

# FIELDVUE™ DVC6200-PD Instruments Automate Startup and Reduce Downtime, Saving a Nuclear Plant \$250,000/hour.

## RESULTS

- Identified valve control problems using techniques such as process modeling
- Avoided delays and plant trips costing up to \$250,000 USD per hour of downtime
- Automated startup and reduced the number of operators required for support
- Improved the plant's reliability and stability



*BEFORE*—The original feedwater recirculation/startup valve assemblies included problematic positioners, exhausts, and solenoids. The unreliable combination of instruments required manual control during startup and resulted in costly delays or plant trips.

## APPLICATION

Boiler feedwater recirculation

## CUSTOMER

Nuclear power plant in Connecticut, USA

## CHALLENGE

The two Fisher® easy-e™ valves that provide high-pressure water to control the drum level of the boiler are critical to this nuclear plant's operation. The valves in this severe-service application were operating okay. But the instruments—non-Emerson positioners and quick exhausts (to quick-close the valve)—were causing problems, particularly during startup.

Before Emerson personnel got involved, the plant needed two operators to manually control these startup valves until the plant reached 25% power. The non-Emerson positioners did not respond quickly enough and had enough overshoot to cause level instability. Manual operation was required to anticipate this overshoot and take corrective action. If manual operators overshoot the set positions, the plant could trip—which happened during its last startup. Each trip or startup delay costs about \$250,000 USD per hour of down time!

To further complicate the project, plant engineers were on a tight schedule. They had a short window in which to find a solution and complete the necessary engineering and design-change documentation for this retrofit.



*AFTER*—Since the FIELDVUE™ digital valve controllers and high-capacity solenoids were installed, the plant has experienced no trips. Connected to the system via a HART® Interface Module, the FIELDVUE instruments provide data about valve performance and alert operators of any problems.



### SOLUTION

Personnel from New England Controls, Emerson's local business partner, worked with Fisher business unit engineers in Marshalltown, Iowa, to find a better, more automated solution.

With process modeling techniques, loop-tuning services, and a custom-valve characterization, the Emerson team analyzed the application and defined requirements. Ultimately, they recommended four FIELDVUE™ DVC6200 digital valve controllers with Performance Diagnostic capabilities to monitor the valves' performance; Fisher® 657NS actuators (size 80) with a two-inch travel to automatically open and close the valves; and high-capacity solenoids to facilitate fast-closing. These devices replaced the existing instrumentation, and the quick exhausts were eliminated.

Plant personnel also engaged Emerson experts to analyze the control system and recommend appropriate tuning values for the process loop and the FIELDVUE instruments.

The new units arrived on site in October 2011. The simplified pneumatic circuit enabled easy tuning and calibration of the valves. After the installation, the plant was able to start up in automatic control with minimal operator engagement.

### RESULT

Since the new equipment was installed, the plant has not tripped. Improved valve monitoring has enhanced safety and simplified maintenance tracking for these critical valves. The plant is more reliable and stable as a result.



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