



# PROBLEM SOLVED™ PAPER

**SOLUTION:** Martin® Air Cannons

**INDUSTRY:** Steel

**LOCATION:** U.S. Steel Corporation, Gary, Indiana  
(Contract Operator: Constellation Operating Services)



*At the US Steel PCI operation, a group of six air cannons was installed on each of the three feed hoppers below the railcar dump.*



*The air cannons are installed to discharge down each hopper's valley angles to clear material from the vessel.*

## PROBLEM

To keep up with the steel mill's around the clock, seven days-per-week schedule, the railcar dump must provide 3000 tons of coal per day, every day. Coal-handling Supervisor Joe Kasper explains, "Our goal is to send about 500 tons per hour—the contents of five rail cars—into the mill. That way we can fill the mill's day bin in one eight-hour shift."

But the operation was at the mercy of the handling properties of the coal. Coal with higher moisture content, material density or size ranges would hang up on the walls of the receiving bin below the car dumper. This slowed the feed rate of material out of the bins and onto the belt and thereby slowed the rate railcars could be moved through the car dump.

"With the out-of-spec' material, we couldn't run more than 275 to 300 tons per hour," Kasper said. "This slow flow would add up to 25 to 30 extra hours of overtime per week," and reduce the profitability of Constellation Operating Services.

## SOLUTION

Following Martin Engineering's recommendation, six Martin® Air Cannons were installed on each of the three feeder bins.

Although equipped with a manual firing button, the air cannons were connected to the operation's PLC control system, to fire automatically. The cannons discharge on a 300-second cycle, where one cannon on each vessel fires every five minutes during coal-feeding operations. The cycle moves through the vessel until all cannons have fired and then repeats.

## RESULTS

Joe Kasper is very pleased with the results of the installation of the Martin® Air Cannons. "With the air cannons installed, we can run even the out-of-spec' coal through our system at 450 to 500 tons per hour. That makes it easier on our operating personnel; we don't have to put in the overtime and that improves our profitability."

"From the coal-handling operator's perspective, the Martin® Air Cannons have made our lives easier. We love those things."

*Martin® XHV Air Cannon Valve is protected by U.S. Patent No. 5,853,160.*

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