Incident during restart of a compressor

Safety Flash Published on **2 July 2000** Generated on **14 January 2025** IMCA SF 04/00

The attached memo from Halliburton sets out the findings to date and the interim actions recommended following an incident in May 2000.

Halliburton SubSea

Brown & Root Energy Services

Stoneywood Park
Dyce
Aberdeen
AB21 7DZ
Tel: +44 1224 722877
Fax: +44 1224 795459

Memorandum

Date: 21 July 2000

To: Dive Supt, Dive Tech, Chief Engineer, Vessel Master/OIM, D Downing, P Harrold

cc: D Martin; M Fitzgerald; P Alexander; P Ratcliffe; S Williams; D Tilley; Project Managers; P Somner; K Coutts; M O'Meara, B Simpson, IMCA

From: Alan Forsyth

Subject: William & James Compressors

Status: JT00031

The purpose of this memo is to present the findings to date and to confirm the implementation of the interim actions recommended following the incident on 8.5.00 in light of a recent incident overseas. The explosion in a Williams and James Gas 977 Transfer Compressor on 8.5.00 occurred during the re-start of the compressor to continue gas transfer operations after a short shut down to change over between storage banks.

The unit had been used for transfer of 13.3% Oxygen in Helium, immediately prior to a changeover to 20% Oxygen in Helium. During the restart for the new gas mixture an explosion occurred within the compressor discharge system. This resulted in pipework ruptures within the final stage cooler, the discharge piping and significant damage to the filter/coalescer element.

The damage associated with the incident has been established as follows:

- Third stage cooling tubes – rupture – resulting in the failure of the cooling jacket seal and loss of cooling water.
- Third stage cooling tubes – stress indication without rupture.
- ½" delivery line failure – between pipe clamp and filter coalescer unit, at the pipe bends.
- ½" delivery line "ballooned".
- Heavy damage to both the filter cartridge and insert with signs of combustion.
- Rupture of filter unit ½" discharge line at the swage fitting. Flame damage to the purification filter, probably from the rupture of the filter/coalescer discharge pipe.

In addition to the incident damage, inspection of the compressor revealed the following:

- 1st stage bores show signs of wear and were considered to be passing oil.
- Heavy carbon deposits on 2nd and 3rd stage discharge valves and ports.
- Liquid separator contained sediment and "tar" like deposits, possibly preventing draining.

Rockwater Limited
Registered in England & Wales
Registered No. 1268625
Registered Office:
Hill Park Court
Springfield Drive
Leatherhead
Surrey KT22 7NL

Rockwater SubSea Wellstream

Halliburton SubSea

Brown & Root Energy Services

Stoneywood Park
Dyce
Aberdeen
AB21 7DZ
Tel: +44 1224 722877
Fax: +44 1224 795459

Memorandum

Following review by the supplier and manufacturer, the company issued an internal statement of interim actions as follows:

1. Inspection of the filter/coalescer units for oil carry over and element condition.
2. Inspection of the 2nd and 3rd stage valves for wear and/or carbon build-up.
3. Cool down period of 60 minutes between operations.
4. Monitoring of CO levels within dive gas is carried out following gas transfer.
5. Inspection of the liquid separator and down loading valves should be carried out to ensure the systems are free of blockage and functioning properly.
6. Oil injection on the second and third stages for machines operating with Heliox or Air mixtures is not recommended by the manufacturer, advise where fitted.
7. Filtration systems should be checked to ensure that activated charcoal has not been used in the filtrate.

The above actions have been advised previously, please confirm their implementation and continued application. In addition, these actions are not exclusive to the 977 series of machines and the company considers these actions to be applicable to all W&J HP gas compressors.

Please acknowledge receipt and compliance with the above to Jean Thomson, Halliburton Subsea Safety Department, by return.

Regards

Alan Forsyth
HS&E Manager

Rockwater Limited
Registered in England & Wales
Registered No. 1268625
Registered Office:
Hill Park Court
Springfield Drive
Leatherhead
Surrey KT22 7NL

Share your safety incidents with IMCA online. Sign-up to receive Safety Flashes straight to your email.