

# Nuclear Plant Measures Friction with FIELDVUE™ Diagnostics, Avoids Power Reduction, and Saves \$274,000 USD.

## RESULTS

- Avoided a power-down and re-start process that would take at least 24 hours
- Avoided a 50% power reduction
- Repaired a leaking valve without having to isolate and remove it from the line



## APPLICATION

Feedwater control on Pressurized Water Reactors (PWR)

## CUSTOMER

Nuclear generating station in Florida, USA

## CHALLENGE

About three million people live within 50 miles of a Florida nuclear plant where safety and reliability are primary concerns. Its parent company operates five power-generating units at the site including two twin-reactor nuclear units. Within these nuclear units, Westinghouse Pressurized Water Reactors (PWRs) supply steam to one high-pressure and two low-pressure turbines with a power output of 690 megawatts.

The facility has three main feedwater regulation valves on each of its PWR reactors. Non-Emerson valves with Fisher® 473 actuators and remotely-mounted FIELDVUE™ digital valve controllers control the flow and level of feedwater in the boilers. During an outage, plant operators changed the valves' packing and brought them back on-line. Within a few weeks, however, they noticed a large packing leak and called the local Emerson sales office for technical assistance.

According to a valve engineer from Key Controls, Emerson's local business partner, "A fossil-fuel plant would simply tighten down the packing, but nuclear valves have a safety function that dictates a certain stroking speed. We couldn't just tighten packing without some sort of proof that they had not exceeded a maximum friction value." He added that they also couldn't measure friction with the usual, portable diagnostics equipment without fully stroking the valve.

*FIELDVUE instruments, used in combination with ValveLink™ software, are diagnostic tools for monitoring the performance of control valves in critical loops.*

***"Faced with a leaking valve, we could either measure the leaking valve's friction using Performance Diagnostics or reduce unit power enough to isolate and fix the problem. The only real choice was provided by the FIELDVUE digital valve controller."***

Maintenance Manager  
Nuclear Generating Station  
Florida, USA



## SOLUTION

Thus, Emerson personnel worked with the plant's Asset Optimization engineer to develop a never-been-done-before solution—measuring valve friction with the FIELDVUE instrument's Performance Diagnostics (PD). Because he had just completed a ValveLink software school through Emerson Educational Services, the AO engineer had confidence in the plan. He believed the initial set-up was wrong because it only indicated 9 to 10 pounds of friction with a one-inch shaft and live-loaded packing.

Key Controls' personnel helped him check and confirm that the specification sheet on the FIELDVUE instrument was correct. The friction value should have measured 150 pounds.

The packing was so loose that, with the lubrication of the water flowing out of it, it may have dropped to as low as ten pounds. They tightened the packing, measured the friction value, and brought it up to the required specification (150 pounds). The AO engineer called Key Controls when they had successfully stopped the leak.

## RESULT

The PD testing that measured friction was done live, with the valve in operation. The other option for repairing this valve was to operate the plant with only two steam generators (50% of its usual power production), isolate the valve, fix it, and start up again. That reduced-power option would have taken at least 24 hours and cost at least \$274,000 USD. The FIELDVUE instrument's diagnostic capabilities enabled the maintenance team to avoid that unpleasant scenario.



*FIELDVUE DVC6200 digital valve controllers may be remotely mounted to monitor control valves in harsh or hazardous environments.*

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