

Case study: Asia

# LIFESPAN 3120R controlled fouling in crude unit hot train heat exchangers

A refiner in Asia that processes a blend of various crude oils was suffering from severe fouling of their crude unit hot train heat exchangers for several years. The furnace inlet temperature (FIT) had declined due to high rates of preheat exchanger fouling and the throughput had to be reduced, especially at the end of run length.

During each run, the refinery had to perform several cleaning operations to improve the efficiency of the heat exchangers, including solvent and water cleaning. As a result, the operation cost was increased and the throughput was reduced. They asked Baker Hughes for recommendations on how to mitigate the high rates of the preheat exchanger's fouling.

To begin, Baker Hughes deployed **ASIT™ Asphaltene Stability Index Test and Design service**, a unique methodology to determine asphaltene stability and fouling potential of the crudes and crude blends.

The ASIT test results indicated unstable crude oil with high fouling potential. Then, hot liquid process simulator (HLPS) tests were performed, which showed that **LIFESPAN™ 3120R heat exchanger fouling control** performed best in the crude slate being processed, significantly decreasing the rate of fouling during the treated test as compared to the untreated crude.

Based on the ASIT and HLPS results, Baker Hughes recommended that the refiner implement a hot train heat exchangers antifoulant program by injecting LIFESPAN 3120R into the desalted crude. Meanwhile, the LIFESPAN monitoring model was used to trend results of the antifoulant program performance. The monitoring model results indicate that there was significant improvement in the FIT decline after the antifoulant treatment. Consequently, no solvent or water cleaning operation was conducted once the treatment program was begun.

## Challenges

- FIT decline due to serious hot train preheat exchangers fouling
- High frequency of exchanger cleaning operations resulting in reduced crude throughput

## Results

- Improved crude unit hot train preheat exchanger performance
- Controlled FIT decline
- Reduced fuel usage and exchanger cleaning operation costs
- Predicted results that closely matched the performance achieved

**Crude unit furnace inlet temperature**  
Significant improvement with antifoulant

