

Combining Multiple Plant Systems into a Single Ovation® Platform Improves Operator Efficiency at AEP's Mitchell Station

RESULTS

- Consolidated four existing PLC control networks connected to more than 40 individual PLCs, 30 paperless recorders, and 12 data multiplexers into a single Ovation system
- Improved operator efficiency
- Decreased the number of alarm systems from three to one

APPLICATION

Two 800-megawatt Foster-Wheeler supercritical coal-fired boilers each with a selective catalytic reduction system and flue gas desulphurization system. Unit 1 has a Westinghouse steam turbine and Unit 2 uses a GE steam turbine.

CUSTOMER

American Electric Power (AEP), Mitchell Station located near Moundsville, West Virginia

CHALLENGE

AEP ranks among the nation's largest generators of electricity with some of the lowest rates in the region. While the size of their fleet is significant, it's the efficiency and the resulting reliability and operational economies that have earned AEP its reputation as a pioneering, low-cost producer of power.

Recent investments in flue gas desulphurization (FGD) and selective catalytic reduction (SCR) equipment at AEP's Mitchell Station required changes in the plant's automation system to maintain optimal operation. The Mitchell distributed control upgrade project had several goals:

- Create compatible control schemes for existing and new plant processes
- Provide seamless operation between multiple plant processes
- Improve operator efficiency through the use of a common platform
- Standardize graphics and control logic



“Our plant operations have drastically improved by combining separate islands of automation and new plant controls into one tightly integrated Ovation system. We have seen an increase in operator productivity due to improved communications and the use of common graphics, control schemes, alarming system, and HMI platform.”

Name

John Schneider
American Electric Power
Krammer and Mitchell Stations



SOLUTION

AEP contracted Emerson Process Management Power & Water Solutions (Emerson) to supply a single Ovation® expert platform for the Mitchell plant that contained control schemes for new FGD, SCR, coal handling, and wastewater treatment processes. In addition, the Ovation system included logic from multiple PLCs, recorders, and data multiplexers, as well as upgraded existing controls.

The Mitchell plant automation system consists of three individual networks; one network for each unit and a separate network for common equipment. Existing boiler, balance of plant, steam turbine, and miscellaneous unit controls were migrated to new Ovation technology. A multiple-network configuration was implemented to enable monitoring of all system graphics and signal diagrams, regardless of their resident network, from any Ovation operator workstation connected to the plant system. Smart Ovation graphics, designed for all the plant common equipment, include “tokens” for passing control between the unit networks. This allows operators to quickly determine who has control of the common equipment from either unit control area and locks out all functions other than process monitoring.

New Ovation logic for the recently installed FGD and SCR equipment, as well as coal-blending and wastewater treatment processes, were integrated with existing controls on each unit and common network. Additionally, four existing PLC control networks connected to more than 40 individual PLCs, 30 paperless recorders, and 12 data multiplexers were also integrated into the Ovation system. Combining the new logic and separate PLC networks with the existing control schemes now provides Mitchell operators with an overall depiction of operations for the entire plant.

Consolidating the plant’s PLC-based controls, paperless recorders, and data multiplexers with four new processes into a single Ovation platform provides Mitchell with numerous benefits such as improved operator efficiency, a common alarm system and HMI interface, and standard control schemes and graphics. Compatibility between existing and new controls provides seamless overall plant process management which leads to improved operations. Operators no longer need to search through various control room monitors for process information. Now, they can quickly and easily access important operational data from any Ovation workstation. Additionally, a reduction in the number of alarm systems from three to one enables operators to concentrate on efficient plant operation rather than continuously responding to and silencing numerous alarms on various workstations. Consequently, reducing the proliferation of nuisance alarms translates into decreased downtime and increased productivity for plant operators.



Absorber vessels, as shown above, were installed for both Mitchell units as part of the new FGD systems. The logic for this equipment was incorporated into the plant’s Ovation control system as part of the upgrade project.



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