



Canada's Total Reliability Magazine

PEM

PLANT ENGINEERING
AND MAINTENANCE

SINCE 1977



Featured in the
MAY/JUNE 2012
issue

Refined Monitoring

**After 13 years, asset management
still thrives at Ontario refinery**



PHOTO: SUNCOR

Refined Monitoring

*After 13 years,
asset management still thrives
at Ontario refinery*

Asset management has proved to be so effective in diagnosing production problems and cutting maintenance costs at Sunoco's Sarnia refinery it has been expanded from the original 50-instrument system to cover more than 3,000 smart field devices and Fieldvue digital valve controllers (DVCs) throughout this 80,000-bbl/day refinery.

The successful trial of a new software-based asset management technology in 1997 led to installation of that first small system, which gained acceptance far beyond expectations. In fact, maintenance savings of 20 to 30 per cent, achieved by utilizing the large amount of information generated by smart field instruments, stimulated the support of asset manage-

ment by the refinery staff and triggered the replacement of old analog (4-20 ma) transmitters by modern digital devices.

In addition to the normal input/output functions of distributed control systems (DCS), these newer instruments are capable of performing self-diagnostics, storing data and communicating their status and condition. This field-generated information went largely unused until asset management, first implemented following that beta test in 1997, produced significant maintenance savings.

We now recognize additional benefits, including improved instrument reliability, faster commissioning of new or updated control networks, more effective troubleshooting of suspected problems, and early identification of instruments and valves requiring overhaul. In fact, our maintenance technicians who use the asset management system every day say they "can't live without it."

That technology, AMS Suite: Intelligent Device Manager,

INSET: Recent enhancements to Emerson's Fisher Fieldvue DVC6000 digital valve controller for SIS help improve reliability, flexibility and availability.

PHOTO: EMERSON PROCESS MANAGEMENT

has been updated over the years but still operates as originally intended, accessing information from our digital field devices, organizing the data and presenting it in a useful manner. With monitors in the instrument shop and control rooms, maintenance personnel and operators alike can now acquire more information in a few moments than could be obtained previously by going into the field and attaching a handheld communicator directly to an instrument. Avoiding troubleshooting trips to the field is just one way in which maintenance dollars are saved.

Since its original installation, AMS Device Manager has been used primarily as a diagnostic aid, enabling instrument technicians to evaluate the condition of field equipment and determine what repairs, if any, are needed and how soon they should be made. The system's Alert Monitor is normally checked weekly to determine changes in field device operation. When warranted, an extended in-shop evaluation may trigger issuance of a work order by the refinery's SAP computerized maintenance management system (CMMS). There is no automatic work order generation at this time, but

that can be accomplished by integrating the CMMS with the asset management system.

A criticality rating of 1 to 3 indicates the value of each instrument with regard to risk. A problem occurring with a 1 rating would create an emergency work order because of the importance of that device to the production process. A 2 rating is less critical, and a 3 can be scheduled for routine repair or replacement when convenient. In this way, preventive routines

have been replaced by predictive maintenance. When the Alert Monitor signals a change in condition, further evaluation establishes the extent of the problem so supervisors can predict when maintenance should be scheduled.

Commissioning of new or upgraded instrument projects is much faster thanks to the AMS Device Manager and the QuickCheck SNAP-ON application during the interlock checkout phase, specifically verifying the integrity of our



safety interlock systems. Using this software, technicians are able to validate all wiring from the control room to the field, saving time because the connections do not have to be checked manually. Loop checking is typically completed in about half the time previously required for this task. As a result, at least two weeks are saved in commissioning a refinery unit; technician involvement is reduced; and the overall cost is lower. A history of the checkout process is also provided.

Information regarding the configuration and calibration of devices serving the control system is stored in a vast asset management database and updated whenever a change occurs. Since process control engineers have access to this information on a read-only basis, they can easily check the configuration parameters or current status of any device on the control network. If a problem with a device is suspected, that concern is passed on to the maintenance department for troubleshooting.

With the AMS ValveLink SNAP-ON application, technicians can communicate directly with the Fieldvue DVCs mounted on control valves, enabling them to configure and calibrate valves from a central location. They also retrieve feedback on valve position, travel deviation and other functional information.

Advance knowledge of the condition of control valves scheduled for overhaul at the next turnaround is especially useful. These schedules were often determined in the past by the length and severity of a valve's service without knowing its actual condition. Many valves were removed for repair only to learn there was nothing wrong. Now, baseline valve signatures made when each valve is new are compared with current signatures to determine which actually need an overhaul. As a result, many valves are removed from the scope of every turnaround, saving time and money.

Periodic checks have also enabled us to uncover improperly operating valves. In one case, a visual examination in the field indicated nothing wrong because the "stem was going up and down." In actuality, the stem was broken and not moving the closed valve. The problem was obvious when a technician viewed it with the ValveLink software, and the valve had to come out for repair.

Even when no problem is found, AMS Device Manager is invaluable as a troubleshooting tool. It helps us decide where and when to repair or replace control system equipment in order to maintain a high level of availability — in the range of 96 to 97 per cent. As a result, the refinery continues to operate at high degree of proficiency, all these years later. **PEM**

Trevor Whitlock works with Suncor Energy Inc. at their Sarnia, Ont.-based refinery.



PHOTO: SUNCOR

ABOVE: Sunoco's Samia refinery has more than 3,000 smart field devices and Fieldvue digital valve controllers throughout its 80,000-bbl/day refinery.