736 Coker Fire Investigation
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May 2018
Executive Summary

- Fire occurred due to release of Heavy Gas Oil to atmosphere and subsequent ignition.
- Root cause determined to be incorrect pipe metallurgy.
- Effective emergency response and deluge system prevented further physical damage.
- No system in place to define critical operation boundaries. Implementation of IOW’s and CCD’s.
- Importance of strong MOC process.
Agenda

- Incident
- Impact
- Emergency Response
- Investigation
- Corrective Actions
- Take-aways
Timeline of Major Events – April 8, 2016

9:57am: Coker HGO release and ignition within 5 seconds
9:58am: Multiple DCS Heater trip alarms to console Operations radio announcement for Alert 1 Fire
9:59am: Upper and Lower HGO Sprays go BADPV Multiple Triconex Heater shutdown trips
10:01am: HSE elevates incident to Alert 3 Fire
10:17am: Total Unit Feed Rate down to zero
10:55am: Major portion of fire is extinguished
10:57am: VERT enters the area for valve isolations
11:10am: All fires extinguished
Impact

■ No injuries
■ Unit shut down
  ▪ Heat on Temp controllers
  ▪ Domino effect
■ Damaged
  ▪ Instrumentation
  ▪ Valves
  ▪ Electrical conduit
  ▪ Pipe rack
  ▪ Concrete supports
Emergency Response

Deluge System Effectiveness
Investigation

- Fire Assessment
- Metallurgical Failure Analysis
- Initiator Analysis
- Historical Review
- Ignition sources identified
- Extent of Damage
- Sulfidic Corrosion
- Microstructure Analysis
- Interviews
- Process data
- Equipment analysis
Investigation

Historical Review

- 2008 Header Upgrade
- P&ID errors
- Transfer of info
- No operating boundaries in place
Overhead View of Fire Damage Area

4" piping from 736Y0003A Lower Fract. Spray Filter (Ref. Iso # 736-3739-34)
1. Mark and label piping to identify field orientation.
2. Using a band saw, cold cut 4" piping at these locations (3' from 90 degree elbow)

4" piping from 736Y0003B Upper Fract. Spray Filter (Ref. Iso # 736-3739-06)
Close-up View of Rupture Area

Classic fish mouth rupture resulting from high temp sulfidation
Action Items

- Replacement
- Inspection
  - Every circuit
  - Safe or Replace
  - 3 months
- MOC Process update
- Integrity Operating Window
- Corrosion Control Documents
Learnings

- **Emergency Response**
  - Admin training
  - Deluge

- **Transfer of Information**
  - In MOC process

- **Self-Policing**
  - Corrosion Control Docs
  - Integrity Operating Windows
Thank you