

COS SAFETY SHARE

WHAT WILL WE DO TO PREVENT THIS FROM HAPPENING HERE?

LOSS OF FLARE PURGE RESULTS IN DETONATIONS

What happened?

During an outage, work was conducted to replace a section of pipe. The isolation was purged with nitrogen, followed by testing lower explosive limit. Testing showed high LELs. The fuel gas scrubber was isolated and de-pressured to expand the isolation envelope. The fuel gas scrubber supplies gas to both the flare pilots and the flare purge. This loss of purge gas resulted in a flammable mixture in the flare that was ignited by the flare pilots leading to detonation events. A temporary nitrogen supply was connected to purge the flare and to extinguish the pilots which stopped the detonation.

What went wrong?

Loss of purge gas resulted in a flammable mixture in the flare that was ignited by the flare pilots leading to detonation events. Flare design does not include source for independent purge back-up. Lack of reliable flame detection extended the trouble-shooting duration which allowed the detonation events to continue for over two hours.

Why did it happen?

Fatigue due in part to short-shift swap influenced key decisions. Inadequate shift handover to dayshift contributed to lack of understanding and adequate risk assessment of plant altering decisions. Personnel appeared to have a lack of understanding of the importance of maintaining a continuous calculated purge gas flow to the flare. The alarm was without action: no prescribed action for this alarm.

What areas were identified for improvement?

- Relief System Site Operating Procedure to include an operator response for low flow purge alarm.
- Update Relief and Flare System Operating Manual to describe the importance of maintaining a continuous minimum flare purge gas rate.
- Complete a review of the effectiveness of the competency process and develop a plan to close any identified gaps.
- Engineer and install an independent back-up purge source to improve overall reliability.
- Review Minimum Manning Policy...to maintain required capability.
- Perform inspections to determine if there is damage to the flare tip and flare scrubber internals caused by the detonation pressure waves.

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