

Case History

New XERIC Heavy Oil Demulsifier Reduces Desalter Oil Carryunder by 70% in Canadian Crude Upgrader

Business Situation

A western Canadian crude oil upgrader processing 100% heavy Canadian feedstocks was experiencing a significant amount of desalter oil carryunder. Most of the oil was present as oily solids that were entrained in the desalter effluent water stream. This upgrader utilizes a two stage desalting system, with fresh water injected to each desalter stage. Raw crude gravity is controlled in the 17 – 20°API range. Salt removal efficiency is approximately 98%, with filterable solids removal efficiencies of 75 – 85%. However, typical effluent water oil and grease (O&G) values were measured by extraction to be approximately 7,300 ppm in the 1st stage effluent, and 1,200 ppm in the 2nd stage effluent.

Project Objectives

Upon discussions with the customer’s engineering and technical personnel, it was agreed that a newly developed Baker Petrolite heavy oil demulsifier would be evaluated to try and improve desalting key performance indicators and operational stability, including reducing the desalter effluent water oil content. The incumbent primary demulsifier had been in use for approximately two years, and sufficient data had been collected to fully understand normal desalter KPIs with this treatment program.

Project Results

Two base case periods were established using the incumbent demulsifier and a solids-wetting agent at an agreed upon dosage. These two base case periods were followed by two tests of the new Baker Petrolite XERIC™ 7000 Heavy Oil Demulsifier lasting six and nine days, respectively. The same solids-wetting agent was also used throughout the entire test period. During all these evaluation periods, feedstock quality was stable and desalter operating conditions were held constant, in order to be able to reliably measure the incremental effects of the new demulsifier formulation on desalter performance.

Data collected during the new product evaluation confirmed that desalter operations remained very stable, and that crude oil salt removal, dehydration and solids removal efficiencies were maintained at slightly better levels than those achieved by the incumbent primary demulsifier. Crude atmospheric distillation column overhead condensing system chlorides remained in

the 70 – 80 ppm range, with constant distillation column steam injection rates and no caustic injections for overhead chloride control.

The most significant improvement using the same dosage of the new heavy oil demulsifier was that desalter effluent water O&G levels were reduced by 65% – 75% in both the 1st and 2nd stage desalting vessels. Trend data for the O&G levels measured in the second stage desalter effluent water are shown in Figure 1.

Project Benefits

Use of this new XERIC Heavy Oil Demulsifier significantly reduced the amount of oil loss from desalter operations at this heavy Canadian crude upgrader, while maintaining desalter operational stability and desired salt, dehydration and solids removal performance.

This case history is presented for illustration purposes only as results may vary between applications.

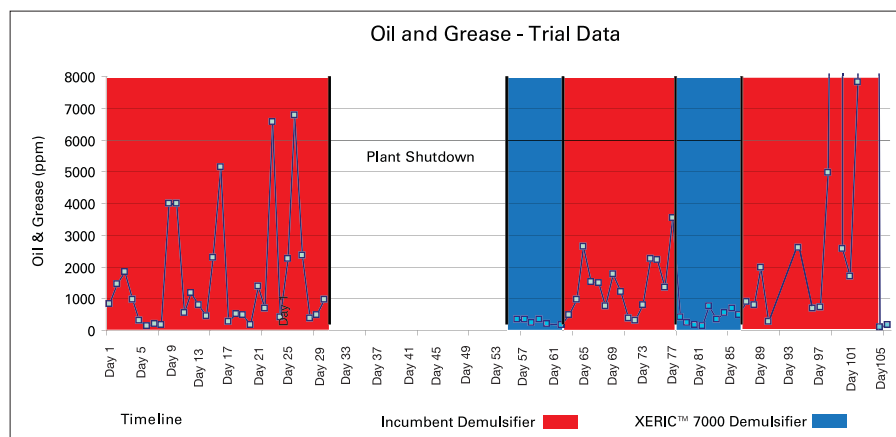


Figure 1. Second Stage Desalter Effluent Water Oil and Grease Values, By Extraction

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