Written by Tina Spivey, Augusta Service Co., Inc.
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Augusta Service Co. Inc. (ASCI), Augusta, GA, is a maintenance organization that serves two parent companies and their subsidiaries. During the past 10 years, we have met regulatory challenges—and the unique challenges of the companies we serve—by installing, adapting, and expanding an automated system to manage the information required for predictive and preventive maintenance.

ASCI is a nonprofit company owned by DSM Chemicals North America, Inc. and PCS Nitrogen Inc. DSM is the world's largest merchant supplier of caprolactam monomer for Nylon 6 polymer, which is used in carpets and textiles. PCS Nitrogen is the world's largest producer of nitrogen fertilizers and its Augusta facility is the largest nitrogen fertilizer producer on the East Coast. Two other production facilities owned by DSM and one owned by W.R. Grace also operate on the 150-acre site in Augusta served by ASCI.

To serve all of these facilities, we maintain a maintenance shop with 25-person electrical and instrumentation (E&I) crews on site at each company's main facility. A back-shift crew and several utility shops assist in providing preventive and predictive maintenance. A maintenance-engineering group provides engineering support to the parent companies through assigned area-maintenance engineers, as well as base support through its mechanical and pipe groups and E&I.

Certification and compliance top priority

ASCI purchased its automated system, DocuMint Solution, in 1992 from Loveland Controls Co., which later became part of Honeywell. Our goal was to develop a test history database to help DSM and PCS attain ISO 9000 certification.

In addition to providing a means of compiling, storing, and organizing test histories, the automated information management system captures crucial details for certification, including "as found" and "as left" test points, environmental conditions at time of calibration, NIST traceable test equipment, and out-of-tolerance specifications on field instruments and test equipment.

DSM now holds ISO 9000 (2000) certification. DSM Resins US, Inc. earned QS-9000 certification and PCS earned ISO 9002 (1994) certification. We expanded our use of the system in 1997 to address the Occupational Safety and Health Administration's (OSHA) Process Safety

Management (PSM) standard 1910, particularly to document compliance with the standard's mechanical integrity rule.

Organizing and managing data

The organization of ASCI's database reflects our need to manage assets for two separate companies, document history on instrumentation loops, and maintain records on individual instruments and equipment. The database hierarchy is Cost Center (a group of equipment in a particular area of the plant), Loop (all instrumentation related to a single function), and Tag ID (each instrument or piece of equipment).

Currently, the database includes 83 cost centers, more than 8600 loops, and more than 38,500 tags. It holds more than 30,000 test results—each linked to specific tag IDs and specific pieces of test equipment.

Test equipment is tracked as well. ASCI maintains three-point, one-point, and certification histories on all 340 pieces of test equipment. Prior to use, each piece of test equipment receives a one-point check for accuracy. The database also designates which test equipment ASCI should segregate for use on ISO 9000 devices. We maintain check standards for one-point and three-point checks in each instrument shop.

Each process calibrator has a test setup for every function it performs, which means ASCI tests a total of 687 functions. We maintain a test equipment function database, which designates each function of each calibrator as an individual record with a test setup assigned.

Creating shortcuts for routine tasks

We also use the software to create quarterly reports for each facility's production staff. These reports reveal specific deficiencies related to past-due or untested instrumentation. Production staff also may use reports to plan for shutdowns, audits, and daily schedules. To expedite these and other routine information needs, we use the Fastask function of the system. Reports include:

- Production update report: Issues a list of all delinquent or untested devices by cost center to update a specific area of the plant.
- Cost center performance: Searches all ISO cost centers to determine the number of devices untested or past due based on date guidelines.

- Scheduler report: Searches for tag IDs or test equipment between chosen dates to allow reports to cross reference with maintenance schedules.
- Plant structure for ISO: Searches and displays only ISO tags, in only ISO loops, in only ISO cost centers, instead of all tags in all loops in all cost centers, which may include instruments that are not ISO quality critical instruments.

By using the program's options, ASCI further customized the information management system to meet its needs.

Equipment group searches are simplified. We assign all OSHA PSM loops separate equipment groups for location, rank values for catastrophic failure risk, and rank orders of importance and FMEA numbers, which help calculate ranking values. The loop database stores and indexes these values and orders in a searchable format. When ASCI blocks off equipment groups for calibration, technicians can search for the equipment group number, load the calibrations for all instruments in the group, and go to work.

Calibration sheets expedite turnaround maintenance. During a plant turnaround, technicians must perform hundreds or thousands of tests in a short time period. ASCI also must manually record much of the maintenance information due to the number of temporary technicians on site. To ensure collection of consistent information, we use the information management system to create calibration sheets that can be printed and attached to work orders.

Reverse trace ensures correction of inaccuracies. When we find out-of-tolerance test equipment, we can trace which process control devices the out-of-tolerance equipment calibrated. Technicians then can check and correct affected devices, if necessary.

The payback

Using this information management system, we have been able to ensure our parent companies and their subsidiaries comply with ISO certification and OSHA PSM compliance. Our ability to customize the system and manage the database effectively has also increased profitability.

In addition to supporting routine preventive maintenance, the system also helps increase the efficiency of work performed during turnaround periods.

We have more efficient maintenance schedules. Using the system to track test history such as failure rates of specific models or specific loop configurations, we can use re-engineering to protect equipment and prevent early failures, re-evaluate the tolerance specifications, or adjust the calibration intervals. The evaluations can help determine the appropriate frequency for preventive maintenance.

We can identify specific equipment makes and models that failed repeatedly or frequently drifted out of tolerance. Maintenance histories stored in the information management system provide the rationale for specifying new instrumentation or a wholesale change-out of a particular make or model. This single benefit saves production downtime and contributes to ASCI's ability to maintain a record of 0.5 percent average production loss of maximum capacity.

The use of the information system as an interlock database has allowed ASCI to identify inoperable and out-of-tolerance interlocks, which are tested during plant outages. It is ASCI's answer to OSHA 1910 PSM instrumentation documentation requirements for its safety interlocks. The ability of the system to track failures allows engineers to focus on technical requests with a solid historical basis for engineering changes. **MT**

Information supplied by Tina Spivey , an associate equipment specialist in instrumentation at Augusta Service Co., Inc., 27 Columbia Nitrogen Rd., Augusta, GA 30901; (706) 894-6147. For information on DocuMint, visit www.acs.honeywell.com

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