Case study: Gulf Coast, United States

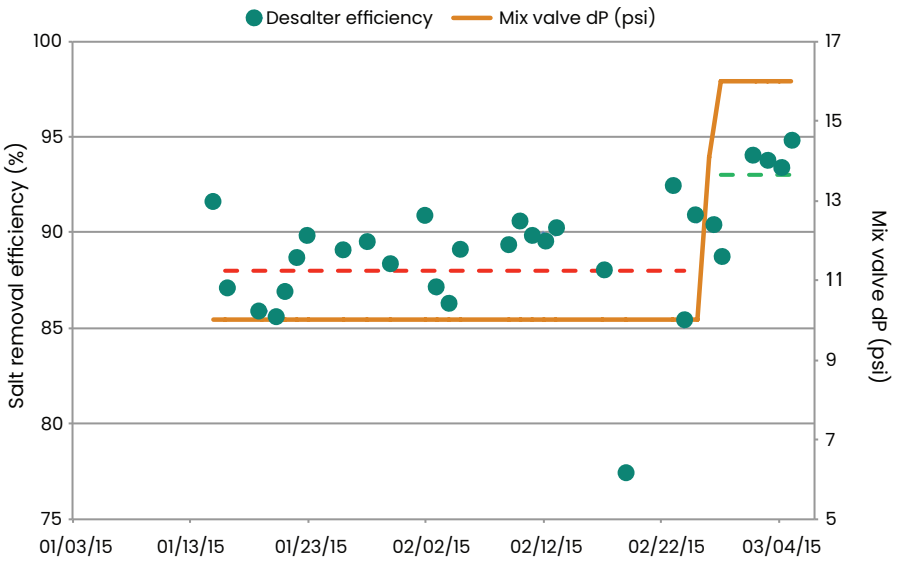
XERIC 7021 heavy oil demulsifier improved desalter operations and decreased slop production

A US Gulf Coast refinery desired to increase the percentage of heavy Canadian crudes being processed in their predominantly Latin American crude diet. However, when Canadian crude made up more than 10% of its crude charge, the refinery would typically experience oil undercarry that generated slop and upset the wastewater treatment plant (WWTP). The refinery reached out to Baker Hughes for help.

Utilizing the **Crude Oil Management™ approach**, the local Baker Hughes team worked with the refinery to develop a plan to enable greater crude diet flexibility and increase profitability. Baker Hughes recommended injecting XERICTM 7021 heavy oil demulsifier to pre-condition the crude blend in the tank farm before it reached the desalter.

Pre-conditioning the crude enabled the XERIC 7021 demulsifier to begin resolving complex emulsions and de-oiling solids well before the crude oil reached the desalters. The off-site tank farm application of XERIC 7021 provided 10 hours of additional contact time for the additive to work, compared to only a few minutes in the desalter with the previous treatment program. This change was critical to allowing the contaminants to be easily removed during the short residence time of the crude oil in the desalters.

Baker Hughes began treating with XERIC 7021 during an oil undercarry upset that spanned multiple days while processing 10% Canadian crude. The desalter brine cleaned up within a few hours once the treated crude reached the unit.



Desalter mix valve dP and increased salt removal efficiency with XERIC 7021 heavy oil demulsifier

Challenges

- Desalter upsets with significant oily undercarry
- Existing chemical treatment program did not include crude pretreatment, unable to resolve heavy Canadian crude oil emulsions

Results

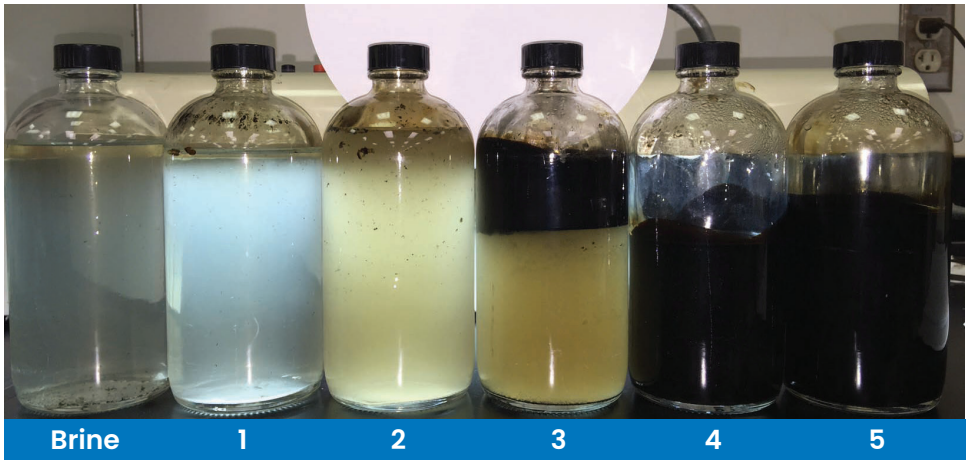
- Increased ability to process Canadian crudes at 30+% of total crude diet, without sacrificing asset reliability or performance
- Reduced size of desalter emulsion layer by more than 25%
- Decreased slop production by 600 BPD, enabling incremental crude throughput at USD 12 per bbl margins
- Increased mixing energy, improving salt removal efficiency by 4%

Pre-conditioning the crude feed with the XERIC demulsifier reduced the emulsion band in the desalters from over 60 in. to less than 18 in. within 24 hours. The refinery team was overwhelmed with the positive results. To date, the emulsion layer has remained more than 25% smaller than the base case.

The XERIC pre-conditioning treatment provided upset-free processing of the economically-favorable Canadian crudes. This allowed the refiner to process as much Canadian crude as desired, gaining a differential margin of $15 USD per bbl versus alternative crude feedstocks.

The reduction in oily undercarry, down to less than 500 ppm oil and grease in the brine, reduced slop oil volumes by 600 BPD while processing the Canadian crudes. This resulted in $12 USD per bbl incremental profit margins due to the reduced slop re-processing. In addition to increasing the customer's ability to process highly discounted crudes, the implementation of the XERIC 7021 demulsifier has simplified the overall treatment program by optimizing or eliminating adjunct chemistries previously required.

Desalter profile prior to XERIC 7021 treatment



Desalter profile 20 hours after implementation of XERIC 7021 treatment

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