



Above: One of 800 railcars operated by Solvay Eco Services for the transport of its highly caustic sulfuric acid.

Right: A closeup of a Solvay railcar valve before a scheduled inspection. If deemed necessary, the valve will be removed from service and sent to Midland Manufacturing for remanufacture.

Passing The Acid Test

Solvay Eco Services business unit finds the sweet spot for railcar valve safety and reliability when transporting sulfuric acid through the use of Midland's Valve Remanufacturing Program

It's a fact of life in chemical manufacturing that a number of hazardous commodities will need to be safely handled along the production and supply chain. Fully aware of the potential risks, chemical manufacturers are extremely vigilant and take great pains to ensure that only the safest, most reliable equipment is placed on the railcars that are used to transport all classes of hazardous chemicals.

Sulfuric acid (H_2SO_4) is a highly corrosive acid that is indispensable to a number of industries, including agricultural, automotive, manufacturing, mining, paper, oil refinery and water treatment, that use it as a commodity chemical in a number of different industrial production processes. In the United States, the Belgian chemical company Solvay, one of the world's largest, through its Cranbury, NJ-based Eco Services business unit, is one of the most prominent producers, suppliers and transporters of sulfuric acid in North America.

As such, it operates six sulfuric acid production plants—one in Hammond, IN, three on the Gulf Coast (Baytown and Houston, TX, and Baton Rouge, LA) and two on the West Coast (Martinez and Dominguez, CA)—from which it transports the sulfuric acid to its industrial customer base

via a fleet of 800 railcars. In addition, Solvay Eco Services is the nation's largest regenerator of sulfuric acid.

"Half of our sulfuric acid volume goes out and is consumed like any other commodity, and after the customer uses it, an empty railcar is sent back to us," explained Nick Bizzarro, Rail Fleet Manager for the Solvay Eco Services unit. "We're also the leader in the regeneration process. We'll send high-strength sulfuric acid to customers who use it as a catalyst and when they are done they send us back the 'used' sulfuric

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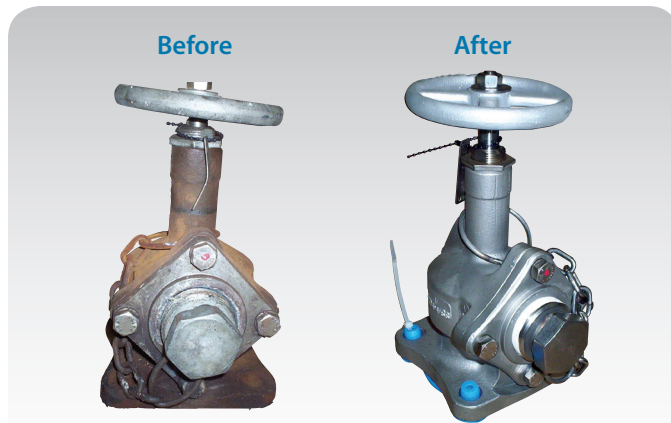
Company: Solvay Eco Services

Location: Cranbury, NJ, USA

Market: Chemicals (sulfuric acids)

Challenge: Develop a cost-effective and measurable maintenance program for Pressure Relief Valves (PRVs) on railcars that carry sulfuric acids

Solutions: Midland's Valve Remanufacturing Program provided performance data on used valves to help establish a 5-year valve-maintenance and requalification cycle that is ideal for Solvay and ensures the safest handling of sulfuric acids



A railcar angle valve shown before and after Midland's extensive remanufacturing process. The valve has been returned to OEM standards at a fraction of the cost of a brand-new valve.

acid which then contains organics. That used sulfuric acid is regenerated, meaning we reburn it, build it back up to strength, remove any impurities, and then it's ready to be used as a catalyst again."

The breadth of its operation means that Solvay Eco Services has a large amount of sulfuric acid riding the nation's rails at any one time, which dictates that the railcars that are used to transport the commodity must offer the highest level of safety and protection against a catastrophic accident, spill or release.

Though Solvay leases all but 19 of the 800 railcars that are used to transport its sulfuric acid, since 1998 the company has mandated that, when possible, pressure relief valves (PRV) from Midland Manufacturing, Skokie, IL, be used on any railcars that it leases.

"All of our railcars are equipped with safety (PRV) valves, and 85% are equipped with Midland valves," said Bizzarro. "Ninety-five percent of our tank cars have been built within the past 10 or 11 years and we designed them with full stainless-steel pressure plates, stainless-steel nozzles, stainless-steel manways, and full domes with lids equipped with safety valves. The railcar owners let us execute the valve changeovers ourselves and we just send them an invoice after the work is completed."

Data Mining Through Remanufacturing

Solvay had been working off the premise that the PRVs on its railcars should be inspected and requalified every three years, which is quite an expense and can also keep a large portion of the rolling stock in the shop for maintenance at one time. However, in 2010 Solvay began using Midland's Valve Remanufacturing Program, in which customers can send valves that have been in the field back to Midland for testing, inspection and cleaning before they are remanufactured to OEM standards and returned to the owner with a new manufacturer's warranty.

One of the program's ancillary benefits is that anytime a valve is sent in to be remanufactured, comprehensive performance data is collected, which allows Midland to compare the valve's performance to industry standards and let end-users make informed decisions regarding maintenance and compliance intervals.

Improved Operational Efficiency

"We went to Midland in 2010 and asked if we pulled the valves and sent them back to them if they could not only requalify them, but also study them and let us know if three years was too long or too short an interval between inspections," said Bizzarro. "That's where our relationship with Midland as a fact-gatherer began. Since then, we've sent about 150 valves to Midland to rebuild and collect data. To date, Midland's findings are that the interval for the valves can be extended to five years or more, so we have chosen to go to a five-year interval, which is a big savings for us."

Now, Solvay's fleet of sulfuric acid railcars not only benefits from using Midland's industry-leading PRV technology, but also takes advantage of Midland's ability to identify and implement a valve-maintenance and requalification cycle that is both ideal for Solvay as a transporter of sulfuric acid and as a way to ensure the safest handling of a highly hazardous commodity.

"I'm confident that the Midland folks will do the best they can to make sure our valves meet our 'absolute reliability' standards for safety when handling sulfuric acid," said Bizzarro. "To have the valve manufacturer gather the data and validate the data at a single location is a huge benefit. To date, it's worked like a charm."