America's Skilled Worker Shortage

According to a recent New York Times article: Despite the fact that there have been 2 million manufacturing employees laid off since 2007, manufacturers are still facing skilled worker shortages. According to the article, “Plenty of people are applying for jobs. The problem, the companies say, is a mismatch between the kind of skilled workers needed and the ranks of the unemployed.”

One reason for this shortage is that manufacturers continue to get rid of low-skill workers and replace them with automation. According to the article, “Now they are looking to hire people who can operate sophisticated computerized machinery, follow complex blueprints, and demonstrate higher proficiency than previously required of the typical assembly line workers.”

This advanced skills problem is not new. In fact, it’s urgency was described as far back as 1990 by the National Association on Education and the Economy. The National Association of Manufacturers (NAM) has also been a sponsor of three studies on skill training since 2003.

NAM’s 2005 Skills Gap Report cited that, “The most critical shortages of employees identified were in production, engineering, and skilled crafts.” The skills survey also said, “Manufacturers came to see that their employees would need more sophisticated skills than those needed in the past and that workers did not necessarily have the skills needed for manufacturing’s current and future challenges.” The report also encouraged manufacturers to view employees as investments rather then expenditures and urged them to invest at least 3 percent of payroll in training.

So it has been 20 years since the alarm was sounded on skills shortages in manufacturing. But the New York Times article says that manufacturers have been

accelerating their efforts at automating their plants, and laying off the low-skilled workers seems to indicate they are not making much progress in training high-skilled workers. Now that they are looking to hire people, they need someone the report defines as a skilled production worker, or “the highest level production technician within the manufacturing environment. A skilled production worker is able to operate manufacturing equipment in more than one process and is capable of recognizing process improvement opportunities. His/her knowledge of manufacturing equipment and processes is sufficient to understand and resolve moderately complex production issues, provide preventive maintenance, and make routine repairs. The skilled production worker applies advanced problem solving and analytical thinking skills to troubleshoot non-routine production issues.” This description sounds a lot like some variation of an apprentice training program that would lead to a journeyman status.

The 2005 skills gap report emphasizes the importance of solving the skills problem by saying, “Today’s skill shortages are extremely broad and deep, cutting across industry sectors and having an impact on 80 percent of companies surveyed. This human capital performance gap threatens our nation’s ability to compete in today’s fast moving and increasingly demanding global economy. It is emerging as our nation’s most critical business issue.”

Big Disconnect

There seems to be a big disconnect between what all of the studies have said is needed and the training that is actually being conducted.

In the 1980s, the large consumer products corporations began to re-engineer their companies. The re-engineering, from my perspective as a supplier, meant operating with fewer workers, buying out 30-year employees, replacing them with lower-skill (lower-paid) workers, cutting back on their internal training programs, and relying more on their suppliers for training.

The problem is that as the lines became more complex, the need for workers with the advanced skills to operate and maintain them also increased. But my experience as a supplier to these large companies is that investment in the training of the new workers has gone down over the last 25 years. In fact, one could say, that the investment in training is inversely proportional to the investment in automation. From a machine manufacturer’s point-of- view this trend has resulted in less preventative maintenance, more emergency breakdowns, and lower-skilled workers.

This has created problems in at least two general areas—the service technicians from the OEM suppliers who manufacture the equipment, and the maintenance and operations people in the plants that are supposed to make the machines run.

The Service Technician

Jim Primmer is the Service Manager for Columbia Machine’s Palletizer Division that builds these complex machines for production lines. He says that to be able to

service any of the many products installed by Columbia Machine, a service technician needs the following skills:

- Mechanical ability and knowledge of how things work (sprockets, chains, belts, etc).
- Working knowledge of pneumatics and hydraulics.
- The ability to utilize a troubleshooting methodology.
- The ability to read and understand electrical prints.
- The understanding of many PLC models.
- The ability to troubleshoot the ladder logic to the rung and execute minor programming without direction.
- The ability to add/change programming as directed by the engineers. Knowledge of HMIs.
- The ability to utilize the programming software to revise the HMI (add buttons, move buttons, etc). Control of VFDs, Device Net, Control Net and Ethernet.
- Good communication skills.
- Knowledge in the use of Word, Excel, and PowerPoint.
- Product knowledge of all models built by the OEM that are still running in the field.
- The ability to train adult learners with PowerPoint programs.
- The capability of writing reports that succinctly summarize a technical problem and are understandable by all involved. Primmer says to train a serviceman with all of these skills will eventually make him/her the equivalent of a journeyman and eventually a master journeyman when he/she learns all of the machines in the field.

Primmer also says that most of these skill sets are also needed in the manufacturing plants. This will be a large part of the need for highly trained (advanced skill workers) because there are virtually thousands of these lines and we need people in both the plants and as OEM service technicians to ensure the production runs continuously and without down time.

What is needed in both situations is an advanced training program.

Next month, I'll discuss how a focus on advanced apprentice training will improve the skills of the manufacturing workforce.

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Mike Collins is the author of Saving American Manufacturing.

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