

# Three Legged Five Whys – A Step Forward?

## Purpose Of This Article

The **Three-Legged Five Whys (3L5W) Report** is now what many customers require of their suppliers to address non-conformance issues. Judging from what was added to the Classic Five Why procedure, we think that the customers who require their suppliers to use the 3L5W Report want to protect themselves from non-conformance issues and encourage supplier to make long term system improvements.

However, after a review of this method, our conclusion is that the 3L5W procedure as widely interpreted is not a step forward and will create confusion and additional problems. Why? For the very same reason that customers criticize suppliers - the improper use of root cause analysis (a.k.a. The Five Whys). Consider this, if the reason customers want suppliers to use the 3L5W is supplier misuse of the Classic Five Whys then, how will adding legs correct this? We would first ask, "Why are suppliers misusing the Classic Five Whys?" Knowing this before embarking on a solution should have been the logical first step.

What follows is our evaluation of a slide program we were asked to review by one of our customers. For us, misgivings about what was presented first arose when we saw the very first slide for the course which read:

### ***"3 legged 5 Why Analysis.***

- Extremely easy to Explain**
- Extremely difficult to do Correctly"**

Later in the article we evaluate two examples from this slide show and find significant, logical errors. :[

## The Classic Five Whys

### Definition

The "Five Whys" analysis is a procedure suggested by Masaaki Imai for troubleshooting problems. It was made popular as part of the Toyota Production System (1970's.)

# Three Legged Five Whys – A Step Forward?

Application of the procedure involves taking any problem and asking "Why - what caused this problem?" Then, when the cause is identified, asking "Why?" again (i.e. "what caused the cause?") The strategy, as commonly understood, is to ask "Why" about five times uncovering links in a causal chain going back in time.

## Purpose of the Five Whys?

The purpose and the power of asking "Why" successively is that, when done correctly, it leads away from lower level symptoms (e.g. defective parts, errors of workers, procedural errors) up into higher level causes (e.g. policies, mandated procedures, or management decisions.) Resolving these higher-level sources of problems allows an organization to evolve its technical and human systems. System evolution is a big strategic advantage and the key to reducing process variation.

## Source of our information

One of our sources was a former Toyota employee who was promoting 3L5W's use in business and industry beyond the Toyota supplier network. It was his slide show we reviewed. (Note, another source of ours reported that when she called a few current Toyota employees they did not recognize the modified procedure as something used within Toyota itself.) All information about 3L5W in this article is from the slide presentation we were sent, including the definitions and phrasing of the three leg questions. The slides we reviewed seem to concern supplier issues which may explain why the Toyota employee had not heard of it. It may be something **taught only to suppliers?** We don't know.

## Description of the three legs

The new procedure creates three lines of inquiry. The "Why, Why, Why ... " process is applied independently to each of the following lines (legs):

### I. Specific Leg

Why did this specific situation happen? (This is the normal non-conformance which is typically "analyzed" using the

# Three Legged Five Whys – A Step Forward?

Classic Five Whys Procedure.)

## II. Detection Leg

Why was this situation overlooked? (This asks why didn't our in-place detection procedures catch this. This second leg is "analyzed" using a new series of Whys.)

## III. Systemic Leg

Why did the possibility exist for this situation to occur? This asks you to look at what about the larger organization, systems, or procedures creates an environment in which this non-conformance occurred? More Whys.

## BPI's Opinion and Recommendations

As a supplier you naturally want to do whatever your customer requires. So, if the customer demands that you fill-out their 3L5W report, then that is what you do. We understand! But we also think you can do this without making logical errors on the one hand and possibly adding needless complexity to your processes on the other. We recommend the following:

1] Use the standard Five Why process BUT USE IT CORRECTLY. It is completely capable of revealing the causal path from any higher-level causes down to the specific non-conformance you are concerned about. You will need a cause analysis method to do this, one that is better than the grab bag of standard quality circle tools. (They ALL have missing critical thinking elements.) The **BPI Problem Solving** analysis is a very practical (quick) and powerful option for doing this.

2] Armed with the **I) Specific Non-conformance** and the **III) Systemic** information (above #1), you can fill out those two parts of any 3L5W report.

3] For leg **II. Detection**, do not perform another Five Whys analysis unless an existing detection method has failed. A mandated Detection Leg implies that a detection method should always be in place to catch non-conformance problems. This we agree with but **only when the standard is stipulated by the customer**. Long term the goal should be to bring your manufacturing process under control

# Three Legged Five Whys – A Step Forward?

so the process predictably performs within acceptable limits. Non-conformance has been all but eliminated except for **Special Cause variation**. The **BPI Problem Solving** analysis is the process to use to determine the cause of Special Cause variation.

4] Once you understand how the non-conformance is being created, use the **BPI Decision Making** analysis to decide how best to protect your customer from future non-conformances.

5] Share your protection plan with your customer in the Detection Leg part of your report. Perhaps the best option will be to install a detection procedure for the short-term to immediately please your customer while working to reduce process variation significantly in the long term to secure your long-term viability as a supplier.

6] We recommend that your people **master proper use of the Five Why process** (review our critique of the two examples below plus read our article "Five Whys - How To Do It Better"). We further recommend that your teams learn our **Systematic Problem Solving** process for identifying problems, finding true causes, and tracking root cause in order to make your Five Why analyses bullet proof. Your organization can sponsor a workshop in-house or individuals can complete the training online. We offer coaching with a **BPI** consultant to build in-house skills.

## Critique of Two 3L5W Examples

What follows are examples from the Three-Legged Five Why slide presentation we reviewed. We were told that these slides are used to teach others about this more "advanced" technique. Example A, is a non-conformance leg of a problem and example B is a detection leg for another problem. Both examples state the triggering link (i.e. oldest link) in the causal chain is a failure to implement a preferred solution. In other words, decision making and cause analysis are confounded in these examples. This is a creativity killer.

**Critique of examples: *Confusing decision making with cause analysis***

**Example on slide A - Non-Conformance Leg:**

# Three Legged Five Whys – A Step Forward?

1. PROBLEM: Missing O-ring on parts numbered XXXX. – Why?
2. Parts missed the O-ring installation process. – Why?
3. Parts had to be reworked. – Why?
4. Operator did not return parts ... after rework. – Why?
5. No standard rework procedures exist. – Why?

Comments: It is not clear to us what teaching point this example was meant to make. But we will use it to make several points of our own.

First, we disagree that #2 was caused by #3. We prefer to state #2 was caused by #4. Note that #3 "parts had to be reworked" would happen first and then #4 "operator not returning the parts to the process ... after rework" would follow (i.e. #4 cannot cause #3). The causal chain has a flawed chronological sequence, a logical error (a broken leg?) The application of the "Therefore Test" would reveal this very clearly. (The **BPI Problem Inventory** process is a front-end process that prevents this type of mistake.)

Second, on the slide, #3 is circled, "Parts had to be reworked", and a note indicates this should be pursued to uncover why rework was necessary. We agree. That non-conformance should have its own investigation, but it should not be part of this series of "Five Whys" because it answers no "Why". The series should read: #1 caused by #2 which was caused by #4 (missing O-ring on part number xxx → because parts missed the O-ring installation process → because the operator did not return the parts after they had been reworked.)

Third, #5 asks why did the "operator not return parts ... after rework?" and answers "no standard rework procedures exist." However, this answer assumes a solution.

The argument amounts to this - the reason the operator did not return parts after rework is because "we have not implemented my idea of having a standard rework procedure." But, another team member might argue with equal confidence that the reason the operator did not return the parts is that "we did not implement my idea of having a worker orientation program to teach new workers about how our process works," or someone else's idea to "only hire rework people with a track record of making decisions that

# Three Legged Five Whys – A Step Forward?

consider downstream effects." So, this does not qualify as a cause analysis. It is a very limited consideration of one solution.

We are unable to say why the operator did not return parts after rework in this case. Perhaps the unit was overwhelmed with rework? Or, the parts were delivered to the wrong location? Or, the worker that knows how to do things has retired? We do know that the cause was not a missing standardized procedure, although the cause might well be ignorance of what to do. We agree that a standardized procedure would be one solution to consider, among many.

## **Example on Slide B - Detection Leg:**

- 1) Problem: Missing threads on fastener part number YYY – Why?
- 2) Did not detect threads were missing. – Why?
- 3) Sensor to detect thread presence was not working. – Why?
- 4) Sensor was damaged. – Why?
- 5) We have no system to assure sensors are working properly. – Why?

The series above gets off to a misleading start by indicating that the cause of the missing threads (#1) is failure to detect threads were missing (#2). Of course, this is false. There are actually two problems here. One - we made parts with missing threads. This has its own chain of causes. And, two –after we made parts with missing threads our detection step failed to detect this. The detection problem has its own separate chain of causes that should start at #2 ("Did not detect threads were missing").

Note #4 asks why the sensor was damaged and answers because we have "no system to assure sensors are working properly." This is the same logical error as described in the example (A) above. The cause of something is never the failure to implement a future solution. The sensor was ineffective for some reason. Find that reason. After you know what you need to know, then go on to Decision Making and decide what to do about it. Maybe you will select a system to test sensors or maybe you will add a

# Three Legged Five Whys – A Step Forward?

back-up sensor or maybe you will adjust the maintenance schedule or whatever.

Deciding on an action that you THINK will fix the problem or that will address the effects of the problem is not the same as verifying the cause.

Don't confuse your decision to take an action with cause analysis. This is a creativity killer. When a decision is made under the guise of cause analysis, viable options are not even brought to awareness! For, after all, if the cause is a lack of some procedure, the solution is to "supply that procedure." (No thinking needed.)

## Conclusion

Use the classic Five Whys tool to complete the 3L5W forms. If properly used the Five Whys will reveal higher order systemic causes, if any, when it is applied directly to any Specific non-conformance problem. Detection failures should receive their own Five Why analysis.

Remember your customer wants to be protected from your non-conformances and has an interest in you evolving your systems. That is the purpose of the 3L5W requirement. Meet this purpose and everyone should be happy regardless if you use detect and sort or the more powerful elimination of variance from within your manufacturing process.

We think that IF suppliers were using the "Five Whys" method properly, there would be no "need" for the "Three-Legged Five-Why" tool. Refer to the previous article in this series ["Five Better Whys."](#)