



DeltaV Product Information CD

SUCCESS STORIES

Aurora Energy

Alaskan co-gen plant updates boiler using DeltaV™ system with FOUNDATION™ fieldbus-based control

The first steam and electric power generating plant in Alaska to implement automated control running on FOUNDATION fieldbus protocol, is up, running, and warming hearts and homes in Fairbanks.

State-of-the-art technology replaced outmoded electro-mechanical control devices on the main boiler, Chena No. 5 (200 Kpph), in order to increase efficiency and reliability at the plant. Running on Fisher-Rosemount's DeltaV system with pre-configured boiler control strategy and Fisher-Rosemount Asset Management Solutions (AMS) software, the installation also includes 110 fieldbus-compliant transmitters and 36 FIELDVUE digital valve controllers.

The \$1 million advanced control system is part of more than \$4 million invested by Aurora Energy, L.L.C., to improve plant operation and expand heat distribution throughout the City of Fairbanks. When the city divested all municipal utilities in 1998, the District Heat and Electrical Co-generation plant was purchased by the Usibelli Coal Mine, Inc., the plant's primary coal supplier. Usibelli formed Aurora to operate the plant and distribute heat energy.

Man at console

Fairbanks' winter temperatures often drop to -40 degrees F, with periods as cold as -70 degrees F. So having reliable heat free of the maintenance headaches of a furnace is an attractive alternative, making Usibelli's Aurora investment in a central heat utility a potentially profitable proposition. But the plant, which dates back to the 1950s, had been neglected and was in serious disrepair.

Aurora Energy's Control Systems Engineer Robert Mulford headed up the cutting-edge conversion, against some skepticism. "Some said it couldn't be done," says Mulford, "Wagers were even made in my own plant that we couldn't automate and bring the boiler on line in time to meet our contractual power obligations to the grid." He continues, "Engineers at one consulting firm advised our general manager that I had 'radical ideas that could be leading the company into dangerous waters.'"

Aurora was aided in this effort by the Fisher-Rosemount Industry Center PC&E (St. Louis, MO), which provided design, project management, and implementation services. PCE Pacific, Inc., an independent Fisher-Rosemount representative based in Seattle, WA, supplied the automation system hardware, transmitters, valve controllers, and ongoing support during the installation and startup phases. Price Ahtna JV of Anchorage, AK, performed installation.

valve

Mulford had "never a doubt" that the new automation system should use smart field instrumentation and the fieldbus protocol. "Providing a digital signal from point of measurement to point of final control assures a higher degree of accuracy and is immune to noise problems attributed to analog systems," he says, adding, "This information is easily integrated into non-control data systems, such as spreadsheets, which can be used for plant optimization."

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Gerald England, Aurora Energy's general manager, notes, "The project came in on-budget and was completed on schedule. The plant has been operating continuously since mid-August (1999) with no interruptions due to the new automation system."

Says PC&E vice president Ron Lutes, "Using fieldbus, we were able to complete the commissioning in record time. Aurora Energy now has a very clean control system that can easily be maintained. Remaining non-fieldbus devices can also be upgraded without added wiring."

Aurora takes special care to address environmental concerns. More efficient burning of coal in one location in itself reduces pollution, and the combustion strategy implemented by the DeltaV system adds a new level of emission reduction. The DeltaV system with FOUNDATION fieldbus reacts faster to boiler upsets, minimizing emissions. The company also plans to tie the DeltaV system to stack opacity monitors to provide accurate real-time reporting of opacity violations, minimizing delays resulting from manual computations.

"I call the resulting automation solution an 'optimization system,'" says Mulford, "because it provides the information needed to maximize boiler output and increase the efficiency of heat transfer and distribution. We knew that a digital system would not solve all our problems, but it gives us the means to solve problems. As we learn to use the data now at our disposal, we'll do a better job of recognizing the condition of operating equipment and diagnosing internal problems."

During the coming winter, plant personnel plan to optimize boiler combustion and auxiliary operation for greater efficiency. The asset management system will also be fully implemented to improve ongoing maintenance. Next year, the company may upgrade three smaller boilers on the old side of the plant and bring coal and ash conveying systems into the DeltaV automation system.

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