IMCA Safety Flash 03/05

March 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 Finger Injury During Loading Operations

IMCA has received a report of an incident wherein a worker's finger was crushed. The injury occurred during an operation when a large heavy axle, weighing some 250kg, was being removed from a reel by two operatives employing a fork-lift truck. The axle moved in an unexpected way, catching one operative's hands between the axle and the fork-lift truck, as he attempted to steady the axle movement.

The operator was given first aid on-site and taken to the local doctor as soon as possible, where analysis revealed a broken finger and cut nerves. A further appointment the following morning with a more senior medical expert led to the operative being taken to hospital, where he underwent surgery, resulting in his keeping his damaged finger.

The company involved performed an analysis of the incident and noted the following:

- The work was conducted without the designated lifting gear and without a supporting forklift. The method utilised was to pull the axle out of the reel by usage of a rope and a forklift. At the end of the operation, it was anticipated by the operator that the axle, once out of the reel, would tilt slightly upwards. The opposite occurred, and, as the axle tilted downwards, the operator tried to prevent this movement using his hand. Unfortunately the little finger on his right hand was crushed as the moving axle met the forklift;
- The operatives were wearing all of the required personal protection equipment – the use of gloves was noted as having provided protection in this incident, to some extent at least;
- Job safety analysis and toolbox talks had been performed for the operation;
- Work of this sort had been taking place on a daily at the site for ten years without previous accident. It had, however, been recognised as a time consuming and risky (in terms of HSE) activity and an investment program had recently been applied for to change to a more efficient and safe system;
- No written procedures or work instructions exist on the specifics of the axle operations. 'Best practice' methodology for removing axles was not utilised. There was no written instruction or information which described best practice for this operation;
- The persons involved were both experienced operators, having served at the worksite for several years; they were familiar with the unwritten best practice. The best practice was not utilised due to their judgment that the chosen method was good enough, and was not imposing risks which could not be handled. The chosen method may also have seemed quicker at the time.

2 Injury While Grinding Without PPE

A worker was cutting an aluminium roof using a grinder when the wheel came apart, striking the worker in the face and causing serious injury between his upper lips and nose. A two week stay in the hospital was recommended by the doctor.

The company involved noted the following:

- an improper grinding wheel had been used;
- no safety guard was found on the grinder
- a face shield was not used;
- the worker had ignored both the company's safety instructions and the warning labels/instructions on the grinding tool.

The company has re-emphasised the importance of following correct and safe practices, using the right tool for the job and adhering to all warning labels/signs.

3 Gas Leak During Removal of Temperature Sensor from Thermo Well

During a recent diver inspection, repair and maintenance programme undertaken by one of our members, one of the identified tasks was the replacement of a defective temperature sensor mounted in a thermo well (a pressure retaining pocket) on a production tree. When the diver started to unscrew the sensor from the thermo well, gas started to escape from the threads. During the completion of the task it became apparent that the thermo well around the temperature sensor was no longer in place or was defective, the sensor was open to the tree internal pressure and the diver was unscrewing a collar behind which was a direct communication path into the tree production pipework.

Both the onshore project team and those at the offshore worksite had extensive experience of this type of operation and the hazard had been identified beforehand, with control measures identified and implemented to reduce the risk to a level that was as low as reasonably practicable.

The company involved has provided the following description of the task which was being carried out.

The replacement of a defective pressure or temperature sensor in a subsea tree or manifold is a very common diver maintenance task. Unlike a pressure sensor which, by design, must be in contact with the internal pressure being monitored, a temperature sensor does not necessarily need to be in the pipeline and is commonly mounted in a pressure-retaining thermo well.

The thermo well is best described as a tube sealed at the bottom and open at the top, welded or bolted to the pipe wall and extending through the wall into the bore of the line to be monitored. Because it is a sealed tube sitting in the bore of the line, the outside of the thermo well is subjected to line pressure but the inside remains at ambient pressure. The temperature sensor, which is screwed into the centre of the thermo well, can monitor the temperature of the line (by heat conduction) but is protected from the effects of the line pressure. It is common for the (threaded) connection between the temperature sensor and the thermo well to be a pressure retaining connection often rated far in excess of the tree internal pressure.

Unlike a pressure sensor which, prior to removal, will typically be isolated from the pipeline internal pressure by double block and bleed valves the integrity of which can be tested, the 'isolation' of the temperature sensor from the pipeline pressure is totally dependent on the integrity of the thermo well tubing.

In service the thermo well can be exposed to corrosive fluids, abrasive sand, vibration and turbulent fluid flow all of which can affect the integrity of the thermo well and allow direct pressure communication between the outside and the inside of the tubing.

Because of the pressure-retaining nature of the temperature sensor/thermo well connection it is possible there will be no visible external indication that the thermo well is defective until the temperature sensor/thermo well connection is broken by the diver, at this point the diver may be exposed to the full pressure in the line.

Conclusion

Modern thermo wells are generally very reliable and are appropriately designed, selected and specified for the environment in which they are used. It would, however, be incorrect to suggest that they cannot fail.

Thermo wells are primarily installed to protect the delicate temperature sensor probe from the pressure, flow and contents in the line rather than to allow the removal of the sensor with the pipeline under pressure. If the thermo well is not defective then the removal and replacement of the temperature sensor is not an intrusive task. Because the Temperature Sensor to thermo well connection is normally pressure retaining there may be no way of ensuring the integrity of the thermo well until the Temperature Sensor is unscrewed from it – releasing the contents of the pipeline into the environment.

However, it is good practice to assume that there may be a hazard caused by retained pressure when working on a thermo well.

The company has noted the following aspects to be considered when planning, risk assessing and carrying out the removal of a temperature sensor from a thermo well:

- Never assume that a thermo well is pressure-retaining – always approach the task in the knowledge that on more than one occasion divers have unscrewed a temperature sensor to find communication though into the pipeline;
- Find out the history of the worksite – How old is the field? Have there been any reported thermo well failures in the past? Is the product particularly corrosive, abrasive or turbulent? Have any temperature sensors previously been changed?

- Consider the design of the temperature sensor – How does it attach to the thermo well? Is it pressure-retaining or non pressure-retaining? Can the unit be released in a controlled manner?
- Identify the pressure and the contents of the pipeline. Check that the pressures and volumes of pipeline contents around the thermo well have been minimised as far as practical;
- Consider that the temperature sensor may be faulty because it has been exposed to the pressure, flow, abrasion or corrosiveness of the pipeline contents;
- The risk assessment should consider the hazard of 'uncontrolled release of retained pressure' in addition to the usually-addressed 'contact with live electricity' when considering the task of temperature sensor removal from a thermo well;
- Ensure that the dive plan and diver briefing highlight the possibility that there may be pressure behind the temperature sensor should the thermo well be defective;
- Ensure that the replacement temperature sensor is deployed and ready to be installed, thereby minimising the time that the thermo well is open;
- Ensure that the divers position themselves out of the 'line of fire' when slackening the temperature sensor;
- Ensure that the divers slacken the connection slightly and break the seal, to check for gas or fluid release before completely removing the temperature sensor;
- If practical use a 'whip check' or otherwise physically restrain the potential movement of the temperature sensor during the slackening of the connection.

4 Diver Injury from Implosion of a Fishing Buoy

There have been previous safety flashes relating to 'Grimsby'-type buoys, and members are asked to note this further incident. Guidance relating to ROV operations is available in IMCA R 001 – Plastic Spherical Air-Filled Fishing Buoys.

During operations in 150m of seawater to remove fishing nets from a wellhead, a diver suffered a serious hand and a wrist injury after a plastic 'Grimsby'-type fishing buoy imploded.

The operation required securing the net, wires and fishing buoys to ensure the safety of the divers in the water (from entanglement), of personnel on the deck (from the potential of explosion due to trapped pressure in the buoys) and of the vessel (from nets or buoyant objects striking or becoming entangled with the vessel). Of particular concern was the risk that fishing buoys may have been damaged whilst underwater and become partially or fully flooded at seabed ambient pressure and that when brought back to surface they might explode, causing injury to surface personnel.

These risks were recognised by the project and dive team onboard and as part of the control measures to protect the vessel and personnel the buoys were punctured subsea by the divers, using a hacksaw. This method had successfully been used on over 20 buoys on previous wells.

The divers were finding this activity physically tiring due to the buoyancy of the buoys and a change was suggested to the procedure for puncturing. The decision was taken by the dive team to change the methodology and place an initial cut on the buoy then to strike the buoy with a chisel to break the buoy. This was successfully tested on the surface.

However, when this activity was undertaken underwater a violent implosion occurred, injuring the divers. Both diver helmet diaphragms inverted and the divers were momentarily stunned by the implosion.

It has been recognised for many years that these fishing buoys pose a hazard to deck personnel and the vessel. What was not recognised is that in attempting to eliminate this hazard underwater, different hazards can be generated.

During the company's investigation it was established that there was a lack of appreciation amongst the dive team of the forces generated due to the pressure differential across the buoy, even with such a small volume. Also it had not been identified that the brittle nature of the buoy's shell material meant it was likely to shatter under any sharp point load.

The company has recommended that when handling such fishing buoys their buoyancy be neutralised using a remote device or that they be recovered to the surface intact, stored in a covered container and quarantined for destruction ashore. It notes the ever-present risk of these buoys experiencing a pressure differential that could cause implosion or explosion at a weak point or contact point and stresses that personnel should not be placed at risk through direct handling of them.

5 Floating Ignition Source Drifts Near to Production Platform

IMCA has received a report of a very serious threat to the safety of a gas production platform, caused by rafts containing bundles of lit cooking gas tank sets. These had been deployed by fishing boats to attract fish and drifted toward the gas production platforms. Such floating lights are an ignition source potentially hazardous to oil and gas operations.

The company involved reports that fishing boats violating the 500 metre safety zone have become a significant problem, increasing the risk of collisions, and endangering the security and safety of personnel and equipment. It has suggested the following possible solutions:

- a continuation of monitoring and reporting of safety zone violation incidents;
- an increased security watch;
- alerting other locations to ensure that they are aware of such potential floating ignition sources;
- continuing PR and friendly communication with fishery groups to make the fisherman aware of the potential danger to themselves and to gas production operations;
- discussion with authorities to find appropriate ways to solve the problem and enforce the law.

6 Diver Hand Burn Injury During Underwater Cutting Operation

A member has reported an incident where a diver received a burn to his hand during use of underwater cutting equipment. The company concerned has advised its employees as follows.

Before using such equipment, ensure that

- hose and cables are in good condition with no visible cuts, cracking or splitting. Cable lug connectors should be securely attached and without visible excessive corrosion;
- all electrical connections are watertight. This can be achieved by carefully taping the connection with approved electrical insulating tape. Tape should extend at least 10cm/4" up the cable on both sides of the connection;
- equipment is seen to be in overall good condition. If any doubt exists as to the condition of cutting and burning equipment, guidance should be sought from the appropriate manager prior to commencement of work;
- any defective components noted during the inspection process should be removed and replaced before equipment is used. Replaced components should be marked and stored in a safe and secure area, and passed for further inspection/ management action as soon as practicable.
- equipment is operated and maintained as per the manufacturer's instructions.

7 Incident Involving Cameron High Pressure Accumulator

IMCA has been passed the attached safety alert (2030 Rev. 1) issued by Cameron, which related to an incident involving a high pressure accumulator.

8 Fatality – Swinging Load Incident

A member has reported the following fatality which occurred during movement of drill pipes. Personnel were engaged in the task of lifting bundles of 12cm drill pipe by crane from the pipe rack to the adjacent catwalk, for eventual placement on the

rig floor. During one lift, a bundle (comprising nine joints) weighing over 2,600kg began to swing horizontally. One individual attempted to manually stop the horizontal movement of the bundle but was pushed backward by its momentum to a pipe rack post which prevented any further backward movement. Trapped between the swinging bundle and the pipe rack post, the employee was struck in the chest by the load. The resulting injuries were fatal.

The resulting investigation identified the following:

- No job safety analysis (JSA) had been performed for the task;
- The employee had only four days of experience offshore and had not been formally trained for the task;
- The immediate supervisor had not been made aware of this lack of training;
- Previous performance problems exhibited by the employee had not been properly handled;
- The contractor had no policy against participation in rigging operations without formal rigger training;
- The operator's contractor selection procedure had not included review of the contractor's safety policy, and the operator had given no clear safety directives for company representatives on site.

9 Fire Caused at the Stern of a Dive Support Vessel by Flaring Gas from a Rig

A member has reported an incident where the stern of a diving support vessel suffered fire damage caused by flaring gas from a rig vent.

The vessel was secured to the diving location via stern lines to a production structure, in order to locate and mark pipelines in the area. An open ended vent on that structure was located near the stern of the vessel and had not been identified as a potential hazard. This open-ended vent was, in fact, a component of a secondary flare system, designed to provide pressure relief to production operations by venting product in the event that the primary system failed.

With the vessel on location, the compressors on the platform shut down, the primary flare system failed and the secondary system began to vent product near to the stern of the vessel. The product ignited, causing fire damage to the vessel stern deck and equipment in the area. Personnel responded quickly to extinguish the fire on the vessel and move off location. No personal injury occurred.

The company has highlighted the following lessons learned from the incident:

- Risk assessment procedures should identify all potential hazards associated with a project, including such flare systems;
- The location, contents and function of all flare systems should be identified at the planning stage, as part of identifying the safe work area, then checked once on location;
- The isolation of all flare systems and vents in the work area should be verified prior to setting up on location;
- Planned work should be communicated with platform personnel via a safety meeting upon arrival at location.

10 Uncontrolled Ascent of Lay-Down Head

A member has reported that a saturation diver in 120m of water, preparing to move a pipeline lay-down head (LDH) using a lift bag, was struck in the back by the uncontrolled ascent of the LDH. The LDH was being used as a deadman anchor to assist in aligning a pipeline.

The resulting investigation concluded that:

- the lift bag affixed to the LDH had a higher rating than the load to be lifted – inaccurate use of LDH weight data provided in the procedure while making a field change;
- there had been inadequate communication – offshore personnel had not been appraised regarding the LDH's true weight;
- there were inadequate guards/protective devices – due to the distances involved in moving the LDH, the lift bag dump line and safety strap were not connected;
- there had been inadequate assessment of the level of change – the task had been carried out under a 'minor' management of change (MOC) procedure.

The company involved has made the following recommendations:

- diving operations using lift bags should always follow the company's guidelines;
- anchors should have a known measured weight or have their weight calculated for the condition of use;
- lift plans should include the weights, weight calculations and methods of those calculations;
- the deletion of a dump valve's safety line constitutes a significant change, requiring the use of an appropriate MOC procedure. When a safety device is disabled or a safe procedure is bypassed, a task must be further risk-assessed, brought to a higher level and fully documented. This is true even in situations where a safety device might increase the risk of incident or injury.

11 Fatality: Grinder Incident

A member has reported a fatality which occurred during preparation of surfaces for welding. A welder was using an angle grinder for the preparation work when the disk of the grinder disintegrated. The hand-held angle grinder was fitted with a 230mm diameter cutting-off wheel, and when it disintegrated, fragments penetrated the victim's chest and abdomen. He was taken to hospital by rescue helicopter, but died the same day.

The investigation showed that the angle grinder and cutting disk were not compatible and that the angle grinder had not been fitted with a guard

The company involved has reiterated that grinding machines should always be used in accordance with manufacturers' instructions, noting in particular that:

- the maximum speed marked on the abrasive wheel should always be greater than the maximum rated speed of the grinder;
- grinding wheels should not exceed the recommended maximum diameter for any given grinding machine;
- worn down wheels from other machines should not be used;
- grinding tools should never be used without the wheel guard attached to the tool and positioned for maximum safety;
- abrasive wheels should be stored and handled with care. They should be inspected for chips and cracks before installation and any apparently damaged wheels taken out of use, marked and stored for inspection/disposed of securely.

12 1Near Miss: Diver's Umbilical Severed by Propeller of Lift Boat

A member has reported a high potential near-miss which occurred during a regular field maintenance operation which was taking place from a lift boat in 7½ metres of water, whereby a diver's umbilical was pulled into the lift boat's propeller before it was completely severed with the diver less than 6 metres from the propeller.

The diver was working underwater on an offshore platform riser. The lift boat was stationed 6 metres from the work site and was elevated 60cm from the surface of the water, leaving the propeller and rudder assembly underwater. The configuration of the lift boat was such that the dive station was above the propeller area at the stern of the vessel. The dive crew's standard procedure on this type of vessel was to secure the propeller driveshaft with a large pipe wrench, chain, binder, and lockout/tag-out. For unknown reasons, this procedure failed, causing the driveshaft to turn the propeller slowly, grabbing the divers hose and pulling the diver toward the propeller. This action occurred very swiftly – in less than one minute over 20 metres of umbilical were drawn in, before it was completely severed. The diver surfaced unharmed.

The company involved has made the following recommendations:

- A purpose-built clamp, which will not become disengaged, with padlock, is to be installed on lift boat propeller driveshaft(s) prior to any diving operations;
- A lift boat must be elevated above the waterline enough to completely expose the propeller and rudder assembly;
- Specific job hazard/safety analysis must be performed, involving both vessel and dive crews.

13 MRSA (the 'Super Bug') and Appropriate Use of Antibiotics

There has been a significant spread of MRSA (the 'super bug') in hospitals in recent times and it is possible that it could become a problem in the future for our members. One of our members has provided the following note to assist in understanding of the problem.

MRSA is a type of staphylococcus aureus ('S aureus', often referred to simply as 'staph'). S aureus are bacteria commonly carried on the skin or in the nose of healthy people. Some are resistant to the class of antibiotics frequently used to treat them, such as methicillin—and thus are known as methicillin-resistant staphylococcus aureus (MRSA).

MRSA infections are usually mild, superficial infections of the skin that can be treated successfully with proper skin care and antibiotics. However, they can be difficult to treat and can progress to life-threatening blood or bone infections due to there being fewer effective antibiotics available for treatment.

Transmission of MRSA – S aureus including MRSA can be spread through close contact with infected people. MRSA is almost always spread by direct physical contact and not through the air. Spread may also occur through indirect contact by touching objects (e.g. towels, sheets, wound dressings, clothes, work surfaces, tools or equipment) contaminated by contact with infected skin.

Identification of MRSA – A sample of the infected wound (either a small biopsy of skin or pus taken with a swab) must be obtained to grow the bacteria in the microbiology laboratory. Once the bacteria is growing, the organism is tested to determine which antibiotics will be effective for treating the infection. A culture of skin lesions is especially useful in recurrent or persistent cases of skin infection, in cases of antibiotic failure, and in cases that present with advanced or aggressive infections.

Antibiotic Resistance – Bacteria, fungi, and even viruses can become resistant to drugs. However, bacteria cause most of the drug-resistant problems. Bacteria can become resistant to antibiotics in a variety of ways and once a particular type of bacteria has developed resistance to a drug, it can pass on this resistance to other types of bacteria. Overall, 70% of the bacteria causing such infections are resistant to at least one of the drugs most commonly used to treat them. In some cases, these organisms are resistant to all approved antibiotics and must be treated with experimental and potentially very toxic drugs. The more often a drug is used, the more likely bacteria are to develop a resistance.

Preventing Antimicrobial Resistance

The following tips can help prevent diseases and avoid bacteria developing resistance to antibiotics:

- Vaccination against diseases that cause respiratory infections, including influenza and pneumococcal pneumonia may be appropriate for some personnel. Preventing respiratory infections and their complications decreases antibiotic use;
- Give health providers your complete medical history, including details about medication allergies and anything currently being taken, including all prescription and over-the-counter medications, home remedies, and dietary supplements. Such details help doctors/pharmacists make better-informed decisions should they need to prescribe antibiotics;
- When antibiotics are prescribed, the medication should be taken as instructed until the course is finished. Stopping early can mean not all infecting organisms are killed and that those which are already most resistant are left behind to grow;
- Never use antibiotics prescribed for someone else, and do not give someone else your medication. Improper use of antibiotics helps bacteria develop resistance and weakens the ability of antibiotics to fight disease.
- Common mistakes which can cause problems in the future include taking antibiotics unnecessarily (e.g. as treatment for viral infections, such as colds, which don't respond to antibiotics); not taking antibiotics as prescribed; and saving antibiotics for later self-prescription.

Ensuring good hygiene can help to prevent disease, with the following tips noted:

- Practice good hygiene, including showering and frequent hand washing;
- Ensure availability of adequate soap and hot water;
- Establish routine cleaning schedules for spaces and equipment;
- Maintain sanitary berthing and food service standards;
- Discourage sharing of towels and personal items (e.g. clothing and equipment);
- Encourage employees to report all skin lesions;
- Cover all wounds.

Precautions Once an MRSA Skin Infection is Diagnosed

Individuals can prevent an MRSA infection from spreading to others around them by following these steps:

- Keep infections, particularly those that continue to produce pus or to drain material, covered with clean, dry bandages. Follow your healthcare provider's instructions on proper care of the wound. Pus from infected wounds can contain MRSA and spread the bacteria to others;

- Advise people in close contact to wash their hands frequently with soap and warm water, especially if they change your bandages or touch the infected wound or potentially infectious materials;
- Avoid sharing personal items (e.g. towels, washcloth, razor, clothing or uniforms) that may have been in contact with the infected wound and potentially infectious material. Wash linens and clothes that become soiled with hot water and laundry detergent. Drying clothes in a hot dryer, rather than air-drying, also helps kill bacteria in clothes;
- Tell any healthcare providers who treat you that you have been or are currently being treated for an antibiotic-resistant staph skin infection.

14 Transponder Pressure Relief System Failure

Whilst reviewing its test and repair procedures for transponders, a member has reported that a serious flaw was discovered in the pressure relief mechanism in two out of three Kongsberg transponders tested. Such transponders are in common use across marine operations world-wide and it is possible that some could exhibit the same fault whereby internal pressure build-up would not be able to be vented automatically.

It appeared that the pressure relief mechanism was locked in place and would not operate, possibly due to an assembly fault by the manufacturer.

Pending detailed instructions from the manufacturer, the contractor instructed its personnel not to disassemble any such transponders.

Kongsberg has been exploring the matter, relating to the RPT model transponder (which went out of production in 2002) and has now issued a technical bulletin on the subject, a copy of which is attached.

Jack B. Moore
President

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CAMERON

January 12, 2005

PRESS RELEASE

On January 10, 2005, an employee of Cameron Controls in our Celle, Germany facility was fatally injured during a routine disassembly of a high pressure accumulator used in subsea and related production control systems.

Internal experts and external authorities have initiated a full investigation to determine the cause of this tragic accident.

A Safety Alert has been issued to all customers who are known to have purchased a production control system from Cameron that contains one of the accumulators in question. While we do not believe there is a safety risk associated with the normal operation or routine maintenance of these units, we have asked that clients refrain from disassembling these accumulators until our investigation is complete.

Cameron continues to be committed to the highest standards of health, safety and environmental protection and will vigorously pursue appropriate steps to improve our safety procedures with pressure containing devices.

On behalf of Cameron, I would like to express our sincere sympathy to the family, friends and colleagues of the deceased in their time of loss.

Jack B. Moore

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12 January 2005

SAFETY ALERT No. 2030

Products Affected:

- **Subsea Production Control System with Subsea Accumulator Module (SAM)**
- **Subsea Intervention or Workover Control System (IWOCS) with Subsea Accumulator Module (SAM)**

Safety Alert:

A serious accident occurred during the disassembly of a high pressure accumulator on January 10 in a manufacturing facility of the Cameron Division of Cooper Cameron Corporation.

Your company has been identified as having purchased a Subsea Accumulation Module (SAM) or Intervention and Work Over Controls System (IWOC'S) containing one of these units.

At this time we have no indication of any problem with the normal operation or routine maintenance of these accumulator bottles. However, if you are currently engaged or planning to disassemble the high pressure accumulators, PLEASE STOP AND DO NOT ATTEMPT to perform this operation without contacting Cameron. Please contact your local Cameron representative or Glenn Chiasson at 713-939-2928 for further information.

A Cameron representative will be contacting all known customers who have purchased a system containing one of these high pressure accumulators.

Glenn Chiasson 1st

Glenn Chiasson
Vice President
Quality & Reliability

Pete Lang 1st

Pete Lang
Vice President & General Manager
Cameron Willis and Controls

To whom it may concern

Deres ref/Your ref	*Vår ref/Our ref*	*Dato/Date*
	KE/AWF	22.12.2004

Technical bulletin,
RPT transponder pressure relief valve verification and repair.

This information is issued to all customers/operators of RPT type mini transponders, manufactured by Kongsberg Maritime (KM).

It has recently been discovered that some RPT transponders may have been incorrectly assembled and have a malfunctioning pressure relief valve due to incorrect mechanical assembly. KM has verified that the production documentation (assembly drawings and procedures) are correct, but that some transponders may have been manufactured incorrectly during production.

Water ingress and over charging the internal battery can cause pressure build up inside the transponder. The pressure relief valve is designed to release and vent any pressure build up. To date KM has not registered any incidents caused by the failure of the relief valve on any RPT transponders.

Customers may choose to verify and repair the RPT themselves. Alternatively, customers may, at their own cost, send any suspect or incorrectly assembled transponders to Kongsberg Maritime's service department in Aberdeen or Horten to have them verified and repaired. KM will carry out this work free of charge.

KM Customer Support will answer any technical and logistics related questions, and would like to hear from any of its customers, giving RPT Type and Serial No as shown on the product identification label on the transponder, should they find any pressure relief valves not working properly.
KM Customer Support phone numbers: Horten +4733023800 / +4799203808, Aberdeen +441224226500.

The verification and repair work is described in the two following procedures below:
1) RPT dismantling procedure.
2) RPT pressure relief valve verification and repair procedure.

Please note that the RPT range of transponders is no longer in production or covered by warranty. They were replaced by the MST range of transponder in 2002.
KM can provide temporary rental transponders to customers that need continuity in their operation.

This information is also published and available on www.kongsberg.com.

Yours faithfully.
Kongsberg Maritime AS

Kåre Edvartsen
Manager Customer Support Hydroacoustics

Encl.

KONGSBERG

RPT transponder pressure relief valve verification and repair	
Product:	Kongsberg Maritime RPT transponder
Contents:	RPT dismantling procedure RPT pressure relief valve verification and repair procedure

RPT dismantling procedure

Caution! Be careful if the RPT has failed (does not answer). The reason may be due to water ingression that can cause a pressure build up inside the transponder.

1. Switch OFF the RPT. Disconnect external cables (if any)
2. Use protective goggles.
3. Move (turn) both channel selector switches back and forth to aid the pressure relief valve opening, in case of pressure built up inside. The valve can be slightly sticky.
4. Prepare to open the transponder in a safe place, out on deck and shielded from people and vital equipment.
5. Fasten the RPT on a stable surface with the transducer against a wall or heavy object. Only the bottom end cap should be able to move.
6. Do not stand in front of the bottom end cap when opening the transponder.
7. Carefully undo the RPT locking screw about 5-6 turns.

   This should break the seal as the O-ring has emerged from the RPT housing. Possible built up pressure will now be released. The design is such that the locking screw still has 4-5 turns left, so the bottom end cap will not blow out.
8. Now the transponder can be completely dismantled.

RPT pressure relief valve verification and repair procedure

Any work must be carried out in a clean, dry area.

Ensure full anti-static precautions have been taken.

1. Dismantle the RPT according to "RPT dismantling procedure" above.
2. Unscrew the four screws holding the interconnection board (round PCB).
3. The PCB is now loose but still attached by 4 wires. Carefully move the PCB to one side so that the two channel switches and the on-off switch (in the middle) is clearly in view (see picture).
4. The on-off switch is assembled differently from the other two, it should have one circlip, and nothing else.

   The two channel selector switches are identical, but should be installed differently. One acts as rotary switch only, the other one acts both as switch and pressure relief valve.

   The one acting as rotary switch only should have one circlip installed right next to the surface of the endcap, and nothing else. The circlip is visible at the bottom of the recess.

   The other switch acting both as switch and pressure relief valve should have:
   a spring,
   a washer, and finally
   a circlip at the very end.
   Because this is recessed, only the washer and circlip are visible.

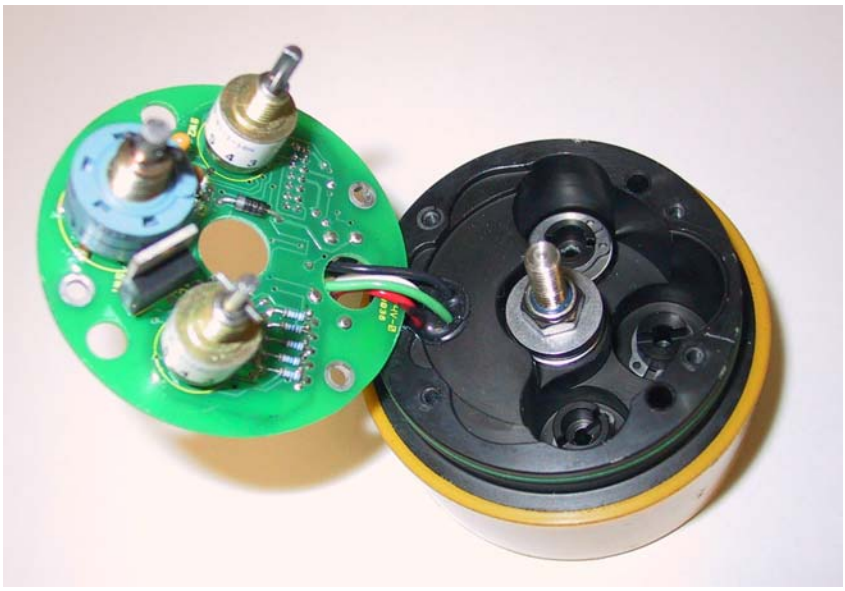
Note!
Do not at any stage during this procedure operate (open) the pressure relief valve. If the valve is opened, there is a risk of catching debris or grit on the o-ring, causing the RPT to leak. If the valve is operated/moved the RPT must undergo a new pressure test. To avoid this, make sure the outside of the valve is properly supported during the next step in this procedure.

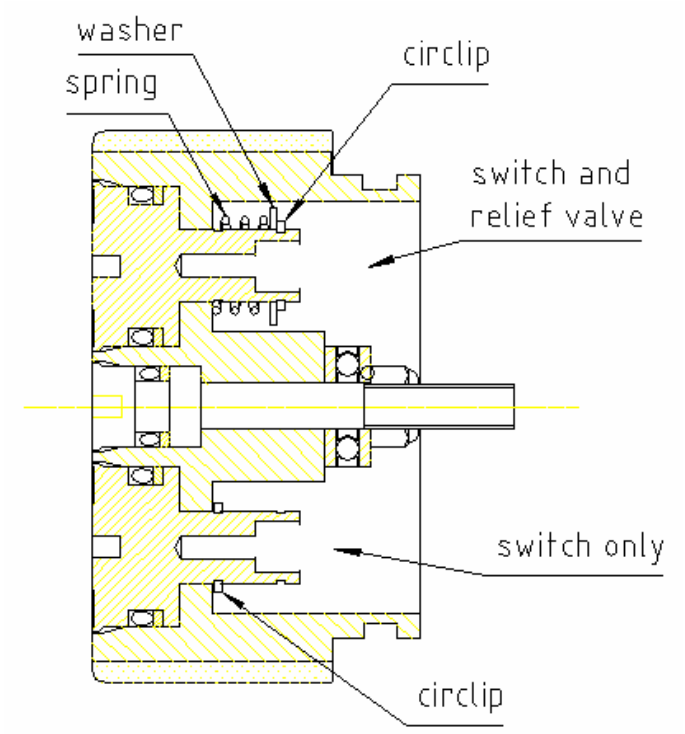
5. To verify correct installation of the relief valve, remove the visible circlip, then the washer and the spring.

   If the valve has been incorrectly fitted with a second (problem causing) circlip this will now be visible at the bottom of the recess (looking exactly like the other "switch only" switch). See attached drawing.
   Remove and discard this second circlip.

   Replace the spring, washer and top circlip, in this order.

6. Refit the PCB and replace the endcap.




washer
spring
circlip
switch and
relief valve
switch only
circlip