

COMPTRENE™ Reduces Inter Cooling Fouling in Ethylene Plant Process Gas Compressor



VALUE DELIVERED

ASSETS

Reduced fouling and extended
compressor run lengths

+230%

BACKGROUND

As ethylene plant run length targets increase and feedstocks change, one of the most negatively impacted areas is the cracked gas compressor, also known as the charge or process gas compressor. Fouling can occur in the machine itself, interstage coolers, knockout drums, or associated piping. The consequences of this fouling can be seen in reduced efficiency, increased vibrations, higher exchanger differential pressure (DP), and other issues – all of which can result in increased energy costs, decreased production, and even unplanned shutdowns.

An ethylene producer experienced fouling in their compressor internals as well as the interstage coolers. As a result of this fouling, the compressor was only able to operate for approximately 900 days before shutting down to be cleaned, in spite of being treated by a competitive program. This run length was well short of plant reliability goals and turnaround targets.

SOLUTION

Nalco Water worked with the customer to survey the system and develop a COMPTRENE compressor program that included monitoring and antifoulant chemistry.

Application of a Nalco Water antioxidant-type antifoulant extended the compressor internal run length turn-around to turn-around.

RESULTS

Interstage fouling was also extended from 900 days to 2100 days, however,

increases in differential pressure were observed after approximately 900 days, as shown in Figure 1 (green line – Run 1), and some throughput reductions occurred near the end of the run.

To further improve performance, a dispersant was added to the treatment program. The additional antifoulant allowed the interstage cooler run lengths to be extended to the 2100 day length, this time with no increase in DP and no limitations in production rates (Figure 1, blue line – Run 2).

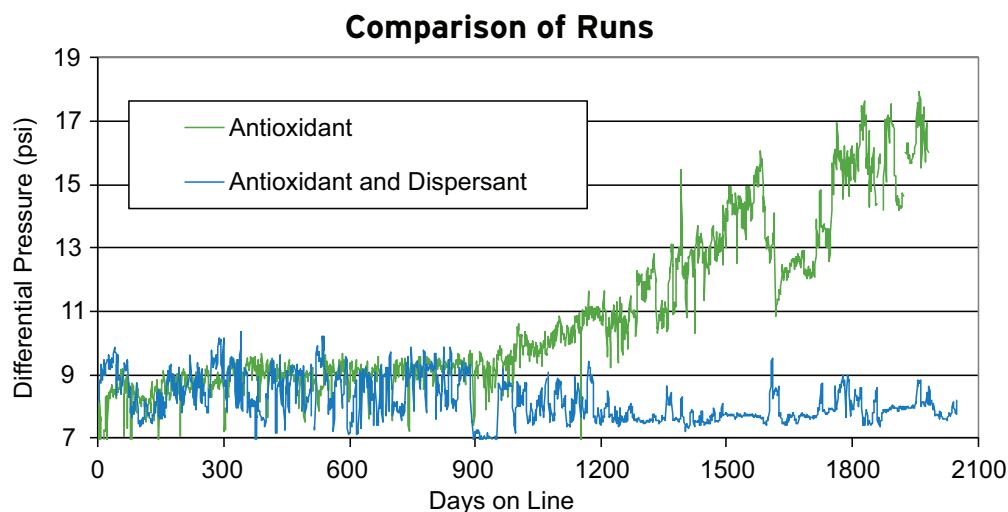


FIGURE 1: COMPARISON OF ΔP AND RUN LENGTH BETWEEN DIFFERENT TREATMENT PROGRAMS



FIGURE 2: INTERSTAGE COOLER AFTER 5 YEARS ON LINE (RUN 1)



FIGURE 3: INTERSTAGE COOLER AFTER 5 YEARS ON LINE (RUN 2)

CONCLUSION

Working with the customer, and utilizing a multi-component treatment approach, the Nalco Water COMPTRENE program inhibited fouling in the compressor and interstage coolers. This reduced total cost of operation and improved profitability by allowing the customer to increase the run length to 5 years without reductions in production rates.

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