



ARCELORMITTAL INCREASES RELIABILITY OF CRITICAL FURNACE COOLING CIRCUIT LEAK DETECTION WITH HIGH PERFORMANCE MAGNETIC FLOW METERS

Application

Blast Furnace Tuyere Cooling Water Leak Detection

Customer

ArcelorMittal plant located in Florange, France. ArcelorMittal is the world's leading integrated steel and mining company, with a presence in more than 60 countries

Challenge

Water is used to cool the tuyeres that inject air into the blast furnace. The flow of cooling water at the inlet and outlet of the cooling circuits is monitored to determine if there is a leak in the cooling circuit, which would show up as a difference between the two flows. The flow measurement must be as accurate as possible to quickly identify a leak, and reliable to prevent unnecessary alarms and shutdowns.

A leak in the cooling water circuit changes the dynamics of the cooling system, impacting the reaction in the furnace, and decreasing the performance and efficiency of the furnace. Moreover, if the leak is not detected in a timely manner and water is injected into the furnace, hydrogen is produced resulting in dangerous safety conditions and causing erosion in the furnace walls and roof that can be expensive and time consuming to repair.

ArcelorMittal was looking for a more accurate, reliable method to measure cooling water flow into and out of the furnace. The allowed difference between the input and output flow is 150 L/hr at a flow rate of 40 m³/hr, or approximately 0.375% of the cooling water flow. The measurement must be repeatable and reliable to prevent false alarms and nuisance furnace shutdowns, and the measurement devices should be self checking to insure they are working correctly.

Results

- Improved safety by identifying leaks before potentially hazardous conditions occur
- Increased furnace availability by reducing nuisance shutdowns
- Reduced maintenance costs and improved leak detection performance

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Besides the improved safety, the Emerson™ solution facilitated the start-up thanks to the seamless integration of the Rosemount™ 8700 Magmeter with Profibus PA protocol in our existing system.

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David Kraemer
Project manager

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Solution

ArcelorMittal solved this flow measurement challenge by installing Rosemount 8700 Magnetic Flow meters on 22 tuyeres to measure the cooling water inlet and outlet flows. The high accuracy configuration implemented delivered 0.15% accuracy, or over 2x the minimum accuracy required, and the superior reliability and advanced diagnostics of the 8700 Magmeter insured ongoing performance in this critical application.

After installation of the Rosemount Magnetic Flow meters, ArcelorMittal experienced faster and more reliable leak detection, enabling them to avoid critical safety issues and unnecessary shut downs. As a result, ArcelorMittal reports improved overall furnace performance.



Installed Rosemount 8700 Magnetic Flow Meters to measure the cooling water flow at ArcelorMittal furnace



Installed Rosemount 8700 Magnetic Flow Meters at ArcelorMittal

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