Cetus EliteSyn™ NG Compressor Oil Protects Against Corrosion

Chevron North America Exploration Production Company, Midland, Texas

Oil life maximized, metal corrosion and oil loss minimized in LeROI® HG12000 non-geared, single stage, oil-flooded rotary screw compressor.

The Situation

Chevron's Mid-Continent Business Unit manages crude oil and natural gas production in the Permian Basin in west Texas. It recovers an average of 130 million standard cubic feet (SCF) of crude oil and natural gas per day. The operations team maintains the drilling and production equipment, such as rotary screw compressors, which are critical to the production process. The recovered gas contains a mixture of heavy hydrocarbons and is identified as being "wet" gas. The recovery process uses rotary screw compressors that operate between 230°F and 260°F to prevent large amounts of the heavy hydrocarbons from dissolving into the oil phase.

Chevron's Mid-Continent Business Unit runs a LeROI HG12000 non-geared, single stage, oil-flooded rotary screw compressor that is direct-coupled to an electric motor. This compressor is capable of processing high volumes of natural gas in recovery operations up to 350 psi.

Maintenance operators noticed that during a routine maintenance to replace oil separator elements (approximately every 2,000 hours) that the element displayed an accumulation of a dark residue on the outside surface.

Chevron's Product Development team was contacted and asked to visit the site to help with identifying deposits which were collecting on the oil separator elements. The Product Development team took the used oil separator elements back to the Chevron Research Center in Richmond, California and performed laboratory tests. After analyzing the data from various tests, the team concluded that the dark residue on the elements contained a high degree of iron, sulfur and zinc. The deposits were the result of corroded ferrous (iron-containing) material in the compressor system caused by a reaction of hydrogen sulfide or other sulfur species in the gas stream. It was concluded that the corrosion inhibitor properties of the current competitive compressor oil were not effective at protecting the system's metal surfaces.

A field test was conducted using four compressors. All four oil separator elements were replaced with new elements. The fluid was drained from all four compressors and an oil flushing procedure was enacted to remove contaminants and any residual compressor oil from the systems. Two of the compressors were filled with Chevron Cetus EliteSyn NG, a polyalkylene glycol (PAG) compressor oil and the remaining two compressors were filled with the current competitive PAG compressor oil.

Gardner-Denver did not participate in, nor do they endorse any activity or results described in this testimonial. Always follow OEM recommendations.

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Oil Evaporation and Make-Up Oil

During the six-month field trial period, compressor oil was added to each compressor due to evaporative loss. The two compressors operating with Cetus EliteSyn NG required seven gallons of additional oil while the two compressors filled with the competitive compressor oil required twice as much—fourteen gallons of make-up oil!

Current Compressor Fluid Oil Separator Element

Chevron Cetus EliteSyn NG Oil Separator Element

Photos courtesy Chevron

Chevron Cetus EliteSyn NG Compressor Oil

- Provides excellent equipment protection
- Provides thermal stability

The Solution

After the six-month field trial, the oil separator elements were removed and replaced. The two elements from the compressors filled with Cetus EliteSyn NG showed no visible deposits while the elements from the oil separators filled with the current compressor fluid contained deposits. When the Product Development team presented the six-month field test data to the maintenance team, they made the decision to stop using their current compressor fluid and switch to Cetus EliteSyn NG.

> "Chevron's Cetus EliteSyn NG outperformed our current product and went above and beyond our expectations. The compressors are critical pieces of equipment in maintaining our license to operate. If a single unit were to fail and emissions were exceeded, it could result in a very large fine, costing $100,000 or more."
>
> *Chris LeBlanc, Rotating Equipment Engineer*

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