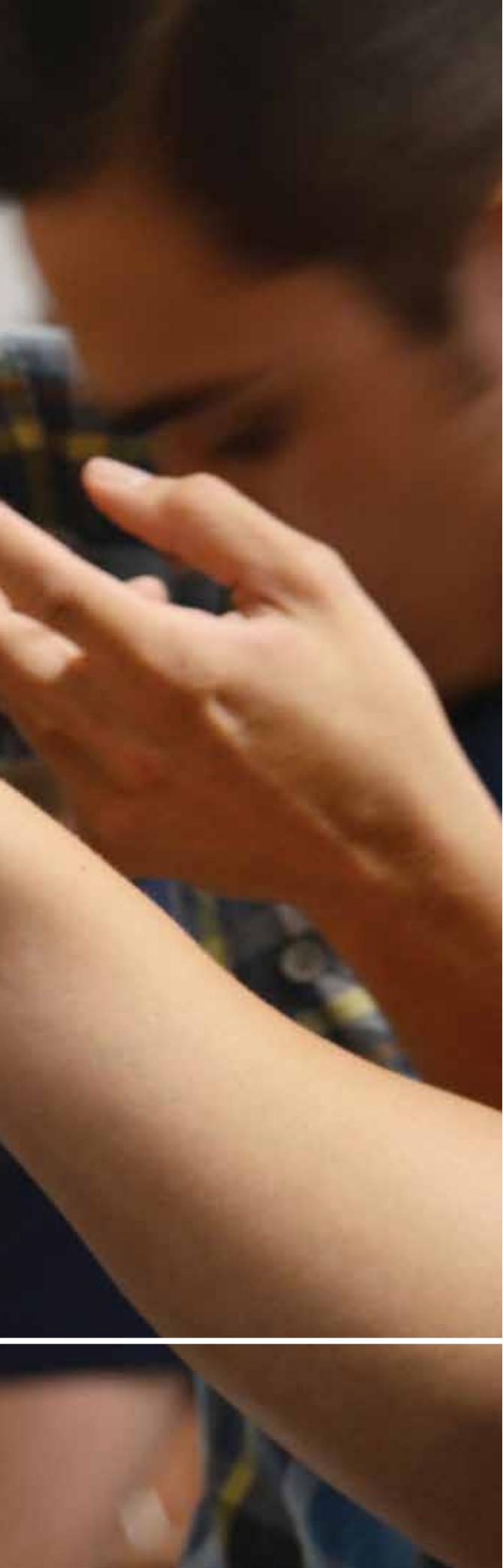




WIRED FOR SUCCESS

Investments in Education Are Paying Off for Steelmakers



By Amanda L. Blyth

Today's steel industry is a high-tech, global business with myriad opportunities. But those opportunities require bright talent. Thus it is more important than ever to get the younger generation interested in a career in steel. Many steel-related companies and organizations are reaching out to students in college and K-12 to spark an interest in science, technology, engineering and math (STEM) jobs. This article explores the training and educational programs offered by five North American steel producers.

ARCELORMITTAL USA

In the mid-2000s, ArcelorMittal recognized that a large number of employees in the maintenance technician mechanical and maintenance technician electrical (MTM/MTE) fields were eligible to retire within the next several years, and the number of potential skilled hires was very low. MTM and MTE positions are highly technical and require employees to have the necessary skills to install, maintain and upgrade automated equipment in the advanced manufacturing sector. In general, potential students and future employees were not aware of this career opportunity. Furthermore, ArcelorMittal USA could no longer offer the traditional five-year apprenticeship programs to train employees with the necessary skills. In late 2007, ArcelorMittal USA and the United Steelworkers began working together to develop a plan that would help individuals become future steelworkers. Steelworker for the Future® was launched in 2008 and modeled off a partnership between ArcelorMittal Dofasco Inc. and Mohawk College of Hamilton, Ont., Canada. This program still exists today and is highly successful.

About the Program

Offered on a continuous basis, Steelworker for the Future is intended for high school students who like working with their hands; are interested and successful in STEM; and do not intend to enroll



in a traditional four-year college or university. Often, successful candidates are students who believe they want to be engineers, but then realize that engineering is very heavy in theory and math, whereas a technician has similar training but is more “hands-on” in the field. Steelworker for the Future also appeals to adults who are looking to change careers and are interested in and meet the program requirements.

The primary goal of Steelworker for the Future is to empower high school graduates to select this education alternative by making them employable upon graduation. The program aims to build a pool of candidates that are prepared to work for ArcelorMittal or any manufacturer as a maintenance technician. The program is designed to have students develop the basic skills at a partner college, get them to a minimum level to pass the craft entrance exam, and then have the knowledge to be continually trained on specific equipment. It's important that students, parents and administrators understand the need at ArcelorMittal, as well as the importance and strength of U.S. manufacturing as a whole, and that the skills they obtain in the program are applicable to all manufacturers.

The program addresses an important workforce challenge for ArcelorMittal, the American steel industry and U.S. manufacturing. It is a win-win for both potential employers and employees, as well as partner schools and the communities in which ArcelorMittal operates.

What Makes the Program Unique?

Internships at ArcelorMittal have traditionally been limited to professional careers such as engineering, human resources, accounting, etc. However, Steelworker

for the Future expands internships to offer on-site technical training at an ArcelorMittal facility. These internships allow students to apply classroom learning, earn credit toward a degree and encounter invaluable mentoring opportunities while earning wages to fund tuition. Also, the program is unique in that it allows students to enter the program at the end of any semester. Other comparable programs are offered to "cohorts" of students who must apply to a "class" and then stay with that class for the duration of the program. ArcelorMittal's program tends to work well with flexible schedules.

Outreach

ArcelorMittal USA has an outreach program with high schools and middle schools to discuss manufacturing, maintenance technician careers, and the importance of obtaining the right skills for a high-demand job. This program reaches more than 15,000 students in local high schools and middle schools each year. Various ArcelorMittal USA sites also hold periodic information sessions at partner college locations to allow individuals to learn more. A key message is always that a four-year degree is not the only way to obtain a rewarding, high-paying career.

Students and Enrollment

Students must complete their first semester at a partner college's specific program before enrolling. Internships are offered throughout the year based on the number of students in the program.

Currently there are approximately 140 students enrolled in Steelworker for the Future programs at partner schools in Indiana, Illinois and Ohio. Since 2010, approximately 90 students have graduated from the program and have been offered a full-time job with ArcelorMittal.

After receiving a two-year associate degree, Steelworker for the Future graduates may have the opportunity to work as an MTM or MTE at ArcelorMittal, choose to work for another manufacturer, or continue their education at a four-year school to obtain a bachelor's degree and become an engineer, manager, etc. As in most manufacturing settings, the options are limitless as to what the individual can achieve over the course of their career.

There are no guarantees of employment at the end of the program. With the internships, ArcelorMittal believes it is helping the students get a lucrative and exciting career in a high-demand field with any manufacturer. Other than the cost of the tuition at the partner college, there is no



cost to the student regarding the internship, testing, etc. If the student declines an offer for full-time employment from ArcelorMittal at the end of the program, there is no obligation for any repayment or otherwise.

Challenges

One challenge is maintaining the balance of bringing in new employees into the MTE/MTM field with upskilling current employees who want these careers. ArcelorMittal aims to upskill current employees when warranted; however, this comes with the cost of training replacements for those employees.

Another challenge is the belief of students, parents, teachers and administrators that a four-year degree is the only path to a rewarding, lucrative career.

Finally, there is the constant battling of the misperceptions associated with manufacturing. ArcelorMittal often opens its doors to students, parents and administrators to show that today's steelmaking is much different than what their grandparents and other generations experienced. Steelmaking today is much safer, highly automated, and demands trained and tech-savvy individuals.

For more information on ArcelorMittal USA and Steelworker for the Future, visit <http://usa.arcelormittal.com> or www.steelworkerforthefuture.com.



CALIFORNIA STEEL INDUSTRIES INC. (CSI)

Situated on California Steel Industries' campus in Southern California is the Industrial Technical Learning Center (InTech Center), which addresses CSI's need to develop electricians, mechanics, machinists, welders, instrument technicians, engineers and individuals in other technical fields.

For 17 years, CSI has worked with area businesses to develop the Manufacturers' Council of the Inland Empire, a consortium of more than 50 companies from the region that has included other steel manufacturers like Steelscape and Gerdau. Together, they identify the industry's workforce requirements and collaborate with local

community colleges to develop career technical education for those ready to take on employment in manufacturing or improve their technical skills.¹

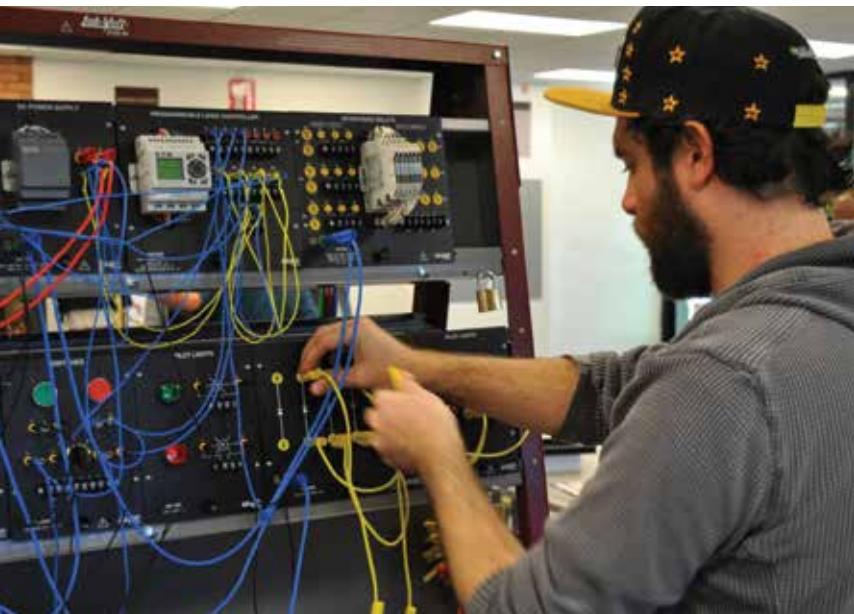
This group joined with 12 regional community colleges, two local four-year colleges, the Workforce Development Boards of San Bernardino and Riverside counties, community organizations, and the Economic Development Agencies to secure a US\$14.9 million grant in 2014. Several million dollars of the grant was slated to renovate, equip, staff and operate the InTech Center.

"We've long partnered with Chaffey College and other programs throughout the valley. Chaffey came to us and said there is a grant from the Department of Labor, who is looking to develop these kinds of facilities. We got the only grant in California, and one of the largest in the nation," said Kyle Schulty, manager of communications at CSI.

From that, the InTech Center was built with the help of some additional funding from CSI. The program is run by Chaffey College, with some of the teachers actually coming from CSI's technical workforce as well as other community colleges.

About the Program

CSI has a long tradition of developing line operators into skilled craft workers through its craft training programs, which are overseen by maintenance committees that provide on-the-job





“It was a fast educational experience I had with InTech. It felt like they had tailored a program that was specific to my trade, with relatable situations, formulas and theories. Also, most of the teachers I had were in the same field so they could relate specific situations that happened to them. It also follows up with certifications. I found it easy to follow and I would recommend it to someone looking to start or improve on an education in a trade.”

— Nick Pacheco, mechanical craft trainee at CSI

various modalities with structured on-the-job experiences in the key skill areas.

“About 25% of CSI’s workforce is here to keep the machines operational,” said Rod Hoover, manager — human resources, of his maintenance and engineering staff at CSI. “A machine shutdown of even a short period of time can cost the company thousands of dollars while repairs are being made. Having skilled workers who can prevent or address these issues quickly and safely is vital for manufacturers like CSI. The more technology we have, the more we need highly skilled technicians to take care of the machinery.”

Before the InTech Center, workers who wanted to improve their skills had to travel to classes offered at inconvenient locations and often inconvenient times for courses that didn’t always align with what employers needed.

The InTech Center is a key element in preparing new workers with needed skills and to keep incumbent workers up-to-date and continually improving their skills by offering the technical courses.

Students and Enrollment

In its first year of operation, the InTech Center trained 821 students (comprising 59,000 training hours and awarded 5,555 nationally recognized certifications) for CSI and many other local manufacturers. That means more than 800 local workers now have the hands-on education and skills to meet the growing requirements of manufacturing companies. The InTech Center features fully equipped electrical, mechanical and computer labs providing training from entry-level blueprint reading to advanced robotics. And, plans are in the works for facilities and



experience, mentor and/or manage trainees, and provide input on curriculum supplied by colleges and technical schools.

In addition, since 2013 CSI has pulled from local community colleges, high schools and technical training programs to fill entry-level craft trainee openings through a summer internship immersion program.

In the last 17 years, CSI has generated more than 105 journey-level craft workers in 2-year programs versus the traditional 4- or 5-year apprenticeship programs due to selecting top talent and providing intense instruction in

equipment to teach basic, intermediate, and advanced welding and machining.

"These kinds of skills can't be taught just in a classroom and that's part of what makes the InTech Center so valuable. Manufacturers will continue to need the electricians, mechanics, welders and machinists who can keep us competitive and able to grow our business," said Hoover.

Outreach

In an effort to maintain a steady stream of top-quality trainees, CSI visits community colleges and high schools throughout the region to introduce students to the craft trades and the possibility of earning a solid wage for skilled work. Interested students take an aptitude test and have a technical interview before being invited to join the craft training programs at the InTech Center.

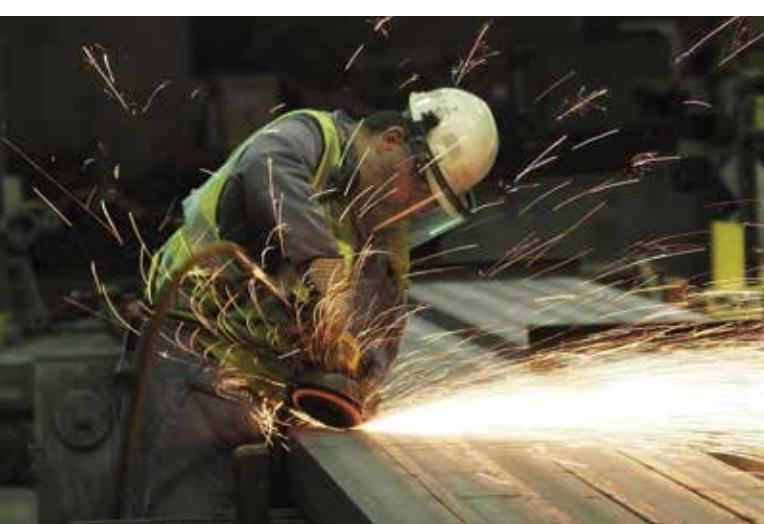
For more information on the InTech Training Center, visit www.intechcenter.org.

CHARTER STEEL

The program at Charter Steel got started through the company's strong partnerships with local high schools. For more than five years, Charter has been doing extensive work in the local classrooms, which led to the question of how to actually get students on-site. That's when Charter Steel found out about the Wisconsin Youth Apprenticeship Program, which turned out to be the perfect program to connect high school students to jobs in manufacturing. Wisconsin's Youth Apprenticeship Program integrates school-based and work-based learning to provide students in their junior and senior years with academic and occupational skills leading to both a high school diploma and a Certificate of Occupational Proficiency in a specific industry. The one- and two-year apprenticeships are

geared toward students who plan to enter the workforce directly from high school; who want to enter a registered apprenticeship; or who plan to enroll in a technical college or a university in an occupationally related degree program. Each student works in partnership with an employer-identified mentor, specialized classroom instructor and high school apprenticeship coordinator to receive the best skills and knowledge possible. They then work at an employer for half of their school day and attend classes for the other half of the day. The Youth Apprenticeship requires that students work a minimum of 450 hours in the one-year program and 900 hours within the two-year program.





About the Program

The program at Charter Steel is intended for high school juniors and seniors who are 16 years of age and older who are interested in pursuing an opportunity in a STEM field after graduation. The program is offered continuously.

GERDAU

Gerdau's student training programs were developed to enhance awareness about the rewarding careers available in the steel industry as well as to invest in the education and development of high school and college students in the communities where it operates. This allows high school and college students to gain real-world experience in the steel industry and allows Gerdau the opportunity to establish a connection with a future talent while helping them prepare for their post-education career.

About the Program

The Gerdau training programs are intended for middle school, high school, technical school and college students

Charter has hired one Youth Apprentice for the 2017–2018 school year.

The goal of the program is to raise awareness of jobs in manufacturing and also to have the Youth Apprenticeship Program serve as a feeder pool into Charter Steel's production and skilled trade opportunities. There are many different pathways a Youth Apprentice can take. Charter Steel will be exploring the skilled trades and engineering pathways. While students are encouraged to stay with Charter upon graduation, they are welcome to pursue opportunities outside of Charter Steel. The hope is that they at least continue to follow some type of manufacturing path.

The program's success can be measured by the amount of awareness Charter raises around jobs in manufacturing. It will also measure success by the number of students who stay with the company after high school graduation. While Charter's program is too new to have a true measure of return on investment, one of its current Registered Apprentices was a high school student that worked for Charter, which is a positive sign.

What Makes the Program Unique?

Under the State of Wisconsin Law, Charter Steel can bring students in under the age of 18 through this program. Before discovering this program, Charter didn't have avenues to bring students in before 18. The other unique part of this program is students get credit through their high school for participating.

Challenges

One of the biggest challenges Charter has faced is finding the right opportunities for students given its heavy manufacturing environment; but Charter hopes it can continue to raise awareness of the great careers available within manufacturing whether it is in production, skilled trades or engineering.

who are or may be interested in career opportunities in the steel industry. Students are typically interested in a broad range of opportunities from leadership and plant management to frontline leadership and skilled trades. The programs are intended to raise awareness of the solid career opportunities available in the steel industry as well as help students develop the skills and competencies necessary to pursue careers in the steel industry.

Programs intended for middle and high school students include co-op opportunities, participating in career days held at local schools, hosting students at one of Gerdau's



facilities, and providing technical expertise or resources and support for student projects.

Programs intended for college-level students include partnerships for on-the-job learning combined with in-classroom instruction, as well as a progressive and challenging internship program where students gain valuable experience as they prepare to graduate.

The marquee program for recent college graduates is the Management Associate Program, which is an intensive 12-to 18-month program for highly qualified recent graduates, many in the mechanical and electrical engineering field. The program is designed to quickly build knowledge regarding the steel industry, supply chain, domestic and international steel operations, as well as developing the skills necessary to be effective people leaders.

Many of the programs are flexible based on the needs of an individual facility/department or in response to a request for assistance from a local school or student. For college-focused programs, these programs are ongoing through a given year, but typically have a spring and fall entry date for new participants.

Students and Enrollment

Many of the program participants focus on operational leadership, metallurgy, electrical or mechanical engineering, or assume functional roles within safety, environment, energy, sales or reliability departments.

Many of Gerdau's current senior operational leaders began their careers as a management associate when they were recent college graduates.

Gerdau works closely with students by assigning them with both a mentor and a coach. Together they develop a career road map so that when the participant is ready to assume their first or next leadership role within the organization, they are matched with locations or departments whose needs match their skills as well as considered geographic and family needs.

What Makes the Program Unique?

The Gerdau programs are unique in their scope and diversity regarding the different types of development opportunities available. The programs focused on middle-school and high-school students are driven from individual

Gerdau locations, which build individual partnerships with secondary and technical schools to customize solutions to help students.

The college and recent graduate programs provide participants individual access to senior leaders, including Gerdau's global leadership team, in order to develop one-on-one relationships. In addition, the diversity of curriculum for participants, including broad technical training across all business divisions as well as focused development to strengthen people leadership skills and specific ownership of an improvement project, are all hallmarks of Gerdau's program. The program invests in the continued post-education development so that participants build a foundation based on making a difference specifically focused on the steel industry.

The success of Gerdau's programs is measured on engagement and future employment of middle, high school and technical school individuals and the retention, promotion and career growth of participants in the post-college full-time employment Management Associate Program.

Outreach

Gerdau considers it imperative to educate current and graduating students about the progressive leadership and technical career opportunities available in the steel

industry. Its programs are proof-positive of Gerdau's commitment to serve communities by investing in the training and development of both active employees as well as middle school, high school and college-age students. And Gerdau's programs help it to build a pipeline of critical talent for the future that will ensure its sustainability for future generations.

Gerdau's programs are marketed in partnership with individual locations as well as its corporate organizational development department. Locations have broad autonomy to engage local schools in order to meet their specific needs. Gerdau's college-focused programs are marketed through its University Ambassador Program, which develops and maintains relationships with universities and business organizations at universities, as well as broad social media and participation through trade associations, career events and steel industry expos.

Challenges

Increased competition for target talent across broad industry groups including technology, aerospace, aeronautics, medical services, and research and development has been a significant challenge, as well as the need for continuous evolution of marketing and communication strategies to attract participants across broad geographies in order to ensure the attraction of top talent.

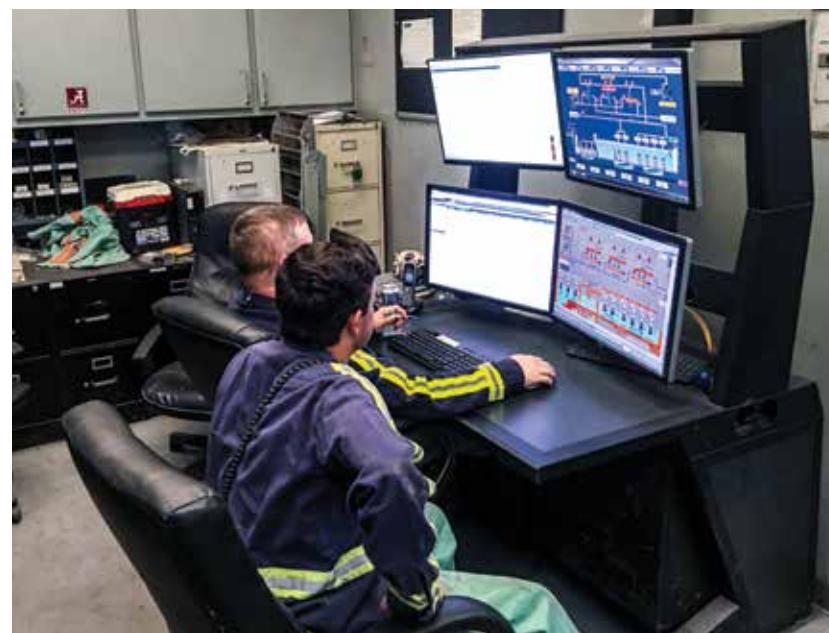
NUCOR

With Nucor's continued growth, the gap between the number of skilled electrical team members it has and the number of potential team members available in the job market has also continued to grow. Nucor could see it was facing a problem. It needed the right people with the right skills to fill its 50 openings in various Nucor mills across the U.S. In the summer of 2014, the company launched the Nucor Technical Academy to provide students with the education and training needed to help fill these positions.

About the Program

Nucor partnered with Shelton State Community College, from which students receive an associate's degree in applied science and electrical technology upon completion of the program. After carefully recruiting and selecting the right students, Nucor's investment includes housing, books, tuition, and a paid wage while students are working at the mill and attending class. During the school term, a typical 40-hour week consists of around 15 hours in the classroom and the remainder in the mill at Nucor Steel Tuscaloosa Inc. Over the summer, students return to work at the respective Nucor

divisions that sponsored them. During this time, they have the opportunity to work full-time with the team they hope to be part of once they are finished with the program. Working side by side with Nucor teammates, students learn about their trade as well as the Nucor culture. They





are exposed to the electrical, mechanical and operations aspects of working in a steel mill.

When students have met all the requirements of completing the program, they are armed with a degree and hands-on, real-world experience. Upon graduation, students return to their “home” Nucor division, where they interview for entry-level maintenance positions. The Nucor Technical Academy serves its students by providing them with a quality education and on-the-job training, while providing Nucor with highly qualified talent.

Students and Enrollment

Now in its third year, the Nucor Technical Academy has 37 students enrolled and is seeking applicants for the August 2017 class. Nucor recruits students from all over the country to enroll in its three-year program in Tuscaloosa, Ala., USA. Ideal candidates possess a strong work ethic, a positive attitude and willingness to learn, and are hardworking and self-motivated.

Nucor is looking forward to welcoming the first graduates of the program to its team in May 2017!

What Makes the Program Unique?

One of the things that make the Nucor Technical Academy unique is the curriculum students complete at Shelton State. The curriculum is built around the expectations of Nucor technicians and is more inclusive than the

requirements of an associate of applied science degree. Students also are provided their own workspace at Nucor Steel Tuscaloosa Inc., where they can work on real-world equipment to reinforce the topics they are covering in class. Students gain familiarity with components and equipment operation as well as the experience of building and troubleshooting electrical systems.

Students in the Nucor Technical Academy get the full experience of going away to college in a structured environment, with the support of Nucor. Students learn what it's like to live with other students from other parts of the country. They move away from home and learn to live on their own and manage their own time and money. And, for many of our students, enrollment in the Technical Academy is also their first job.

While these things are important, what really makes the program unique is the way the students are included in the Nucor team. Students are provided with the same expectations and level of accountability as Nucor team members. Students are included in all of the company's safety programs and teams, as well as its continuous improvement strategies. During enrollment, Nucor Technical Academy students get exposure to all the operating areas of the mill. Upon completion of the program, students have a strong understanding of how a steel mill operates and how Nucor team members keep

"The Nucor Technical Academy is a huge opportunity for me. Nucor brings in kids from all over the country, they pay for your housing and school, and also pay you for the hours that you are at work and are in class. I have learned a lot over the year I have been in this program; not just in the electrical field, but in teamwork and family aspects as well. The whole team is here to answer any questions I may have, and they are always looking out for my safety. I truly believe when I finish the three-year program that me and my new friends from across the country will be some of the best technicians in our field thanks to the education and opportunities that have been provided to us by one of the best companies in the world."

— Hunter Nichols, *Nucor Steel Tuscaloosa Inc.*

Nucor competitive. While the students are being educated as technicians, they are being trained to be team members.

Outreach

Each Nucor division conducts its own recruiting and selection in their communities. To increase awareness of the program, Nucor has developed a web page describing many aspects of the Nucor Technical Academy. The web page features a video showing interested candidates what Tuscaloosa looks like, what kind of housing is provided, as well as the classroom atmosphere at Shelton State. Interested candidates can also apply for consideration right from the web page.

Challenges

Nucor knew it wanted to maximize the amount of time students are able to spend one-on-one with its team members; however it was found that, initially, the students would stick together and not always be engaged with the team. Thus a schedule and area assignments were designed for each student to ensure that each day, every student has someone who is expecting them.

Another challenge of a training program is having the patience and planning to endure a three-year program. Oftentimes when recruiting a technician, the need is immediate. However, during the three years the Nucor Technical Academy students are training, they are growing as teammates, as individuals and as technicians. Nucor



believes that after completion, these students will progress faster than an experienced hire.

Possibly the most difficult challenge Nucor experienced is selecting the right student at such a young age. Many of the academy's students begin their enrollment between the ages of 18 and 20 and have limited work history or life experiences to draw on. It is very difficult to predict who will do well in a technical role in what can be a very demanding work environment. Also faced is the societal bias associated with learning a trade versus going to university to earn a four-year degree. Communicating to the parents of students the opportunity to learn a skill set and begin a career with a top employer is a major point of emphasis at all recruiting functions.

For more information about the Nucor Technical Academy, visit www.nucor.com/careers/academy.

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REFERENCE

1. A. Nelson, "Community Colleges and Inland Empire Manufacturers Build Training Center to Close Skills Gap," www.caeconomy.org.

Iron & Steel Technology hopes to expand on this article in the future. If your steel-producing company offers an employee training or educational program similar to those described within, we encourage you to share it with us. Contact Amanda Blyth at ablyth@aist.org.