



U. S. Chemical Safety and Hazard Investigation Board RECOMMENDATION STATUS CHANGE SUMMARY

Report:	Husky Energy Superior Refinery Explosion and Fire
Recommendation Number:	2018-02-I-WI-R3
Date Issued:	December 23, 2022
Recipient:	Cenovus Superior Refinery
New Status:	Open – Acceptable Response or Alternate Response
Date of Status Change:	February 16, 2024

Recommendation Text:

Develop and implement a slide valve mechanical integrity program that addresses erosion and ensures proper functioning of the slide valves during a shutdown. The program must include, at a minimum:

- a) A slide valve mechanical integrity standard that defines monitoring and inspection requirements, with acceptance criteria, required for the safe operation of the FCC unit during transient operation (such as a startup, shutdown, standby, and emergency).*
- b) Monitoring that includes process data analysis and mechanical preventive activities to evaluate the mechanical condition of the slide valves during the operation of the FCC unit between turnarounds;*
- c) Quarterly presentations of process data and mechanical preventive maintenance data to refinery operations management and maintenance management to drive key decisions such as shortening the turnaround cycle and/or planning a maintenance outage;*
- d) During turnarounds and other potential slide valve maintenance outages, evaluate the adequacy of the slide valve mechanical integrity program for the safe operation of the FCC unit during transient operation. If the inspection demonstrates unsuccessful performance, make appropriate corrections.*

During the next major FCC unit turnaround at Cenovus Superior Refinery, demonstrate that the slide valve mechanical program is adequate for the safe operation of the FCC unit during transient operation. If the inspection demonstrates unsuccessful performance, make appropriate corrections to the slide valve mechanical integrity program.

Board Status Change Decision:

A. Rationale for Recommendation

On the morning of April 26, 2018, the primary and sponge absorber of the Husky Energy Superior Refinery exploded during the planned shutdown of the facility's fluidized catalytic cracking (FCC) unit. Debris from the explosion struck an asphalt storage tank approximately 200 feet away. Asphalt leaked from the damaged tank and over the containment wall spreading into the FCC and crude unit operating areas before eventually catching fire. Husky Superior Refinery

reported that 39,000 pounds of a flammable hydrocarbon vapor mixture as well as approximately 17,000 barrels of asphalt were released during the incident.

36 refinery and contract workers received medical treatment as the result of the incident. Of those 36 injuries, 11 met the criteria to be considered an Occupational Safety and Health Administration (OSHA) recordable injury. None of the injuries suffered were deemed life-threatening. It was reported that the explosion shook buildings up to a mile away. The plume from the burning asphalt was visible from neighboring communities. An evacuation order was issued by county officials to protect the public from the smoke plume and as a precaution for fear the incident would escalate.

As a result of the incident the facility was destroyed. The incident resulted in \$550 million of onsite and \$110,000 of off-site property damage. This incident was recorded as having the 33rd largest adjusted property damage loss in the hydrocarbon extraction, transport, and processing industry since 1974¹. In September 2019 a permit was issued to rebuild the refinery and construction began soon after. Husky Energy merged with Cenovus Energy, Inc., a Canadian oil and natural gas company, on January 1, 2021. The refinery is expected to resume operations in 2023 as Cenovus Superior Refinery.

The U.S. Chemical Safety and Hazard Investigation Board (CSB) investigated the incident and found several safety issues including ineffective transient operation safeguards, a lack of process knowledge, ineffective process safety management systems, a lack of available industry knowledge and guidance, and failures in emergency preparedness. As a result of these findings, the CSB issued one recommendation to Cenovus Superior Refinery (Cenovus). This status change summary addresses CSB Recommendation No. 2018-02-I-WI-R3.

B. Response to the Recommendation

Cenovus notified the CSB on November 8, 2023, that they had successfully implemented the recommendation. Cenovus has developed and implemented a slide valve mechanical integrity program in accordance with the requirements of the recommendation. Cenovus provided ample documentation in support of their assertions which was reviewed by the CSB and determined to be sufficient.

The recommendation cannot be evaluated for closure at this time, however, because certain actions must take place at the facility's next turnaround which will not occur for approximately five more years. Upon completion of the remaining requirements at the facility's next turnaround the recommendation may be evaluated for closure.

C. Board Analysis and Decision

Based upon the information above, the Board voted to change CSB Recommendation No. 2018-02-I-WI-R3 to: "Open – Acceptable Response or Alternate Response."

¹ Marsh JLT Specialty, "100 Largest Losses in the Hydrocarbon Industry," 2022. [Online]. Available: <https://www.marsh.com/us/insights/research/100-largest-losses-hydrocarbons-industry-html>. [Accessed 5 October 2022].