

Emerson's PlantWeb™ with Ovation™ Contributes to Cost Savings and Improved Operations at China Power Investment's Pingdingshan Luyang Plant

RESULTS

- 60% cost savings from utilizing PlantWeb digital architecture for control of the water treatment system
- 80% reduction in the number of I/O modules and associated cabling used in the water treatment system fieldbus application
- Enhanced operational efficiency through centralized plant control and monitoring
- Improved operational stability due to integrated steam turbine and boiler coordinated control strategies



APPLICATION

Two 1,000-MW ultra-supercritical coal-fired units, each with a Dongfang boiler and a Harbin steam turbine

CUSTOMER

China Power Investment Corporation (CPI), Pingdingshan Luyang Power Plant Units 1 & 2, located in Xinji Township, Pingdingshan City, Henan Province, China

CHALLENGE

China's Henan Province, in central China, is the fifth largest provincial economy of China and the largest among inland provinces. Over the past two decades, the Henan area has seen rapid growth in its economy.

The Pingdingshan Luyang power plant, which will ultimately feature six 1,000-MW ultra-supercritical units, is being constructed in phases. The plant will produce additional megawatts to support the region's economic development. With the first two units entering commercial operation in 2010, CPI required a proven state-of-the-art automation system able to incorporate digital technologies provided by a vendor experienced with the complex strategies of large ultra-supercritical units.

"The megawatts produced by the Pingdingshan Luyang power plant are critical to meeting the region's demand for power. Our selection of Emerson's PlantWeb™ architecture with Ovation™ controls allowed us to efficiently and cost effectively bring the plant online and reliably operate to support generation needs. Emerson's proven experience with automation of other 1,000-MW ultra-supercritical plants made them a logical choice for this important project."

Mrs. Feng Xiufang
I&C Director
China Power Investment Corporation
Pingdingshan Luyang Power Plant



OVATION®

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www.EmersonProcess-PowerWater.com



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Process Management

SOLUTION

China Power Investment Corporation (CPI) selected Emerson Process Management's PlantWeb™ digital architecture featuring Ovation™ expert technology to monitor and control the major operational processes of the first two Pingdingshan Luyang units. Emerson's PlantWeb solution is a digital bus-based approach to plant automation and control that incorporates high-speed communications networks, intelligent field devices, asset management software, and bus I/O technologies. This approach provided a number of operational and economic advantages that ranged from reduced wiring costs, streamlined device configuration and more efficient plant startup, to operations and maintenance savings. For Pingdingshan Luyang Units 1 and 2, the comprehensive digital automation solution consists of the Ovation control system, AMS Suite: Intelligent Device Manager and Scenario™ simulation technology, as well as HART® field devices from Rosemount® and Fisher®.



The Pingdingshan control room uses state-of-the-art Ovation technology proven in 1000-MW ultra-supercritical units.

At each unit, the Ovation system performs data acquisition and monitors and controls all major plant components, including the Donfang boiler and Harbin turbine. Unifying boiler and turbine operations translated into a number of significant operational benefits. For example, fully coordinated boiler and turbine control improved unit stability, responsiveness and thermal efficiencies; provides tighter overall control of plant operations; and presents a more concise view of key plant and turbine parameters. The Ovation system also manages the flue gas desulfurization (FGD) system, modulating control system, sequence control system, electrical control system and balance of plant processes; as well as water treatment, ash handling, transportation and other auxiliary systems. The Ovation systems are integrated utilizing multi-networking technology.

The water treatment area uses Emerson's AMS Suite predictive maintenance software and makes extensive use of digital bus-based technologies. The Ovation system incorporates 12 Foundation fieldbus segments with a total of 65 Foundation fieldbus devices, including pressure transmitters, temperature transmitters, level transmitters, flow transmitters; as well as 20 PROFIBUS DP segments, with 180 PROFIBUS DP devices including electric actuators, motors, valves and analytical instruments.

In all, Emerson supplied 81 controllers and 42 workstations, and the Ovation system is responsible for more than 41,000 I/O points.

To further ensure a smooth start-up and ongoing operation, Emerson provided a high-fidelity Scenario simulation solution. Configured using control logic identical to that of the Pingdingshan Luyang plant, the Scenario solution offers a highly realistic engineering analysis environment. The simulation solution features a virtual architecture, in which the actual Ovation controllers are replaced with virtual controllers that reside on one or more Microsoft Windows-based PCs. Despite the smaller footprint, virtual controllers provide one-to-one functionality that mirrors the Ovation controllers that comprise the plant control system.

Results from implementing PlantWeb with Ovation at the first two units of the Pingdingshan Luyang project proved successful. In the water treatment area alone, CPI experienced a 60% cost savings associated with reduced wiring costs and field service time due to a streamlined configuration process. Additionally, use of digital bus-based technologies in this area contributed to an 80% reduction in the amount of I/O modules used versus traditional hard wired I/O. The plant also experienced enhanced operational efficiency by centralizing all plant control and monitoring activities into a single unified system.



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