

Steel Mill Reduces Downtime, Improves Productivity Through Wireless Monitoring of Secondary Systems

RESULTS

- 5% productivity improvement, downtime reduced
- Eliminated coiling temperature rejects due to insufficient water flow
- Reduced downtime due to grease system failures
- Eliminated damage to roughing mill work rolls due to insufficient work roll coolant water
- Eliminated downtime due to back-up roll bearing failures



APPLICATION

- Run-out table cooling water flow
- Grease system pressure
- Work roll coolant pressure
- Back-up roll bearing lubrication temperature

CUSTOMER

Wheeling-Pittsburgh Steel Corporation, Mingo Junction, OH

CHALLENGE

Wheeling-Pittsburgh Steel Corporation is a progressive manufacturer and fabricator of selected metal products. When the Mingo Junction mill increased the product mix with a heavier and wider material, it required more run-out table cooling water to maintain the proper grain structure throughout the strip. Unfortunately, as the new product was being rolled the target coiling temperature could not be achieved. Manual valves used to scale the curtain flow to the proper setting for each product could not be confirmed with flow meters, since they were too expensive and difficult to install in this congested environment.

SOLUTION

When the run-out table was down, the customer installed four Rosemount 3051S Wireless Flowmeters, with Annubar® Primary Elements and one Smart Wireless Gateway. The measurements were easily integrated into the plant OSIsoft® PI System™ with a Modbus® interface through the gateway, where trending and reporting are done. "It only took two hours at the end of one day for a person to drill four holes and install the flow meters," said Gary Borham, Operations Manager, 80-inch Hot Strip Mill. "The next day, we installed the gateway, and had the whole system working. I got the flow numbers I needed within 24 hours of installing the devices. Wireless is fantastic." The flow information obtained from the wireless transmitters enabled Wheeling-Pittsburgh Steel to fine tune the sprays. Since then, coiling temperature rejects have been almost entirely eliminated.

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Gary Borham
Operations Manager
80" Hot Strip Finishing Mill

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SOLUTION (CONTINUED)

The ease of installation and cost of installing a wireless device compared to its wired counterpart has convinced Wheeling-Pittsburgh Steel to use wireless on many other monitoring applications. On the same run-out table a rash of roll failures prompted the customer to look at the grease system. The rolls which deliver the strip to the coilers can overheat, and any lack of lubrication can stop the roll which will cause strip surface defects. It was discovered that the grease system was malfunctioning and not adequately lubricating the roll bearings, creating downtime and impacting productivity. A Rosemount 3051S Wireless Pressure Transmitter was installed on the system and raises an alarm if the pressure drops or cannot be maintained, so preventative measures can be taken. This has eliminated downtime from rolls freezing up.

The mill was also experiencing work roll damage and subsequent downtime in the roughing mill due to coolant flow problems. The roll failure investigation uncovered a problem with a manual valve that was closing and dropping pressure and flow to rolls. Wireless pressure transmitters were installed on each roughing stand to insure a practice of maintaining constant flow and pressure of coolant to the work rolls. Since the adjustment and practices were put in place roll failures have disappeared.

The latest secondary system to benefit from wireless technology was the back-up roll bearings. Back-up roll bearing failures cause major downtime. The customer installed Rosemount 648 temperature transmitters in the drains to determine any increase in the inlet and outlet temperatures. If an increase is detected a small delay will occur to allow time to repair the problem. In the past bearing lock-ups would cause a lengthy delay in production while the back-up rolls were changed. Lengthy, unscheduled downtime has been replaced with short repair times, and costs due to equipment damage of the back-up rolls has been eliminated.

Borham concluded that wireless technology has allowed Wheeling-Pittsburgh Steel to gain process data almost effortlessly in areas where wiring would have been too costly. "We are building an infrastructure that opens up opportunities for more applications. The result is better information from difficult-to-reach areas of the mill, and this is helping our personnel prevent unscheduled downtime, meet customers' quality requirements, and optimize productivity."

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