

STARTING A DEMING ENGINE

Making Plan-Do-Check-Act Work for You

By Richard Flynt

Most OSH professionals are familiar with the continual improvement formula popularized by W. Edwards Deming in the 1950s. Deming taught his plan-do-check-act method to help companies improve quality, but the value of this approach was soon recognized as a way to improve all kinds of processes, including environmental and safety systems.

Every popular management system today includes this Deming cycle as a fundamental concept. In fact, the approach has become so ingrained that a typical process engineer would find Deming's concepts to be common sense. However, while the Deming cycle fits neatly into a process improvement effort, not all OSH professionals find it easy to implement for the purpose of improving safety.

For one thing, we are not looking at the physical dimensions of a part or product, we are looking at something far more widespread and subjective: risk. How can a typical OSH professional possibly expect to continually reduce risk with this model? Consider how many Deming cycles a safety professional actually facilitates. Most find it difficult enough to travel only one time around this cycle and, once that is accomplished, we generally move on to something else before we start around the same cycle again.

If you pull the starting cord on a hard-to-start lawnmower, that engine will turn over, but only if you continue to pull on the cord. Some may have found a way to make the model work, but it must be exhausting, constantly pulling the cord, knowing that there are other areas you need to address. You keep wishing the engine would start and that you could let it run all by itself. This running engine is continual improvement. That is where we would all like our improvement efforts to be. This article addresses a way to help make the Deming cycle not only practical, but self-sustaining—a way to effectively start the engine.

As with any good safety program initiative, management commitment is crucial, so before going too far down this road, an OSH manager would want to gain upper management buy-in for this idea.

Following is an example of how to proceed. For this case, assume this is a small company of 250 workers that runs 24/7 and has eight distinct areas or processes (e.g., one or more production lines, warehouse and shipping, maintenance shop), and a supervisor or manager is responsible for each of these areas or processes.

Step 1: Break Down the Task Into Manageable Parts

Break down what you are trying to improve into manageable parts by conducting a series of initial risk assessments, performed by the OSH department, for each area. Use the common approach of scoring risk by estimating probability (likelihood) and severity (consequence), but while most risk assessment matrixes use ranges of 1 to 4 or 1 to 5, expand these

to 1 to 10. Also, multiply (rather than add) the probability and severity numbers to provide a risk score of 0 to 100. This added resolution will come in handy later on.

For this example, we'll score the risk of 12 separate hazards in each of the example company's eight areas. These scores will be hazard-specific. We'll score the risks found on Production Line No. 2. Next, we'll sum these individual scores to create a total risk score for this area (Table 1).

TABLE 1
EXAMPLE RISK SCORE FOR AN AREA

Area hazard	Probability	x	Severity	= Risk
Ergonomic injury	6		3	18
Chemical burn	6		6	36
Forklift involved injury	4		8	32
Lockout/tagout incident	3		8	24
Respiratory injury	2		8	16
Hearing injury	1		3	3
Electrical incident	4		5	20
Confined space incident	3		9	27
Fall protection and ladders	5		5	25
Fire	2		8	16
Slip, trip and fall injury	7		3	21
Hand safety	8		3	24
Total risk score for Production Line No. 2				= 262

FIGURE 1
RISK MATRIX

Severity of event	10	10	20	30	40	50	60	70	80	90	100
9	9	9	18	27	36	45	54	63	72	81	90
8	8	8	16	24	32	40	48	56	64	72	80
7	7	7	14	21	28	35	42	49	56	63	70
6	6	6	12	18	24	30	36	42	48	54	60
5	5	5	10	15	20	25	30	35	40	45	50
4	4	4	8	12	16	20	24	28	32	36	40
3	3	3	6	9	12	15	18	21	24	27	30
2	2	2	4	6	8	10	12	14	16	18	20
1	1	1	2	3	4	5	6	7	8	9	10
Probability of occurrence of the event											
	1	2	3	4	5	6	7	8	9	10	

We'll repeat this scoring exercise for each area or process in the facility, creating a total risk score for each one. Some areas will have a higher risk for forklift incidents (warehouse), while others may have a higher risk for hearing loss (noisy areas). These differences are the precise reason we separate areas, which allows them to be addressed independently.

Step 2: Show the Results to Senior Management to Enlist Their Support

Share the risk scores and how they were derived with the senior manager, or as high up the executive hierarchy as possible. Sell the idea that the best way for the organization to reduce incidents and injuries over time is to strategically attack risk. Suggest that since this risk has now been quantified for each department, it is feasible to put a requirement in place to hold each supervisor responsible for reducing their area's total risk score by, for example, 10% by the time their performance review comes due. While the OSH department should work closely with supervisors to help them reduce their risk, then verify that reduction with new risk scores, it must be the supervisor's responsibility to get the work completed.

If the senior manager agrees, the lawn-mower engine has just started. You can stop pulling on that cord now.

The supervisors may take exception to your subjective risk scores until they realize that the higher the original scores, the more opportunity exists to reduce the scores for credit. Remember, it does not matter how "accurate" the risk scores are; they are only needed for comparison to the previous year. So, resist becoming tied up in arguments on probability or severity.

Using the example in Table 1, suppose the supervisor from Production Line No. 2 asks to sit down with you to better understand what she might do to reduce risk in her area. You go over the scores with her, explaining the reason for the probability and severity numbers. While you are talking, she realizes that her area of the facility does not even use forklifts; the trucks are only cutting through her area as a shortcut to get to somewhere else. And now she sees it. She negotiates with the warehouse manager, and together they find an alternate route for the trucks that, while slightly longer, completely removes the risk of any forklift incident from her process area. This reduces her risk by 32 points (Figure 1), which is more than the 10% she needs for the year.

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She shares this reduction with the senior manager during her review and is given an A+ on her safety responsibilities. Perhaps the following year, she will be enticed to reduce the risk from chemical burns since that risk score is high and she can achieve her goal by attacking only a single item.

In this way, the higher-risk hazards are naturally given priority. They won't all be as easy as this forklift example, but it is amazing how much low-hanging fruit exists just waiting for someone to find it. The OSH manager's conversation with the area supervisors should be educational for the supervisors. Take the opportunity to explain using the hierarchy of controls to mitigate hazards. If they have been leaving safety completely up to you, this is your chance to get them involved.

Making a Measurable Difference

The idea is not to create a lot of new work for the supervisors; it is to get them engaged by asking each of them to do a little work over the course of a year to make a small but measurable difference in the safety of the facility. Add that small but measurable difference to the other small differences from each of the other seven separate areas, then add that number to the overall reductions in risks that you have been working on, such as functions that are not area-specific (e.g., new training programs, new facility-wide work-permit process, improved emergency evacuation process).

If you decide to try this, make changes to suit your facility's needs; the concept is the important part. You could create a 20-by-20 matrix, or ask for a different percentage improvement in the scores, or modify the example list of 12 hazards to better reflect the conditions in your facility. Do whatever works for your facility.

Now, when someone asks what you did last year to make your facility a safer place, you will not be pointing to programs or policies that you have rewritten or the number of training classes delivered. You will be able to say and prove that you facilitated the reduction of risk in your facility by 10%. And you will also be able to project with confidence that this annual reduction will continue for years to come. Your engine is running, and Deming would be proud. **PSJ**

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