National Center for Supply Chain Technology Education

RESOURCES FOR EDUCATION & INDUSTRY

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Foundational Skills of the Supply Chain Technician

Re: Analysis of initial competency and basic skill development for technology for supporting supply chain technology operations.

To accommodate the growing demand for skilled technicians in supply chain operations, there are several areas required as a starting point. These skills are the foundation one must master and develop at high levels to efficiently progress as a skilled technician. Often overlooked as insignificant basic skills, one would expect to practice naturally, these principles must be mastered to render proper development for adaptation to support supply chain operations in any environment. These skills are ranked below, prioritized from highest to least.

1. Basic comprehension of reading and mathematics to understand mechanical and electrical processes.
2. Critical thinking skills.
3. Troubleshooting development for problem isolation of all applications.
4. Blueprint / wiring diagrams / prints / electrical schematics proficiency.
5. Electrical background / knowledge.
6. Mechanical aptitude.
7. Patience.

The skills listed above are essential for technicians. This basic skill set can be attained through education, experience and practice. Once this basic foundation has been laid, a technician can advance to more technical applications driven by logic. This includes, PLC controlled applications, PC based controllers, robotics, mechanical and electrical integrations, pneumatics and hydraulic devices. Once the foundation has been established, more advanced skills can be developed depending on the interest of the technician and /or the specific needs for the support of the supply chain operation.

To evaluate, the basics will be addressed in more detail.

1. **Basic comprehension of reading and mathematics to understand processes**.

   In short, every technician must be able to read with attention to detail to capture content from technical manuals regarding correct processes and procedures for proper operation of equipment. I highlight this skill because often equipment is not operating correctly and performing due to operator error and/or improper installation of the device, as opposed to, malfunctions of the machinery itself. Having fluency with the technical manual will allow the tech to be more familiar with possible errors that might occur, including built-in safeties, to protect the operator and equipment. This skill and practice will allow the tech to be more familiar with new and/or existing devices as well as eliminate down time and keep production moving.

2. **Critical thinking.**

   Critical thinking is not a trait, but a practice. I believe when approaching a problem in any arena, one must ask several questions to effectively target the issue and problem at hand, rather than just the symptom. My questions vary, but some samples are below:

   a. What is not working or processing?

   b. When was the last time this process was working?

   c. What makes this process work? I.e., switch, power, motor, plc input, etc…

   d. Has anyone worked on this?

   e. Are the safeties engaged?

   f. Are there any abnormal functions, odors, and/or feels of the equipment etc…

   An array of questions can be developed to attack a problem and each technician will develop their own style, but it is imperative that a critical approach be adapted to correctly identify the problem. If this is not done, in many cases, loss of production time will occur. Technicians with weak critical thinking skills focus on symptoms rather than the actual problem. In doing so, they miss the problem entirely and replace improper parts, slowing down the process.

Troubleshooting development and procedures for problem isolation for all applications

This skill is closely connected to critical thinking. Once the technician has critically thought about the problem at hand and properly isolated the problem, it is important to sharpen troubleshooting skills. For example, if power is the issue and is not present at point C, why? What should the voltage be? Where can I find the correct voltage? How do I check for the correct voltage? What equipment do I use to check for the voltage? How do I work safely in this process? Another example, on the mechanical side, is why is the motor not moving? What makes the motor move? Power? Chain? Gear Box? Developing this skill of asking the right questions enhances technicians troubleshooting abilities. Training, experience, and lab exercises can develop and sharpen troubleshooting abilities until they become second nature.

3. **Blueprint / wiring diagrams / prints / electrical schematics proficiency.**

   Acquiring this skill is necessary if you want to communicate with your equipment. I have always said, "If I have the prints, schematic, etc… I will fix the problem." This is because I can look at the processes, the inputs and the outputs of the equipment on any front, mechanical, electrical, hydraulic, and pneumatics and I can determine what processes should be operating when, how and why. If a tech cannot understand the drawings or prints of the equipment, any critical thinking and troubleshooting merely becomes a guessing game, which can costs a company thousands of dollars in down time and lost wages.

4. **Electrical background / knowledge.**

   For all the skills and disciplines that can be learned and mastered, I believe mastering electricity and having a thorough understanding of it is a necessity. Every application that exists has some connection to an electrical process indirectly or directly. Understanding how electricity works will aid the technician in understanding how to troubleshoot electrical applications and all associated peripherals. This knowledge can be acquired through education and experience and is vital to the foundation for successful technical support. In addition, and ironically, understanding the process of electricity will aid the tech in understanding the processes associated with pneumatics, hydraulic, plumbing, etc… This skill, coupled with the first four qualities, will advance the technician to high levels of achievement in problem solving and support in national supply chain operations.

5. **Mechanical aptitude.**

   The ability to be mechanically inclined is a plus. However, most techs require specialized training to enhance their natural abilities. It would be impossible to cover every type of mechanical application or process in one class, or even with twenty years of experience. Processes are always changing and improving with new mechanical designs consistently emerging. In this view, touching on the basics of mechanics through education, including labs, is beneficial by preparing the tech though the process and focus of mechanical applications. Going back to critical thinking and troubleshooting procedures, how does a mechanical process work in any particular application? What parts are in involved? What is a normal mechanical noise compared to a problem noise? This skill is important because in most applications mechanical processes

are driven by electrical controls. If an issue exists, the qualified tech will clearly be able to isolate an electrical issue from a mechanical one, with this skill. Again the end goal is to support the supply chain by keeping production in force and limiting down time.

6. **Patience**

   Some may question how patience can be categorized as a skill rather than as a personal quality or trait. However, I believe this is a skill that must be learned. When applying the processes and skills learned to support supply chain organizations, patience must be central to each of the applied skills to eliminate mistakes, provide accurate information, and offer clear thinking when attempting resolutions. There may not be a class for patience but certainly exercises can be created to promote this skill.

In conclusion, to accommodate the growing demand for skilled technicians in supply chain operations today, foundational training must be mastered before more complex disciplines can be learned. As has been said, for one to learn calculus, one must master algebra first. I think the foundation for a supply technician would be to follow this rule: Master basics - then advance to more complex issues. This analysis is one small part of the big picture for the training and preparation for technicians training to support Supply chain organizations.

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