



## SOFTWARE SAVES \$50,000 FOR INSTRUMENT CALIBRATION

CHECKING OUT THOUSANDS of instruments and calibrating them prior to installation in new power plants is largely a manual job. Documentation of instrument calibrations is also usually done manually. In preparing documentation manually, the documents may become illegible, lost, or, depending upon how the data is stored, security can be an issue.

When documentation is lost, or is unacceptable, instrument calibration must be redone. Occasionally, if the original raw data does exist, a technician can recreate new documentation. In either case, significant labor costs are incurred. Similarly, time spent dealing with the past detracts from current progress and may even lead to missed milestones or completion dates.

### REDUCING CALIBRATION COSTS

In a large project, additional personnel may be assigned to collect, review, edit, and organize the documentation. The aim is to make sure that the calibrations are correct, complete and accurate prior to the data being presented to the plant's owner. However, this was not a problem at the recently completed 480 MW combined-cycle Front Range Power Station, constructed by TIC near Colorado Springs, Colorado.

At this project, one technician printed out calibration certificates for more than 60 turnover packages. Although more than 1,200 HART and conventional devices were documented, no calibration document was questioned or returned. Because no additional costs were incurred for recalibration of the instruments, or reworking the documentation, the project is estimated to have saved up to \$50,000 in avoided costs. These savings were possible through the use of software originally designed to help end-users reduce instrument startup and maintenance costs by accessing diagnostic information from smart field instruments.

The database that functions as an integral part of this predictive maintenance technology is also suitable for use by instrument technicians, making instrument testing and calibration easier and less time consuming. Furthermore, a record is automatically generated every

time an instrument is calibrated or a configuration parameter changed.

This procedure takes advantage of the instrument database built into the AMS Suite: Intelligent Device Manager software created by Emerson Process Management. Loaded into a PC, in a control room or maintenance shop, this software communicates with smart field instruments on the control network, capturing diagnostic information generated by the devices. The massive amounts of data obtained in this way are integrated into a single database, organized, processed and presented on the PC monitor. As a result, it simplifies the work of the engineers and technicians.

Engineers at TIC had been evaluating calibration management systems for several years, looking for a more effective means of dealing with the documentation. Contractually TIC is obligated to provide calibration and test information to the customer once the project is completed. Because instrumentation is essential to any power plant project, TIC needed a way to manage the documents while certifying

the integrity of the instruments without incurring exceptional costs.

The company was not looking for a predictive maintenance system, but an intelligent device manager technology designed primarily for the testing and calibration of instruments. Although the software is intended for use with smart instruments, it is capable of handling device data and calibration parameters of any field device.

The Front Range Power Project was selected as a pilot site for application of this software because the timing was right, and the project team was willing to try new methods and technologies. In addition, the project was close enough to TIC's offices for support if needed.

According to TIC, the software allows even the most unorganized person to present his or her work in an orderly fashion. Once standard procedures are set up, multiple people can use the program to produce consistent final documents. On a project of this size, about one-and-a-half technicians would be assigned for calibration activities. Besides inspecting, bench testing and documenting all arriving instruments, the tech-



*Software speeds up instrument calibration and commissioning.*

## FIELD NOTES

nician must also test and calibrate all instruments installed as a part of OEM-supplied equipment. At the Front Range Power Project, one technician performed all initial calibrations, and the documentation for each was accurate and complete.

For the 288 HART devices in the system, the technician connected the device via the PC or field communicator, scanned the parameters and uploaded the device information into the system. The correct tag name was assigned along with a test procedure and then downloaded into the Fluke 744 calibrator.

Since it was not necessary for the technician to enter the information via a keypad to the calibrator, the operation was fast and accurate. After an instrument is calibrated on the bench the results are uploaded from the calibrator to the database. The procedure for conventional (non-smart) instruments is similar. However, it is necessary to manually enter the

parameters for each of the devices into the database as a first step.

Calibration results, archived for each instrument, provide the basis for documentation. As a result no handwritten notes or reports are required. If the calibration history of any field device is needed at a later date, it is immediately available on the PC monitor for review or printout. At the Front Range Power Project, the instrument database was updated throughout the commissioning and startup activities. Eventually the data was retrieved, edited and printed for inclusion in the turnover package.

### **THE BENEFITS**

According to TIC the quality control of the calibration and testing of a project's instruments has improved substantially. In operation, if an engineering change is necessary the instruments can be recalibrated and the reason for the change recorded.

One benefit to the plant's owner is that the archived calibration data can be utilized to develop a viable predictive maintenance program for the plant. All that's required is the installation of the AMS Suite: Intelligent Device Manager as an adjunct to the control network. This is then used to monitor the condition of the field devices and equipment.

On the Front Range Power project, TIC used substantially less man-hours to complete the calibration activities than would have been previously required for a similar sized project. In addition, the turnover package was completed on the first pass and no rework was necessary. Because all of the data exists within the AMS Device Manager, there is no need to store multiple copies of paper documents. TIC currently has three large projects in which they are using the intelligent device manager for instrument calibration.