

Shenandoah Valley Manufacturing Workforce Needs

Report Prepared for



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Introduction

Jay Langston, executive director of Shenandoah Valley Partnership (SVP), contracted Joe Sprangel of Emmanuel Strategic Sustainability LLC (ESS) to interview Shenandoah Valley manufacturers to learn their top workforce needs. The initial objective was to interview representatives from ten manufacturing companies across the area represented by SVP. Outreach by SVP to the invited manufacturers resulted in interviews at eleven locations. The companies included:

1. Cadence Inc – Staunton, VA – Rachel Brown – HR Manager
2. ComSonics, Inc. – Harrisonburg & Weyers Cave, VA - Corporate Director of Human Resources
3. Daikin Applied – Verona, VA - John McNally - Sr. Director of Operations & Mark Phillips - Sr. Human Resources Manager
4. Danone North America – Mt. Crawford, VA - Jeannine Peterson – HR Director
5. Dynamic Aviation – Bridgewater, VA – Joel Shank - Vice-President, Human Resources
6. Innovative Innovation Systems – Lyndhurst, VA - Michael McGinnis – President & Owner
7. Kennametal Inc – New Market, VA - Brittany Strietzel – HR Manager
8. Modine Manufacturing Company – Buena Vista, VA – Steve Holiday – HR Manager
9. Munters Corporation – Buena Vista, VA - Brian Frost - Director of Operations
10. NIBCO of Virginia – Stuarts Draft, VA – Mark Frazier – Plant Manager
11. Supply One – Weyers Cave, VA – Bahar Mikael – HR Manager

The Interview Format

The interviews began with brief overviews of the ongoing work of SVP and the background of Joe Sprangel as it related to the job at hand. The conversation then shifted to the objectives of the interview to:

- Share the example of the BRCC, JMU, and Merck & Co Inc in Elkton, VA, to find where similar opportunities might exist
- Look for common issues at several of the plants
- Determine if other hybrid concerns would arise

The interview session began with the open-ended question of:

What are the top 2-5 workforce issues faced by your facility?

As the interviewee's shared responses, additional questions were asked for further information or clarification of the respondent's answers. The pattern would continue until there were no more workforce issues to share. For each of the occupation areas, they were asked to share each occupation's specific training needs. The interviewees were also prompted as necessary to list particular needs such as:

- Digital skills

- Project skills
- Soft or fundamental skills

Those wanting additional information on the sub-elements of these skills can find them in Appendix A.

Interview Responses Overview

A complete set of notes taken during the recent interviews of eleven Shenandoah Valley manufacturing companies are available for review in Appendix B. A study of these notes yielded such common themes to include:

- Difficulty in getting sufficient candidates even to apply
- Many new hires leave in a few days
- Skilled trades are even more problematic
- Many are training their people
- Employees do not come in with a good understanding of the required work ethic
- Education programs not fully meeting company needs
- Several plants could expand, some significantly, if they could find people
- Childcare and transportation issues at some plants
- A need for further implementation of lean manufacturing
- Minimal work in moving to Industry 4.0

The hiring results align with research industry reports where:

- At a historic high of 89%, the number one issue for manufacturing executives is filling the gap between available employment candidates and their plant operations' needs.
- 2.6 million baby boomers will retire in the coming decade, increasing the severity of this growing employment shortage.

Several companies are working to resolve their needs for skilled personnel through internal training. The typical approach is to utilize more experienced personnel to train new hires. In many cases, the interviewees were not aware of the various training program opportunities in the area.

The Network2Work program in the early phase of adoption in the Shenandoah Valley did resonate with interviewees. All of the companies are open to exploring opportunities to expand the pool of job candidates.

The interview sessions and plant tours were an opportunity to gauge lean manufacturing and six sigma implementation. A significant possibility exists to further leverage productivity gains with deeper lean and six sigma implementation.

The Industry 4.0 manufacturing revolution is occurring globally. There was little evidence of this transition occurring in the Shenandoah Valley with those I was able to interview. Elements of Industry 4.0 should begin to be adopted by the manufacturing sector or lose the ability to maintain competitiveness. The aspects of Industry 4.0 include:

- Connected computers that are connected and communicate with one another without human involvement
- Industrial Internet of Things
- Internet of Systems
- Real-time data
- Connected supply chains
- Autonomous equipment and vehicles
- Robots
- Additive manufacturing

Possible Next Step

Based on the initial response to requests to interview representatives at various manufacturing locations and the feedback shared during the interview sessions, there is a desire to find solutions to the mounting difficulty in filling the employment needs of their operations. Reflection on the gathered information led to the next step of an industry summit for those interested in improving workforce development in the manufacturing sector in the Shenandoah Valley. A proposed plan could include:

- An exhibit hall of the various area providers of workforce development services
- A conversation around a Say Yes! To Manufacturing campaign
- Panel discussions around the workforce need solutions – Network@Work, neurodiversity, veterans, open hiring, development of training programs, etc
- Presentations on the benefits of adopting or further embedding lean manufacturing, six sigma, and Industry 4.0
- A manufacturing community dialogue with area politicians
- Discussion around how to leverage GO Virginia and other funding opportunities

Concluding Remarks

The entire community of those interviewed was very gracious and open with their feedback regarding their challenges. I sense that there is a strong appetite to work together to improve their potential to fill their workforce needs in all areas. There was also evidence of opportunities further to develop the efficiency and effectiveness of their operations. In most cases, there is also potential to expand operations if there was an improved workforce climate in the Shenandoah Valley.

I thank everyone for their contribution to this work. I look forward to furthering the conversation and actions to improve the manufacturing workforce climate in the Shenandoah Valley.

Appendix A

The following topics were additional prompts during the interviews:

- Digital skills
 - Artificial intelligence
 - Automation
 - CAD/CAM
 - CNC programming
 - Computer skills
 - Instant messaging
 - Online collaboration platforms
 - Robotics programming
 - Social messaging apps
 - Text
 - Work-based social media
- Project skills
 - Environmental management system
 - Lean manufacturing
 - 5S
 - 5 Whys
 - Kaizen
 - Kanban pull system
 - Level loading
 - Mistake proofing
 - One-piece or continuous flow
 - Overall equipment effectiveness
 - PDCA
 - Quick changeover/SMED
 - Standardized work
 - Takt time
 - Total productive maintenance
 - Visual management
 - Waste elimination
 - PFMEA
 - Project management
 - PPAP
 - Quality management systems
 - Change management
 - Corrective & preventative action
 - Design control
 - Management responsibility

- Process & production control
 - Product surveillance
 - Resources
- Quality tools
 - Cause & effect diagrams
 - Check sheets
 - Control charts
 - Histograms
 - Pareto charts
 - Scatter diagrams
 - Stratification
- Six sigma
- Soft or fundamental skills
 - Attention to detail
 - Communication
 - Creativity and originality
 - Critical thinking
 - People management
 - Problem-solving

Appendix B

The following are the notes that I took during each of the interviews:

Company A HR Manager – 02/26/2021

Full-service contract manufacturer of aerospace, automotive, medical, and industrial products and technologies with 200 employees

- The company has recently received a bronze medal from Ecovadis for sustainability.
- They have trouble finding technical people that can hit the ground running. The issue is more critical as the recruit to staff their second shift. They have increased their second shift pay differential. Even those with a machinist background can have difficulty dealing with extremely high tolerances. They do have little turnover on the first shift.
- Talent with CAD/CAM, CNC programming, laser, and computer skills is difficult to find. They are utilizing some robots and cobots to assist workers, not replace them.
- The company does have a tuition reimbursement program.
- Fundamental skills in coaching, communication, and teamwork are a need area.
- The company is utilizing lean manufacturing.
- The company is becoming more flexible when it comes to supporting the struggles of its workforce. Childcare and transportation are problematic for part of the workforce. Rachel has researched Nordic approaches to supporting working parents.
- The turnover they have experienced from COVID-19 has them rethinking how they deal with substance abuse issues. They have concerns with drug and alcohol-related concerns.
- The company is using Alert Media to communicate with the workforce.

Company B Corporate Director of Human Resources – 03/26/2021

Manufacturer of products to help broadband providers with leakage detection, installation, and system integrity with 100 employees.

- The company has an ongoing need for employees with soldering talent and essential electronics backgrounds. The condition exists in both the repair facility and in the manufacturing.
- There is also a need for material handlers and electronic technicians. There was a good training program at Massanutten Technical Center that is no longer available.
- The manufacturing site has an ongoing need for assemblers and some machine operators. They are currently looking for those with the aptitude and training them since they cannot find people with existing skills.
- They are a [V3 Program](#) certified program working to employ veterans and a DARS Vocational Rehabilitation company. There have been no job candidates to date from either program.
- They have a career ladder program developed for all jobs at the company.
- The company is 100% employee-owned.
- HR is actively involved in workforce development and a current member of the Shenandoah Valley Workforce Development Board.

Company C – Director of Operations & Sr. Human Resources Manager – 04/01/2021

Manufacturer of industrial/commercial chillers and air conditioning units with 350 hourly and 200 salaried employees.

- They stated that their training from initial design to customer delivery is outdated. They are looking at how to develop new training using new technologies like virtual reality.
- Hiring and retention is an ongoing issue that is made more difficult due to their unionized workforce.
- HR had previously worked at General Dynamics, where company partners trained potential employees an hourly wage to get them to a hireable level. The joint venture led to a regional training center for manufacturing employees.
- Their more experienced employees are doing the training of new employees that leads to inconsistencies in overall culture and job expectations.
- The experience for them is that community colleges are less nimble than what is needed by manufacturing.
- The company has a strong focus on lean manufacturing and six sigma, where they do their training.
- There was agreement that a Say Yes! To Manufacturing regional marketing campaign could be beneficial in increasing manufacturing employment candidates. In particular, one focused on filling regional employment needs. The conversation was that it does not need to be a blue-collar or white-collar choice—the benefits of a hybrid of both provide additional opportunities.
- They have an excellent tuition reimbursement program. The conversation continued around how to leverage a career path that did not lead to student debt.
- There was support on developing collaborative training with an example of raw material management as one suggestion.

Company D – HR Director - 02/26/2021

Food & beverage company with 640 employees

- Certified B Corporation.
- The first concern shared was efforts to help an operation like Merck take away from the candidate pool for other facilities. The remark was not to discourage doing more of this type of work but to emphasize the limited skilled talent in the area.
- The position of machine operator was the top workforce issue. They are having trouble finding candidates capable of executing the technical needs of the plant's processing.
- The recruitment of people with maintenance skills is another issue. A particular concern is the hiring of maintenance managers with the capability to lead others. They are also having problems finding maintenance technicians. The plant has a maintenance training program where they work with Massanutten Technical Center and Blue Ridge Community College to develop individuals with this skill set. They still have trouble finding enough people that can be successful in learning the requirements of this trade.
- The plant has a difficult time at all skill levels getting people to come to work.
- There is a generally workable union, but it does limit what they can do to improve plant operations.

- They can fill operations excellence positions by recruiting them from Virginia Polytechnic Institute and State University and Old Dominion University.
- The mini-manager role is another that is difficult to fill despite a \$100k salary. A deterrent is an expectation of being on-call 24/7/365. They are having trouble finding candidates with the necessary combination of technical and fundamental skills.
- The plant now has a training and development team with support from Lord Fairfax Community College.
- They are using Facebook as a workplace communication format at the corporate level.
- They identify needs for project skill development by doing internal training and through local schools.
- Fundamental skill development is of interest with particular needs of effective communication, time management, and proper documentation.
- Overall interest in supporting workforce development initiatives in the valley.

Company E –Vice-President, Human Resources – 03/25/2021

Provider of mission-specific services includes sourcing, overhauling, modifying, flying, and maintaining 300-350 employees in Rockingham and 650 for the entire company.

- The top issue is difficulty hiring experienced trades personnel in avionics, certified airplane mechanics, engineers/engineering technicians, and sheet metal workers. They can generally find the other trades, but sheet metal workers are the most difficult to find.
- The turnover rate is 14% for the overall company. Those that leave tend to go to Morgantown, West Virginia or Virginia Beach and Winchester in Virginia. Those that leave tend to go for reasons other than pay.
- The trades jobs start at \$14-15 per hour, where new employees can quickly get to \$20 per hour. The top end is \$30 per hour. They have made significant advancements in skilled trade pay in the past few months.
- The lack of talent in the Shenandoah Valley with aviation experience is a definite issue. They do have success when they recruit those looking for a valley environment experience.
- They currently work with an aviation training center that develops those with basic aviation skills like sheet metal. The training need may be an opportunity to develop a program similar to the Merck model.
- There are some contract workers utilized for positions that do not require specific skilled trades training.
- The following need is leadership development. The company is currently doing an internal training program where about 20% of the work is outsourced to external providers. Last year they did shallow training each month on 12 different topics. This year, they go deeper where they focused in the first quarter on trust and are moving into empowerment for the second quarter.
- When recruiting talent, they look for those that will fit their culture and have the necessary skill set. If either is missing, they will not make the hire. The culture requirement is the top priority. A job candidate with a good culture fit but needs further training can be given consideration. An employee candidate who possesses a robust skillset will not receive an offer if there is a lack of culture fit.

- The culture is one where people like working together. There is a sense of caring for one another in teamwork and collaboration.
- The workforce experienced some issues with childcare during the early stage of the pandemic. The company was as flexible as possible to support employee needs before the COVID-19 outbreak, so it was easy to adapt to these new challenges. There has been a further shift in the opportunity for remote work as a practical approach during this timeframe.
- Transportation does not seem to be a problem for their workforce.
- Thirty percent of the workforce are veterans.
- The company is AS 9100 certified.
- They started their lean journey about three years ago. They have hired a director of continuous improvement.

Company F – President & Owner – 03/22/2021

Design, fabricate, install, and service custom industrial refrigeration systems with 300 employees.

- They have seen almost no one applying for their open positions. Owner believes that he could grow to 500-550 employees if he could find the workforce talent needed for their work at all levels of the operation. The company is currently turning away work for this reason.
- All new plant employees go through 10 days of training and testing before moving into production work.
- They are currently bringing in welders from out of state. They are not seeing the level of pipe welding talent they need coming out of the Valley Career and Technical Center.
- The company offers welding apprenticeship opportunities to those that express interest and can do the work. The apprenticeship training happens on Saturdays.
- There is also a need for additional electricians.
- The company develops project managers from their existing engineering workforce.
- They tend to currently be able to hire engineers from UVa, VCU, and Vtech. There is a better opportunity to retain engineers that are local to the Shenandoah Valley.
- The plant is Safety & Health Achievement Recognition Program (SHARP) certified by OSHA.
- They are also Underwriter Labs (UL) certified, where a UL inspector makes an unannounced quarterly plant visit.
- They are currently working toward ISO 9000 certification.
- There does not seem to be an issue with childcare or transportation for their employees.

Companyh G – HR Manager – 03/01/2021

A metalworking tools manufacturer with 70 total employees.

- Their top workforce issue is finding the talent needed to do their work. The company has difficulty filling their need for 40-50 machinists and maintenance, programmers, and quality personnel.
- Critical thinking skills will become more acute as they continue to do more customized tool work. The work expansion will likely lead to the need for another 5-9 machinists.
- They are flexible in hiring those with the potential to enter in assembly and train them internally to run their Haas CNCs.

- Absenteeism is an issue with newer employees.
- Childcare and transportation do not seem to be an issue for their employees.
- There is a need to get the message out around the benefits of working in manufacturing.
- The plant is currently a three-shift operation.
- The current workforce is primarily one of the long-tenured employees.
- Five-axis training is an area of need for them.
- Teamwork training is another area that would be of benefit to them.

Company H – HR Manager – 03/10/2021

Design, manufacture, and test heat transfer products for various thermal management applications and markets with 220 hourly workers and 40 salaried employees.

- It is currently recruiting an HR manager and an engineer that could be mechanical, electrical, or industrial by degree.
- Business growth requires another 40 hourly employees
- The local area is not currently yielding enough candidates to fill employment needs
- Starting pay is \$17-18 per hour, with production pay around \$22-23 per hour
- A three-shift operation with about ten people on the third shift
- The salaried workforce has been relatively stable
- Modine had to improve the vacation plan with five days available to those that start in the 1st quarter of their first year with an opportunity to earn some lesser time for those starting later in the year
- The new president of Modine is looking for plants to implement the Modine Operating System

Company I - Director of Operations – 03/18/2021

Manufacturer of innovative, energy-efficient, and sustainable climate solutions for mission-critical processes with 280 employees.

- Struggle to recruit and retain blue-collar workers. The company currently has 30 open positions with starting pay of \$14.25. They have recently relaxed the hiring policy that has helped gain some additional candidates.
- Childcare and transportation are a bit of an issue for some employees.
- Recruiting and retaining HR managers is an ongoing issue.
- They are doing work release with the local jail.
- They have spent \$5 million to contract labor outside the area to fill workforce needs.
- Corporation has an overall company goal to reduce its carbon footprint by 50% by 2030.
- They produce a quarterly sustainability report, and this is an increasingly more important aspect of their work. The company developed a product design that has earned a green label that is a solid economic model to gain additional sales.
- Two mechanical engineers focus on lean manufacturing that has reemerged as a priority for the company in the last 18 months.
- The engineering group has 32 in total that includes electrical, mechanical, and refrigeration engineers.
- The plant is overall in good shape as it related to technology needs.

- The company would like to further integrate into the community

Company J – Plant Manager – 03/03/2021

Manufacturer of world-class fittings with 440 employees

- The company has a difficult time getting enough people interested in filling open regular production positions. The starting pay is \$15/hour that goes up to \$18/hour after 90 days. A cold header operator can earn up to \$40/hour.
- The packing and shipping facility works 12-hour shifts where the employees rotate between three days one week and four days the other week. The manufacturing facility works 10-hour shifts four days a week. At the time of the interview, they performed a lot of overtime to fill repair needs due to the southern United States' deep freeze.
- Industrial electricians are a problematic hire. The plant is experiencing troubleshooting experience due to a shortage of individuals with this capability.
- They currently have about 20 Fanuc and Kuka (the new standard) robots, with plans to add more Kuka robots.
- They are standardizing with GNUTTI manufacturing equipment.
- There is a need for people with vision system capability.
- They are internal training tool room people.
- They currently have 10-12 apprentices
- Mark mentioned that Debbie Melvin had secured training program funds that are running out.
- Company requires that management employees hold at least a bachelor degree that can be an issue for some people that want to advance to that level. Their growth and limited job candidate pool allow an excellent opportunity for advancement.
- The company does have a tuition reimbursement program.
- They have annually supported internship opportunities for BRCC engineering students. They have hired a couple of BRCC graduates. Feels that BRCC does a good job of training these students.
- Childcare and transportation have not been a concern for their workforce.
- They have a zero-tolerance drug policy that limits potential job candidates.
- The company had \$2 million in documented continuous improvement savings in the previous year.

Company K – HR Manager – 03/18/2021

Packaging solutions provider of packaging management programs, managed services programs, food packaging programs, retail store services, and on-site management programs with 128 total employees.

- A concern that high schools are not made aware of the benefits of working in the manufacturing sector.
- They searched for an electrician for several months and finally convinced the person that had left to return to the company.
- The company is seeing a lack of motivation in the younger members of the workforce.
- Recent graduates do not have a comprehension of the requirements to be successful in the manufacturing plant environment.

- Job candidates believe that having a more significant number of former employers on their resumes is good. The provided resumes are of poor quality.
- The company has difficulty in finding sufficient numbers of mechanically inclined job candidates.
- They do not have any apprenticeship programs.
- The plant has a low level of lean manufacturing engagement. There was no visual management in the plant.
- They have developed a “University” to train their workforce internally.
- The plant has a strong emphasis on safety.