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“Our maintenance workforce is growing older, and the pool of qualified applicants for maintenance positions is growing smaller. Where do we find our replacement technicians? How do we prepare them for these jobs?”

These questions have been and will continue to be front and center in every maintenance manager’s mind. Competition for top skilled maintenance industrial technicians has exploded. The sources of qualified recruits have dwindled—*and are now overtaxed*. Yet our manufacturing plants, commercial and industrial facilities and our transportation fleets still need qualified technicians to assure their continued performance and reliability.

The era of maintenance skills shortages has been growing for more than two decades. This situation is a result of the conditions I’ve discussed in previous columns: Aging Baby Boomers; fewer young people entering careers in industrial maintenance; a precipitous decline of vocational/technical education in our schools; an overemphasis on “a college education” by our society, our politicians and our schools. Couple these factors with the myth that manufacturing is on the way out in America and you have the “perfect storm.” Riding this one out will take foresight, planning, out-of-the-box thinking and leadership.

In those previous articles I’ve also spoken of some solutions: Educating local school boards, teachers and administrators on your business’ need for entry-level maintenance technicians; helping local and federal politicians understand the skills-shortage situation in your own business and others in your area; setting up in-house training programs and working with local community colleges. There’s one more: Grow your own maintenance technicians.

The seeds for growing new maintenance technicians have already been sown in many of our plants and facilities. They now need to be cultivated, nurtured and harvested. Let’s explore how you can begin growing your maintenance workforce of the future, right in your own facility.

Define entry-level requirements

First, we need to ask what it is that entry-level maintenance technicians must be able to demonstrate to be productive. Begin with the abilities of your current top maintenance performers. Most likely, they started out with *good mechanical aptitude and ability*. They were able to *work with their hands*. Their *problem-solving skills* and their ability to think through puzzles were superior. A *healthy work ethic, safe work habits* and the ability to *communicate* and *work with others*, coupled with r*eading, writing and basic math skills* have also been important in these top performers' success. Finally, since the working familiarity with *computers* and *software* has become so essential in today's plants and facilities, your top performers typically have been willing and *able to learn* new skills, new machines *and follow written procedures.*

That's it! Here you have the dozen or so basic requirements for an entry-level maintenance technician. Given this set of basic knowledge, skills and aptitudes, an entry-level candidate should be able to learn and master the job-performance requirements of a maintenance technician in your plant.

Look for candidates

Now we need to begin looking for people with the entry-level requirements listed above. Consider your experienced production-equipment operators and setup technicians. They have informally demonstrated many of these entry-level requirements in their present roles. Some may be very senior employees; others might be young upstarts who may be getting a bit bored with their limited work assignments.

The good news is that they are already employed in your company. They know their way

around. They understand how things get done. Moreover, they have a track record that's available for scrutiny. You can observe their actions and behaviors. You can discuss their potential with their current supervision. These factors alone, however, should not be a basis for selecting them to be an entry-level maintenance technician. They're simply a good starting point for your selection process.

If your plant has a collective bargaining agreement with a labor union, the selection process you use must be consistent with that agreement. Generally, labor agreements state "the most senior qualified person" is to be selected for a higher-level job role. Seniority/years of service are the easy part. The challenges lie in what constitutes "qualified." That's covered next.

Interview and check references

This phase of the process involves initial discussions with the potential candidate's supervision and area management. Some businesses already have processes in place for selecting and promoting from within. Use these processes whenever they exist. In some cases, site leadership and human-resources management may get involved in making such a transition happen. The bottom line here is to open doors and seek support for this approach to filling maintenance vacancies and/or preparing for the future.

The candidate interview process should be no different than when interviewing potential employees off the street. What IS different are the reference checks and the discussion about work history with these candidates. Since they are current employees, they have histories with the company—*which are matters of record and should be consulted*. Information about their work and abilities also can be gleaned from/through other records, including quality reports, changeover times, equipment efficiency, productivity, etc.

Look for demonstrated ability

This part of the "growing-your-own-skilled-maintenance-workforce-of-the-future" process answers the question of whether specific candidates have the demonstrated ability to succeed in the proposed maintenance technician job role(s). Remember, such individuals are not yet skilled technicians—*they are still "candidates."* Here, we're looking for "potential" to succeed. Prior maintenance experience is a plus.

Without such a "demonstration" process, many companies use the "probationary" period on the job to assess a candidate's abilities to succeed in the job role. Without specific on-job performance requirements, this approach is time-consuming, often ineffective and incomplete.

Let's start with the basic requirements discussed earlier (in the sixth paragraph)—*assuming these are consistent with your own list.*
What is the best and fairest way to determine a candidate's abilities in each of these areas?

- **Mechanical ability**: *Work history and demonstration*
- **Work with hands:** *Work history and demonstration*
- **Problem-solving:** *Work history and demonstration*
- **Healthy work ethic:** *Work history*
- **Safe work habits:** *Work history*
- **Communications:** *Work history and interview*
- **Work with others:** *Work history*
- **Reading, writing and basic math:** *Demonstration*
- **Computers and software:** *Work history and demonstration*
- **Ability to learn:** *Work history and demonstration*
- **Follow written procedures:** *Work history and demonstration*

Demonstrated abilities must be based on actual job-performance requirements, not some off-the-shelf assessment process. [1] I prefer simple simulations that allow the candidate to use the most basic tools of the trade interacting with actual parts and maintenance-related procedures. Since I am a mechanic, I'll outline a simple *mechanical simulation* for the candidate to demonstrate his or her abilities.

Step #1…
Combine related requirements to be included in a simulation activity. From the preceding list: Mechanical ability; Work with hands; Problem-solving; Reading, writing and basic math; Follow written procedures; Ability to learn.

Step #2…
Assemble simulation device(s) with basic tasks to be completed. Consider the application of bearings, shafts, threaded fasteners, cotter pins, gears or chains and sprockets, drive belts, hydraulic or air cylinders and controls, sliding components, cams, temperature/pressure gauges, spare parts, etc. Make sure this assembly reflects components and devices that are common to machinery in the plant.

Step #3…
Write simple, straightforward procedures (or work instructions) to perform specific tasks with the simulation device(s) consistent with procedures used by maintenance in your plant. Consider tasks that involve measuring, alignment, adjustment for fit, sizes, part replacement, lubrication, taking readings, solving problems, etc.

Keep in mind that the procedures (or work instructions) must have a “standard” for successful completion. Consider these: The device must rotate freely with no binds; within 0.04”; plus/minus 2 F degrees; no safety violations; function properly, etc.

Step # 4…
Develop a sequence of procedures to be demonstrated and the methods to be used in setting up the simulation device. Be able to set up and show proper operating conditions of the simulation device. Write simple work orders that describe the problem to be solved on the device.

Step #5…
Have several top skilled maintenance mechanics attempt the simulated tasks using the work orders and procedures. Adjust the tasks, work orders and procedures as needed.

Step #6…
Set a reasonable timeframe for each task to be completed based on the times set by your top skilled mechanics. Consider that successful candidates may take three to four times longer since they do not have the same level of experience.

Step #7…
Write an administrative procedure that outlines how to set up and administer the assessment process using the simulation device. Get the appropriate approvals to proceed from leadership, human resources and labor union leaders.

You now have a basic skills-assessment process that will assist in the selection of current employees who have the potential to succeed in a mechanical-maintenance-job role.

Setting up maintenance training processes
Next month, in “Growing Your Own: Part II,” we’ll outline the approaches and methods for setting up a basic maintenance-skills training program using in-house talents, online and off-the-shelf resources and local tech schools (if available). Stay tuned…MT

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Reference

1. Assessments must be consistent with the Federal Uniform Guidelines for Employee Selection Procedures requirement for “job-content validity” based on current job-performance requirements.

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