Systematic Application of KI-3878 Corrosion Inhibitor Mitigates Corrosion in Flowline and Production String

Fieldwide application reduces line breaks and associated cleanup costs, central Alberta

Mitigating long-term corrosion issues
An oil and gas producer in central Alberta, Canada, was concerned about continuous corrosion control throughout the production field. Long-term issues with corrosion and asset integrity from high water production percentages and high acid gas concentrations elevated concerns about potential flowline and production string failures.

M-I SWACO, a Schlumberger company, worked with the production company’s integrity management team to create a sound mitigation strategy that would address corrosion issues in the field. The M-I SWACO team performed a thorough system survey and outlined fluid parameters required for laboratory testing, including acid gas concentrations, produced water analyses, and flow regimes. Field production parameters were 1.0–2.0% of H₂S, 0.5–6.0% of CO₂, 117,000 mg/L of Cl⁻, at least 90% average water cut, and a laminar flow regime.

Applying KI-3878 corrosion inhibitor
Working with the operator’s production team, M-I SWACO created a mitigation strategy for continuous application of KI-3878 corrosion inhibitor and a comprehensive service protocol that included evaluation of laboratory results and monitoring. A corrosion inhibitor evaluation performed by an independent third party confirmed excellent corrosion mitigation with the KI-3878 corrosion inhibitor.

The customer’s asset management team ranked major group flowlines into high-, medium-, and low-risk lines. Based on lessons learned from previous failures caused by underdeposit corrosion, pigging was optimized to improve line cleaning and enhance corrosion control. The high-risk lines were monitored using electrical resistance probes, iron and manganese values, and KI-3878 inhibitor residuals.

Expanding for fieldwide application
The operations staff, asset management team, and local M-I SWACO technical and sales representatives held monthly corrosion mitigation meetings. Discussions covered laboratory and corrosion results along with field difficulties. As the oil production staff’s confidence in the results increased, the mitigation program was expanded to the entire field. Significant savings stemmed from the achieved reduction in line breaks and subsequent cleanups.

CHALLENGE
Prevent corrosion in flowline and production string caused by long-term high water production and corrosion.

SOLUTION
Systematically deploy KI-3878* corrosion inhibitor across the entire field.

RESULTS
Saved significant costs by reducing line breaks and required cleanup.