GE
Measurement & Control

CUSTOMER SUCCESS STORY

GE ULTRASONIC FLOW METERS MONITOR STEAM FLOW MEASUREMENT IN BOILERS AT ALCOA-SAN CIRPRIAN

A global leader in lightweight metals technology, engineering and manufacturing, Alcoa innovates multi-material solutions that advance the world. Its technologies enhance transportation, from automotive and commercial transport to air and space travel, and improve industrial and consumer electronics products. A pioneer in the aluminum industry for over 125 years, today Alcoa employs approximately 59,000 people in 30 countries to deliver value-add products made of titanium, nickel and aluminum, and produce best-in-class bauxite, alumina and primary aluminum products.

PROBLEM

Alcoa uses three steam boilers, operated in parallel, to provide the production units with steam to support the production process. In order to measure the steam flow, Alcoa initially installed flow nozzles, which is a type of flow measurement based on differential pressure methodology. Each flow nozzle provides a flow measurement that is used to control the load of a boiler. With three boilers, one may have a higher load (meaning more work) than the other boilers depending on the steam demand. The customer suspected that flow nozzles were measuring in excess because the yield of the system had been too high since installation, and the flow measurement was not sensitive to any process actions taken to reduce energy usage.

SOLUTION

Alcoa needed to improve the flow measurement to:

- Understand the current efficiency of the boilers to produce steam
- Measure improvements in boiler efficiency and control, based on process actions
- Control and improve steam quality

They ultimately decided to install GE's GS868 Ultrasonic Steam Flow Meter with FPTA buffers and BWT transducers in a flowcell. Now with the new meters in place to monitor steam flow measurement in boilers, Alcoa is able to get the actual yield of the steam production and monitor the impact of the flow measurements taken to improve steam production.

PAYBACK

After installing GE's GS868 Flow Meter, Alcoa confirmed that the flow nozzles were measuring flow rates 6-10% higher than the actual flow. Using the ultrasonic flow solution, Alcoa began to improve the yield of steam production and monitor the impact of improvements. With the use of the GE Ultrasonic Flow Meter, Alcoa reported a yield increase of 2-3.5% in steam production. With this 2.5% improvement in steam yield results, Alcoa realized a total yearly savings of over $220,000 for the three boilers:

- Annual steam generation: 110T/h*20h/day*300day/year=660kT/year
- Approximate steam cost: $4.5/T
- 2.5% yield improvement = 16,500T additional steam produced
- 16500T*$4.5/T= $74.25k per boiler per year.- $222k/y savings for three boilers

GE Oil & Gas – Measurement & Control

Chilled Water and Steam

DF868 Ultrasonic Liquid and MV80 Vortex Flow Meters

BENEFITS

GE's GS868 Ultrasonic Flow Steam Meters quickly detect any change or problem in the steam generation, either in quantity or quality. The ultrasonic technology provides accurate and repeatable flow measurements across a wide flow range of 1-200 T/h (high turndown), cause no pressure loss, have no moving parts, no drift and no maintenance. With pressure and temperature inputs, the GS868 also provides a direct mass flow measurement, which simplified Alcoa's overall system installation and wiring requirements, resulting in lower overall installation costs and on-going operating costs. Alcoa commented that the "repeatability and lack of drift over the years is amazing."

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