



Question: *“Through our process of improving, we’ve been placing heavy emphasis on standardization of work practices and work execution. At the same time, we expect our best ideas for improvement through innovation will come from the very people we are molding into compliance with standards. Intuitively, these are opposing forces. I’d like some insight from people who found success in managing opposing forces such as this.”*

...Vic Lawrence, Maintenance Manager, REC Silicon

I certainly enjoy getting questions like this. Here, in an edited-for-space-nutshell, is how I answered:

Thanks for your great question, Vic, and for being an avid reader of *Maintenance Technology*. I’ve run into this puzzling concept quite a bit lately. Let’s sort out how and why innovation and standardization should actually work together...

Innovation

The often-used term “innovation” refers to a new and improved product or method—*it’s basically a new way of doing something*.

By its nature, it means change for the better. The term “continuous improvement” sets the stage for ongoing innovation or changes in the ways of doing things that keep businesses profitable and their products and services competitive and in demand. In the world of lean manufacturing and lean enterprises, this means ongoing innovation (i.e., driving waste and non-value-adding stuff from the value stream). Again, this is related to retaining, regaining or capturing a business advantage.

Standardization

Written by Bob Williamson, Contributing Editor
Thursday, 14 July 2011 10:02

Another term that's entered our performance improvement lexicon is "standardization," which means adherence to standards. It refers to an acceptable (required or agreed-to) level of quality, performance or measurement. A "standard" therefore, is the norm for the way something gets done. Sound rigid? It is.

How can you have standard work practices or methods where/when innovation or continuous improvement is demanded or expected? These concepts sound mutually exclusive or at least in conflict with each other—*as in something is either standardized or it is improving*. We can dissect this issue using the following example.

Preventive maintenance standard work

Look at the way preventive maintenance (PM) is performed on a critical asset in your plant. Then evaluate how it's done by different crews or individuals—*how well do they follow the appropriate procedure and how effective is the PM?*

Problems should be addressed before they cause damage, defects or unplanned equipment downtime. Clearly, there are two different things to be concerned with: Is the PM procedure being followed and is it effective?

When we dig into these two aspects of a PM, we typically find that 1) different people or crews treat the PM procedure differently; and, 2) equipment reliability is a real mixed bag, depending on WHO did the prior PM. Some crews or individuals will follow the PM tasks to a "T." Others pick and choose what they actually do on the PM list. A few will simply do their own thing and call it a PM. Sometimes the equipment runs flawlessly between scheduled PMs. Other times the equipment reliability is lacking—*it routinely breaks down or exhibits functional problems*.

In the above example, there is a definite need to IMPROVE the PM effectiveness because of the reliability issues between PMs. This is where innovation can hit a brick wall! Where do we start?

You have two basic options: 1) The Commander says, "You guys better start paying attention to these PMs so we don't have any more problems with this equipment. I mean it!" Or, 2) The Innovator says, "Let's step back and define how the PM should be done so we don't have any more problems."

I vote for Option 2 (the Innovator).

Written by Bob Williamson, Contributing Editor
Thursday, 14 July 2011 10:02

Let's do some "what-if-ing." What if we didn't standardize the PM work instructions? How could we improve the equipment performance, reliability, quality, safety? If we defaulted to Option 1 (the Commander), we would still have human variation crew-to-crew or person-to-person—and *the equipment would remain consistently inconsistent.*

Maybe the PM, as written, is flawed. The good guys recognize this and compensate for the errors, while the others merely follow it as written or totally ignore it because they know it has flaws. (I've seen all these conditions!) Sadly, non-standard work drives highly variable results...and sometimes chaos.

So, we'll start standardizing our PM work instructions. Here's a basic five-step process:

Step #1: Current conditions. Let's look at how the PM is currently performed. Collect everything that identifies the current practice, both written and unwritten.

We know when one of the crews performs the PM we have now that it works flawlessly, so let's start with what we already have—*document it.*

Step #2: Future conditions. Next, we're going to get all of the crews and all of the individuals who normally perform this PM to look over the list and make specific comments, modifications, additions, deletions, etc. The challenge is to come up with a single PM procedure that everyone is willing to follow to a "T." (Oh, that would be a "standard.") Sure, some people will fuss about the "new" procedure. Your job is to convince them that the goal is to make the PM easy and 100% effective.

What we would like to have here is very specific: step-by-step, in a logical sequence, with specifications (calibrations), lube, parts, permits, supplies, tools needed and about how long the PM should take. In other words: standardized PM work instructions. With these types of instructions for a PM, we have a base from which to evaluate its effectiveness, as well as a base for making very specific improvements (a.k.a. "innovations").

NOTE: Standardized Work Instructions (SWIs) are detailed and specific instructions that define how any process is to be completed in a consistent, timely and repeatable manner. Training and qualification to follow these instructions, along with accountability to follow them, will drive out the human variation in the work process and, thus, eliminate problems.

A caution about checklists...

Checklists should be used as a visual reminder of the detailed work instructions, NOT as a substitute. Checklists are NOT “trainable.” Rather, they are a visual cue of what is to be done in sequence. Unlike checklists, standardized work instructions ARE “trainable.” They contain everything that the least experienced person who is expected to perform the tasks needs to know to be safe and consistent in his/her actions.

By “trainable,” I mean you can’t teach a person the “how to” of a procedure if the checklist only states “what” to do. For instance, the checklist says “Grease the lube points.” What is NOT indicated is critical to training for successful task performance: How many? Where are they? What type of grease? How much grease? Any safety issues? Etc. Etc.

Let’s see how these SWIs form the foundation for continuous improvement (innovation).

Step #3: Accountability for action. Hold the PM groups accountable for following the new procedures. In many cases, you (and they, too) will notice the effects on the equipment, and they’ll easily see the value of the new SWIs. Evaluate and measure the efficiency and the effectiveness of these new instructions.

Step #4: Innovation. In most of today’s plants and facilities, there are those who will come up with a better way. CAUTION: Only when the ENTIRE group of people who perform the procedure AGREE to try the “better way” should it be attempted. Once they agree to try it, modify the PM work instructions, make sure everybody is trained in the new procedure—*and hold them accountable for following it.*

This is where “leadership” comes in: Providing resources, following up and making people accountable will be of key importance.

Step #5: Standardization. Once a “better way” is proven to actually be better (easier and/or resulting in improved performance and reliability), the SWIs are formally revised and approved. Should a new SWI not show improvements or benefits to efficiency or effectiveness, this fact should be documented and the prior PM procedure reinstated. (NASCAR race teams do this all the time.)

Written by Bob Williamson, Contributing Editor
Thursday, 14 July 2011 10:02

What you've just read about is continuous improvement and standardized work in action. Note how these concepts are NOT mutually exclusive, but instead are mutually beneficial. Monitoring PM performance becomes easy: Any deviation in the SWIs will result in obvious equipment performance, reliability or safety issues that weren't present when the procedures were being followed—*human variation crept back into the mix.*

After reading my answer, Vic wrote back:

“In essence, when chaos is the order of the day from one process to the next, any improvement will make a difference. However, one can never know if the results are directly linked to the documented ‘idea’ or if someone just stumbled on something by a flippant act that goes unnoticed.”

I responded:

Vic, you've got it! When improvements aren't documented and people aren't held accountable for adhering to new standards, both successes and problems will recur randomly. But there's one more consequence if chaos (non-standard work) is the order of the day: When an unnoticed “flippant act” causes a catastrophic failure, the actual cause often goes undiscovered. Yet, because of the failure, the pressure is on to improve! Improve what?

I went on to provide Vic with some random quotes, including one of my own musings:

“Without a standard, there is no logical basis for making a decision or taking action.”

...Joseph M. Juran

“Measurement is the first step that leads to control and eventually to improvement. If you can’t measure something, you can’t understand it. If you can’t understand it, you can’t control it. If you can’t control it, you can’t improve it.”

...Dr. H. James Harrington

“If you cannot standardize it, you cannot improve it. If you cannot improve it. . . well, you’re pretty much screwed.”

...Robert Williamson

I hope these thoughts will help all of you. MT

RobertMW2@cs.com