GE Energy

CUSTOMER SUCCESS STORY

CONTROL SOLUTIONS

Power Generation – Coal Fired

ALABAMA POWER – WILSONVILLE, ALABAMA USA

"GE's Control Solutions team did a great job with the new rectifier installation. We had a short time frame to work with to prevent delays and the shop kept us updated daily on the progress of the work. We are very pleased with the results and performance of the new rectifiers to date." —Norman E. Smith, Alabama Power Gaston #5

EX2100 Generator Controls

PROBLEM

Alabama Power's E.C. Gaston Steam Plant is a coal-fired power facility located near Wilsonville, Alabama. Unit #5, a supercritical unit with a generating capacity of 884 megawatts, went into commercial operation in 1974. After 30-plus years of operation, its original GE Alterrex excitation system, which controls field current to the generator, was showing its age. Although water cooling designs have proven to be advantageous over air cooling ones in Alabama's climate, the complexity and age of the vintage water-carrying components in the diode bridges were becoming a maintenance headache. The local indicating bulbs on the front panel were burned out, and the copper cooling water lines to the diode bridges were leaking. The maintenance staff was forced to use workarounds, such as shutting down one bridge for repair while the other was running, and even resorting to water buckets at times.

SOLUTION

In early September 2008, Unit #5 was in a planned outage for several weeks. Was there sufficient time to address the Alterrex diodes before the scheduled startup on September 24th? GE's Control Solutions advisors in Colorado said yes, so the Alterrex cabinets were quickly removed by the Gaston staff and shipped to Colorado. GE replaced each diode bridge assembly with its latest EX2100 Alterrex diode bridges, which feature:

- One continuous stainless steel cooling tubing per bridge, with all stainless tubing, isolation valves and standard industrial fittings throughout the diode stator water cooling loop.
- A new diode bridge diagnostic interface panel providing thermal monitoring via bridge mounted thermistors, fuse monitoring and remote alarm connections as well as DCS and unit control interface.
- A simplified bridge alarm annunciation panel with LED indicators and test provisions.

The replacement did not require modification of the Alterrex cubical doors or impact the critical collector cooling air thermal designs. Working extra shifts, the Controls Solutions team in Longmont, CO, completed the diode retrofit and shipped the cabinets back to Alabama in plenty of time for the scheduled startup.

PAYBACK

The new rectifier installations have performed as designed with no problems reported to date. The plant maintenance staff can now spend their time planning and executing more critical projects. With more efficient and effective use of their maintenance resources, the plant expects to reduce maintenance costs and improve their bottom line.

BENEFITS

EX2100 Alterrex diode bridge designs provide:

- **Installation simplicity –** 80% reduction in diode cooling piping and diagnostic wiring.
- **Ease of maintenance –** via the simplified bridge diagnostic panel.
- **Excitation System Performance –** stator water system cooling insures full rating without the risk of problems associated with air cooled offerings, such as heat sink fouling, plugged filters and fan failures.

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