



American Welding Society®



CASE STUDY

THE IMPACT OF BECOMING TRAINED AS CERTIFIED RESISTANCE WELDING TECHNICIANS A CASE STUDY WITH KNAPHEIDE MANUFACTURING

The prolific use of advanced high strength steels (AHSS) have changed today's weld perfection requirements throughout the metal working industry. Despite being one of the most misunderstood and underappreciated welding processes, resistance welding is one of the most robust, proven and simple of all the various welding processes used today. The resistance welding industry is competitive and high production, using costly and valuable equipment and requiring the expertise of well-trained technicians to keep pace with today's relentless marketplace.

The new Certified Resistance Welding Technician (CRWT) credential separates the qualified from the untested. Certified Resistance Welding Technicians (CRWT) are highly trained personnel with knowledge and experience to operate and maintain equipment, improve product quality, increase productivity, reduce fabrication costs, and positively impact the bottom line.

Knapheide Manufacturing Company, based in Quincy, Illinois, recognized the benefits that having their welding staff CRWT certified would bring not only to their organization but to the industry as a whole.

About Knapheide

German immigrant, Herman Heinrich Knapheide began working in New Orleans, made his way upriver to Quincy, Illinois, and started a wagon manufacturing company in 1948. He hired skilled German wheelwrights and blacksmiths, gained a reputation for high quality and guaranteed his wagons with a warranty. Six generations later, under the leadership of Harold W. (Bo) Knapheide IV, Knapheide is still of the most respected providers of service bodies in the industry, known for its quality and company pledge to never settle for second best. Today, Knapheide is a predominantly GMAW company that employs about 900 people on the shop floor, of which approximately 70% are welders, working in three shifts.

The Knapheide shop floor utilizes about 250-inverter-based GMAW power sources, a dozen stationary resistance welders and six hand-held resistance weld guns. When asked how they evaluate which parts to weld using Resistance Welding vs GMAW, Welding Assembly Quality Manager and 40-year Knapheide veteran, Rocky Murry, sites joint type as a primary consideration: *"We have a lot of parts where it's easier to do resistance welding as opposed to doing GMAW. Once we figure out how they will be assembled, there are generally less distortions with the metal using resistance welding."*

The Decision to Become CRWT Certified

In 2001, Knapheide started developing an extensive welding program. After it had been established for a few years, the company moved resistance welding from under the manufacturing and engineering department to the welding program. Lane Sparrow, Senior Welding Specialist at Knapheide Manufacturing was there at the beginning. *"The lack of knowledge in the resistance welding industry is amazing. A lot of people think you push a button, and it makes a weld. It's real simple, right? Well, understanding that background and being able to share that with the operators makes everybody successful. Not only does it make our team successful, but it makes the operator successful and the company successful."*

Driven by the fact that they needed knowledge to produce repeatable, quality parts using resistance welding, Rocky and his team were tasked with finding opportunities and ways to enhance their knowledge and skillsets.

Finding CRWT Training

The CRWT exam tests the student's knowledge, skills and abilities in conducting the setup, operation, maintenance, testing and quality control of resistance welding equipment. It spans an array of principles, processes, metallurgy and machinery as presented in the following AWS Standards, among others.

- AWS C1.1M/C1.1, *Recommended Practices for Resistance Welding*
- AWS RWPH (*RW Pocket Handbook*)
- RWMA *Resistance Welding Manual*
- AWS A2.4, *Standard Symbols for Welding, Brazing and Nondestructive Examination*

Rocky and his team jumped at the chance to become initial adopters of the CRWT program. "Ray Michelena was giving a seminar on resistance welding down in Houston." Murry recounts. "We'd started our welding training program at Knapheide, but when we heard him talk about the CRWT program, it gave us an opportunity to really train our people in depth about both the art and the science of resistance welding."

Studied Results

An example of how troubleshooting makes a better product at Knapheide is the way backplates are welded to a stake. "For years we caught expulsion, or molten metal where sparks fly out, which you shouldn't see at all. We couldn't get the expulsion to go away, or to even be minimized. We knew part of the problem was that it was close to the edge, but we couldn't figure out how to reduce it." stated Murry. "During the training, one of the things we talk about was slope. So we added some slope, which made the metal more malleable, and it actually closed the gap before the spot welding program started, which reduced the expulsion tremendously. We knew what part of the problem was, we didn't know what all the problem was. So by doing the training, we got a really better understanding of what we were looking at, what we had to do to be able to fix it, and we could do it after the training."

Sparrow also commented that the training and seminar showed him the importance of electrodes, the effects of changing them, and how helpful it can be. "We use what we call spot caps. Depending on the face diameter or the style of the electrode, it can actually depict where the majority of the resistance takes place within the welding process or within parts. What we found was we were having some difficulties getting the welding just right with certain items. We set back a couple of items that we were troubleshooting, swapped electrode positions. By changing, we were able to change that level of resistance in certain areas and be successful with getting the welding. In one, we actually changed the electrodes in the machine and changed where that reinforcement was taking place. As a result we were able to get much more successful outcomes on the welds."

Preparing for the CRWT

When the Knapheide team was asked what was most beneficial to exam preparation, they all said that the in-person training and hands-on explanation with Ray Michelena explaining it from top to bottom was hands down the most important to them. "There are eight different books that make up all of this information that you have to try to learn, put together and retain in order to take and pass the test," stated Murry. "The information in the books is very difficult just to read and understand without someone being able to explain it."

On the other side of that in-person training according to Sparrow, it's just study, study, study. "The more you keep your nose in the book, the more things start to fall in like and you can actually start putting those pieces of the puzzle together."

The End Result

Knapheide is now in the process of getting everyone trained and tested to be CRWT certified. They are doing so with the belief that this not only increases knowledge at Knapheide, but it sends a message to the industry that Knapheide is committed – no matter if it's GMAW or resistance welding – to producing the best possible components for their customers.

Knapheide is hopeful that having their welding staff become CRWT Certified will have greater impact outside their organization. Sparrow commented, "I think we all understand the true necessity of having skilled welders. If our example can help other companies to push to better their employees, we're bettering the whole industry, not just each individual company. Because it's networking, what I may teach somebody today, they may be able to teach several people down the road. So that kind of growth is actually pretty amazing if you can start spreading that through the industry as a whole."

Benefits to CRWT Training

The Knapheide team agrees that one of the beneficial things CRWT training teaches is how to look upon on the shop floor differently. "We walk up to a machine now, and we have the confidence that we can troubleshoot and solve the issue. We're not there just trying to throw darts in the wind. That puts a lot of confidence that the operators on the shop floor have in us," says Sparrow. "We have confidence in our ability and the knowledge to do it. The fact that the operators have faith in us that we can solve these types of issues sets our team apart from others in the industry." Because of the CRWT program, employees on the shop floor now know more of the technical side and how to troubleshoot some of the finer details. They no longer say, "Oh, I'm just a welder." Or, "I just build car parts."

Now we know not just how to troubleshoot, but we can do a lot of things; set up our own welding schedules, understand what was problematic when it came to resistance welding, things that we didn't know in the past."

A Financial Commitment

Murry is careful not to understate the financial commitment from the company. "I think sometimes that when we talk about the training and certifications like the CRWT, people lose sight of the dollars that it costs the company to do this. This is important enough for us to make time for our people to study part of their workday. We try to set two hours a day aside for the guys, if possible; we try to get a minimum of 10 hours a week for them. Most of the guys on the team are CWIs and CWEs, now we want them to be CRWT. This stuff is so important to our company that we're willing to let them use part of their day to study for these tests. This is not a cheap venture, but that's how committed Knapheide is to doing what's right by our customers and producing quality products with quality trained people."