

The VUE To Success

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FIELDVUE® Instruments Milestone: 350,000 Units Sold

In this challenging business environment, the Fisher Valve Division proudly holds up FIELDVUE® Digital Valve Controllers as a dramatic success story, a testament to the power of innovation.

Since 1994, when the product was introduced, customers in virtually every industry have purchased and installed 350,000 FIELDVUE instruments worldwide—more than Fisher's top five competitors combined!

Mike Rauber, FIELDVUE Program Manager based in Marshalltown, Iowa, USA said the product line continues to evolve and improve from both a functionality and reliability standpoint. "FIELDVUE was the first digital device of its kind in the marketplace, and over time, it has become the standard," he said. "FIELDVUE instruments now represent the majority of our positioner sales."

Fisher has added Performance Diagnostic (PD) capabilities, which enable FIELDVUE users to monitor and test a valve while it remains in-service and on-line. PD functionality represents the future of control valve diagnostics and is a key enabler for predictive control-valve maintenance.

FIELDVUE team members worldwide have also worked to broaden the range of potential applications. Digital Valve Controllers are now available for fieldbus (DVC5000f) installations, safety-instrumented systems (DVC-ESD), and high temperature (remote-mount) valve applications.



Production employees in Singapore ship hundreds of FIELDVUE® Digital Valve Controllers every week.

During 2003, the FIELDVUE development team will introduce a stainless-steel version of the DVC6000 Digital Valve Controller, targeting severe-service applications. Off-shore oil platforms, for example, may choose the DVC-SST to resist seawater corrosion.

According to Rauber, FIELDVUE instruments lead the pack of digital devices powering Emerson's PlantWeb™ architecture. "Many of Emerson's largest customers now have a significant, installed-base of FIELDVUE instruments and a better appreciation for the benefits of valve monitoring and predictive maintenance," he concluded.



Texas Refinery Upgrades to Fieldbus, Implements State-of-the-Art Diagnostics

United States



A refinery in Texas is becoming a reference site for Fisher instrument diagnostics and monitoring. In January 2002, the first three-dozen Fisher valves with FIELDVUE® DVC5000f (fieldbus) instruments were installed at the site. By June 2003, the site had installed an additional 355 FIELDVUE units as part of a Fluid Cat-Cracker (FCC) re-instrumentation project.

The FCC unit was operating with an analog (4-20mA) and panel-board control system. A two-phase re-instrumentation converted the unit to PlantWeb™ automation, including a DeltaV control system with both FOUNDATION™ fieldbus and HART® communications technology.

Phase One of the re-instrumentation began in October 2002 with a turnaround. Thirty of the most critical valves were fitted with DVC5000f (fieldbus) instruments. The turnaround provided an opportunity to work on valves in inaccessible areas. Instruments on critical valves were mounted and tubed in conjunction with the original positioner for switching (cut-over) later. Instruments on non-critical valves were mounted, calibrated, and removed for later re-instrumentation.

Phase Two, the cut-over, began in June. While running, the FCC unit switches to fieldbus communications via its new DeltaV control system.

The cut-over process was made possible by mounting the DVC5000f instruments on the actuator's secondary mounting pad, with the original positioner still in place. Both pneumatic signal outputs were then tubed to the actuator inlet via a three-way manifold valve. To cut-over, the output of the DVC5000f was matched to the original positioner's signal, and the three-way valve was operated to apply the signal air from the new DVC5000f to the actuator, without disrupting the valve position. The three-way valve was then locked and the original positioner could be removed.

Fisher developed an enhanced version of the DVC5000f (Rev. 9) instruments to operate in a pressure mode on valves where a second positioner could not be mounted. In pressure mode, the positioner's travel feedback is turned off, thereby creating a "fieldbus-to-pneumatic converter." The DVC5000f can be mounted remotely because travel feedback is not used, and it thereby provides a pneumatic signal to the input bellows of the existing positioner. This converts the valve to a fieldbus device without disrupting the process.

Later, when there is a scheduled turnaround, the DVC instruments can be easily converted to travel control and the old pneumatic positioners will be removed.



The unusual cabling on this control valve enables a "live" cut over from an old analog positioner to a new FIELDVUE® DVC Digital Valve Controller with FOUNDATION™ fieldbus

For the FCC project, the customer took advantage of many new FIELDVUE enhancements:

- DVC instruments communicate travel feedback on Emergency Shutdown valves. Essentially, the DVC was mounted without an air supply and in combination with AMS ValveLink® software, which documents valve strokes from scheduled tests as well as inadvertent trips. Thus, users can obtain credit for *all* valve strokes for SIL certifications.
- The FCC project also represents the refinery's second implementation of PlantWeb Alerts on the DVC5000f instruments. Diagnostic capabilities were the deciding factor in the customer's decision to convert to fieldbus technology, resulting in a run-time increase of 1% for the refinery.
- Working in conjunction with the DVC instruments, AMS ValveLink SNAP-ON™ software provides on-line instrument calibration and diagnostics.

Jim Pfeil and Robert Meinecke of Puffer-Sweiven, Emerson's Houston-based sales Representative, are among those involved in the re-instrumentation and cut-over project. "Fortunately, this customer understands our PlantWeb™ philosophy and the cost and process benefits of monitoring valve performance," Pfeil said. "Statistical analysis of the final control element advances them toward their goal of more predictive maintenance and plant up-time."

Three new fieldbus projects are underway for Hydroprocessing on site, and they include DeltaV control systems, FIELDVUE DVC instruments, and Rosemount transmitters.

Success Stories

FIELDVUE DVC6000 Instruments Aid Gas-Lift Production

Last summer, one of Fisher's largest Latin American customers applied FIELDVUE® DVC6000 Series instruments to more than 30 valves in a gas manifold, gas-lift application. The Model 357 valves without instruments were designed to work with electric actuators only, but the customer was dissatisfied with their performance.

Hector Abarca of Conind de Venezuela, the local Emerson sales representative, studied the performance problem and came up with an affordable alternative to replacing the valves. He and Fisher personnel from the Service Center in Maracaibo modified the valves to work with Fisher 585C actuators and FIELDVUE DVC6000 Digital Valve Controllers.

The customer uses a gas-lift management system to produce natural gas and crude oil from fields in Eastern Venezuela. Like others in the industry, they want to ensure that lift gas is applied to individual wells at a precise rate to achieve maximum production from the field and minimum consumption of compressed gas.

"This customer chose our FIELDVUE instruments because they provided both dynamic performance and predictive maintenance (through diagnostics)," Hector said. "These DVC capabilities make it possible to reduce process variability and optimize the performance of their Gas Lift Injection operation."

Gas-lift is a preferred method for augmenting the natural reservoir pressure and thus increasing production. Efficient gas lift applications, including automated flow control and optimization techniques, can achieve production improvements of between 5 and 10%.

During the next two years, the customer plans to apply more FIELDVUE instruments to more than 400 other valves. Some of these instruments will include Performance Diagnostics (PD) functionality, which enable users to monitor and test control valves while they remain in operation.



Venezuela



At this remote gas-lift injection operation in eastern Venezuela, DVC-instrument diagnostics enable more predictive, control-valve maintenance.

Remote-Mount DVC6005 Instruments Are Part of Nuclear Power Project

A Fisher, Asia Pacific sales team won its first order for 86 of the new remote-mount FIELDVUE® DVC6005 (HART®) instruments, designed to isolate DVC components (such as the I/P, relay, and electronics) from harsh or hazardous areas. This installation is the first of its kind within a nuclear plant environment.

The Engineering, Procurement, & Construction (EPC) project will build a fourth, two-unit nuclear power plant in Taiwan. The Japanese contractor awarded a portion of its multi-million-dollar project to Emerson's local sales Representative, Nippon-Fisher, who will supply control valves. Fisher digital valves will be installed in the radiation area of the plant.

The specification requires that all valves have a controller, as well as a position transmitter. Because this application is considered severe service, the contractor decided to remotely-mount Fisher's FIELDVUE instruments and set up a HART®-to-analog converter application. With this scheme, the DVC

Nova Chemicals' E3 Plant Uses Advanced Diagnostics

Nova Chemicals' E3 ethylene production facility in Joffre, Alberta, Canada has more than 480 control valves with FIELDVUE® Digital Valve Controllers (DVC) in service. For more than a year, Nova personnel have monitored the valves' performance and documented some impressive time and cost savings.

During commissioning, for example, the valves with HART®-based DVC instruments, Advanced Diagnostics (AD) level, were connected and field checked using AMS ValveLink® software. (The alternative would have been to manually record configuration parameters using the hand-held HART 275 Communicator.) Automating the fieldwork saved an average of one hour per device or about 720 hours!

The ability to create valve signature curves and diagnose performance problems also resulted in significant, long-term production benefits. Nova personnel have dedicated an AMS ValveLink station in the maintenance shop, and they check it daily for control-valve alerts. With detailed and timely valve performance data available, they can identify and solve problems before an actual valve failure or shutdown occurs.

Canada



The 480 valves installed across the site range from 8- to 24-inches in diameter. The traditional maintenance approach (taking the valves "off line" for visual inspections or repairs) is not always possible. In fact, some of Nova's valves require a crane to remove and re-install. Thus, diagnostics, made possible by AMS ValveLink and FIELDVUE DVC capabilities, has proven an invaluable tool for predictive maintenance and trouble-shooting.

Performance Step Tests were conducted on twenty of the site's most critical compressor recycle valves. Though it's difficult to quantify the maintenance savings, these step tests helped identify valve problems relating to corrosion, over or under travel, tuning, and calibration errors.

Testing the compressor recycle valves also identified oscillations at minimum flow that could have damaged the compressor. The AMS system manager said that applying Emerson's technology has changed the way Nova conducts and plans maintenance, enabling the company to maximize its investment.

Fisher products' capabilities have also changed Nova's turnaround work practices. By comparing base-line valve signatures to the test results during a turnaround, maintenance technicians can focus on a few valves that need attention or repair. The availability of diagnostics data also makes it possible to pre-order needed parts as well as eliminate the high costs of expedited shipments and over time.

At full capacity, the E3 plant, which is the largest ethylene cracker in the world, produces 2.8 billion pounds of ethylene per year.

Taiwan



instrument's feedback mechanism is mounted on the valve actuator in the radiation area, while the base unit of the DVC6005 Series instrument and its micro-processor are located in a non-radiation area. The distance between the actuator and base unit in these remote-mount applications ranges from 10 to 30 meters.

Project managers expect this remote-mount solution to not only reduce installation costs, but also to improve equipment reliability, by putting fewer moving parts in the field. Using Fisher's new Remote-Mount DVC6005 instruments also provides diagnostic capabilities for these important valves.

Due to the support and cooperation of FIELDVUE teams in Marshalltown, Iowa, USA and Singapore, 43 units were delivered in August 2002 and the balance shipped by year-end.

The nuclear plant expects to begin commercial operation in 2004.

The Vue To Success newsletter is cooperatively produced by Fisher Controls' FIELDVUE Instrumentation and Communications departments.

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Please forward correspondence to Lesley Smid, Fisher Controls' Technology Center, Marshalltown, IA, Phone: (641) 754-3249 or FAX: (641) 754-2054.

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Remote-Mounted DVC6005 Instrument Targets High-T

Fisher has made it possible to remotely mount a FIELDVUE® Digital Valve Controller and digitally monitor the performance of control valves in severe-service or tight-fit applications. Fisher's new DVC6005 (HART®) instrument is an extension of the DVC6000 Series of Digital Valve Controllers, which are direct-mounted to a control valve. With the DVC6005, however, the valve position feedback potentiometer is mounted on the control valve, but the remainder of the instrument's components are mounted on a pipe stand or wall—as far as 100 feet away from the valve.

The remote-mount option is ideal for applications in which high-temperatures (up to 250-degrees Fahrenheit), vibration, or limited space make traditional installation difficult or impractical. Users within the Pulp & Paper or Nuclear Power industries, for example, may prefer to isolate DVC components (such as the I/P, relay, and electronics) from harsh or hazardous areas.

Fisher has developed hundreds of mounting kits to remotely apply the DVC6005 instrument to sliding, rotary, and quarter-turn actuators; the smaller-sized Baumann valves; as well as many competitors' valves. Fisher maintains a library of the



various mounting kits available. Your local sales office can help you with kit selection.

In August 2002, Emerson's Asia Pacific sales team submitted the first order for the Remote Mounted DVC6005, from a nuclear power customer in Taiwan. (See story on page 3.)

For more information about the DVC6005, contact your local Fisher sales office.

Global Diagnostics Center Personnel Analyze Valve Performance Data On-Line

Emerson employees who work for Asset Optimization and Instrument & Valve Services are making it easier for customers to diagnose valve-performance problems. The Global Diagnostics Center (GDC), headquartered in Marshalltown, Iowa, USA, has become an on-line, any-time resource for data analysis and diagnostic interpretation.

Your local Fisher sales office can make arrangements for this service, either on demand or as part of a service agreement. You will get a detailed analysis of your valve's condition and performance, as well as recommended corrective actions. Members of the GDC team—including Bob Dostal, Tom Imsland, and Tom Brunson—are eager to interpret valve-signature data generated by the FlowScanner® system or a combination of FIELDVUE® instruments and AMS ValveLink® software with Performance Diagnostic capabilities.

Customers with decreasing in-house resources and increasing demands to reduce costs will value the availability and experience of GDC personnel. To shorten downtime, speed up equipment fixes, and extend the time between planned outages, you, too, should take advantage of this service. Emerson's diagnostic service capabilities can help you improve predictive maintenance, pre-plan repairs, and anticipate parts orders.

Doug Ruring, GDC team leader, said: "Valve diagnostics, using FlowScanner or FIELDVUE advanced capabilities (such as Performance Diagnostics), coupled with interpretation services, will help you not only improve but also sustain maximum control valve performance. With this technology, there is no guesswork."

For more information, contact your nearest Fisher sales office or call the North American Response Center (1-800-654-7768).

Fisher Controls International LLC
205 S.Center Street
Marshalltown, IA 50158

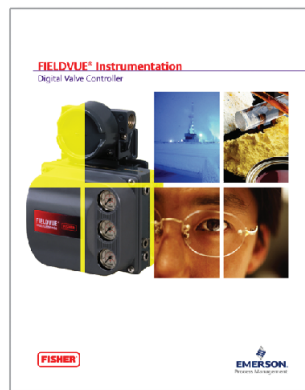


Temperature Applications

FIELDVUE® Brochure Updated

An updated, 16-page, four-color FIELDVUE® brochure (No. D350941X012) provides detailed information on the Digital Valve Controller's design, its role in PlantWeb® digital plant architecture, and its value in providing data for predictive maintenance decisions.

Order a copy from the Fisher-Marshalltown Publications Stockroom or view a pdf file of the brochure on-line at <http://www.documentation.frco.com/groups/public/documents/brochures/d350941X012.pdf>.



Magazine Features DVC-ESD Solution

The March 2003 issue of *Control Solutions* magazine includes a special supplement authored by two Fisher FIELDVUE® team members. The article titled "Using Smart Positioners in Emergency Shutdown Applications" describes the benefits of using FIELDVUE Digital Valve Controllers in Safety Instrumented Systems (SIS).

DVC-ESD instruments not only test the SIS valve's mechanical movement but also allow partial stroking of the valve while it remains in service. The text introduces SIS, SIL, and Risk Tolerant Analysis concepts as well as basic installation, operation and configuration guidelines for smart positioners.