

Chevron El Segundo's Power Outage Recovery & Tarry Drum Mitigation

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Overview



Desired Outcomes

Share Chevron's effective response to the loss of several key pieces of equipment and three potentially tarry drums following our Best Practices.



Lightning Strike

- On January 31st, a lightning strike fell on a power pole within the Chevron El Segundo Refinery's Sulfur Acid Division.
 - The strike resulted in a power dip at several substations throughout the refinery with a complete power outage at the sulfur units.
 - In addition to the temporary loss of power to several units within the refinery, all units were required to begin cutting back feed immediately to address the SRU power outage, including the Coker.





Lightning Strike

Coke Chute 01/31/2019 10:28:21 AM





Coker Posture Prior to Lightning



Coker Impacts

Power Dip

- Loss of all electric pumps
 Feed
 - Overhead accumulator HC/H2O
 - HCGO pumparound
 - Jet/Diesel draws
- Loss of furnace induced draft fan
 - ➢ Furnace trip to natural draft → elevated CO and reduced transfer temperatures

Power Outage

- A + B modules circulating oil
 - C module superheated steam stripping (oil removed)
- Low steam header pressure
 > 150# → 30#
 > 850# → 340#



Recovery Priorities



Tarry Drum Procedure





Handling Tarry Drums



Feeding Time \rightarrow **11.5 hours** Time Below 850F \rightarrow **10 minutes**

Recommended Path Forward → If feed available, switch feed to adjacent drum and increase steam strip to 1.5 hours

Actual Path Forward → Steam strip for 4 hours



Handling Tarry Drums



Feeding Time \rightarrow **7.5 hours** Time Below 850F \rightarrow **21 minutes**

Recommended Path Forward → If feed available, return to normal transfer temperature and continue feeding

Actual Path Forward → Steam strip for 9 hours



Handling Tarry Drums



Feeding Time \rightarrow 3.5 hours Time Below 850F \rightarrow 42 minutes

Recommended Path Forward → Superheated steam strip for minimum 8 hours

Actual Path Forward -> Superheated steam strip for 10 hours



Superheated Steam Strip

- Steam is superheated to a tube metallurgical limit across all 4 passes while the switch valve is open to E drum for a total of 10 hours
 - Comparable to our online spalling method
- Once feed was reintroduced to F-501C several days later, start of run furnace skin temperatures matched those of a spall or decoke.



Outcomes

Successes

- All pumps and fans safely returned to service
- No hot spots or blowbacks during drum cuts
- No step changes in furnace skin temperatures or fouling rates following incident
- No foamovers resulting in vapor line dP

Challenges

- HGO pumparound and rundown coke fines

 Reboiler plugging
 HGO stripper level controller plugging
- Furnace pass flow plugging
- Debutanizer loss of heat input resulting in LPG odors in off-test tankage



Outcomes







HGO Stripper Level Controller







Outcomes



Startup



- Both crude units online
- and on-spec Pulling all sidecuts onspec with exception of diesel (hydrotreater unavailable)

Questions



