

MAJOR ELECTRIC UTILITY SOLVES DRY SORBENT INJECTION (DSI) MATERIAL FLOW PROBLEM

A major electric utility's coal-fired plant in the Midwest needed to meet Federal emissions standards while keeping power output maximized. This 2600 MW plant contained a pair of the largest coal-fired generators in the U.S. To meet Federal emission standards, the plant installed a **Dry Sorbent Injection (DSI)** system designed to mitigate hydrogen chloride (HCl) and sulfur dioxide (SO₂) flue gas emissions.

THE PROBLEM

DSI technology relies on bulk solid materials that exhibit poor flow properties, such as **Hydrated Lime, Trona, Soda Ash and Sodium Bicarbonate**. At this generating station, the process feeding the powdered material to the DSI system consisted of a 5-foot diameter mixer connected to three legs of parallel screw conveyors. Materials were dropped three stories via an array of rotary valves, screw conveyors and hoppers, then to a final dilute-phase pneumatic conveyor that supplies the DSI system. There were a total of two of these DSI systems (one per each 1300 MW generator), so the opportunities for flow problems were doubled, given the amount of twists, turns, and distance the powder needs to reliably travel in order to keep the system running properly. The company faced significant penalties and fines of millions of dollars if emissions from the plant were not up to compliance standards.

THE SOLUTION

The utility contacted Control Concepts, Inc., manufacturer of the AirSweep® Material Activation System. The AirSweep system has become the default flow aid choice among many manufacturers of proprietary DSI systems, as well as among some of the major manufacturers of DSI materials used in those systems. These



VA-51 AirSweep mounted on screw conveyor trough

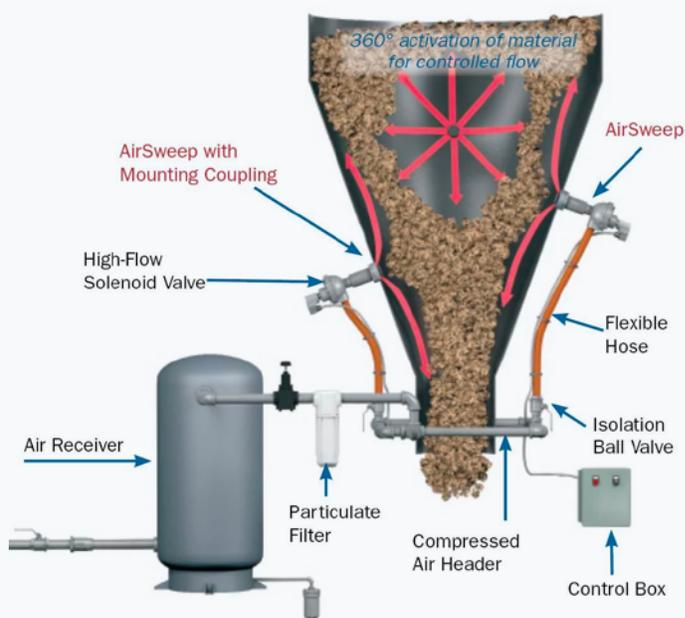
manufacturers know that the AirSweep system can provide on-demand flow of a wide variety of DSI materials, including Hydrated Lime, Trona, Soda Ash, Calcium Carbonate, Sodium Bicarbonate and others. Each AirSweep nozzle delivers a powerful pulse of air or inert gas, knifing between the material and the inner contact surface of the vessel, chute, duct, etc., to break friction and immediately restore flow. Control Concept's key Midwest distributor worked closely with the utility and the generating plant's personnel to design an effective system. An AirSweep system was installed consisting of [Model VA-51](#) nozzles mounted on the vessels, and [Model VA-06](#) nozzles mounted in the numerous possible chokepoints in the ducts, screws and elbows. All nozzles installed were constructed from 316 Stainless Steel to resist corrosion. Local controllers were provided, tying into the plant's DSL system to start and stop the system depending upon the need for DSI material.

RESULTS

The generating plant has been **running continuously and at capacity** since autumn of 2015, with no compliance issues, thanks to the DSI system and assistance from the Airsweep Material Activation System.

HOW AIRSWEEP WORKS

1. Each AirSweep® nozzle disperses a powerful burst of high-pressure, high volume air or inert gas in 250 millisecond bursts.
2. The quick pulse sends a shock wave along the inner vessel wall, lifting and activating stalled material and breaking the friction bond between the material and vessel wall.
3. The system is pulsed in a pre-set sequence when material is to be discharged from the bin.
4. A typical system will consist of 3 or 4 AirSweep® nozzles, high-flow solenoid valves, sequence timer/controller, air filter, regulator, air receiver, flex hoses and ball valves.



MORE INFORMATION

[AirSweep Model VA-51 webpage](#)

[AirSweep Model VA-51 Product Sheet \(PDF\)](#)

[AirSweep Material Flow Test – Hydrated Lime \(video\)](#)



Control Concepts, Inc. provides a 7-year warranty on the AirSweep® unit.

AIRSWEEP IS USED IN COMPANIES SUCH AS



AIRSWEEP® IS USED BY MORE THAN HALF OF S&P 500 COMPANIES

Contact us for a custom engineered AirSweep solution

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