

# 736 Coker Fire Investigation

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## Executive Summary

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- 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

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- Incident
- Impact
- Emergency Response
- Investigation
- Corrective Actions
- Take-aways

## 736 Coker



April 8, 2016 at 09:56 AM

## 736 Coker



10:01 AM

## 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

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**Deluge System Effectiveness**



# Investigation

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- Fire Assessment

- Metallurgical Failure Analysis

- Initiator Analysis

- Historical Review

- Ignition sources identified

- Extent of Damage

- Sulfidic Corrosion

- Microstructure Analysis

- Interviews

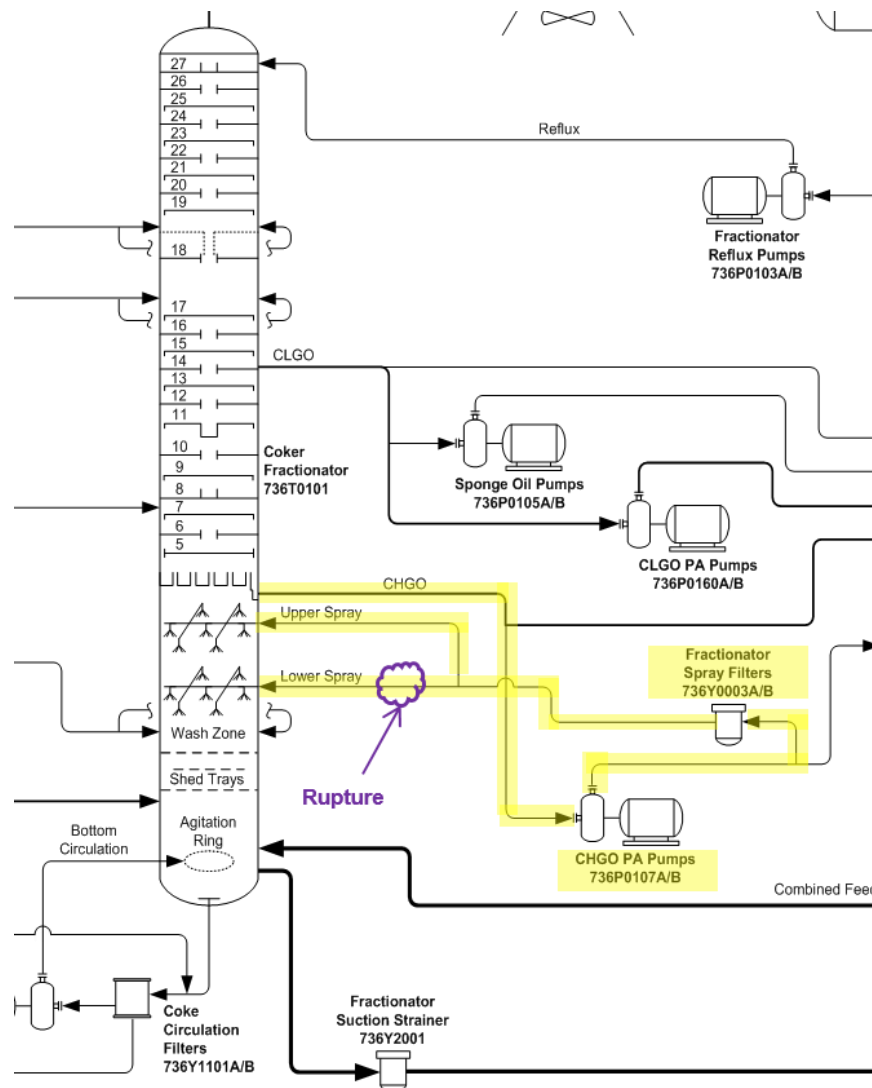
- Process data

- Equipment analysis

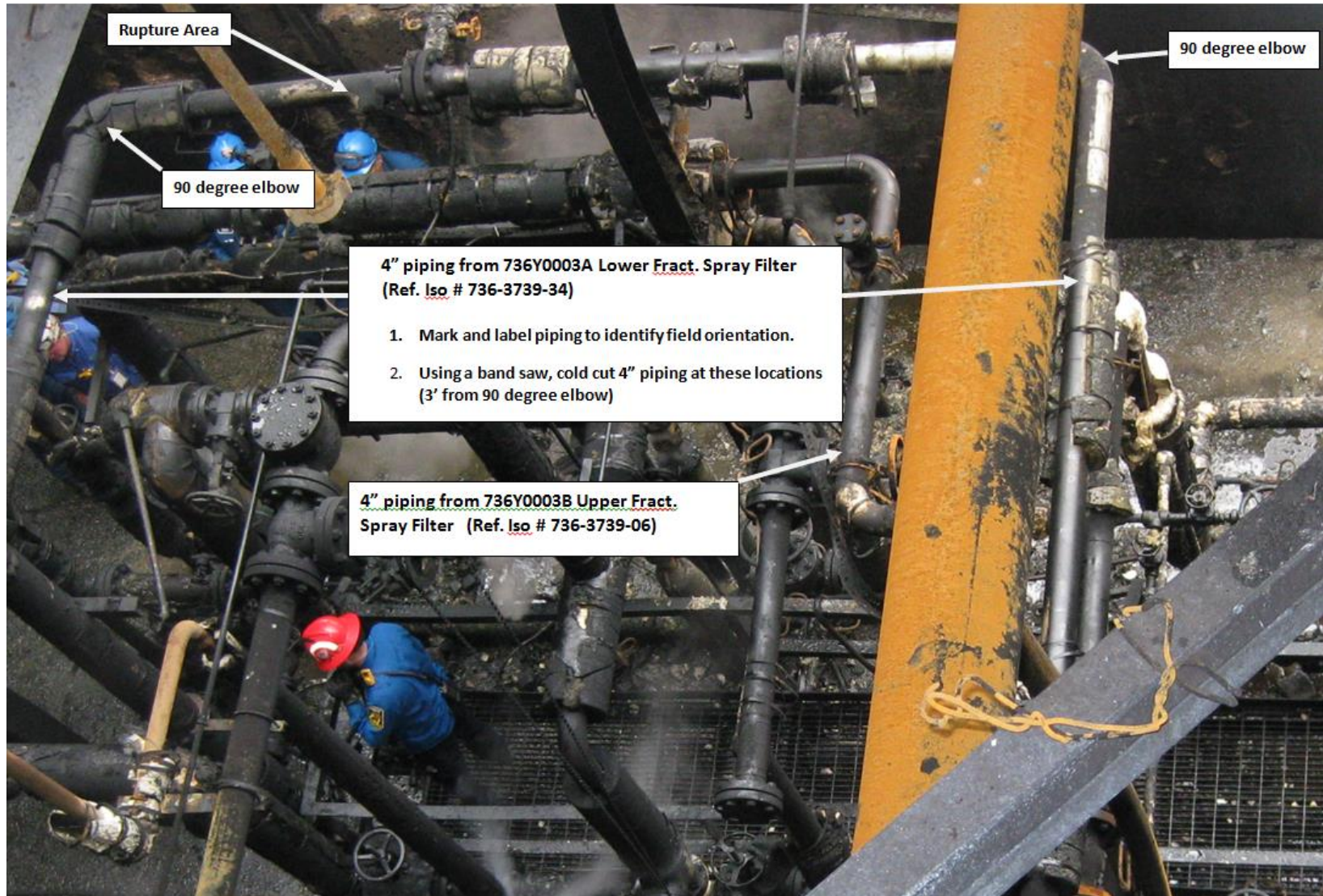
# Investigation

## Historical Review

- 2008 Header Upgrade
- P&ID errors
- Transfer of info
- No operating boundaries in place



# Overhead View of Fire Damage Area



# Close-up View of Rupture Area



**Classic fish mouth rupture resulting from high temp sulfidation**

## Action Items

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

# Learnings

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## ■ Emergency Response

- Admin training
- Deluge

## ■ Transfer of Information

- In MOC process

## ■ Self-Policing

- Corrosion Control Docs
- Integrity Operating Windows

**Thank you**