

MILESTONE Heater Fouling Control Technology Increases Throughput and Reduces Maintenance Costs on Coker Heater

Problem

A North American refinery had been experiencing accelerated fouling in the furnace tubes in their delayed coker unit. The fouling resulted in rapid tube skin temperature increases of 5°F - 12°F (2.8°C - 6.7°C) per day vs. the desired target rate of 1°F (0.6°C) per day. In order to prevent excessive tube skin temperatures, the four individual heater coils had to be cleaned by pigging on a rotating basis about once every 2 weeks. This required that production be reduced during each pigging operation. As the run progressed, a decision was made to drop the furnace outlet / transfer line temperature by 5°F (2.8°C), and reduce charge rates by 10%, in an attempt to return the tube skin temperature increases to the control range of 1°F (0.6°C) per day. Even with these adjustments, furnace tube skin temperature increase rates were above the control range.

Solution

After examining unit operations and analyzing the coker feed using proprietary Coker Stability Index testing, Baker Petrolite representatives recommended the application of MILESTONE™ fouling control additives designed to mitigate the specific fouling mechanisms identified in this coker heater. The tube skin and transfer line temperature monitoring was continued to determine the effect of the treatment program.

Results and benefits

The MILESTONE program was initiated under the exact operating conditions and feedstock that were present at the end of the run - with high fouling rates. During the first 30 days after beginning the use of MILESTONE™ fouling control additives, temperature losses on all tube passes were maintained at less than 1°F (0.6°C) per day. After 40 days of continuous operation at normal production rates using MILESTONE™ additives, the transfer line temperature was increased to the normal operating range. By the 50th treatment day the unit charge rate was returned to previous "clean" operating levels. The tube skin temperature losses continued at less than the 1°F (0.6°C) per day control range. During the entire treatment period, 5 pigging/cleaning operations were cancelled. The unit was also able to return to previous throughputs, plus an additional 5% higher throughput (record levels), after treatment with MILESTONE additive technology. This refinery achieved a MILESTONE program payout of at least 20:1.

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



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