Automation & Skilled Maintenance

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A technologically advanced production line is a system and all of the machines are connected. Each machine has its own programmable logic controller, structural parts, pneumatic systems, electrical systems, and sometimes hydraulics. The machines are all connected together by Ethernet that goes up to the plant IT department computer so that the output can be measured by the minute. These are very sophisticated machines and the plant manager is always looking for ways to make the line faster or more efficient. This means continuing to modify the line with new technology.

Automation has solved one labor problem but has created another problem. Downtime on some of these lines can cost up to $1,500 per minute so doing the preventive maintenance to keep them running at 99 percent efficiency is absolutely necessary.

The problem is that thousands of highly skilled workers are now retiring and we don't have enough programs to recruit and train the highly skilled maintenance workers for automatic lines. This is a two-part problem. First, there are the end user manufacturers who operate these advanced production lines. They are faced with a variety of issues such as:

- The trend for more automation and complexity in factories in the future.
- Automation and technology which have exceeded the skills of many workers.
- The impending retirement of millions of maintenance workers who have developed these skills over a long period of time.

- Very few training programs that can train maintenance workers to handle high speed packaging lines.
- Inadequate maintenance and training budgets.
- The perception many young people have that plant maintenance isn't a safe career path because of manufacturing's bad image caused by offshoring and layoffs.

The OEM Problem

Second, there is an even bigger problem for the OEMs who manufacture all of the packaging machines for the lines:

- Every time a new maintenance worker is hired or transferred to the automated line, it is usually the OEM's service staff who is asked to train the new person.
- The OEMs who build the packaging machines and conveyors usually train the initial maintenance people, but don't have enough staff for ongoing training.
- Many end users either can't or won't do the preventive maintenance on the line and the policy becomes "react when it breaks."
- Most OEM service departments do not have enough service technicians to answer all of the needs of end users.

Columbia Machine's Palletizer Division in Vancouver, WA is a typical example of an OEM in the packaging industry. They manufacture palletizer and conveyor systems for these types of sophisticated production lines. They have to train the maintenance people and operators, who service the machines for the life of the machine. Jim Primmer, Service Manager of the Palletizer Division, says it is hard to find and train people to be traveling service technicians.

Ideally, he would like them to be graduates of a two-year technical college and have both mechanical and electrical engineering skills. They also need at least one year of practical experience maintaining or operating similar machines. Jim says "the ideal candidate has to have a knack for troubleshooting and must be able to communicate with written communications". The factory has programs of formal classroom training on every product in Columbia's product line. But, Jim says, "Formal training must always be backed up with hands-on training to apply what has been learned."

Advanced Programs
There are a few training programs that are doing a pretty good job of graduating people who can enter this field.

Indianhead Community College, New Richmond, WI. Indianhead offers a two-year degree program called "Automated Packaging Systems Technician." The program really emphasizes the hands-on learning and a multi-skilled approach.

PMMI- The Packaging Machinery Manufacturers Industry Association offers train-

the-trainer-type workshops for its members but does not offer specific hands-on training for maintenance.

Purdue University at Calumet is offering the first comprehensive packaging machinery-focused mechatronics engineering technology program. The four-year engineering programs are vital to the packaging machinery industry because some of the production lines are now so sophisticated that they require a graduate engineer.

These programs are headed in the right direction, but there just aren't enough of them.

What Can Be Done?
What can engineering schools do? Those with mechatronics programs should provide more hands-on training and fewer theoretical classes. They should also expand from robotics into packaging machinery and automation which offers much greater opportunity.

What can the government do? The Department of Labor needs to encourage the states to support the advanced manufacturing skills and maintenance training rather then investing in training for low paid service jobs.

What can the industry associations do? Industry associations should make investments in creating more programs that are teaching the actual hands-on skills needed for jobs in the end user plant or OEMs.

What can manufacturing companies do? Most of the manufacturing OEMS who manufacture the machines for the automatic lines simply do not have the service engineers and technicians to satisfy all of their customer's needs. As described earlier in the list of problems, the end users have a lot of movement on the jobs, are cutting back on their training budgets, and expect the OEMS to be there any time they have a need. Yet the equipment gets more sophisticated every year, and skill levels are not keeping up with automation trends. The situation for the OEMs can only get worse and they will be expected to do more for their end user customers.

Becoming a professional maintenance engineer or technician to handle these automated lines, or as a service person for an OEM, is a good career opportunity for students who have a knack for things mechanical and electrical. The job security is there because many operations, like paper mills and beverage and chemical plants, are not going to be offshored. In addition, more of these automatic production lines are going to be installed as American manufacturing continues to compete globally.
Mike Collins is the author of Saving American Manufacturing.

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