Question 30: What is your minimum charge heater firing limit, especially when highly heat integrated or when processing cracked stocks? Do you have any hydroprocessing units run without firing the charge heater?

Gerhard Kraus (UOP)

The low firing limit is caused by burner instability. Heaters can be turned down by completely shutting off some burners; but there is also a firebox temperature component. Burner instability would be noticed visually – examples being flickering, irregular flame pattern plus increased CO emission. UOP designed heaters generally consider a targeted minimum firebox temperature of 1000°F for conventional Low NOx burners. The low firing limit in reality would depend on the actual burner used, firebox geometry, and fuel composition.

Michael Leidy (UOP)

Do you have any hydroprocessing units run without firing the charge heater? Hydroprocessing units do exist that can operate for periods of time without using the fired heater, however, not having or operating without a feed fired heater poses a process safety hazard since the ability to remove fuel gas from the feed heater (reduce firing) is a useful operating lever that facilitates the reduction of the inlet temperature to the reactor. Units designed and operated without continuously operating a feed fired heater require bypasses around many (if not all) of the feed effluent exchangers that should be opened to reduce heat to the inlet of the reactor in the event of a temperature excursion. In addition units (particularly hydrocracking) that have a high beta ratio (heat recovered in the feed versus the amount of heat added by the charge heater) may require bypasses of the feed effluent exchangers aswell.

Tags

Emissions

Heat Exchangers

Process

Reactor Vessel

Resid Hydrocracking

Safety

Year

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