



Total Solvants achieves 100%

predictive maintenance

Process plants are waking up to the possibilities of smart instruments.

Theoretically, microprocessor-based "smart" field instruments should provide a wealth of useful data for plant maintenance programmes, even if the instruments are not connected with a fieldbus. However, while smart transmitters have been around for a long time - the first ones were introduced by Honeywell nearly 20 years ago - the reality today is that few plants have taken advantage of the diagnostic possibilities they offer.

Total Solvants' Oudalle plant in the Normandy region of France has proved to be an exception. It is one of the first process industry plants in Europe to implement predictive maintenance on all field instrumentation and associated production equipment, which includes

400 valves and process variable transmitters.

Total Solvants is a subsidiary of Total Raffinage Distribution, itself a subsidiary of Total FINA ELF group. The Oudalle plant produces about 100 products, including special spirits, white spirits, kerosene cuts, iso-paraffin, solvents for ink, drilling, fluids, pesticides, aromatics, and plasticisers.

Like many other process plants, Oudalle upgraded to "intelligent" microprocessor-based devices in 1995, because of the accuracy and extra features of the instruments. It doesn't cost much extra to do this. Volume manufacturing has diminished the price differential between "smart" and conventional instruments in the past decade, so smart instruments are routinely specified when replacements are needed. Nevertheless, the Oudalle plant did not achieve open access to the wealth of information their smart

instruments generated until four years later, in 1999.

This information is the basis of the plant's reliability centred maintenance programme, a new effort which plant managers say has been "highly effective."

100% predictive

"We've gone beyond systematic maintenance toward a 100 per cent predictive maintenance environment," said Pierre Piquenot, who manages the Instrumentation, Electrical, and Computing Department at the Oudalle plant.

"Our slogan is: 'More than preventive...now predictive,' because every maintenance action is calculated and scheduled for the least disruptive time, depending on how essential the equipment is to the process. We prevent unexpected breakdowns by evaluating

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evidence provided by the AMS (Asset Management Solutions) software and by forecasting the useful life of all 300 transmitters and 100 control valves on our distributed control network."

Mr. Piquenot's assistant, Jean-Luc Le Gall, elaborated, "When notified of an apparent problem, we search the database for a specific device tag number to obtain basic information, such as specifications, adjustments, and calibration parameters. Then, we interrogate the device online to assess its operating condition and determine whether to replace it or make repairs. Finally, we decide when to do the work. Such decisions were not possible previously, because this kind of inside information was simply not available."

The AMS software, developed by Fisher-Rosemount, allows maintenance personnel to look directly into smart field instruments "in a way never before possible," he says. When loaded into a PC connected to a control system,

AMS communicates with HART or Foundation Fieldbus devices on the network, capturing information regarding their condition. Massive amounts of field-based data are integrated into a single database, organised, processed, and presented for use by engineers and technicians.

AMS also helps to save workers' time by streamlining such tasks as loop checkout and tuning, instrument configuration, and calibration. It allows maintenance personnel to troubleshoot field devices from the safety and convenience of the maintenance shop and it also helps them document their activities automatically to eliminate manual record keeping.

A history file is created for every field device, collecting information related to work completed. "As found" and "as

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left" data are automatically stored in the database, eliminating step-by-step manual documentation. This information eliminates surprises and helps technicians determine in advance what may be required to repair or replace any device on the control network.

Avoiding 90% of the work

Jean Luc Le Gall said that in the past his technicians had to service all 100 control valves annually. However, AMS helped them avoid 90 percent of that work over the last two years by showing that only 10 valves actually required maintenance.

"Of course, we focus on those valves that require immediate maintenance," he said. "With our ability to access their built-in diagnostics, we can measure wear levels in valves and forecast their longevity. Keeping all the valves operating at or near maximum performance levels gives us a sense of peace."

According to Pierre Piquenot, the benefit afforded by AMS is directly linked to the availability of essential equipment so that nothing interferes with the production and throughput remains high.

"The AMS system is so integrated into our process, we sometimes forget what an impressive amount of work it does for us," Mr. Piquenot said. "Even so, we have great expectations. AMS can be coupled with our computerised maintenance management system (CMMS) to create potential work orders each morning for our review and action. We also expect field-based data to become an element of our total plant management system, giving every plant post access to information on every valve or transmitter." ❖

