
Question 68: What is your experience with processing raw crude in the FCC? What types of crude have you tried to process in the FCC? What are the yield impacts? Any corrosion issues associated with this mode of operation? What additional corrosion monitoring is needed?

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I have not had any experience running raw crude directly into an FCC unit; however, I know there are refiners out there that do. Many refiners who are running a high percentage of tight oils into their crude units have found that there is typically a shortage of FCC feed, which has led to some of them charging tight oils straight into the FCC. However, most people running crude into their FCC units are typically doing so as a result of an upstream problem that is starving the FCC of feed.

One of the big challenges sending tight oil straight to the FCC will be the high variability that is seen, from batch to batch, in many of the feedstocks available. Big shifts in API gravity of tight oils will have a big swing on the operation of both the reactor and the regenerator (coke make), as well as main fractionator operation (conversion: gasoline versus diesel yields). Spikes in metals content can deactivate catalyst quickly and have impacts on overall heat balance of the unit and overall unit conversion.

Yield impacts will depend on the type of crude being processed; typically, these lighter tight oils will yield a high overall conversion due to the high percentage of gasoline already present in the feedstock and the low amount of distillate and bottoms left to be cracked. The tight oils tend to be high in paraffin content, which can lead to poor octane numbers.

These tight oils are known to be high in iron and sodium; these levels may need to be monitored to prevent overhead corrosion. Another item is the potential for crude incompatibilities. Asphaltene destabilization may be a concern and could lead to fouling of exchangers. An additive program may be necessary to prevent this problem.

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