

Norton Manufacturing's training program and the national skills standards cover training in skills from basic machining to programming of advanced CNC machining centers.

By RANDOLPH TOSCANO, JR.
Human Resources Manager
Norton Manufacturing Co.
Fostoria, Ohio

The timing couldn't have been better, as it turns out. At first, we intended to develop a training program especially for our needs. After months of work, the last piece of the program came to us ready to roll right into our program. And we ended up being named the nation's first employer to give the National Skill Standards a job.

Norton Manufacturing, in Fostoria, Ohio, produces performance-engineered crankshafts for high-performance vehicles including the Dodge Viper and V-10 engine. A considerable amount of the work we do involves precision machining to extremely tight specifications. Needless to say, we have to count on the skills and knowledge of machine operators to maintain quality, use high-dollar equipment properly, and get the job done efficiently.

The number of Norton employees has quadrupled in the last 5 years and we expect to double again in the next 5. Unfortunately, we're no luckier than the rest of the industry in recruiting solid machining trainees with strong mechanical aptitudes. The

pool of available machine operators in our area is small to start. In Ohio, the average age of individuals skilled in metalworking is at least 50 years. Although the pay is good, the job doesn't have the "glamour" to attract career-seeking young adults. Many of the applicants who are interested lack the communication skills needed for modern manufacturing programs such as statistical process control, total quality management, and increased employee involvement.

Trying to hire trained operators with those skills didn't work. Calling yourself a "machinist" is like listing your height as "tall." Says who, and by what definition? By what training? On what equipment? With what materials? To what critical tolerances?

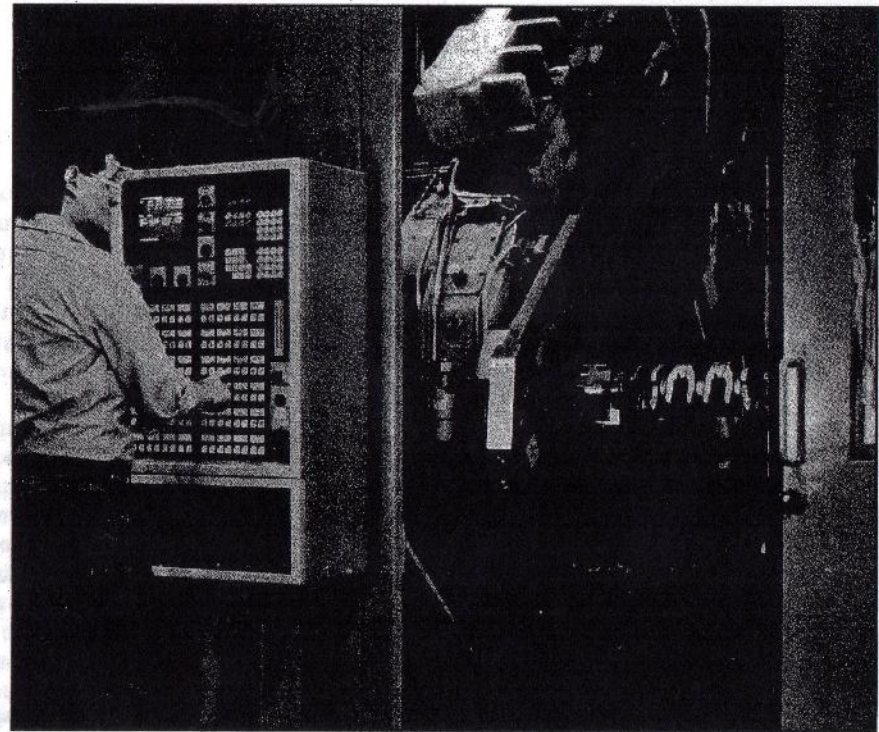
Norton already had solid training partnerships with the area's vocational high school and the technical college. Nevertheless, some skills kept coming up short.

So when Norton management developed its 5-year growth plan, they knew growth couldn't happen until we could count on qualified workers to fill the jobs. Recruiting a pool of qualified machine operators was going to be a lot tougher than getting the contracts.

We also knew the solution would have to be something new.

Finding The Missing Ingredients

By the time I joined Norton in 1994, Norton's task force had been working for a year to develop that



Win-Win Training: Putting The National Skills Standards To Work

In less than two years, this company not only put a sweeping training program in place to prepare its own workforce, but it is also implementing the first training program designed to produce skilled operators for the entire industry.

solution. This group had been networking with state officials and area educators, evaluating human resources software, and developing partnerships with Private Industry Councils and state training programs.

We were ready to start analyzing each machining task to develop training materials. But some key ingredients were still missing. We needed performance standards to act as a

training goal. We also needed a motivator. Working machinists felt they were trained. And, in more than one sense, they were right. As often as not, they resisted additional training because it was too employer-specific. Why invest their time to learn something they wouldn't be able to use anywhere else?

We needed an incentive to attract the right kind of trainees, to hold

What Are National Skills Standards?

William Ruxton, NTMA vice president and director of the Metalworking Skills Standards Pilot Project, defines a skill standard as a description of work with a required level of performance. The machining skills standards focus on a set of common duties and specify performance requirements in terms of knowledge, skills, and other abilities. Each task carries a set of performance requirements that can be tested using standard materials.

The metalworking skills standards include five clusters:

- **Machine Skills**—for general and specialized tasks.
- **Tool and Die Skills**—tool maker, die maker, mold maker, jig and fixture maker, and so on.
- **Metal Forming Skills**—stamping, roll forming, spinning, springmaking, and so on.
- **Machine Rebuild/Maintenance Skills.**
- **Screw Machine Skills.**

Each cluster has three performance

levels from Level I (the most fundamental) to Level III (the most sophisticated). Level I covers skills that can be expected of an operator with one year's experience in an apprenticeship program, that is, basic competence with machine tools and accessories, basic shop math and inspection techniques. Level II covers more complex skills and concepts, such as the principles of computer numerical control (CNC), angular measurements, and auxiliary equipment. Level III is comparable to "journeyman" capabilities, competent with a range of tools and machining tasks, task planning, and working with minimal supervision.

The standards were developed through technical work groups around the country and benchmarked against similar standards in Japan, Germany, Australia, and other nations. Once completed, the standards were validated by a large pool of U.S. workers and employers.

NTMA, headquartered in Ft. Washington, Maryland, near Washington, D.C., can be reached at (301) 243-6200.

their enthusiasm, and to keep them in training. We needed something that would answer the question, "What's in it for me?"

Both of those needs were met by the National Skills Standards for Metalworking. At the same time that we were working on training development here in Ohio, an industry task force led by the National Tooling & Machining Association (NTMA) had just completed the standards for all three levels of machining skills. (See box on previous page.)

What they needed now was a guinea pig—a company that could plug those standards into a training program and see how well the machining standards—and the operators trained according to those standards—would work.

The National Skills Standards Solution

For Norton, National Skills Standards in Metalworking are useful for four reasons:

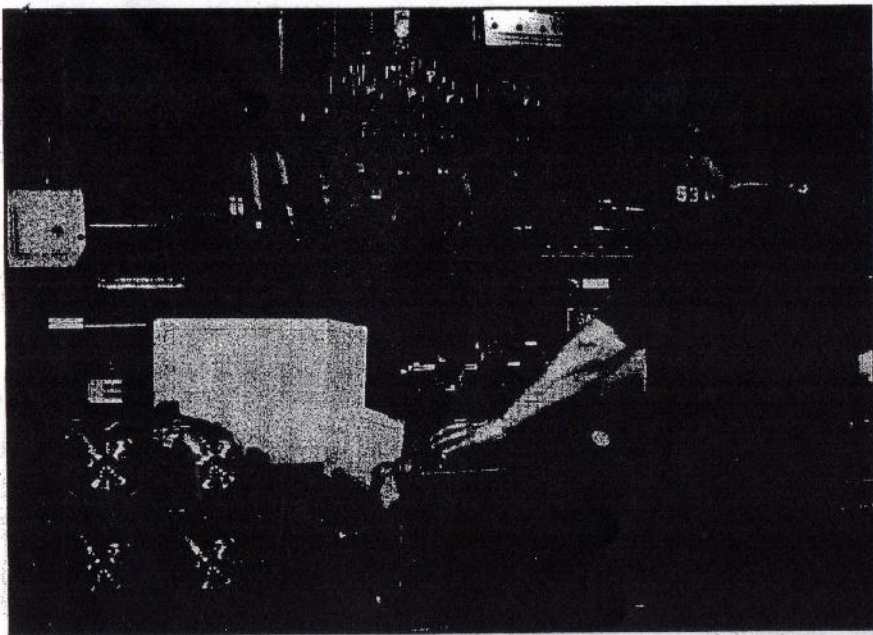
- **They're designed to meet employers' needs.** They apply universal definitions of demonstrated performance levels to specific precision machining tasks. They also help eliminate redundant training tasks and save time in training operators to be flexible, multifunctional employees. Training is modular, similar to the "merit badge" approach in scouting, so you can choose any and all portions that meet your needs—short specialty courses, employer-specific training, or programs tailored to specific regional needs. Standards can

also be incorporated into existing training—as Norton has—under the new federal-state initiative on school-to-work transition.

- **They wrap in many of the "soft" skills.** Today's employers rely on communications, team-building and problem-solving skills to hold production costs down through continuous improvement programs. Norton is no exception. Assuring customers that a company's entire workforce is not only knowledgeable in the "soft" skills but is also certified in technical areas is an enviable marketing tool.

- **The skills are transportable.** The national standards give workers better job opportunities; they can go where the work is and retain income security. Standards help employers like Norton by eliminating the costs of full training for every new operator. With certification testing for each of three machining skill levels, Norton will know exactly what they're getting with each new applicant, and applicants know exactly what they have to offer.

- **National Skills Standards training credits are designed to be transferable.** If workers are to be encouraged to continue learning beyond apprenticeship level, we have to allow an uninterrupted learning path with smooth transitions. Being able to transfer credits to 2-year and 4-year colleges is critical. Efforts to ensure this are underway. Many community colleges are already adopting the standards as performance goals within their curricula, which should



One of the tasks identified for the future is developing ways to attract women in the workforce to machining careers, from which women traditionally have been steered away.

generate support for offering college credits for machining-related courses.

Merging The Standards With Training

To develop our training materials, Norton entered into a joint agreement with several area businesses and organizations to license **PROTECH II**, a human resources software package. Pilot project partners, including state officials, educators, and Norton's training coordinator, attended several software training seminars conducted by the manufacturer, **Proactive Technologies, Inc.**

(Denver, Colorado), at Norton's main production facility.

The same software company also has been working with the Metalworking Skills Standards Board, which was coordinating the standards development and approvals. When the standards were approved for Level I Machining Skills in January, they were provided to Norton in **PROTECH II** form on disk and merged with our job-task analyses.

This software continues to perform critical "time-compressing" functions for the project. For instance, if this

training program is operational on schedule, as we expect, the project will have been completed from ground zero—including numerous job-task analyses—in a little over one year. Considering that traditional methods for just one analysis usually takes several months to conduct and a few more for complete analysis, the time savings are substantial.

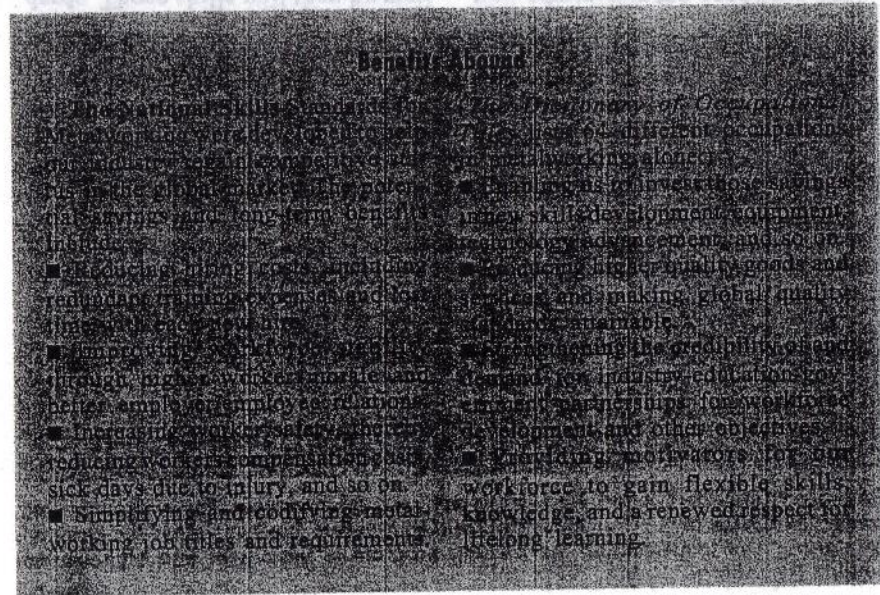
Just as significant, every analysis is performed using the knowledge and cooperation of a Norton employee. Operators are chosen as "job experts" for skills demonstrated on the job. They work with Norton's training coordinator, Gabriel Gonzalez, as the software program "walks" them through a detailed analysis of each job. This data forms

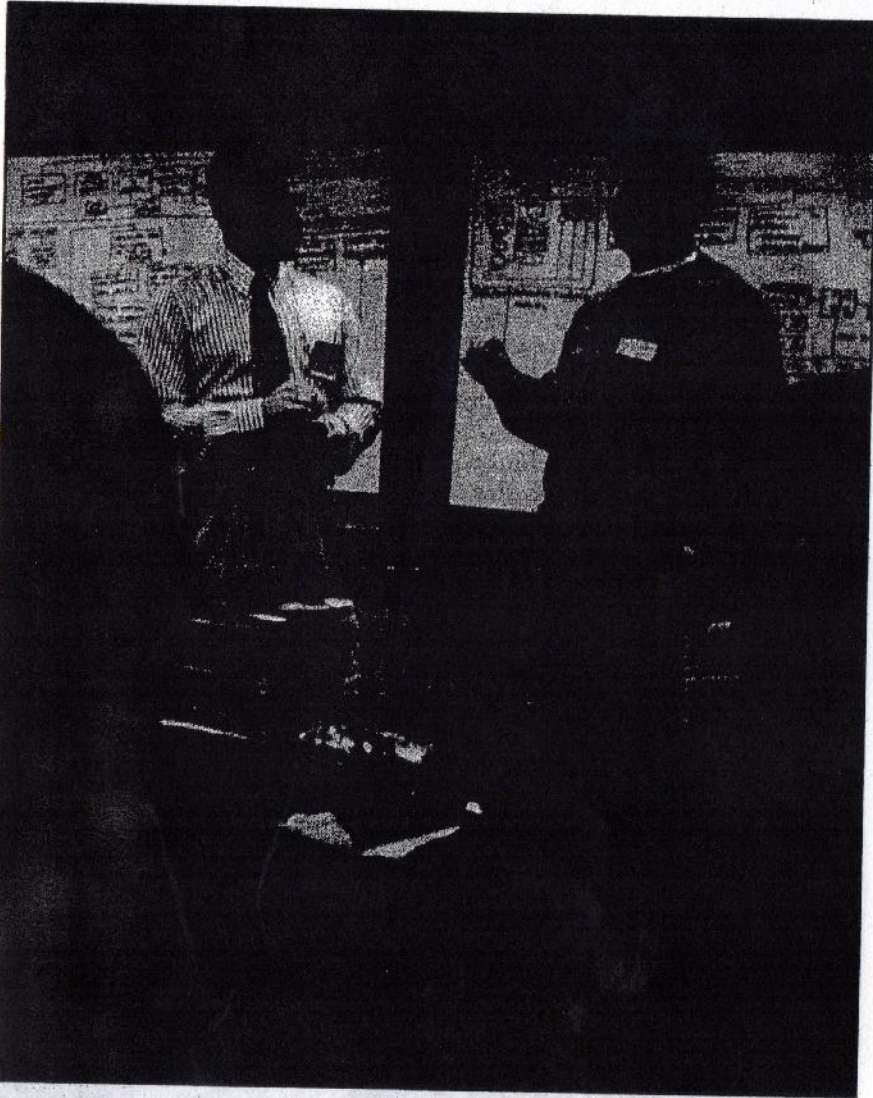
the foundation for training in the technical and interpersonal skills we need to develop in all our workers—those we're training now and those we'll need in the years to come.

Training Classes Begin

In fact, the first curriculum developed from that worker-generated data was put to work March 6, 1995, when the first class for new trainees began at nearby Vanguard-Sentinel Vocational School. Applicants were prescreened by the area Private Industry Council using criteria drawn from Norton's software data. The final decision to accept an applicant rests with Norton management.

Trainees receive classroom instruction and hands-on lab machine





Since the Pilot Project began, Norton's human resources manager, Randy Toscano (left), and Frank Gibson of the Ohio Industrial Training Program, have explained the essentials of starting and implementing the training program to businesses and organizations around the country.

experience. Logbooks are kept to track performance scores in the lab, the classroom, and on the job. Mechanical aptitude is monitored and evaluated during training sessions.

By June, our first class was getting on-the-job training with pay, 20 hours per week, at Norton through a Norton-PIC program. When academic training ends the week of August 8, trainees will become full-time Norton employees, with on-the-job training to continue as the school-to-work portion of the program. We estimate that our first group will be ready for certification by November 1995.

Meanwhile, current employees have undergone National Skills Standards preassessment testing. The tests measure competencies in basic literacy skills and establish a baseline for training, including any limited remedial training.

After any preliminary training, Norton employees will begin paid training with suppliers and schools to develop the skills needed in addition to those required in the standards. Those skills will then be well-established for the mentoring needed when current trainees reach that stage.

The Certification Process

Meanwhile, a test-development work group has been set up to lay out the certification process. Members of the Metalworking Industry Skills Standards Board, appointed by the project steering committee for the metalworking skills standards project, are responsible for development and

approval of all test procedures, and oversight of the entire credentialing process.

To determine which skills were needed for each level, 400 industry people identified skills they felt were critical, by responding to a national survey. After the exams were developed, test development experts screened them for built-in biases and other factors that might jeopardize their validity. Approvals for the Level I exam are expected some time in October or November.

Tests are formatted for pass/fail assessment and trainees have a limited amount of time to complete them. They must be able to meet the performance criteria within the time allowed. Highest priorities are hands-on performance tests and safety procedures, with supplemental short written tests on math proficiency, workplace communications and other "soft" skills. Current thought is that, for the time being, schools will administer the academic portions of the exams and Norton mentors will conduct hands-on testing. Testing and certification procedures are still being developed.

Outcomes

This training program was little more than a source of frustration less than two years ago. By August, 1995, our first trainees will be well on their way to the nation's first certifications in machining

The Metalworking Skills Standards And Goals 2000

The Metalworking Skills Standards Project began in 1993 with a cost-sharing grant from the U.S. Departments of Education and Labor. Twenty-two such projects were funded for industries from health care and hospitality to electronics and retail. These projects, when completed, will establish national voluntary industry-based skill standards for occupations that employ more than half a million people in the Great Lakes Region.

Under *Goals 2000: The Educate America Act*, Congress authorized appointment of a National Skills Standards Board to oversee and maintain these standards and their respective certification processes.

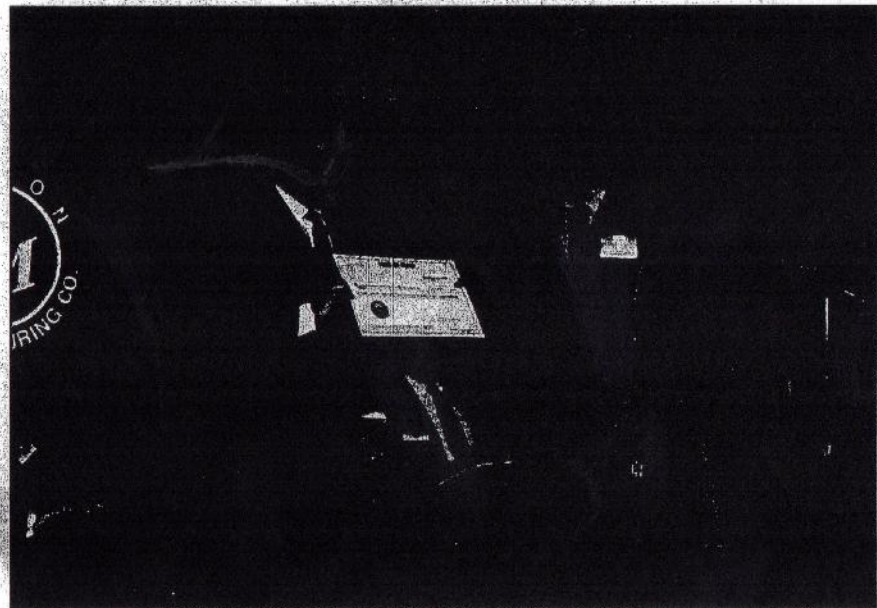
In 1993, the National Tooling & Machining Association was joined by

the Council of Great Lakes Governors (CGLG) to win funding for establishing the metalworking standards. CGLG represents eight midwestern states—Ohio, Indiana, Illinois, Michigan, Minnesota, New York and Wisconsin—where half of the nation's metalworking industry is located. A steering committee was formed to administer the project, with representatives of the NTMA, CGLG, the Association for Manufacturing Technology, the International Association of Machinists, and other trade organizations.

The Metalworking Industry Skills Standards Board was established to pursue the technical track. The implementation track is coordinated by the Regional Workforce Quality Network, part of the CGLG.

O'Leary, Governor Voinovich's Department of Development regional representative. After we had done all we could do back in 1993, these individuals got the effort moving again. They pulled the parties together and said, "This is what they need; what can you do to help?" Finally, the wheels began to turn.

The Norton National Skills Standards Pilot Project serves as an exceptional model for partnering, not just for businesses in need of workforce skills development, but also for entire communities looking for ways to use all the resources available to create and retain jobs.



Norton Manufacturing Co. CEO, Richard Norton (left), accepts an award citation from Thomas O'Leary, regional representative for the Governor's Economic Development Outreach Team, State of Ohio Department of Development, for implementing the first National Skills Standards Pilot Training Program.

A great deal of credit also goes to Norton's management and employees. Without the vision for business growth in one view and the vision for personal growth in another, none of this could have been accomplished.

Some doubted the program would ever exist, much less call on coworkers' experience for developing teaching materials. Those same workers now appear to be far more enthusiastic about the program and their future at Norton. In fact, turnover has slowed significantly since the program

reached the point at which plant workers became actively involved in the process.

Participating in the development of the training curricula has become a source of pride for many operators. They feel they're part of something important, something historic. They believe, as we do, in the value of this project for the company and for the industry as a whole. **MMS**

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skills. Making that much progress in such a short time continues to amaze and gratify everyone involved. The Norton Pilot Project has generated a lot of interest, both inside and outside the metalworking industry. Our progress is monitored by large corporations and small businesses, by adult learning services and economic development agencies, and by groups like the national Advanced Manufacturing Centers and The Modernization Forum.

Much of the credit for this progress goes to Frank Gibson, Jr., training coordinator for the Ohio Industrial Training Program, and to Tom