

Case study: Great Plains, United States

# SULFIX SX9252 H<sub>2</sub>S scavenger enabled refinery so<sub>x</sub> compliance, avoided multimillion-dollar amine unit investment

Sulfur oxides (SO<sub>x</sub>) are emitted when refineries send H<sub>2</sub>S-laden gases to the flare. The US Environmental Protection Agency (EPA), through regulation subpart J, mandates that SO<sub>x</sub> emissions be less than 162 ppm.

In order to comply with this regulation, a refiner contacted Baker Hughes on-site sales personnel and requested a solution to confirm the flaring emissions stayed in compliance. Our on-site Downstream Chemicals team has a proven track record of finding and implementing chemical solutions for the operational needs of the refiner.

While H<sub>2</sub>S can be removed from flare lines with the use of amine units, this requires a multimillion-dollar equipment investment. To avoid this high cost, the refiner decided on a direct injection approach using SULFIX™ H<sub>2</sub>S scavengers, a more cost-effective solution.

The Baker Hughes team began by thoroughly inspecting the flare system to determine the ideal injection points and equipment requirements, then worked closely with refinery personnel to determine the H<sub>2</sub>S levels, gas-flow rates, and the amount of H<sub>2</sub>S scavenger that would be needed to certify compliance. The team determined that a direct injection setup using steam, at multiple locations on the flare line, with the SULFIX™ SX9252 H<sub>2</sub>S scavenger would be the ideal solution.

Through direct injection via steam, the SULFIX™ SX9252 scavenger program helped to reduce the H<sub>2</sub>S in the flare line from approximately 2,000 ppm to less than 150 ppm over a period of several months. The program is continually monitored by the Baker Hughes team to confirm the H<sub>2</sub>S levels remain low and in compliance with EPA SO<sub>x</sub> emissions regulations.

## Challenges

- Design a robust H<sub>2</sub>S scavenger program to rapidly adjust to fluctuating operating conditions and maintain regulatory compliance
- Variable H<sub>2</sub>S load in the flare line, with concentrations exceeding 2,000 ppm and flow rates surpassing 1 MMSCFD

## Results

- Multiple SULFIX™ SX9252 scavenger injection sites accurately addressed the fluctuating H<sub>2</sub>S concentrations in the flare-gas line, avoiding a multimillion dollar investment in amine units
- H<sub>2</sub>S concentrations reduced from approximately 2,000 ppm to less than 150 ppm, enabling the refiner to meet US EPA requirements

