

Products Reduce Downstream Contaminants on FCC Catalyst

The effectiveness of crude oil electrical desalting and its downstream benefits in crude unit fouling and corrosion control have been well documented from several sources. With more refiners catalytically cracking heavy resid streams, however, it is necessary to look beyond the crude unit in some cases to define the impact and benefit of crude oil desalting on downstream cracking operations. Improved desalting, using advanced Embreak* technology, provided one refiner with the following benefits:

- Elimination of oily desalter effluent during tank swings
- Improved salt removal lowering crude tower overhead corrosion potential
- Decreased calcium and sodium content of the FCC feed, extending FCC catalyst life and providing a return on investment (ROI) of 433%

Discussion

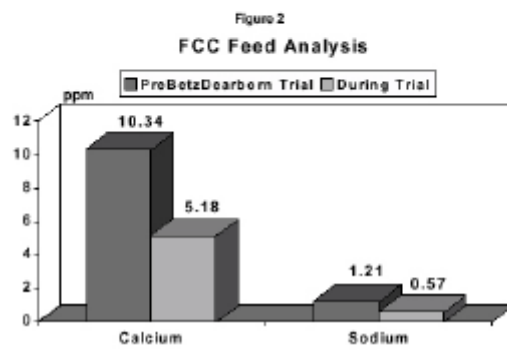
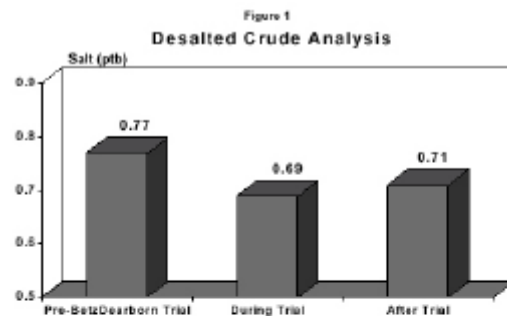
A Southeastern refinery operating a 57,000 bpd crude unit, processed a blend of crudes. The desalting system consisted of a two-stage operation composed of two Petreco Cyelectric desalters. For several years, this refinery had been using a competitive desalter treatment program and experiencing oil in the undercarry, inconsistent desalter efficiency, limited vendor service, and elevated calcium and sodium levels in the desalted crude.

The desalted crude was processed through an atmospheric distillation column, where the sodium and calcium concentrated in the atmospheric resid. Atmospheric resid was fed to the fluid catalytic cracker where the metals contaminated and deactivated the catalyst.

The refinery granted GE Water & Process Technologies an extended desalter trial. The criteria for success was based on the ability of GE products and services to:

1. Improve desalting efficiency

2. Reduce the amount of calcium and sodium in the desalted crude and FCC unit charge
3. Reduce oil in the effluent brine
4. Stabilize unit operations



In order to achieve these goals, GE implemented a two-phase chemical treatment program, plus recommended several mechanical changes. More specific, GE initiated a treatment program consisting of Embreak demulsifier, an oil soluble primary emulsion breaker, fed in conjunction with an Embreak reverse breaker, a water soluble wetting agent. The mechanical changes included optimizing the mud wash program, readjusting the desalter crude inlet distributor valves, and increasing the differential pressure across the mix valve. As shown in Figures 1 and 2, the GE total treatment program successfully improved desalting efficiency, as well as reduced the calcium and sodium in the desalted crude.



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