SMARTGUARD high-temperature corrosion control program

Safely process sour and acidic crudes with confidence, improving refinery profitability

Refiners often consider increasing the amount of sour or high total acid number (TAN) crude processed to improve the refinery’s profitability. Typically, as sulfur levels increase, the risk of sulfur corrosion on low chrome steels increases within the crude unit. And, as crude oil TAN levels are increased, the risk profile for high-temperature naphthenic acid corrosion increases within the crude unit. Higher amounts of naphthenic acids can lead to higher rates of corrosion in the desalted crude oil, diesel, gas oil, and bottoms circuits—negatively impacting unit reliability and performance.

The SMARTGUARD™ high-temperature corrosion control program, from Baker Hughes, a GE company (BHGE), addresses the constraints you face in processing sour or high TAN crudes to deliver the right assessment, tailored additives, and real-time monitoring to increase your crude sulfur or TAN levels and ultimately improve your operating margins.

The SMARTGUARD program uses a combination of corrosion inhibitors, detailed unit surveys, and monitoring techniques to reduce the impacts of high-temperature corrosion on your refinery operations. This multidisciplinary program provides effective management of every element in your corrosion control endeavors including:

- Equipment impact assessments to identify high-risk areas for corrosion and damage
- Mitigation strategy development to provide the proper combination of crude blending and corrosion inhibitor usage
- Monitoring program design and implementation to deliver real-time, non-intrusive corrosion measurements in high-risk areas

Applications

- Refinery crude distillation

Benefits

- Allows processing of higher TAN and sulfur crudes without upgrading equipment metallurgy
- Improves flexibility of crude oil selection
- Captures value of discounted crudes
- Improves unit safety and equipment reliability
- Minimizes iron deposits and downstream unit fouling
- Minimizes the negative impact of phosphorus on downstream units
Detailed assessments for targeted treatments

Our experienced corrosion experts systematically assess your operation to gain a clear understanding of your equipment, materials of construction and performance history, unit operating parameters, feedstock and distillate characteristics, and feedstock supply options. Once a complete risk assessment is made, BHGE can design engineering controls using processing limits, sampling and corrosion measurements, as well as inhibitor treatment, to manage corrosion mitigation and monitoring efforts appropriately.

One of the key features of our assessment is the measurement of specific carboxylic acid number (SCAN). Our proprietary test method directly measures the acid contribution from the naphthenic acids in a hydrocarbon stream, delivering a more accurate predictor of potential naphthenic acid corrosion than the standard TAN method. Based on the results of the comprehensive corrosion impact assessment, BHGE ensures that the correct amount of inhibitor is delivered safely and effectively to all susceptible areas of the unit.

Thorough monitoring for effective control

BHGE recommends using a variety of real-time corrosion monitoring technologies. Real-time measurements allow for rapid responses to process changes and optimized corrosion mitigation efforts.

After assessing current corrosion monitoring practices, BHGE can deliver tailored SMARTGUARD program monitoring protocols that will:

- Assess the effectiveness of the implemented corrosion control measures
- Adjust additive dosage rates, if necessary
- Establish limits for crude blends and operating conditions
- Provide an early warning of problems or upsets

Using this monitoring framework, BHGE will heighten the awareness of the corrosion dynamics and provide you with the confidence to push crude acidity and processing parameters to their limits.

Improved refinery operations for better margins

Our SMARTGUARD program has consistently helped refiners reduce feedstock costs and improve operating margins. The ability to process higher sulfur and TAN blends that would not have typically factored into your refining operations opens up a broader profit opportunity.

Contact your BHGE representative today to find out how our SMARTGUARD program can provide flexibility in your feedstock selection, safely reduce your sour and acidic crude oil processing risks, and increase overall refinery profitability.