	'O' Ring Seal	1	1F
SL12/50	Stud 1/2" UNC x 19/16"	4	1G
4919/59	Nut 1/2" UNC	4	1H
SL12/4	Stud 5/16" UNC x 3/4"	2	1J
4919/64	Nut 5/16" UNC	2	1K
2547/8	Washer 5/16"	2	1L
BU6024101	Valve Unit - Suction	1	1M
BU6024102	Valve Unit - Delivery	1	1N
SL12/51	Stud 3/8" UNC x 5/8"	2	1P
4919/57	Nut 3/8" UNC	2	1R
BL9/54	Bolt 1/2" UNC x 3/4"	1	1S
2547/11	Spring Washer	1	1T
U6123101	Piston Unit	1	
	Comprising Ref Nos 2A - 2K		
W42847	Piston Rod/Crosshead Assy	1	2A
42853	Piston	1	2B
42857	Shim	1	2C
*42857/A	Shim	As Reqd	2D
42863	Bolt 1/2" UNC x 2 3/4"	1	2E
42869	Tab Lock Washer	1	2F
42861	Piston Ring	7	2G
42862	Guide Ring	1	2H
42570	Gudgeon Pin	1	2J
9107/7	Circlip	2	2K
U6023101	Cylinder Unit	1	
	Comprising Ref Nos 3A - 3E		
W42844	Cylinder/Liner Assy	1	3A
9655/3	'O' Ring Seal	1	3B
9771/78	Cap Screw 1/2" UNC x 4 1/2"	4	3C
SL12/37	Stud 1/2" UNC x 2 3/4"	6	3D
4919/59	Nut 1/2" UNC	6	3E
U1613002	Water Jacket Unit	1	
	Comprising Ref Nos 4A - 4D		
13935	Water Jacket	1	4A
SL12/4	Stud 5/16" UNC x 3/4"	2	4B
2547/8	Washer 5/16"	2	4C
4919/46	Nut 5/16" UNC	2	4D

PART NO.	DESCRIPTION	QTY	REF
U6112101	Wiper Packing Chamber Unit Comprising Ref Nos 5A - 5E	1	
42877	Wiper Packing Chamber	1	5A
8532	Breather	1	5B
			5C
SL12/28	Stud 1/2" UNC x 2 3/8"	4	5D
4919/59	Nut 1/2" UNC	4	5E
U6011101	Crosshead Guide Unit Comprising Ref Nos 6A - 6C	1	
25004	Crosshead Guide	1	6A
SL12/39	Stud 1/2" UNC x 4 1/8"	4	6B
4919/59	Nut 1/2" UNC	4	6C
BU6122102	Pressure Packing Unit	1	7
BU6122101	Wiper Packing Unit	1	8
42854	Distance Plate - Cylinder	1	9
42876	Pressure Packing Chamber	1	10
42875	Wiper Packing Housing	1	11
42855	Distance Plate (Packings)	1	12
			13
MR0845-30V	'O' Ring Seal	1	14
MR1395-30N	'O' Ring Seal	2	15
8603/LEOTITE	Gasket	2	16
4617/4	Plug	1	17

*NOTE: Thickness of shim Ref No.2D to be sized to give 0.035"/0.040" clearance under head when cold.