Bar Coding: Error-Free Data Entry

100% Gain in Maintenance Productivity

As users of CMMS have discovered, even the most powerful system is only as good as the information it contains. Keyboard data entry is vulnerable to error which can then migrate throughout the entire system creating larger problems. Entering data under time pressure increases the risk of error greatly. What bar coding has done for the world of retailing, it promises to the plant maintenance environment – accurate information entered rapidly to be acted upon in a number of ways. Bar code technology is one of the most important maintenance productivity tools.

Pilot Project

Many CMMS packages have already integrated bar code scanning in the parts stockroom, but few have implemented it on the factory floor. Recently the Cable and Connection manufacturing division of Hughes Aircraft (Irvine, CA) volunteered for a pilot project that incorporated bar code technology into the TMS® maintenance management system they were in the process of installing. Barcoding can also be added once the software is in place.

Portable Scanners

Here's how it works. TMS® prints out PM work orders based on information contained in the system. A bar code is assigned for each work order number. Emergency or corrective maintenance jobs are assigned a number when the work is completed, when information is downloaded. Data entry is via a portable wand used by workers to scan the work order number, the bar code number on his own badge, and finally the bar code on the machine on which he is working. This enters the time the work began. Parts, activity codes and job status, for example, the type of maintenance activity performed, why it stopped (end of shift, lunch, etc.), and the status of the machine when work was stopped, can all be scanned. When the job is completed, the worker scans the machine's bar code to record his time.

Downloading

At the end of the shift, data collected on the wands are downloaded into the TMS® system using software provided by scanner manufacturers. The wands are cleared and distributed to the next shift, and the cycle begins again. There is no keyboard entry whatsoever, and because the information cannot be altered in any way, its accuracy is assured.

Portable scanners such as this data wand allow efficient data entry with significantly lower risk of error.

At Hughes, bar codes took the place of keyboards at the outset. After a ten minute training session, maintenance workers learned the scanning sequence and were ready to work with it.

Maximizing Efficiency

The system allows tighter control of labor time, parts, and preventive and corrective maintenance activities. User groups report that the average time for keyboard entry of work order information was about three minutes. Bar codes can cut that time in half. That's a gain of 100% in maintenance productivity. The value of eliminating data entry error is probably immeasurable.

Circle 604
19th Century Plant Puts Maintenance On Line

Ease of Use Sells Cutlery Manufacturer on TMS®

How do you bring a 174 year old company that makes a product so specialized, much of its equipment is designed and built in-house to unique specifications, into the computer age? Bill Sacramone, Internal Systems Manager at Russell-Harrington Cutlery Inc. (Southbridge, MA) which has been manufacturing professional knives and cutting tools for meat packers and restaurants at the same site since 1818, had an opportunity to answer this question when he began investigating ways of automating maintenance.

Finding the right CMMS and hardware to run it were crucial to the entire operation, because the maintenance department at Russell-Harrington is not only responsible for keeping machines running smoothly, it actually builds many of the highly specialized machines, for example, sanding equipment for the wooden handles that don't exist elsewhere. Unique machines also represent a singular challenge for preventive maintenance. Maintenance routines and even spare parts all have to be developed and sourced internally.

Because maintenance at Russell-Harrington had been totally manual, Sacramone's main concern was getting a system that was practical and easy to implement. "Because of the kind of work we do, our maintenance people have developed unique skills. Bob Ouelle, our maintenance manager couldn't be swayed by the romance of technology. To him, a computer is just another tool. Great if it works. It's as if you gave them an air wrench instead of a hand wrench to do the same job."

The acquisition project took six months of reviewing various software packages and hardware options, and field visits to inspect systems in other facilities. In January 1990, Russell-Harrington went on line with TMS® (Total Maintenance System) using an IBM PC 386 power server and two terminals with printers. "I looked at a lot of software for less money," Sacramone said.

Bill Sacramone, Internal Systems Manager, Russell-Harrington Cutlery holds the TMS®-generated preventive maintenance work order for machinist Paul Fru.
said, "but you had to be a computer jock to keep them working. Our experience with this software is a good testimonial for system self-support."

**Unique Problem, Unique Solution**

Better inventory control of some 6,000 part numbers, many unique to the company and some obsolete, produced savings of 15% in the first year. Savings were also realized from improvements in control of maintenance tasks and productivity. But perhaps the best return on the investment came from a custom application within TMS\(^*\) unique to the Russell-Harrington operation. Because no precedent exists for many of its machines, an internal plant order system had been devised to enable the company to establish book value for insurance and tax depreciation purposes. This had been a time-consuming manual process in which the accounting department would collect relevant data—maintenance hours expended in construction and assembly; the cost of materials and parts—to come up with a value of these capital assets.

In TMS\(^*\), the same data becomes the basis for readily accessible engineering files and maintenance manuals for each piece of original equipment. Machine drawings and notes can be scanned into the system.

TMS\(^*\) was readily adaptable to Russell-Harrington's IBM PC 386. In the first year alone the company realized 15% savings from better inventory control.
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Let's Treat the Disease

News
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Synthetic lubricants from 67 companies are featured in Plant Engineering magazine's exclusive cross-reference product guide. (Photo courtesy of Dow Corning) 78

Features

Maintenance

Cross-Reference Product Guide For Synthetic Lubricants 78

Synthetic lubricants offer a number of operational advantages over mineral-based products across a wide array of applications, including bearings, gearboxes, compressors, vacuum and diaphragm pumps, rotary shaft seals, valves, hydraulic systems, and instrumentation. Managing Editor Ron Holzhauer discusses selection considerations, analyzes the types of products available, examines the compatibility question, and presents an exclusive chart of products from 67 companies.

HVAC

Preparing for a Safe Boiler Startup 91

Preparing a boiler to start up safely and efficiently demands a specific set of procedures be followed. In this article, Douglas M. Rode, P.E., The Hartford Steam Boiler Inspection and Insurance Co., points out that poor maintenance is the cause of more than half of all boiler failures. He presents guidelines for getting a boiler ready to run initially, after a planned or forced outage, or after being mothballed. The author also outlines concerns common to all startups, including fuel problems, the need for planning, and the importance of maintaining safety controls.
Boiler and supporting equipment must be inspected and repairs made before startup.

Overpressure protection is provided by rupture disks with one moving part.

**FLUID HANDLING**

**Pressure Relief With Rupture Disks**

Safety pressure relief can be accomplished with valves or rupture disks. Rupture disks are unique because they are noncorrosive, maintain accurate relief settings, provide a large orifice for pressure relief, and protect against internal deflagration. F.N. Nazario of Exxon Research & Engineering Co. discusses five types of rupture disks and their operating characteristics.

**MATERIAL HANDLING**

**Understanding and Evaluating Bar Code Reading Systems**

Optical bar code technology is probably the most widely accepted form of automatic identification because of its accuracy, simple operation, proven performance, and reasonable cost.

**FACILITIES**

**Methacrylate Resins for Surface Protection**

Methacrylate resins have been used internally for more than 25 years in industrial floor and wall resins and are increasing in popularity among applicators. These systems cure by a hardening mechanism that allows their use under extreme time constraints. Borys F. Schafran of Degussa discusses specifications, preparation, and installation techniques for these systems.

**CONFERENCE**

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