

TAR FURNACE

What happened?

Incident description:

- The gas fired heater tripped as the flame scanner did not see a flame. After several attempts to start the heater the explosion doors opened, and the flame burns outside the explosion doors.

Direct cause:

- An abnormal amount of fuel gas has entered the heater after resetting the heater for start-up.
- The Fuel gas ignited, and explosion doors opened, and flames burnt outside of the explosion doors.

Causes

Contributing causes:

- Regular nuisance alarms from the flame scanner.
- The procedure not followed; fuel gas valve opening was 45% when the heater was reset for commissioning.
- Low fuel gas pressure trip activated but did not show on the Conlog alarms to alert the panel operator that the heater had tripped.
- The valve opening on the DCS does not correspond to valve opening in the field.
- Conlog alarm was not acknowledged when flame scanner alarm was activated after the third time. As it was deemed as a nuisance alarm.
- Flow fluctuations on pass flows made it difficult to restart the heater.
- No clear guideline on when to call out stand-by personnel for abnormal situations.

Causes

Root cause:

- The commissioning procedure was not followed to open the fuel gas valve to only between 24-28%.
- When the heater tripped, the FV- 009 valve was shut outside but the operator does not see the same indication on the DCS.
- This valve was not designed with a forced manual closed function.
- When the valve was reset to commission the heater, it opened to the previous position of 45% that is set by fuel gas flow valve, leading to excess fuel gas fed to the heater.

Questions