# REACHING OUT TO TOMORROW'S WORKFORCE

## RECRUITING YOUNG WORKERS TO BE THE NEXT GENERATION OF ENGINEERS AND MANAGERS IN THE INDUSTRIES THAT MAKE AND USE VALVES IS A DAUNTING TASK...BUT WE ARE MAKING INROADS.

**BY PATRICK A. TOENSMEIER**

Technical illiteracy on the part of students, confusion and misinformation about manufacturing and careers in heavy industry, and an uneven response by government and business to the need for comprehensive training programs are already posing serious challenges to the industries that make and use valves—and will only escalate in the future.

The major problem is demographic: a study by the National Youth Employment Coalition found that by 2010 there will be almost twice as many workers retiring than younger workers entering the labor market—76 million older workers compared to 41 million new workers.

While not every job lost to retirement will have to be replaced, the statistic highlights the growing gap between the pool of workers the industry needs and what they are likely to find.

According to the same study, jobs will also go unfilled because of shortfalls in the public education system. As many as one-third of students nationwide don't graduate from high school, and 40% fail to complete four-year college programs within six years. With more than 75% of new jobs requiring post-secondary education or training, and U.S. companies now spending more than $60 billion annually on training, much of it remedial, meeting workforce needs will not only be difficult, but expensive.

"Almost every day we receive a valve specification from a customer who can't understand the document's verbiage because he is not

valve-literate," says Greg Johnson, president of United Valve and chairman of the Valve Manufacturers Association's Education and Training Committee. "They want us to tell them what the words mean. A 'Valves 101' course will go a long way toward educating customers and vendors. This is why VMA is moving full speed ahead to provide basic training on the types of products the association's member companies manufacture. "

## Ways Out

Experts say there are ways out of the workforce dilemma, many of which are generating local successes around the country. These include making greater use of two-year technical colleges for training, recruiting associate-degree technicians as aggressively as graduates of four-year engineering programs, developing more outreach to high school and junior high school students, and doing a better job of marketing opportunities in manufacturing and industrial plants to students, school administrators and, importantly, parents.

Associate degrees from community colleges are attracting more interest from companies seeking technicians. One reason is that course instruction often includes subjects taught in four-year engineering programs, though the work is more applications oriented.

"The community college is really an interface between engineering and implementation," says Mike Mires, Dean of Instruction for Technical Education at Spokane Community College, Spokane, WA. "We are an applied science group. It's great to design a programmable logic controller, but how it interfaces with motors and controls is up to the technician we train, who is our niche."

Graduates of two-year technical colleges are capable of moving into entry-level positions that in many cases would be filled by four-year graduates and, importantly, advancing with on-the-job training and additional coursework.

Experts also point out that associate-degree colleges have long attracted students who are older and more focused on career training than many students at four-year schools. In a global economy that places a premium on technical expertise, workers can expect to change jobs many times and learn different skills. Two-year colleges are important and accessible ways to train and retrain these workers.

Two-year technical colleges are thus selling points for businesses looking to expand or locate operations in neighboring areas. As a result, their curricula are constantly updated to stay current with companies' needs.

"There's a misconception in the market that a bachelor's degree will solve workforce needs," Mires notes, "but that's really not true in the trades and technical professions."

## Support Grows

Two-year colleges also attract professionals seeking career changes—so much so that one educator in Texas calls them "the graduate schools of the 21st century."

State and federal support of these schools is sizeable and ongoing. In one notable expansion, Richland College in Dallas is developing a campus in nearby Garland, TX, that will be primarily for workforce training, rather than a steppingstone to a four-year program. Slated to open in 2009, it's one of five new campuses that are part of a $450-million, state-funded package of improvements for Texas community colleges.

One proponent of hiring associate-degree technicians is Glen Spielbauer. He has a two-year degree in electronics technology, is a systems technician at Continental Electronics and a manufacturer of radio transmitters in Dallas. Spielbauer has also worked for a packaging company, co-owned a factory automation business, done consulting work, written for trade magazines and is a member of the American Technical Education Association.

### VMA'S 'VALVE ED' PROGRAM TO LAUNCH IN 2009

VMA's Education & Training Committee is now working on development of a Valve 101 training program, which will be introduced as a PowerPoint presentation in the first quarter of 2009, then expanded into eLearning and other formats.

Additional modules will be developed, with an Actuator 101 program also in the works for next year. Also under consideration are modules on topics such as valve maintenance, repair, corrosion, castings, quarter-turn valves (and many other specific valve types), as well as other courses that are industry or application-specific.

To spread the word, VMA Education & Training Committee members will make presentations at a variety of end-user industry shows beginning mid-2009.

A new one-day event, the Valve Basics Seminar & Tabletop Exhibit, will be introduced next fall in Houston, a location with a large concentration of valve users, to provide convenient and inexpensive training for industry newcomers. Eventually, these events will be expanded to other areas of the country with numerous plants.

In addition, VMA plans to set up a database of presenters/trainers to serve as a resource for companies and organizations that wish to have valve training conducted on site. The association will also reach out to a variety of educational institutions, including two-year and engineering schools, to offer valve training programs and speakers.

Watch future issues of *Valve Magazine* and VMA's websites—VMA.org and ValveMagazine.com—for additional information about VMA's Education & Training program as it develops. If you have any questions, please contact Judy Tibbs at jtibbs@vma.org or Greg Johnson at greg1950@unitedvalve.com.

As he has progressed in his work, Spielbauer has returned to technical college for additional training in such areas as circuit design, computer architecture, calculus, physics and engineering management. He also received a B.A. in General Studies from the University of Texas in Dallas.

Spielbauer believes that industry needs to look closely at the value these graduates bring to companies, and tailor recruiting and advancement policies accordingly. Employers should hire associate-degree technicians not just for the shop floor but with an eye toward promoting them to sales, marketing and management.

Some companies do this, but Spielbauer says more should familiarize themselves with the courses that are a staple of technical colleges. "A lot of human resources departments don't understand how advanced these courses are," he notes.

Coursework at many colleges routinely includes training in the latest CAD/CAM and CNC software, along with courses in hydraulics, pneumatics, industrial electronics and coordinate measuring systems.

Courses proposed for the Garland campus, for example, include applied physics, statistical process control, process chain and inventory management, lean manufacturing, continuous quality principles and OSHA rules. There will also be courses in basic mechanics, reading blueprints, workplace and management software, and Spanish.

Spielbauer says more companies, industry associations and labor groups are working with technical colleges to develop areas of study. The colleges themselves are actively recruiting high school students—a high-value target for industry—in an effort to interest them in technical and manufacturing careers.

## The Spokane Example

In Spokane, Mires works with industry clusters that belong to the local Chamber of Commerce to develop programs geared to students. The need to recruit and train young workers is acute in the area. "We have about 20,000 opportunities in Spokane for manufacturing [jobs]," he says, "and the workforce is retiring."

In fact, the greater Spokane region recorded 19,651 manufacturing jobs in 2007, according to Mark Mattke, workforce strategy and planning director at the Spokane Area Workforce Development Council. Defying national trends, the council projects that manufacturing jobs will increase by 15% to 22,514 in 2017.

Mattke credits this to a diverse economy that has created a base of light and heavy manufacturing. Industries include steel service, maintenance, repair and assembly, casting and aluminum fabrication. Those who claim that U.S. manufacturing has no future have never been to Spokane, where "average annual earnings are $56,000 per worker including benefits, which is a good family wage," Mattke notes.

The Spokane area shows the viability of manufacturing and the opportunities that exist for students. Nevertheless, as Mires observes, "the exposure of most kids out of high school to opportunities in manufacturing is nominal."

One reason for this is that technical training doesn't get much attention from public schools. "Everyone is so concerned with scoring for 'No Child Left Behind' that they've ignored the professional-technical career track," he says.

While high school is a prime target for Mires, efforts are also directed at middle school students, especially one segment of the potential workforce—girls. "We have an event called 'Pizza, Pop and Powertools.' We bring in 400 eighth-grade girls to expose them to welding, carpentry and other parts of the construction trades, in classes that are almost always taught by women working in these areas."

Other programs in Spokane include a Construction Career Day, which attracts about 800 high school students, many of whom are allowed to operate cranes and bulldozers (under strict adult control, of course), and a Manufacturing Work Week, which is primarily for juniors and seniors.

"There's more recognition that community colleges play a big role in work-

force development," Mires says. "At least 80% of technical jobs don't require a bachelor's degree, but 50-60% of employers would like a worker to have an associate's degree."

## Starting Young

Some schools are investing in technical education. One approach is with Project Lead the Way (PLTW), a national program run by a not-for-profit organization that develops partnerships between industry, colleges and schools to create pre-engineering curricula for students. PLTW seeks to interest high school and middle school students in technical careers by providing introductory training in state-of-the-art technologies, advanced computer software, promoting math and science courses through high school and offering optional summer internships.

PLTW states that the courses are available as part of a school's general education curriculum and reflect national standards in math, science and technology. Students that add PLTW courses to their schedule benefit by improving their preparation for two- or four-year college programs and, ideally, finding a career they want to pursue.

The need to prepare students for technical careers is also recognized by universities. According to an article in the August 2008 issue of *Power Engineering*, the Swanson School of Engineering at the University of Pittsburgh has developed the Power & Energy Initiative, a program designed to interest undergraduate and graduate students in careers in the power and energy industry.

The program was set up in collaboration with regional companies to address the need for new workers. The U.S. Department of Labor projects that 50% of the utility workforce in the U.S. could retire in the next 5-10 years, posing severe challenges to daily operations and knowledge transfer. Swanson has developed introductory courses in power and energy, and plans to add more that will lead to a concentration or certificate designation. Local industry is responding by hiring Pitt engineering graduates.

## Marketing Modern Manufacturing

One of the most important ways to improve workforce development, though, might be in something as basic as marketing. Mires believes industry needs to do a better job in conveying the image of modern manufacturing to students and their parents.

"Most of the public sees a dirty, dank industry when they think of manufacturing," he says. "They think it's not a place to invite youth to work in. Modern factories are clean. Manufacturers need to promote this image of their industries."

Companies also need to do a better job of explaining the financial benefits of a career in manufacturing. Mires notes that many industries have good starting pay for technicians. In Spokane, biomedical electricians start at $45,000 per year, Mires says, and at $55,000 in other parts of the country. "In the trades, though, the talk is about *hourly* wage, while other professions stress *annual* pay." So while some professions tout a starting salary of $40,000 a year, technical jobs are offered at $20 per hour, which is actually slightly more. "Kids don't make the translation," Mires says, and don't know immediately which career is more lucrative. "We have to compare apples to apples and talk about annual wages."

One demographic is working in industry's favor: The U.S. population is becoming larger, increasingly diverse and has the potential to be the best educated in the world. History shows that these factors contribute greatly to the skills that sustain manufacturing. The valve industry and other industries that use valves can capitalize on the intellectual potential of young workers by working closely with two-year colleges and local schools to promote the value of technical careers. In the process, these industries will increase the pool of qualified workers they need to enhance operations. VM

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