

AMS Suite Turns Losses into Gains in Brazil

RESULTS

- Saves \$72,000 US each time an unscheduled boiler shutdown is avoided
- Reduces process variability associated with bypass valve operation
- Prevents unnecessary internal boiler wear that occurs with unscheduled shutdowns
- Improves plant performance through online monitoring and tuning of digital valve positioners
- Increased operational safety



APPLICATION

An integrated asset management solution is based on Emerson's AMS Suite of predictive maintenance software, capable of accessing diagnostic data from smart HART instruments and digital valve controllers.

CUSTOMER

UTE Norte Fluminense is an important 780 MW natural gas power plant in Brazil that is wholly owned and operated by EDF, a major nuclear energy company with worldwide operations. UTE Norte Fluminense was built to deliver consistent electric power to the northern region of the state of Rio de Janeiro, including the metropolitan area of the city of Rio de Janeiro.

CHALLENGE

Most of the power for the State of Rio de Janeiro is provided by hydroelectric plants. Enough electricity to meet the demand can be generated only when reservoirs are full. As a result, voltage dips and power interruptions occur with disturbing frequency. The natural gas-fired UTE Norte Fluminense plant helps to eliminate the fluctuations and ensure a constant supply of electricity for more than two million people in the region.

However, the output of this plant suffered periodically due to unscheduled boiler shutdowns. This occurred automatically when excessive bypass valve variability caused the feedwater to one of the boilers to become dangerously low. The plant has five boilers – three serving the 500MW steam-driven turbine and two serving the 280MW gas turbine. The water level in each boiler is controlled by two bypass valves. If a boiler shutdown occurred due to low feedwater, the plant could not generate full power, resulting in lost revenue of approximately \$72,000 US before the boiler could be restarted. This happened five times over a two year period.

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“Using asset management associated with our intelligent field devices, we can obtain extremely important benefits for the company.”

Marcos Ribeiro da Silva,
Engineering Specialist,
UTE Norte Fluminense

SOLUTION

The UTE Norte Fluminense plant is equipped with Fisher FieldVue™ digital control valves and DVC6000 valve positioners with PD diagnostic level. This enables plant personnel using AMS Device Manager with the ValveLink™ SNAP-ON™ application to monitor valve performance and make online adjustments as necessary while the valve continues to operate.

Excessive bypass valve variability may be indicated by a “device alert” initiated by the AMS Device Manager or operating personnel may suspect a problem. Several diagnostic tests are available to obtain critically important information needed to identify the problem without shutting down a boiler. The step response tests measure the tuning of the DVC positioner, how quickly it responds, and how much overshoot occurs when the control system sends a new setpoint to the valve. This indicates variability, i.e. the failure of a valve to maintain a setpoint or slowness in responding to setpoint changes.

Prior to the use of the ValveLink SNAP-ON application, excessive variability could go unnoticed until the water level in a boiler got so low that boiler shutdown was activated automatically, causing a costly unscheduled shutdown. Now, when operating personnel receive a “device alert” warning, the valve can often be tuned online to alleviate the problem. In case of valve wear or damage, it can be repaired during a scheduled shutdown.



“Using AMS Suite asset management tools, we are able to identify bypass valve problems before they cause an expensive boiler shutdown.”

Marcos Ribeiro da Silva,
Engineering Specialist,
UTE Norte Fluminense

Type of Boiler	Energy Production (megawatts/h)	Number of Bypass valves have	Number of Boiler	Total value produced/h (US\$)	Total time taken to return the plan after shutdown (h)	Total impact if occur the unscheduled shutdown (US\$)
Gas	280	2	2	\$ 15,000.00	3h	\$ 45,000.00
Steam	500	2	3	\$ 27,000.00	1h	\$ 27,000.00
						\$ 72,000.00

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