



NEUNDORFER
PARTICULATE KNOWLEDGE

Case History Success Story

Optimizing SO₃ Systems in Multiple-Unit Plants

The Duke Energy W.C. Beckjord Power Plant, located in New Richmond, Ohio approximately 20 miles east of Cincinnati, is an 862-megawatt rated utility power plant with six coal-fired units each equipped with electrostatic precipitator systems. The first four units each have a Wahlco molten-sulfur flue-gas conditioning system to provide SO₃ conditioning for proper precipitator operation. Neundorfer, Inc. assisted with the installation of SO₃ flue gas conditioning systems on the two remaining units—one new SO₃ system from Neundorfer for Unit 6 and a refurbished system from another plant for Unit 5.

Initially, Units 2 and 3 shared an SO₃ system, but the plant could never seem to attain the proper SO₃ levels necessary for acceptable stack emission levels. So the company added a new SO₃ system from Neundorfer specifically for Unit 3 and dedicated the old system to Unit 2. “Even just by separating the two units, performance improved for both,” said plant engineer Alan Burck.

Still, Burck pointed out that with frequent and dramatic changes in fuel, the units could not keep up with SO₃ conditioning at needed levels. The plant obtains its fuel from a wide variety of sources, so there was constant variation in the characteristics and performance of the fuel. “The system required an ongoing, dynamic solution,” said Burck. “We didn’t have the resources to continuously monitor and adjust precipitator conditions—it was essentially a full-time job.” The plant’s operators were making reactive, manual adjustments to SO₃ levels about every four hours, or whenever a problem occurred. By the time the system responded to these changes, additional adjustments were required and the cycle continued endlessly.

Duke Energy turned to Neundorfer, Inc. for assistance. Neundorfer recommended their patented SO₃ Optimization software which identifies the level of ash resistivity that produces the lowest stack opacity and dynamically adjusts the SO₃ injection rate using precipitator electrical data and stack opacity as key inputs. The module continuously monitors precipitator conditions, detecting changes in precipitator electrical and emissions data, and makes ongoing adjustments in the SO₃ injection rate as needed to maintain optimal resistivity and desired emission levels.

As a result of implementing this proactive SO₃ optimization software module (which can be used with any SO₃ system), the plant has experienced significant performance improvements across all four units, including reduced emissions, load reductions and less sulfur consumption. Burck says, “The greatest benefit is that we can now prevent emissions from ever exceeding established opacity limits, and it does not require our round-the-clock attention.”



NEUNDORFER
PARTICULATE KNOWLEDGE

4590 Hamann Parkway
Willoughby, OH 44094
(440) 942-8990
Fax: (440) 942-6824
www.neundorfer.com