



PROBLEM SOLVED™ PAPER

SOLUTION: Martin® BB4 / Master Blaster Air Cannon

INDUSTRY: Iron ore

LOCATION: Harsco's Customer JSW Steel Limited, Bellary, Karnataka, India



HARSCO India pvt. Ltd. has secured a O&M contract at the JSW steel plant, Bellary



The Martin® BB4 / Master Blaster Air Cannon attaches to a straight pipe assembly extending into the vessel.



Located around the hopper at the discharge chute, the cannons dislodge accumulating cargo and aid flow.

PROBLEM

Harsco's Customer JSW steel plant in South Central India was experiencing serious clogging issues on a hopper chute leading to the main bulk conveying system. Conveying 1680 mt/d (1850 st/d) of raw iron ore, fines would collect on the walls, quickly build up, then rathole and eventually block the chute completely. The 24 hour operation would require 3 or more hours per day of downtime for clearing of the material. Workers would be pulled from other duties to use mallets to hit the side of the chute to create enough vibration to loosen clogged material, at some points poking at it from above or below. The result was a labor intensive and expensive problem that damaged equipment and posed a hazard to workers due to the sudden release of material.

SOLUTION

Operators invited Martin Engineering India into the plant to examine the problem and offer solutions. After performing a thorough evaluation, technicians decided to install four 70-liter (18.5 gallon) Martin® BB4 / Master Blaster Air Cannon. Placed on the lower decline of the cone-shaped chute at a 30° downward angle and connected to the plant's existing compressed air system, the units fire a blast of air at up to 120 PSI (8.27 BAR) from a pressurized tank. With an effective area of up to 22.6 ft³ (640 L), the air blast mitigates material buildup across the face of the vessel. Even with the powerful discharge, the air cannon works quietly dislodging both wet and tacky material while promoting proper cargo flow.

RESULT

After 6 months of operation, workers close to the project report that there have been no shutdowns due to clogging issues, either on the slope or the narrow discharge of the chute. Monitoring the return on investment, managers report that labor costs have reduced significantly and production flow has increased, further lowering the cost of operation. "We are very happy with the performance," said an operator. "We can fire on an automated schedule or manually if it's an especially humid day, which makes material stickier." Managers are now working with Martin Engineering India on installing a similar solution in other areas of the plant.