Step Change Safety Alert

Alert Title

Gas Release from Molecular Sieve flange

Incident Date

18th September 2013

Location Type

Fixed production platform

Specific Equipment Involved

Molecular Sieve STG flange

Description of What Happened

At approximately 08:30 on the 18th of September an individual enroute to his worksite noticed a visible gas leak. He contacted the control room and the Ops Supv and HSEA who arrived on scene shortly after.

The leak source was confirmed as the Molecular Sieve STG flange and the area barriered off. All hot work spark potential permits were discontinued and personnel withdrawn from the area. The specific area of the plant was shut down and blown down.

This was one of a series of RTJ (Ring Type Joint) flange leak incidents which have occurred on the MOL Sieve piping system on this installation over the previous years.

Cause of Incident

The thermal cycle of the Molecular Sieve skid caused bolts in the flange arrangement to loosen.

Incident Consequences

Hydrocarbon release and emergency shutdown action.

Lessons Learned

- As part of failure investigation stemming from an earlier release, a pipe flexibility model was constructed using pipe stress analysis software to determine the forces and moments at the flanges. This was with a view to determining if any additional supports were required and/or to ensure existing supports were in the correct locations. All the flanged connections passed the analysis for both the operating and the seating conditions. It was therefore concluded that any modifications to the pipework were likely to be ineffective.
- A process study was performed to determine areas of high cyclic stress and this identified the flanges that were most at risk of loosening due to the thermal cycle.
- Upon breaking the flange, the RTJ was found to be slightly distorted which may have contributed to the release.

Recommendations/Actions

- A bolt tension control method and annual maintenance check should be implemented at the flanges identified most at risk of loosening, to ensure the bolts are maintained at the correct torque.
- When joints are disturbed in the future, new RTJs should be installed prior to reinstatement. These RTJ flanges are subject to thermal cycling so distortion could occur over a period of time. When the old RTJs are being removed the flanges should be checked for any damage to the flange groove and gasket faces and any signs of bolt elongation.

Contact Details (Optional)

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