Harley-Davidson Motor Co. in Milwaukee, WI, is upgrading its buildings on Juneau Avenue. The first building was constructed in 1906 to house the company's manufacturing operations. Now the original factory has grown to a 650,000 sq ft campus, most of which is on the National Register of Historic Places.

Harley-Davidson produces heavyweight motorcycles and a complete line of parts and accessories. Until 3 years ago, building and equipment maintenance was managed almost entirely on paper by the facility's maintenance staff.

In addition, the company's maintenance inventory had grown to about 10,000 parts valued at about $120,000. Most items were small parts, such as nuts, bolts, and pipes, and electrical components, such as gang boxes and fuses. All of them had to be tracked so that maintenance was never caught short.

"Everything ran fairly smoothly, but things did not always get done, because a piece of paper may have been misplaced," says Andy Thorsen, acting maintenance manager for Harley-Davidson.

The facilities manager, along with the company's information services group, decided to automate maintenance operations at headquarters using an IBM AS/400-based computerized maintenance management system (CMMS) already in one of the company's manufacturing plants. "It just did not fit our needs," says Thorsen. "It was geared more for a manufacturing facility than for a corporate headquarters with office buildings and labs."

The maintenance staff decided on a more relevant set of criteria for the CMMS. First, the system had to be based on personal computers (PC). Second, it had to have the ability to create custom work orders. And the software application had to be based on a nonproprietary database.

After reviewing several CMMS applications, Harley-Davidson chose Datastream's MP2 for DOS, upgrading to a Windows version a year and a half later. The multitasking system has several integrated modules that track and schedule maintenance tasks and resources. The

modules cover maintenance areas such as equipment, labor, service and work order requests and management, preventive maintenance (PM), statistical predictive maintenance, inventory, and purchasing.

Implementation was gradual. First, details about the equipment at the facility were entered. Then about a year's worth of paper-based work orders were entered into the system. This information provided a maintenance history for reports, existing maintenance work orders, and inventory. Next, the maintenance inventory was entered into the system. Along the way, the maintenance staff established cost centers and began to assign accounting codes to all equipment to identify the department for which work is done.

To handle work order requests, Harley-Davidson purchased a Work Request System module in early 1996 to replace its paper-based system. About 30 PC-based dedicated workstations are distributed across the complex. Work requests are entered into the system and then sent electronically to the maintenance department. The system collects basic information, such as the name and location of the person initiating the request, and a description of the work needed. Thorsen uploads the requests to the work order module, which generates and prints preventive, corrective, and predictive work orders. He can also create and print work request history reports by type of repair and reason for breakdown.

CMMS in action

The CMMS is used daily by 10 maintenance people covering six crafts: millwright, piping, machine repair, electrical, stationary engineering, and shipping. They use a workstation in the shop to enter work order information.

Harley-Davidson uses the PM Tasks module extensively, explains Thorsen. "Probably 80 percent of our machine repairman's job is PMs, maybe 15 a week, ranging from one hour to a whole day per. About a year ago, we decided to put this all on the computer. That way, we can track costs, inventory, and tasks."

Setting up PM tasks was not difficult, according to Thorsen. With an equipment description already in the system, Thorsen and the repairman only needed to enter a description for the PM task, including frequency and task instructions. Each month the department adds more PM tasks.

Work requests are scheduled on a priority system. "We have priorities one through five, where one is a safety item and five is whenever we get to it. Most of them fall in the two to four range," Thorsen explains.

The Work Order module assigns and tracks all the PM tasks and new work order requests, scheduling resources as necessary. Normally, the system generates between 70 and 80 orders a week. To make servicing easier, Thorsen has set up the work orders so that all orders for a specific building are scheduled at the same time.

Harley-Davidson also implemented a module that includes an electronic catalog from W. W. Grainger, Inc., with more than 200,000 tools and parts for maintenance and other applications. Maintenance personnel can import data from the catalog directly into the system's inventory and purchasing functions.

An Occupational Safety and Health Administration (OSHA) database includes OSHA regulation sections 1901 through 1910. Maintenance personnel can cut and paste information directly from that database into work orders.

A bar code module lets maintenance personnel enter data directly into the system. Data include personnel and part identification numbers, work order numbers, start and finish times, and other details to close out work orders. Bar coded maintenance documents can be printed, along with bar coded labels for inventory parts.

Regular maintenance saves money

Virtually all manual maintenance management has been eliminated. Paper-based work orders have been reduced by 95 percent. The maintenance staff is no longer swamped by paperwork, work orders are no longer misplaced, and maintenance calls are handled immediately.

In addition to standard reports on labor, equipment, inventory, and efficiency, customized reports can be produced, including a monthly report listing work orders by departmental accounting code. This feature lets the maintenance department know how much to bill which other departments. Routine tasks such as replacing light bulbs are not charged back to the departments, but the report shows those items too.

The system's greatest benefit, according to Thorsen, is the capability to create, schedule, and track PM tasks for all kinds of equipment--and track the labor and materials costs associated with those tasks and new work orders. This information becomes the basis for the cost/benefit analysis required in the maintenance department's repair-or-buy decisions.

Using the CMMS has allowed Thorsen to shift maintenance labor to more productive tasks. "We've saved a lot of money on maintenance costs and parts by doing PM tasks--just oiling and checking belts, tightening belts on conveyors, tightening rollers, and doing work like that on schedule," concludes Thorsen.

"We have become more anticipatory, more foresighted instead of reactionary. Before, we'd wait until something was down; then we'd fix it. Now, we see if we can make it not go down in the first place. It's like that with all our machinery, and it's been very successful." **MT**

Information supplied by Datastream Systems, Inc., Greenville, SC; (800) 955-6775.