

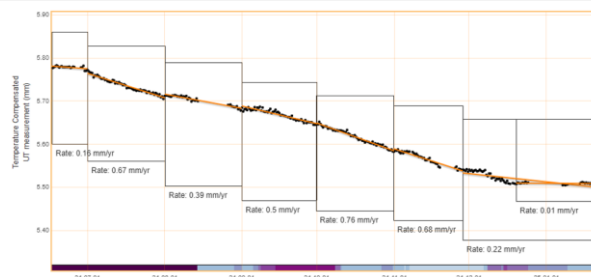
Production Solution featuring Smartguard high-temp corrosion control additive coupled with flow regime simulation mitigated corrosion in HVGO circuit

CHALLENGES

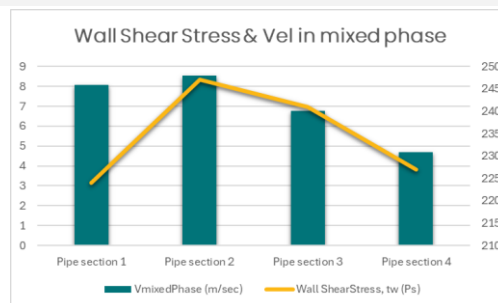
- Variations in the processing of heavy, high sulphur and high TAN crude slates resulted in a high vacuum gas oil (HVGO) TAN of 1.5 mgKOH/g and a sulphur content of 3.0wt%
- HVGO circuit was a mixture of non-corrosion resistant alloys, i.e., 5%Cr and 9%Cr sections with a syphon upstream of the extraction pump
- Measured corrosion rates were as high as 40MPY (~1.0mm/y) when processing high TAN and S crude slates
- Mitigating corrosion without negative impact on hydrocracker catalysts due to the presence of P in the chemical additive and the hydrocracker HVGO feed

SOLUTION

- The [SMARTGUARD™ high-temperature corrosion control program](#) was utilized for its wide repertoire of tools and technical support resources, including:
 - Risk assessment with detailed flow regime simulations
 - Shear stress calculation on specific sections of the HVGO pipeline
- Solution incorporated a chemical with only ~2.3% of phosphorous in horizontally-oriented molecule for less P content at the same ratio of protection
- Chemical dose rates were optimized in conjunction with operational changes to successfully reduce corrosion rates



UT thickness measurement shows flat trend after chemical dosage optimization.



Shear stress calculations

RESULTS

<3 mil/yr

Corrosion rate based on ultrasonic thickness (UT) measurements in +6 points across HVGO line

Eliminated

Negative effects downstream due to P-based chemicals

Zero

Unscheduled shutdowns or metallurgical upgrades for significant savings

“TAN and sulfur are slightly lower in the final period, but not enough to justify the decrease in corrosion rate without the effect of the additive.”

– Irene P.
Customer Technical Advisor