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Accountability and Accreditation Matter

Accountability is a word that is bandied about in casual conversation and serious discussions. But, how is accountability measured, especially in education? The concept of accountability has led to major shifts in federal education policy and in local school district politics. One of the methods used to ensure accountability in education is program accreditation.

Generally, accreditation is a nongovernmental peer review process that complies with nationally recognized standards established for the practice of accreditation in the United States. Often, the process has various objectives depending upon the organization or program seeking accreditation. For welding programs, generally there are four objectives for accreditation, as follows:

1. To hold welding degree programs accountable to the community of stakeholders, including the welding industry, higher and secondary education, and students, ensuring the programs have clearly defined and attainable mission statements, goals, and student outcomes appropriate to prepare individuals for successful employment and continued education.
2. To evaluate the success of the welding program in achieving its mission, goals, and student outcomes.
3. To foster continuing improvement in welding programs.
4. To implement and maintain a system of self-evaluation for compliance to industry and institutional standards.

The American Welding Society (AWS) is currently directly involved in the development process for two accreditation programs and serves as a partner for the development of the Weld-Ed welding engineering technology accreditation program. Recently, AWS has become the lead welding society for ABET (formerly Accreditation Board for Engineering and Technology), and it has been developing the SENSE (Schools Excelling through National Skills Standards Education) accreditation program for the past few years.

Both accreditation programs in which AWS is directly involved are intended to improve accountability in welding education. It is not the intention of AWS to dictate the content or delivery methods but to assure the stakeholders in welding education programs have adequate input into the process. ABET, the largest accreditation organization in the world, has a long-standing accreditation process that includes a self-assessment, document audit, and site visit. The process of accreditation requires a determination of compliance with general student outcomes that ensure students are adequately prepared to enter the welding industry.

In addition, the ABET process is prescriptive in the number of credit hours required, the qualifications of the faculty, and the quality of facilities and student services. As AWS faces the future, the Education and Training Committee will be seeking qualified faculty for curriculum guidance and to serve as auditors.

The AWS SENSE program (senseonline.org) began in 1993 with a grant award by the U.S. Department of Education to develop a series of standards and a program for the recognition of welders based on welding performance and practical knowledge testing. Although the SENSE program has a set of key indicators (student learning outcomes), each school may develop or use any curriculum that covers the welding content and performance requirements. However, there is no oversight of program outcomes nor evaluation of preparation for required testing and data recording. Therefore, the purpose of the SENSE accreditation program is to ensure compliance of welding programs with the general objectives of accreditation.

The Weld-Ed accreditation (weld-ed.org) is focused on welding programs offering associate degrees in welding engineering technology. Weld-Ed uses elements from both the ABET and SENSE accreditation processes to ensure some commonality among programs. The intent is to minimize the documentation needed to complete one or more of the accreditation processes.

Cost is always an important consideration for all schools. AWS and Weld-Ed are sensitive to the restrictive welding budgets of especially small schools. Site audit costs are often the largest expense of accreditation. Both AWS and Weld-Ed are working on innovative methods to reduce site audit costs, such as virtual audits or using the school’s advisory committees.

As funding becomes increasingly linked to accountability, and as state boards of education seek national accreditation for education programs, the accreditation programs offered through AWS fill the need for accountability in welding education.”
SPARKING CONNECTIONS – 2020 AWS MEMBERSHIP CHALLENGE

■ What it is:
Be the spark that ignites the people you know to become AWS members, and get rewards.

■ How it works:
Build up points throughout the year for each AWS Member you recruit: 5 Points per Individual Membership and 1 Point per Student Membership.

■ What you get:

- Grand Prize Winner: $200 gift card
- 2nd Place: $100 gift card
- 3rd Place: $100 gift card
- 4th Place: $100 gift card

All other participants earning 10 or more points will get AWS branded merchandise based on points accrued throughout 2020.

The Fine Print: All AWS members in good standing may participate and are eligible to receive rewards based on points accrued January 1 – December 31, 2020. Participant eligibility is determined at the sole discretion of AWS program administrators. AWS staff members and administrators of commercial / corporate or educational packages that include AWS memberships in the pricing structure are not eligible to participate. For more information, visit aws.org/be-the-spark
Eight professionals share insights into running a successful job shop
The bedrock of U.S. manufacturing, job shops are defined as a type of manufacturing system in which small quantities of a variety of custom products are made for other businesses (Ref. 1). The products manufactured by job shops can vary significantly from job to job, often requiring a unique setup and sequencing of process steps (Ref. 1).

The United States is home to tens of thousands of job shops (Ref. 2) that are making the manufacture and fabrication of parts better, faster, and cheaper than ever before. To learn more about how they manage their businesses, the Welding Journal reached out to seven job shops and one used equipment dealer. The industry leaders who shared their knowledge and expertise for this article included D. A. Smith, owner, Smith’s Welding Works, Garland, Tex.; Shaun Huibschen, partner — managing director, Metal Arts LLC, Wichita, Kans.; Rob Goncalves, general manager, G2 Metal Fab, Livermore, Calif.; John Bray, president, Affiliated Machinery Inc., Pearland, Tex.; Sean Moran, welding engineer, American Hydro Corp., York, Pa.; Robert P. Mudge, president, RPM & Associates, Rapid City, S.D.; Scott Lord, president, WesLor Enterprises, Lyons, N.Y.; and Jason Yantus, quality assurance manager, J&J Truck Bodies & Trailers, Somerset, Pa.

Provide a brief overview of your job shop.

D. A. Smith, Smith’s Welding Works: We style ourselves as a custom fabrication and installation business. That’s what I’ve done for the last 40-something years. We do a lot of different things, like structural steel, and we used to do a lot of pipe, but we don’t do it anymore because it’s too hard to find good pipefitter welders. We do large, custom homes. We’ve done six or seven townhouse operations in the last several years for different builders. We fabricate and install the structural steel, and they add two floors on top of all that. Custom homes have a lot more steel in them than they used to. We also do different types of repairs. One of the bigger things we’ve done in the last 20 years has been for the HOV [high-occupancy vehicle] lanes for Dallas. They’ve got a big machine called a zipper that moves the concrete barricades from one part of the highway to another part of the highway, and we do a lot of repairs on the parts for the machine. That’s one of the bigger, ongoing repair projects we do.

Shaun Huibschen, Metal Arts LLC: Metal Arts LLC is based in Wichita, Kans., and we manufacture structural and miscellaneous steel (see lead photo). Our markets include commercial, industrial, and residential general contractors. Primarily, we serve the commercial and industrial markets. Projects include K–12 schools, college facilities, manufacturing facilities, commercial developments, hotels, office buildings, and many more — Fig. 1. We have provided steel for customers
Fig. 1 — A welder at Metal Arts LLC, Wichita, Kans., performs surface finishing on a guard rail that will be used for the stairs of a local high school. Built out of flat bar, the component is coated with a black powder before final installation.

Fig. 2 — Welders at G2 Metal Fab, Livermore, Calif., join stainless steel studs to plate with ⅜-in. fillet welds by performing dual-shield flux cored arc welding using stainless wire.

Fig. 3 — American Hydro Corp., York, Pa., builds some of the largest turbines in the world.

Fig. 4 — This used dozer face had its outer wings modified to reduce carry back. An RPM wear liner package was installed using the company’s manufactured chrome carbide overlay plate. Shown in the background is the RPM shop in Rapid City, S.D.

Fig. 5 — A welder at WesLor Enterprises, Lyons, N.Y., performs pulsed gas metal arc welding on a ⅜-in.-thick Monel 400® cone.

Fig. 6 — At J&J Truck Bodies & Trailers, Somerset, Pa., a robot is employed to weld the understructure for an aluminum dump body.
in Kansas, Oklahoma, Nebraska, Missouri, Texas, Colorado, and Minnesota. Metal Arts was founded in 1971, and has changed ownership once, in 2001. Our projects range from several pounds to 1500 tons.

Rob Goncalves, G2 Metal Fab: G2 Metal Fab has been in the fabrication industry for 12 years, and our general manager has 20 years of experience in welding and fabrication. We fabricate structural steel and miscellaneous metals for the industrial sector, and we work with aluminum, stainless steel, and carbon steel — Fig. 2.

John Bray, Affiliated Machinery Inc.: Affiliated Machinery Inc. was established on April 1, 1996. We are a used welding equipment dealer. We buy, sell, and rent used welding equipment all over the United States. Most of our customers are independent welding distributors. Therefore, there are a variety of customers who use our equipment — from small fabrication shops to large offshore platform fabricators to people who just need a welding machine for their weekend repairs.

Sean Moran, American Hydro Corp.: American Hydro Corp. was founded in York, Pa., in 1986 by four engineers — Selim Chacour, Dr. William Colwill, John Degnan, and James Nolt — who recognized that the hydropower industry needed a manufacturer who specialized in the upgrade and rehabilitation of turbines and turbine components. We build some of the largest hydraulic turbines, pump turbines, and large pumps in the world, as well as offer custom solutions in upgrading and rehabilitating existing hydro plants, which significantly improve performance and extend the life of the units — Fig. 3. Our focus is primarily on Francis, Kaplan, and propeller-type turbines, and reversible pump turbines along with other new turbine components, rehabilitation of existing equipment, and/or complete equipment packages.

Robert P. Mudge, RPM & Associates: RPM & Associates Inc. was founded in April 1982. We focus on providing cost-effective wear solutions for coal-fired power plants, cement plants, a variety of mining operations, chemical processing plants, and more. Typical products and services include the following: new and rebuilt worn coal pul-

verizer rolls, tables, wear liners, and journal assemblies; chrome carbide overlay plate (Fig. 4) in a variety of alloys and several different thicknesses to ensure the proper overlay plate is available for each application; new and rebuilt/hardfaced worn coal transport pipe and elbows and ash handling pipe spools; and reverse engineering services utilizing advanced laser measuring and scanning equipment combined with CAD software.

Scott Lord, WesLor Enterprises: Our company has been in business for 33 years and has had three locations. The first was 3500 sq ft, second was 10,000 sq ft, and our current location is 30,000 sq ft, which we have plans of expanding by another 20,000 by the end of 2021. We consider ourselves as a custom manufacturer that specializes in turnkey projects and short-run production of material handling equipment — Fig. 5. Our audience is mainly the salt and aggregate industry as well as the construction side of the healthcare field.

Jason Yantus, J&J Truck Bodies & Trailers: J&J Truck Bodies & Trailers was established in 1958. Our main product that we produce is dump bodies, both steel and aluminum — Fig. 6. We also manufacture multiple types of steel and aluminum trailers and pressure/vacuum tanker trucks. Our sister company, J&J Truck Equipment, is a premier upfitter of mechanic service trucks, crane bodies, lubrication trucks, winch tractors, snow and ice equipment, and wetline kits. They specialize in hydraulics and specialty fabrication as well.

What software and equipment do you utilize in your job shop?

D. A. Smith, Smith’s Welding Works: In our office, we use a program for all of our paperwork. We don’t use any software at all in the shop. We use MIG, TIG, and stick welders [gas metal, gas tungsten, and shielded metal arc welding machines], and we have two portable machines set up on a trailer. We do about 50% shop work and 50% portable on site.

Shaun Huibsch, Metal Arts LLC: Until recently, our shop operated using paper drawings and paper cut lists. Our office, however, utilizes Strumis software for project management and estimating. In the first quarter of 2020, we will be integrating Strumis into the shop, with the goal of going paperless by the end of 2020. Every workstation and machine will have a dedicated tablet or computer for interacting with the Strumis software.

Rob Goncalves, G2 Metal Fab: We use Structural Materials Manager by E.J.E. Industries to create cut lists. The equipment we use includes ironworker and punch, plate roll, tube bender, vertical saw, portable plasma cutters [cutting machines], and several CV welders [constant voltage welding machines] for stainless steel, aluminum, and carbon steel using gas metal arc welding and flux cored arc welding processes.

John Bray, Affiliated Machinery Inc.: The customers we sell to have many types of equipment, not just welding machines. Because we are selling to a large group of different size distributors most of the time, we don’t actually visit the end user unless there is a problem with the machines. A few of our customers are the end user of the equipment, so we do get to see what they are manufacturing.

Sean Moran, American Hydro Corp.: When visiting our shop floor, individuals will see installations of high technology. These tools help shift more manufacturing processes to automatic means. Plasma arc cutting in three dimensions and robotic welding provide results in a fraction of the time. Fiberoptic communications reduce spurious signals to machine tools for programming. The computer-driven hot-forming and numerical machining techniques developed by American Hydro engineers have resulted in cost-effective manufacturing — from the initial wrought plate cutting to the final finish and dynamic balancing of the turbine.

Robert P. Mudge, RPM & Associates: RPM employs the following equipment in our shop: one CNC-controlled overlay plate system; two pulverizer roll rebuilding systems and two 650-A DC welders [direct current welding machines]; one air arc system with 12,000-lb positioner; one stationary positioner with multiaxis manipulator and one welding head; one welding system used to apply hardfacing to the inner diameter of coal transport elbows; one portable welding system with two welding heads used to rebuild worn
pulverizer tables; one 4-roll hydraulic forming roll; one CNC 5-axis plasma cutting system; one StingRay high-pressure parts washing system; three manual lathes, one manual vertical turret lathe, and one CNC large vertical turret lathe with live spindle; one manual knee mill and one knee mill equipped with varidrives; one CNC horizontal boring mill with 4th axis; one FARO portable coordinate measuring machine; and one FARO Focus laser scanning system. RPM employs the following software: Inventor®, AutoCAD®, and Siemens NX for CAD; Esprit®, Centroid™ CNC, and Siemens NX for CAM; SigmaNest® and OmniBevel for cutting; FARO® CAM2®, FARO Scene, Autodesk® ReCap™, and Varicut for inspection/simulation; and Sage 50 and Project Tracker (in-house developed) for accounting.

Scott Lord, WesLor Enterprises: The main design software we use is AutoCAD Inventor with some drawings in SpaceClaim. The CAM software we use for our Amada laser and AKS plasma is the MTC nesting package. We also have a large Doosan mill that is programmed with the Fusion 360™ version of AutoCAD. Most of our welding equipment is Miller with a couple of Lincolns in the mix.

Jason Yantus, J&J Truck Bodies & Trailers: Robotic welding machines along with I-Logic and Autodesk® Inventor in the engineering department. A lot of the welding is still performed using the semiauto MIG [gas metal arc welding] process.

What do you feel is special about how your job shop is run?

D. A. Smith, Smith’s Welding Works: We do quite a bit of physical work with not as many men as I used to have because we’ve gotten smarter with how we do things. I’ve had as many as 18 men back in the mid ’90s, and now I usually run four, no more than six, men. We don’t fabricate our shape plate like we once did; we farm it out to a company where that’s all they do, so we don’t have the drop that we once did, and I don’t need the manpower that I once did. By buying the plates precut, I get them done cheaper than I can do them because I’m down two to three men by not having them on the payroll. So we’ve gotten smarter about what we do and how we do it. We also turn down some work. I used to do a lot of different repairs and fabrications, but it’s hard to get good-quality workers that have a craftsmen mindset. We’re just not getting the quality craftsmen we used to get. More and more, they’re just not trained, so we’ve had to get smarter with how we fabricate and how we do things.

Shaun Huibsch, Metal Arts LLC: Our shop is special because of the people. Our processes are industry standard, and when we transition to a paperless shop, our people will still be the driving force of our company. There are countless fabricators throughout the world; the only way to differentiate is to build an outstanding team, and we believe we excel at building teams.

Rob Goncalves, G2 Metal Fab: G2 is special because of our culture. We are a family-owned company and we endeavor to help each employee know that they are valued by the company, and that they bring value to the company. We operate with a spirit of teamwork and cooperation, as opposed to competing against each other.

John Bray, Affiliated Machinery Inc.: Because we do get to visit some of the end users of our equipment, we get to see everything from a company making metal fences to the inside of NASA working on projects for the space program. When you visit shops of all different sizes, you would be amazed on what you find that people are building. It seems a small shop with a good manager can survive longer than the big ones because of poor management. It isn’t rocket science as much as applying common sense without becoming greedy. Some owners I have known over the years want to grow their business for their family to take over, or just to sell it outright to another company.

What are some key aspects of a successful, well-run job shop?

D. A. Smith, Smith’s Welding Works: Being able to adapt to whatever the situation requires. You put the customer first and you provide a quality product at a fair price, and you’re able to respond in a timely fashion to whatever the customer wants or needs. If the job isn’t going quite the way it should go, you’re able to adapt and finish it and do it with quality and in a timely fashion. You have to be able to think outside of the box and not get locked in. You have to think, ‘If this doesn’t work, well, what will work and what will make it easier and quicker and still make money?’ And I like to think that I’ve been able to do that for the past 50 years.

Shaun Huibsch, Metal Arts LLC: A successful shop is one where everyone is on the same page. It’s a cliché, but it’s true. Therefore, communication is king. One of the core reasons for integrating Strumis software into our shop in 2020 is to get everyone on the same page. When everyone can see the same information, then there are few
chances for miscommunication, and we all move forward as a team.

Rob Goncalves, G2 Metal Fab: A successful, well-run shop should have a culture of teamwork and cooperation, with buy-in from all employees on the company philosophy. Once that is in place, other key aspects are having quality shop drawings, good communication between each department, good QC procedures, and skilled welders and fitters.

John Bray, Affiliated Machinery Inc.: In our business, it seems like the hardest part in staying alive in the welding industry is timing and being able to manage your business in both the good times and the bad. We have seen shops take on work for no profit just to keep their employees with them. Like any business venture, there are reasons why you see one shop last for decades and another be closed after just a few years. Where you are located around the United States can have a bearing on your success. People say the Gulf Coast is one of the best places to find a welding job. There are a lot of opportunities here with the oil and gas industries if you are qualified in your work experience. Thus, you see one shop close and another open up just a short distance away. Like any business, you have to adapt to the changing times.

Robert P. Mudge, RPM & Associates: RPM operates under a unique culture where management, accounting, production, engineering, and safety departments communicate very well. This does not mean we do not have lively discussions, because we do. But everyone has a professional respect for each other’s ideas and perspectives. Everyone’s goal is to be safe and provide the best quality and most cost-effective, not lowest initial cost, products and/or services to our customers.

Scott Lord, WesLor Enterprises: The key to a well-run shop is clarity and organization. If everyone knows exactly what is expected of them and they have the right tools, materials, and space to accomplish their task, it all works. Take one of them out of the equation and you have inefficiency and confusion.

Jason Yantus, J&J Truck Bodies & Trailers: Shop organization “flow” and a quality group of employees.

What is the most difficult aspect to control when managing a job shop?

D. A. Smith, Smith’s Welding Works: The most difficult thing I’ve encountered is the employees. Getting them to show up and come to work ready to work. It’s not always the money; often times, the men bring baggage with them. I’ve talked to several other shops when I need more help or I need something, and they say the same thing. Getting the employees to come to work and come to work on time, and be ready to work, it’s harder now than it’s ever been.

Shaun Huibsch, Metal Arts LLC: Maintaining your team can be more difficult than building it. Unemployment is low, and everyone is looking for talented people. Controlling turnover is key in our current environment, and if you don’t find a way to control it, you will find yourself unable to compete, buried in retraining costs, and unable to maintain your quality standards.

Rob Goncalves, G2 Metal Fab: The quality of the finished product is the most difficult aspect to control. There are many places where mistakes can be made during the project, and it is challenging to try to minimize and eliminate all defects. We are constantly seeking to improve our quality so that our customers receive the best product possible.

Robert P. Mudge, RPM & Associates: The most difficult item for us to manage is the change in expectations — customer expectations and vendor expectations. A close second is finding qualified and reliable workers. Customers have more rules and regulations to adhere to than they did in past years. The net result to RPM is more complex contracts, rather than simple purchase orders, that transfer as many risks as possible associated with the work RPM is performing for them, from them to RPM all the while demanding quicker deliveries, lower prices, longer life, and longer pay terms. Regarding the vendor expectations, stock inventories are becoming a thing of the past. Deliveries are extended while many orders require a percentage of prepayment. Combine this with the change in customer expectations and it creates a perfect storm that management faces every day. RPM has an intensive training program that takes time and money. Recruiting and retaining qualified and reliable workers requires constant attention. If it was easy, everybody would be doing it.

Scott Lord, WesLor Enterprises: I feel the most difficult thing to control for us is the level of employment vs. the amount of work. Sometimes we are so busy that there isn’t enough hours in the day, and other times we are debating having the shop swept for the third time today. Our work is based on capital investment of our customers, and that seems to coincide with the national economy.

Jason Yantus, J&J Truck Bodies & Trailers: Lead times of incoming materials from vendors.

Conclusion

Sharing valuable information about their businesses, these industry leaders shed light on some of the key aspects associated with managing a successful job shop. Many pointed out the importance of having a talented team that works well together and communicates effectively to get a job done. They also emphasized that producing high-quality products that meet customers’ specifications in a timely manner is crucial for any job shop. Their collective voices further highlighted the difficulty many job shops face in attracting and maintaining employees with the skills set needed. Other challenges included vendor lead times, retraining costs, meeting customers’ expectations, and maintaining high quality standards.

References

Friends and Colleagues:

In 2018, The American Welding Society established the honor of the Certified Welding Inspector Lifetime Achievement Award (CWI-LAA). The award is intended to recognize individual members for a career of distinguished service, outstanding accomplishments, exceptional leadership, and innovative contributions in the area of welding inspection and welding inspection technology. Individuals receiving the award may be currently working as a CWI, or have worked as one in the past. The selection committee is seeking nomination packages for qualified individuals who have demonstrated specific accomplishments in one or more of the following areas:

- Advancements in the field of welding inspection.
- Mentorship of individuals entering the field of welding inspection.
- Effective application of existing and new inspection technology.

This could be evidenced by one or more of the following:

1. Development of novel concepts or tools related to welding inspection.
2. Participation in activities directly related to the recruitment, training, education and/or mentorship of individuals entering the field of welding inspection.
3. Leadership in AWS or private industry, particularly as it impacts advancement of the welding inspection profession.
4. Consultancy in technical matters or welding industry business matters, including expert witness activities related to welding inspection.
5. Publication of books, papers, articles or other significant works related to welding inspection.
6. Meaningful participation in AWS committees, Sections or other AWS voluntary contributions related to welding inspection.

For more specifics on the nomination requirements, please contact Malisa Mercado at mmercado@aws.org at AWS headquarters in Miami, or simply follow the instructions on the AWS CWI Lifetime Achievement Award nomination form located at: aws.org/cwilaa.

Please remember, we all benefit in the honoring of those who have made major contributions to our chosen profession and livelihood. The deadline for submission is July 1, 2020. The CWI Lifetime Achievement Award Committee looks forward to receiving numerous nominations for 2021 consideration.

Sincerely,

Kerry Shatell
Chair, CWI Lifetime Achievement Award Committee