Checklists: Often-Overlooked Improvement Tools

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"D'ya think I'm stupid? Checklists are for dummies." "I know what I'm doing. I've done it for years." "Why would I ever need a checklist?" These types of remarks sum up what, even now, is a widely held view among maintenance and reliability teams on many plant floors.

Have those people ever forgotten to do something? Of course they have. We all forget. That's human. Yet, I continue to be amazed at the resistance when I suggest the use of checklists for critical tasks.

Maybe it's just me: I make lots of lists and check things off as I go through a "normal" (or abnormal) day on the job. When I was taking pilot training, the use of checklists was drilled into my brain. Mistakes and omissions could be deadly.

In my 25 or so years studying NASCAR race teams, I have seen thousands of checklists being used by highly skilled people every day as they prepare, repair, and maintain their vehicles for 100% reliability. Are checklists part of your maintenance-and-reliability (M&R) toolbox? They should be.

Checking Off "What" to Do

We've all used them in one form or another: grocery lists, to-do lists, dates to remember, calendar of activities. Checklists serve as visual reminders of something important to do. Something, that if it weren't written on the list, we might forget.

A checklist is about WHAT to do. Sometimes we not only itemize all the important tasks, but place them in an order of performance, *i.e.,* a sequence. While detailed procedures (work instructions) define HOW all the critical tasks are to be performed, the checklist only provides an ordered summary of WHAT must be done. One of the clearest examples is a *pilot's checklist.*

Aircraft pilots use a sequential type of list every time they prepare to fly and throughout the entire flight operation. But pilots haven't always used them. The beginning of pilot checklists dates back to 1935, at Wright Field, in Dayton, OH, during consideration of aircraft for the U.S. Army. Even though a Boeing design appeared to be favored, the company lost in a competitive bid to Douglas Aircraft because of a takeoff crash during final testing. That test essentially branded Boeing's prototype as "too much airplane for one man to fly."

Despite the highly experienced flight crew on the Boeing plane, the cause of the crash was blamed on "Pilot Error." As a result, Boeing's pilots got together and developed checklists to make sure that, in the future, everything would be done, and nothing would be overlooked. Their checklists included take-off, flight, before landing, after landing. Using these checklists, the pilots and co-pilots then flew over 9,200 hours, (1.8 million miles), without a serious accident. The U.S. Army eventually ordered 12,731 of these aircraft: the legendary B-17 Flying Fortress.

Today's pilots and flight crews use checklists during every phase of flight from pre-flight to powering down after landing.

Making Checklists

Note that checklists are not the starting point for improving equipment performance and reliability. They merely summarize the critical tasks or steps that are documented in detailed operations and maintenance procedures, work instructions, and training. The checklists serve as visual cues or reminders of important points learned in training sessions.

Start your checklist development by asking these two questions:

1. Do the consequences of failure justify the use of checklists to help prevent human error? Will errors result in penalizing personal injury, environmental incidents, costly defects or off-quality production, equipment damage, overly lengthy or incorrect repairs, and/or prolonged or inaccurate changeovers? If so, checklists will help eliminate errors.

2. Are the detailed "how to" procedures accurate and complete for the critical tasks? If so, checklists should be developed to help assure compliance to the procedure on the job.

Here are a few examples of checklists used to improve equipment (and human) effectiveness:

- **Checklists for kitting parts.** A "parts-kit list" for a work order helps improve maintenance efficiency and effectiveness. All of the parts needed for a maintenance job are gathered and put in a secured place before the work is scheduled. There is no sequence or order to this type of list. Just make sure all the items needed to complete the job are gathered in one place and checked off in the process.

- **Checklists for sequence of activities.** Some checklists serve as reminders or visual cues of tasks and sequence. Accountability relates to the checklist being followed in sequence as written, such as an equipment *startup checklist*.

- **Checklists for task performance & procedure hand-off.** In the case of *maintenance checklists,* it may be important that each item be signed off as it is performed. The initials of the person performing each task allows follow-up on issues or questions for accountability. These initials also can be helpful when handing off a lengthy procedure to a follow-up crew or maintainer to complete a job that's already underway.

- **Checklists as historical reliability records.** Some maintenance checklists are sequential and have critical measurements that must be made, verified and/or recorded. These checklists should possess the "accountability" as described above as well as the actual readings or measurements made. In some cases, these checklists should verify "GO-NO GO" conditions, specification, or criteria.

Final Thoughts

The bottom line here is that most reliability problems are caused by people making errors or overlooking proven operations and maintenance techniques during a machine's lifecycle.

Checklists help save lives and make race cars and aircraft safe and reliable. They are just as important in what they do for plant equipment and processes. Keep these points in mind:

- Checklists serve as reminders, visual cues
- Checklists are used by experienced and qualified people, as well as by trainees
- Checklists are not a substitute for training
- Initials are preferred over checkmarks

If you and others at your site haven't yet done so, why not take a giant step toward continuous improvement: Begin leading an important culture change and make checklists a vital part of your M&R toolbox today.

About the Author

Bob Williamson is a long-time contributor to the people-side of the world-class-maintenance and manufacturing body of knowledge across dozens of industry types. His background in maintenance, machine and tool design, and teaching has positioned his work with over 500 companies and plants, facilities, and equipment-oriented organizations. Contact him directly at 512-800-6031 or bwilliamson@theramreview.com.