The VUE To Success

A publication of Fisher Controls' FIELDVUE Instrumentation Team.

www.FIELDVUE.com

Vol IV, Issue I

Take Advantage of Performance Diagnostics . . .

Fisher Controls International, Inc. offers Performance Diagnostics (PD) as a key element of Predictive Maintenance programs. PD is a suite of diagnostics that enables FIELDVUE®-instrument users to monitor and test a valve while it remains in-service and on-line, responding to control-system inputs. Analyzed results for average friction and dead band are calculated and displayed. Other instrument or valve data, such as travel deviation, relay stability, air supply, or actuator pressure can also be collected and plotted simultaneously.

To run Performance Diagnostics on any valve, you need two things: (1) a FIELDVUE® instrument (DVC5000 or DVC6000) with the PD level and (2) ValveLink® VL2000 software with PD functionality. Monitoring can be accomplished through DeltaV, multiplexers, or individual valves can be accessed through a simple modem connection.

Software Program Manager, Lorin Miller, said Fisher is the first in the industry to offer this capability. "With PD tools, you no longer need to take a valve out of service to determine its dead band and average total friction," he said. "Further, with ValveLink software, you can trend valve-performance data over time, gaining more awareness of device condition and thereby maintaining overall equipment reliability."

After you purhcase a PD instrument, call (641) 754-2222 to register yourself as a PD user and begin to take advantage of these capabilities, as well as a data analysis service.

And Data Interpretation Services

Correctly analyzing and interpreting the on-line data you've collected is another important aspect of any successful maintenance program.

To help you, a Diagnostic Interpretation service has been created within the Fisher Service organization to provide analysis and reports of PD-generated data. This interpretation service is part of the purchase of the DVC-PD instrument for the first year, up to two reports per valve. Beyond that, the service will continue by contractual agreement.

Jim Rimmer, Manager-Diagnostic Services, says members of his team have extensive valve and data-interpretation experience. They will analyze and report on your equipment's health, enabling you to make more informed maintenance decisions. Their report includes visual and calculated observations as well as recommended actions, with a red, yellow, or green-light symbol designating "urgency."

Jim said, "Implementing PD capabilities and the services associated with diagnostic analysis will advance you toward your ultimate goals of predicting maintenance and reducing costs."

For more information about this service, contact your local Fisher sales office or any one of Fisher's world area contacts: Jim Rimmer (North America), Peter O'Byrne (Europe), or Alfred Lee (Asia Pacific). ■

FISHER®

EMERSON™
Process Management

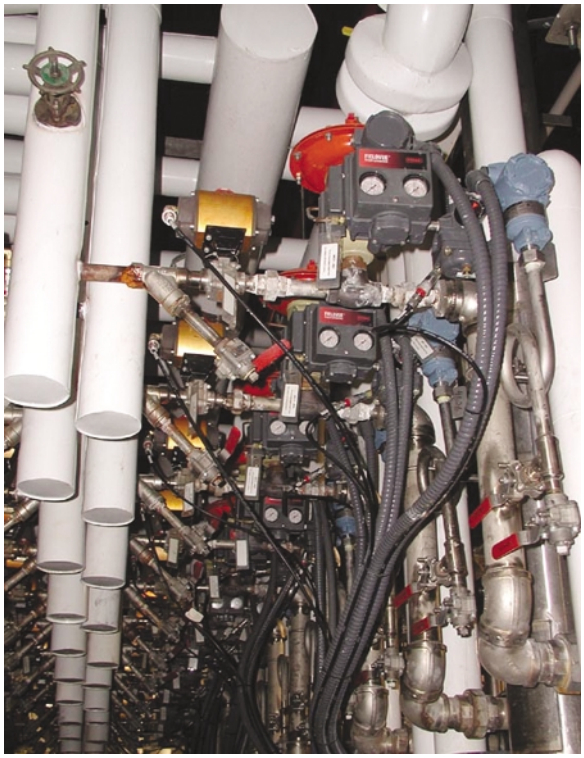
Iowa Producer Relies On FIELDVUE® Diagnostics

When a plant in northern Iowa installed a new production line, Fisher Controls and its local Representative, R. S. Stover, provided a variety of products and services that not only helped meet its startup schedule but also increased process availability and reduced commissioning and maintenance costs.

Team Fisher supplied control valves—many with FIELDVUE® Digital Valve Controllers—for steam, air, and nitrogen lines, as well as an AMS system, including ValveLink® SNAP-ON™ applications software, to monitor valve performance.

Plant personnel chose the Emerson solution to improve reliability and volume production, as well as reduce maintenance costs. The ability to diagnose equipment problems is critical on this production line, where a malfunction may result in a purged or discarded batch. Before production can resume, the line must be thoroughly cleaned. Consequently, downtime costs can be tens of thousands of dollars per hour.

Diagnostic capabilities inherent in FIELDVUE instruments and software have improved predictive maintenance on site—and those improvements began before the new line went into full production. During commissioning, AMS ValveLink software was used to conduct diagnostic tests and create valve-performance signature curves on 82 of the 86 valves in the new line.



The Baumann sanitary valves installed in the sterilizing area of a production line included FIELDVUE® Digital Valve Controllers, and therefore, an efficient way to monitor their performance.

The plant engineer said, “Using the FIELDVUE instruments, smart transmitters, and AMS software, we accomplished in minutes what would have taken hours to find and correct using hand-held communicators. FIELDVUE instruments and Fisher people have been tremendous resources in support of our control valve diagnostics and maintenance programs. They are helping us make significant operating improvements while lowering our maintenance costs.”

Startup A Critical Process

Sterilizer lines are especially critical to the process and the main areas that can cause a purge. When the first half of the sterilizers were installed, Fisher engineers discovered (through diagnostic tests) a number of valve-related issues that would have delayed startup.

Thirty-six valves on the sterilizers had various, minor problems, likely caused by careless handling during valve installation or changing out the pipe unions. (For the whole project, 99 percent of the problems proved easy to correct, i.e. no major repairs required.)

Customer and Fisher personnel met with the piping contractor to share test results. Consequently, valve installations on the other half of the sterilizers were completed with far fewer valve-related problems.

One of the process engineers said, “The valve work (diagnostic tests) conducted before startup was the best money we spent on this project, and it amounted to less than five percent of total project costs.”

By conducting these control valve diagnostic tests in the early stages of the project, Fisher helped the customer:

- Meet the startup schedule,
- Prevent a purged batch and therefore reduce downtime costs,
- Reduce labor and maintenance costs (especially on the second pair of sterilizers), and
- Improve record keeping -- The baseline data was stored and will be used as a basis for comparison in future tests and diagnostic interpretation aids.

Site personnel have learned to value Fisher Controls’ predictive maintenance techniques and tools. The customer concluded, “Fisher’s FIELDVUE instruments and software enabled us to identify and correct valve-performance problems and thereby get the line up and running again at a significant savings.” ■

Calcasieu Refinery Realizes Dream Of "Totally Digital" Control

In 2001, the Calcasieu Petroleum Refinery in Lake Charles, Louisiana upgraded all of its 25-year-old pneumatic controls to Emerson Process Management's PlantWeb® and FOUNDATION™ fieldbus technology. It is believed to be the first refinery in the world controlled entirely by bus-connected intelligent field instruments, including Fisher's FIELDVUE® DVC5000f Digital Valve Controllers.

The ease of twisted-pair cabling, as well as the virtually automatic commissioning of the instruments and valves, enabled Calcasieu personnel to complete their retrofit in six weeks - a 75% time savings compared to conventional upgrades. Because of nonincendive circuit wiring methods used in this Division 2 (normally non-hazardous) work area, no hard conduits or intrinsic safety barriers were required.

Jody Verret, process and mechanical superintendent at Calcasieu, was surprised and thrilled by the ease and speed of the installation. "We had one worker on the console and one in the field with a radio, running cable and calibrating and commissioning instruments over the network—nearly as fast as the field guy could plug the devices in," he said.

Rob Wood, senior engineer at John H. Carter Company, the local Emerson Representative office, said, "Every instrument that could be fieldbus is fieldbus."

This FIELDVUE DVC5000f instrument on a Fisher, easy-e ® valve serves a 5,000-barrel-per-day crude unit, added during a recent retrofit at the Calcasieu Refinery. This assembly, like many others throughout the complex, communicates and receives power via FOUNDATION™ fieldbus technology.

All tolled, there are 22 fieldbus segments at the site, carrying a total of 116 instruments. Each segment communicates by TCP/IP Internet protocol on a dual redundant optical-fiber Ethernet LAN to operator and engineering work stations (DeltaV consoles). AMS software enables remote instrument configuration, calibration, diagnostics, and preventive maintenance.

With just one session of training, Calcasieu people put the new system in themselves and expect to implement future additions, as needed. The result is a totally digital, scalable network that makes the most of intelligent instruments and field-based control.

Besides lower operation and maintenance costs, the customer reports an increase in operating capacity. In summary, Calcasieu site managers expect to realize an annual return of 80% on their million-dollar automation investment. ■

Texas Refinery Is Reference Site For Fieldbus Solution

This is one of three dozen FIELDVUE® DVC5000f (fieldbus) instruments in operation at the refinery in Deer Park, Texas, operated by Shell. Several of the units on site were installed via hot cut-over implementation.

Operating since April 2001, the FOUNDATION™ fieldbus solution at Deer Park has been very successful, proving the value of interoperability, control valve diagnostics, and "real-time" data. Thus, the system now serves as a reference site for others who question the capabilities and benefits of field-based control.

Shell is expanding this initial installation, applying fieldbus technology to a cat cracker reinstrumentation project and hydro treater units.

The Vue To Success

newsletter is cooperatively produced by Fisher Controls' FIELDVUE Instrumentation and Communications departments.

It is written primarily for Fisher Controls' customers and field sales associates, and distributed as both an electronic and printed piece.

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

FIELDVUE® DVCs Improve The Reliability of Saudi Aramco's Safety Instrumented Systems

FIELDVUE® Digital Valve Controllers (DVC) have helped improve the reliability, flexibility, and safety of Saudi Aramco's Safety Instrumented Systems (SIS). The instruments facilitate partial stroking and on-line testing of valves in SIS applications, while reducing the likelihood or severity of a valve's failure.

Saudi Aramco was the first international Oil & Gas industry organization to apply Fisher's "smart instrument" technology to SIS and block valves in an operating facility. In late 1999, FIELDVUE instruments were installed on Emergency Shut Down (ESD) valves at the Shedgum Gas Plant and the Yanbu Refinery in Saudi Arabia.

Saudi Aramco personnel have publicly praised the results of these initial applications. Patrick Flanders of Saudi Aramco, who championed the concept and its development, said Fisher's solution brings a new era of security and field-proven reliability to SIS. "Before this DVC ESD concept evolved, it was difficult to functionally test these valves and very difficult to document any meaningful test results. Now, thanks to the Fisher FIELDVUE design, it is not only possible but we can check valves more safely, at lower cost, and with greater efficiency."

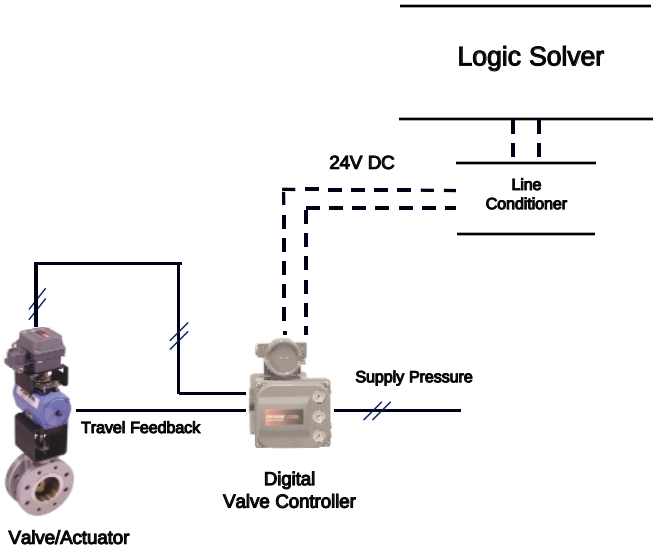
Flanders added that Fisher engineers also made this technology easy to apply and configure. Using either the hand-held communicator, ValveLink software, or an external push-button, FIELDVUE users can (a) configure the valve for partial stroking and (b) set valve travel. With the HART protocol, the valve position is communicated over the same twisted pair of wires that provides the valve power.

Flanders praised the Fisher-FIELDVUE team for listening to Saudi Aramco's ideas and needs. "This is one product truly based on a customer's requirements and direction for limited valve-travel testing. What was once a very manual process is now semi-automatic," he said. "With the DVC in the ESD loop, the valve travel is controlled to predefined limits and test data is collected during both on-line partial stroke tests and during full-stroke tests (while the valve is out of service). In other words, the device doesn't automatically initiate testing, but it does automate the testing process, greatly simplifying the testing procedures and time required of our operators."

Saudi Aramco is expanding its use of Fisher FIELDVUE instruments. A recent project at the Yanbu Refinery includes 40+ DVC ESD valves, which were applied to a fired-heater upgrade. ■

Advantages & Disadvantages Of Using A Solenoid Valve In SIS Applications

Several installations are available for using FIELDVUE® DVC6000 ESD instruments in SIS applications. One of these solutions does not require a solenoid valve. Customers will need to evaluate, however, the pros and cons of this solution, depending on the specific application and objectives.



Traditionally, safety shut-down valves were not tested during operation. The only component within a traditional SIS that could be tested on-line was the solenoid valve, and this was possible if a redundant solenoid valve was mounted in parallel.

With a DVC6000 ESD solution, partial-stroke testing can be performed on-line for the complete SIS valve assembly. The solenoid valve (already in place in many applications) can be used in series with the FIELDVUE Digital Valve Controller to take the valve to a safe condition.

When applied externally (in the pneumatic path of a Safety Block Valve), a solenoid valve can increase the port orifice if a faster stroking speed is needed. (If a solenoid is not used, this would require an additional quick-exhaust valve.) Using an external solenoid valve improves the PFD (Probability of Failure upon Demand), but worsens spurious trip number.

Use of a solenoid valve internally to a microprocessor-based device (as done by other manufacturers) not only is limited to one pneumatic path to drive the valve to a safe condition, but also restricts the flexibility of increasing the stroking time.

Customers concerned about spurious trips may simply decide to eliminate the solenoid valve, using the Two-Wire Solution shown above. ■

Fisher FIELDVUE® Valves 'Get The Gain' In Process Loop Performance

A Fisher valve with a FIELDVUE® Digital Valve Controller is a proven way to tighten control and improve reliability for any process loop. This single assembly, appropriately applied and maintained, can result in higher yield and throughput, more uptime, and decreased operating and maintenance costs.

As manufacturers, you face increasing demands for performance and profitability. To meet these challenges, you are investing in many levels of the business, from new automation systems to real-time optimization. Studies from every industry show that the final control element (the control valve, actuator, and positioner) is the level to address first. Real gains and results can be achieved by improving the performance of a single control-loop or more specifically, the performance of a single valve.

Fisher has documented results from closed-loop tests that demonstrate that the right valve can improve control loop variability by well over 1%. If a corresponding set point change is made after a high-performance valve assembly is installed, the return on the bottom line quickly pays for any re-instrumentation, often within a few weeks.

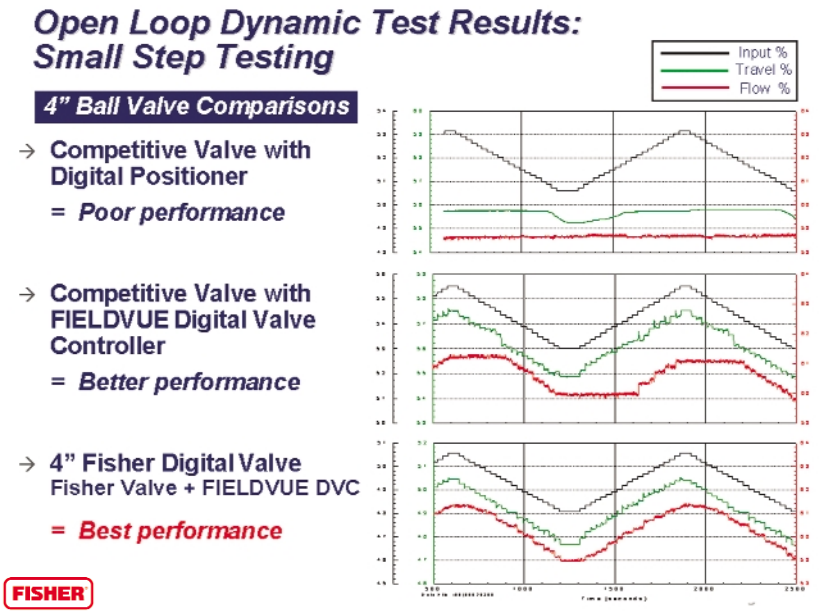
Leaders in optimization initiatives, like EnTech, recognize the importance of the control loop and the value of spending time and money on the field control equipment "in the basement".

Bill Bialkowski, President of EnTech says, "The undesirable behavior of control valves is the biggest contributor to poor loop performance and the destabilization of product uniformity."

In another example, performance optimization work at ExxonMobil initially focused on the upper levels of control, but ultimately led to a surprising conclusion. More than half the value of Advanced Process Control came from addressing the performance of the final control elements in the profit critical loops, and that gain came even before the advanced control package was implemented.

What makes a good control valve? It is very important that the control valve and all related instrumentation (positioner, actuator) be designed as a unit with performance in mind. Stability, friction, and the positioner's responsiveness are a few of the variables to consider. To verify the performance of any control valve assembly, dynamic testing in both open-loop and closed-loop conditions must be used. Old-fashioned, static, bench-top testing does not provide the information required to develop the best control equipment.

Let Fisher, the global-leader in digital valve technology and dynamic testing procedures, help you achieve significant gains in process loop performance. ■



Results of open-loop dynamic tests demonstrate the importance of the control valve assembly. In each of these dynamically loaded tests, the valve was "asked" to move to small input signal changes. (Each step was 1/8th of 1% of full range.) The black line is the input signal and the red line is the process variable (flow %).

In the top chart, a competitor"s four-inch ball valve assembly does not respond to more than a 2% change in input signal.

In the middle chart, the same valve, equipped with a FIELDVUE DVC, performs better, responding to a 1% change in input signal.

The best results were obtained by using a valve assembly designed for dynamic performance. In the bottom chart, a Fisher four-inch ball valve with a FIELDVUE DVC provides a process variable for very small changes in the input signal.

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

ValveLink® Software With PD Cracks Tough Case

Fisher sales and service personnel sometimes feel like detectives, analyzing clues to determine the root cause of valve-performance problems. Too often, positioners are blamed when something goes wrong. Through the use of new, on-line diagnostics technology, however, performance problems can be tracked to their root cause.

The Fisher team in New Jersey used ValveLink software with Performance Diagnostics to trend valve-performance variables and convince their customer not to replace newly-installed FIELDVUE® DVC5000 Digital Valve Controllers. The local refinery had just added DVC instruments to three large Fisher valves in their Utilities area. Unfortunately, the valves would, at times, “just go open” on their own, causing the gas turbine to shut down. Upset, the operations people blamed the new technology for the problem.

Bill Gumienny and Ed Smigo of PROCONEX, working with Matt Doyle of the Fisher Service Company, were determined to find the root cause. Using a PC with ValveLink software and Performance Diagnostic capabilities, they proved that it was the tuning of the control PID that was at fault.

With the PID tuning corrected, the refinery experienced no more problems.

The FIELDVUE instruments remain on the job, supplying critical information about valve performance and helping to improve control and reliability.

Case closed. ■