IMCA Safety Flash 26/16

October 2016

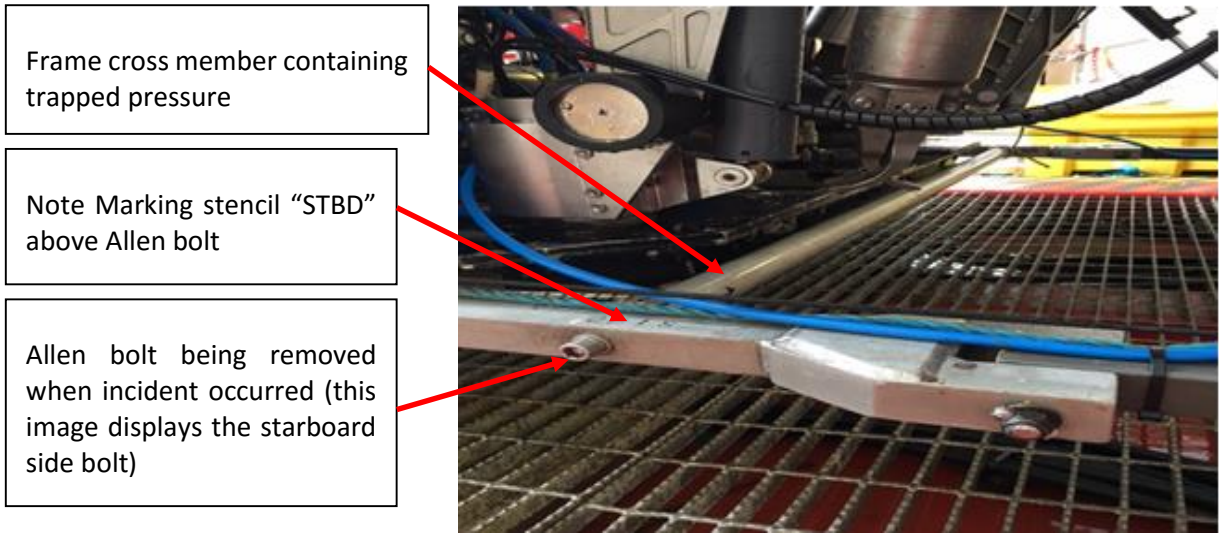
Focus – Stored Energy/Trapped Pressure

This safety flash has two incidents, both of which relate to stored energy. The first deals with a release of trapped pressure from part of the tooling frame of an ROV. The second is an update from the International Association of Oil & Gas Producers (IOGP) containing further findings from an incident published earlier in 2016, relating to a small plug ejected from a pressurised pipeline.

1 Near Miss: Release of Trapped Pressure After ROV Dive

A member has reported an incident in which there was an unplanned release of trapped pressure from part of the tooling frame under an ROV. The incident occurred when it was noted that the frame was not deploying correctly and was slightly twisted. Upon investigation the coil mounting frame had been fitted upside down. The crew began to remove the cross member using an Allen key to separate the frame into two sections for removal and to ease the handling during the turning over portion of the task.

Upon the first quarter turn of the port side Allen bolt, a hissing noise was heard. The supervisor immediately evacuated the area and had it barriered off.



The system was left to bleed down naturally. The risks of the job were re-assessed and additional personal protective equipment (PPE) was identified for further work in removing the frame.

Causal factors:

- The frame was manufactured on the vessel;

- The potential for trapped pressure had not been identified;
- The frame had been incorrectly fitted.

The following **actions** were taken:

- An engineering solution was identified to prevent possibility of trapped pressure – holes drilled in cross member;
- Safety flash issued;
- Other similar systems checked and modified as required;
- Clear markings applied to ensure correct frame orientation.

Members may wish to refer to the following incident:

- IMCA SF 07/14 – Incident 1 – *First aid injury: thermos cup exploded after being in hyperbaric environment.*

2 Failure of Threads – Follow up to "Corrosion Coupon Plug Ejected from Pressurised Pipeline"

The IOGP published safety alert number 273 in May 2016, regarding an incident in which a corrosion coupon plug was ejected from a pressurised pipeline. This was passed on to IMCA members as IMCA SF 18/16 – Incident 3 – *Stored pressure: corrosion coupon plug ejected from pressurised pipeline.*

This forms a follow up to the previous alert and is part of a summary of the main lessons learned, relating to the wearing of threads on bolts.

What Went Wrong?

- The threads of the access fitting were worn down to such an extent, that they were unable to restrain the plug upon minor disturbance (the ¼ turn of the plug);
- The access fitting was installed during pipeline construction in 1987. It is estimated to have been subject to over 140 retrieval and installation cycles;
- Bottom-of-pipeline debris can cause galling of threads on stainless steel plugs, which in turn can damage the threads of carbon steel access fittings;
- The Original Equipment Manufacturer (OEM) supplied thread tapping assembly service tool had been used routinely for every plug coupon retrieval and installation cycle without the use of flushing oil to remove debris from the threads;
- In the presence of bottom-of-pipeline debris and thread damage, the repetitive removal of internal thread material can lead to ever smaller contact surfaces, increasing contact stress, increasing wear rates and/or galling;
- Smaller thread contact surfaces reduce the ability of the access fittings to restrain the plug;
- Absence of a tool to determine the internal thread condition under pressurised conditions meant that the internal thread condition was unknown.

The main lessons learnt were summarised thus:

- Threaded access fittings, which are subject to frequent use of a thread tapping assembly service tool (used to clean internal threads from debris and galling damage) can suffer from reducing thread contact surfaces. This mechanism was previously not identified;
- The internal thread condition was neither confirmed after each use of a thread tapping tool nor periodically verified because this was an unknown degradation mechanism.

The full report can be found on the IOGP's website here.