

## Trends in continuing education for electricians

### Application Note

The pressure is on for electricians and technicians to accomplish tasks that were nonexistent ten years ago. Industry-wide, expectations are growing for electricians to know more and do more. To compete, they need training that will guide them down new avenues. Training institutes, schools, and employers are responding with new coursework and specialized programs.

In many cases the **demand for more** revolves around the computer—getting electricians and technicians up to speed in the world of digitized, computerized machinery. But that's not all. The economy, federal safety standards, and even customer service trends are affecting what electricians and technicians are expected to know.

#### Industrial

Consider an example at Kraft Foods in Philadelphia, Pa., where about 15 electricians keep the plant running smoothly. Added demands on those electricians have led to the establishment of a new school. William Van Stone, maintenance supervisor, brought

a course to Kraft Foods in Philadelphia, Pa., to train the company's electricians in the latest electronic technology. By helping its employees broaden their skill sets, Van Stone says Kraft is following an international trend. Gone are the days when electricians were hired to just change fuses and pull wire. Today, wire-pulling jobs often go to outside contractors, while the Kraft plant electricians do everything from replacing VFD drives to building a PLC platform or searching the Web for parts or installation instructions. "To maintain our equipment, we need electricians who can work with

computers, the Internet," Van Stone points out.

All Kraft electricians now take a course that familiarizes recent hires with Kraft's equipment and teaches older employees the skill sets needed for today's equipment. Once electricians complete the three hour-per-day, two-week course, they are on their way toward "enhanced electrician" status, a higher level within Kraft's ranks.

"I find the number one (issue) for electricians is computer skills. For most older guys that's new territory," Van Stone says.



Learning to troubleshoot motors and drives and get accurate output voltage at the 2005 NTI seminars.

## Refrigeration and appliance

Technicians in the refrigeration and appliance industry are experiencing changing demands of their own—but these relate to skills that never used to be offered in the classroom. Renton Technical College, Renton Wash., Instructor Paul Baeder says most prospective employers don't ask him about a particular student's GPA as much as they do about their personal skills. "They want to know are they reliable, trustworthy? What are their customer skills? There is a big emphasis on human relations."

Again, the world of the appliance technician is not what it once was. Companies like General Electric and Sears want their technicians trained in the basics, but most importantly they want technicians who know how to interact with the customer. "You're a guest in a person's home," Baeder says. The training program does in fact offer human relations material in their coursework. "We have teaching exercises that use role play often."

Appliance manufacturers are experiencing a shortage of trained technicians. Because the industry has become so diverse, most employers want their technicians to arrive with the basics and then learn the specific technologies on the job. To earn a Washington State specialty electrical license, for example, Renton Technical College grads will have to put in 720 hours of training and then take a state test, Baeder says. All of these training hours take place outside the school curriculum, after graduation or in part-time employment during the technical college program.

## Plumbers and pipe fitters

Contractors have been expecting more from plumbers and pipefitters as well: largely, the computer skills to work with today's HVAC/R systems. For the plumbers union, the laptop is becoming as important as the tool belt. Just starting a newly installed HVAC/R system requires a laptop to instruct the pumps to begin running.

"Computers are everywhere," says Eddie Moran, training director at the San Antonio JATC Plumbers & Pipefitters Local #142. "Finally they're hitting the construction industry."

Finding apprentices who are prepared for that change is challenging. In response, local JATC plumber and pipefitter training programs are bringing more up-to-date HVAC/R training into the program and, in many cases,



Glen Mazur and Bill Weindorf lead a class at the 2005 NTI seminars on basic and advanced test tool skills.

## New job opportunities require more skills

The huge drive in industry for greater efficiency and reduced downtime is making planned maintenance very popular these days. The catch is that planned or condition-based maintenance requires an expanded skill set.

To support a planned maintenance program, a technician needs to understand how the quality of power affects electrical systems and loads—in any kind of industrial or commercial building.

He or she also needs to know how to use heat detection equipment, such as infrared thermometers, to detect problems that may result in down time. Planned maintenance also requires technicians to take data, analyze it, and report out on it.

This expanded skill set includes knowing how to use new-generation test tools such as power quality analyzers, advanced DMMs, and thermal imagers. Currently, not enough electricians possess these more advanced skills or tool knowledge, which means there's no shortage of jobs for those who do.



have split the program to make HVAC/R a specialty of its own. That's due to the complexity of modern HVAC/R systems and their integration other building systems such as security and fire alarms. Many systems now come with fiber optics connections to other systems and direct digital controls that self-diagnose temperature fluctuation and other problems.

For the past year, students at the San Antonio JATC have been learning their way around DC controls and variable frequency drives because of the rapid transition of refrigeration and air conditioners to direct digital systems and fiber optics.

"We discovered a few years ago that the apprentices weren't getting up-to-date training," says Moran. Contractors complained that their employees couldn't find their way around variable frequency drives. "AC controls used to be pneumatic," Moran says, and in the past ten years that has changed dramatically.

To meet employers' needs, about four years ago Moran's chapter began offering separate coursework for apprentices specializing in HVAC/R. The result is a "push from below," with new apprentices understanding technology their senior coworkers have yet to learn. "It's changing the whole scheme," Moran says.

Most graduates of the traditional plumber and pipefitting program take jobs in construction, while the HVAC/R graduates find

positions working with new refrigeration and A/C technology. The remaining transition now, Moran says, is getting contractors accustomed to hiring NJATC apprentices who specialize in HVAC/R. "They're used to hiring guys with the basics and training them in the field."

The demand for specialized training is not lost on the students. The San Antonio course had 29 applicants for the program when it opened, only nine of whom were able to be admitted due to size constraints.

## Safety

Increasingly stringent safety regulations are also impacting the electrical and construction industry. Proper training is essential to make everyone from project foremen and contractors to apprentices aware of how to conduct their work safely and within state and OSHA guidelines. To keep the senior electricians up to date, Sal Scotto, service support engineer for Piller, Inc., says they now offer annual training for their 35 technicians throughout the country. Piller is a manufacturer/service company for large-scale UPS systems. Piller's technicians tend to be highly technical, installing and troubleshooting high and low voltage equipment.

Scotto says he doesn't expect new employees straight out of school to have much hands-on experience. As a matter of fact, often they have almost none.

"They might have worked with switchgear that was 15 years old," he points out. As a result, "There's a lack of troubleshooting (skills), a lack of thinking outside the box."

The best way to train new employees in troubleshooting and creative problem solving, Scotto has found, is to pair new hires with senior electricians. "Working with an experienced person is the quickest way to learn," Scotto says.

The pitfall is that sometimes the senior electrician is not up to date with the latest safety practices and can pass on incorrect information. That's where Piller's annual safety training comes into play. Courses are taught in the home office in Middletown, NY, and will soon be available to regional field electricians, as well.

Both schools and employers want to fill the gap between the skill sets they seek and the skills technicians have. As technology evolves, the economy affects employers' demands, and regulations tighten, that trend is sure to continue.

Options for training include union training centers, training institutes, community colleges, and adjunct courses at four-year universities. All certified instructors and company trainers are eligible to receive free curriculum from Fluke on a variety of electrical test and measurement subjects. Visit [www.fluke.com/education](http://www.fluke.com/education) for more information.

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