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Thermal Maintenance Solutions

Valero Refinery Replaces All Seal Legs with S_xSeal 2000s

The S_xSeal™ 2000's unique design and proprietary internal sealing mechanism ensure sealing integrity at the Valero Jean Gaulin Refinery. The outcome is issue-free sulfur sealing performance in an above-ground design that is simple to install, operate, and maintain.

Client Challenge

All SRUs require some means of sealing the sulfur rundown lines between condensers and temporary storage. The purpose of a sulfur sealing device is to prevent process vapor (with remaining H_2S and SO_2) from escaping with liquid sulfur. Refineries and gas plants have two options for achieving a vapor seal in sulfur rundown lines. One option is the in-ground device, commonly referred to as a seal leg. The other option is an above-ground sealing device, often called a sulfur trap or sulfur seal, which uses a float-trap design to seal an orifice.

Historically, Valero's Jean Gaulin Refinery had used seal legs in all six sulfur rundown lines. However, when issues occurred, the SRU had to be shut down for maintenance on the seal legs, which required removing the seal legs from the ground in order to repair them. In fact, the refinery had planned to replace all six seal legs as part of a scheduled turnaround, when an unexpected challenge arose. One seal leg was stuck in the ground as a result of corrosion and solidified sulfur between the sleeve and the seal leg, according to project manager Christian Lessard. At the recommendation of Valero's Director of SRU Gas Treating Best Practices, the Jean Gaulin Refinery engaged CSI to provide a reliable above-ground sulfur sealing solution to replace its seal legs.

CSI Solution

Within three business days, CSI Applications Engineer Bruce Thacker arrived at the Jean Gaulin Refinery to discuss Valero's challenge, and to recommend options that would meet the refinery's technical specifications, timing, and budget. With only a few months before the planned

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Jean Gaulin Refinery's S_xSeal™ 2000 sulfur sealing devices, shown in production at CSI

Solution Overview

Client Profile

Valero's Jean Gaulin Refinery is located on a 370-acre site south of Quebec City in Quebec, Canada. The refinery relies on imported crude oil for feedstock, and has a refining capacity of up to 265,000 BPD.

Business Objective

To provide a more reliable above-ground sulfur sealing solution without the performance and service issues of seal legs, within the tight timing of a refinery-wide turnaround

Solution

Benefits of S_xSeal™ 2000:

- Safe, reliable sealing performance
- Above-ground design for drop-in installation & easy maintenance
- Safe, visual confirmation of operating status
- Supplemental pressure relief

CSI Products & Services:

- S_xSeal™ 2000 sulfur sealing device
- ControTrace® steam tracing
- ControHeat® valve jacketing
- ControCover custom-fit, removable insulation
- Installation/commissioning support services

CSI Solution (cont.)

shutdown, four critical project objectives were clear:

1. Meet refinery specifications and safety expectations
2. Deliver an above-ground solution that could be implemented within the established shutdown & start-up dates
3. Minimize site work during shutdown by:
    - Maintaining the existing seal leg inlet and outlet offset
    - Eliminating/minimizing the need to replace existing piping
    - Leaving decommissioned seal legs in place
4. Provide rod-outs for cleaning all condenser valves & piping

One of six S_xSeal™ 2000 units operating successfully at Valero's Jean Gaulin Refinery near Quebec City, Quebec

By implementing CSI's S_xSeal™ 2000 units, the Jean Gaulin Refinery achieved all four project objectives, and more. CSI was able to meet the established shutdown/start-up schedule because the S_xSeal™ 2000 is designed for drop-in installation. CSI adapted the connecting piping in order to minimize the site work during the turnaround, and to provide the rod-outs that were specified. In addition, CSI designed these standard S_xSeal™ 2000 units for a wide range of sulfur flow rates and differential pressures—giving the refinery the flexibility to increase capacity in the future without having to upgrade their sulfur seals. Finally, CSI exceeded safety expectations, since all S_xSeal™ 2000 models are equipped with sight glasses that provide safe, visual confirmation of operating status. These sight glasses eliminate the need for the look boxes operators had used with the original seal legs.

Valero's Jean Gaulin Refinery now has a reliable above-ground sulfur sealing solution that meets all refinery specifications, without any of the performance or service issues experienced with the previous seal legs. After the S_xSeal™ 2000 units had been in operation for a month, the refinery's project manager, Christian Lessard, expressed Valero's complete "satisfaction with the excellent performance" delivered by CSI.

SxSeal™

"The S_xSeal™ 2000 sulfur trap was the best option to meet our goals. We were convinced that it was the best product to meet our specifications, timing, and budget."

CSI "efficiently managed every project detail. CSI's sales, technical, engineering, and procurement groups did an outstanding job from the beginning to the start-up of the sulfur traps."

Christian Lessard,
Project Manager
Valero Jean Gaulin Refinery

CSI

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