CASE STUDY:
Sub-Bituminous Coal
TIVAR® 88 High Performance Lining Solution

THE CASE IN BRIEF
Application: Wet Scrubber System Modules
Quantity: 24
Liner: TIVAR® 88-2, 1/4" Thick
Bulk Material: Sub-Bituminous Coal (PRB)
Substrate: 10 Gauge Stainless Steel
Problem: Wear, Abrasion, Cost
Date Installed: 1999 - 2000

TIVAR® 88-2 LINERS ELIMINATE FLYASH BUILD-UP IN WET PRECIPITATOR SYSTEM

Background: the Xcel Energy (formerly Northern States Power) Sherco Plant, located in Becker, Minn., is a coal-fired facility that burns a low-sulfur, sub-bituminous coal from Wyoming and Montana. This plant, Xcel's largest, was the site were the wet precipitator process within a scrubber system was pioneered - a process that removes more particles and SO_2 from flue gases. The stack opacity went down to 10% from the original 30% as a result of the installation of the wet precipitator. This system was possible because of the calcium content in the PRB coal; it was high enough to neutralize the sulfur dioxide when mixed with the water spray. The Sherco plant is rated at 2,425 MW.

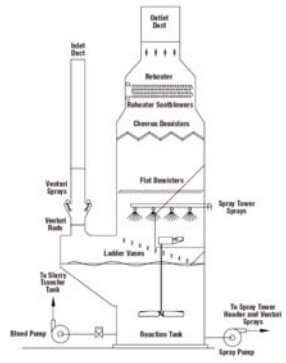

Fig. 1: Original NSP Sherco scrubber module configuration.

Problem: The original scrubber module (Fig. 1) for Units 1 & 2 was retrofitted with the wet precipitator system to further reduce the emissions of particles and SO_2 (Fig. 2). However, the 10 gauge stainless steel sloping surface above the venturi rods and the crossover duct slope under the venturi rods could not withstand the abrasive conditions of the spray, so maintenance personnel were frequently called upon to patch holes. Eventually, they had to line the area, trying first a polyurethane that was successful, but expensive. When it, too, needed to be replaced, plant staff determined they would look for a material with which they were familiar and one that was not only abrasion- and wear-resistant, but also cost-effective.

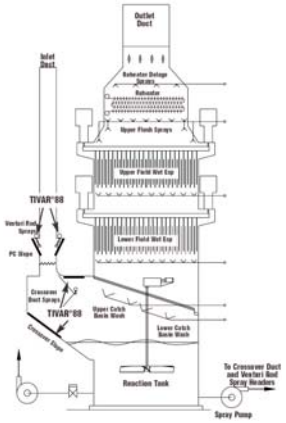

Fig. 2: Retrofitted System - 101 Module West Esp Flush Water P&ID

Solution: Having a familiarity with Quadrant Engineering Plastic Products and its TIVAR® 88 material from applications at other Xcel plants, TIVAR® 88-2 liners were installed. Chosen for its key abrasion- and wear-resistance properties, TIVAR® 88-2 was lower in cost compared to other liners options. Additional benefits included no flyash build-up due to TIVAR® 88-2's low coefficient of friction and the fact that TIVAR® 88-2 was easy to fabricate.

Results: The TIVAR® 88-2 liners are performing exceptionally well according to senior system engineers at Xcel. Maintenance costs and downtime have been reduced while maintaining the 10% stack opacity.

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