

Getting to the Root of the Matter

BY PAT THOMASHEFSKY

Using a more in-depth problem-solving method can be effective in unearthing the true cause of a quality-related issue.

HOW MANY TIMES HAVE WE HEARD OR SAID THE TITLE OF THIS ARTICLE? I WAS THINKING ABOUT THIS WHILE GARDENING THE OTHER DAY.

I had a pesky plant; I'm trying to be nice by not calling it a weed. I thought I had gotten it out the week before, but there it was, growing in the same place as tough as ever! If I don't figure out how to rid my garden of these invaders, they are going to pop up all over the place. By just addressing that one plant I will not have looked at the bigger picture. Are they coming up other places? Is there a common cause? In applying some deeper analysis, I may be able to do a better job of fixing the problem than by focusing on just that one weed—er, pesky plant.

So what does this have to do with your business as an AISC Certified Fabricator or Erector? Well, root cause analysis (RCA) is a methodology for finding and correcting the most important reasons for performance problems. It differs from troubleshooting and general problem solving in that those two methods typically seek solutions to specific difficulties, whereas RCA is directed at the underlying issues.

The Right Response

Bad things happen, mistakes are made; these are facts of life. The extent of the damage now, or whether bad things happen again, is a product of how you respond. RCA is by no means a requirement of the AISC Certification program. Within your corrective action program it is generally required that once you realize the non-conformance, you find out the root cause, then determine the remedial action or corrective measure and figure out how you may prevent it from happening again.

However, RCA goes further. It can be used in almost any situation where a gap exists between actual and desired performance. Furthermore, RCA provides critical information about what to change and how to change it within systems or business processes.

Often, without RCA, you may charge ahead with quick-fix solutions that merely sweep the errors under the rug for the time being, only to have them inadvertently revealed at some later date—potentially in some much worse incarnation. What you need is a method that identifies the core issues affecting the performance.

As a business process improvement tool, RCA seeks out unnecessary constraints as well as inadequate controls. In safety and risk management, it can reveal both unrecognized hazards and broken or missing barriers. It also helps target corrective action efforts at the points of most leverage. RCA is an essential ingredient in pointing organizational change efforts in the right direction. If you want your problems to go away, your best option is to kill them at the root.

Five Simple Questions

OK, by now you may be thinking, "I understand what you are saying, but isn't RCA time consuming?" Fortunately, there's a simple tool to help you implement RCA, and once you master this tool you will realize that the benefits far outweigh the costs.

The tool is known as the "Five-by-Five Whys." Asking "Why?" repeatedly is a favorite technique of most three-year-olds in an effort to drive parents crazy, but it can also teach you and your team a valuable lesson in quality. By repeatedly asking "Why?" (five is just a good rule of thumb), you can peel away the layers of symptoms, which can lead to the root cause of a problem. Very often, the reason that appears to be the "true" cause of a problem will lead you to ask another question. You may find that you will need to ask the question fewer or more times than five before you find the answer.

The following is an example of how to use this tool:

- Write down the specific problem. Writing out the issue helps you formalize the problem and describe it completely. It also helps your whole team focus on the same problem.



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- Ask why you think the problem happens and write the answer below the problem.
- Ask why again and write that answer down.
- Loop back and ask why until the team is in agreement that the problem's root cause is identified. This may take fewer or more times than five.
- Using a Management, Man, Method, Measurement, Machine, Material, and Environment (MMMMMME) "fishbone" diagram to list the causes while you are asking the questions will help focus the on where the true cause may exist. (You can find a fishbone diagram on our web site at www.qmconline.com under "Resources.")

Once you've finished your initial line of questioning and feel you have the cause of the problem, go back to your answer for the first "why" and ask these questions:

1. What proof do I have that this cause exists? Is it solid? Is it measurable?
2. What proof do I have that this cause could lead to the stated effect?
3. What proof do I have that this cause actually contributed to the problem I'm looking at? Even given that it exists and could lead back to this problem, how do I know it wasn't actually something else?
4. Is anything else needed, along with this cause, for the stated effect to occur? Is it self-sufficient? Is something needed to help it along?
5. Can anything else, besides this cause, lead to the stated effect? Are there alternative explanations that fit better? What other risks are there?

The point of these questions is to establish existence, necessity, and sufficiency. Keep asking these five questions for each cause, at every level of questioning. If you diagram all of this, you will end up with a tree of causes leading up to the original problem. Some may be less important than others, but you will have a much more complete picture of the causes leading up to your problem. Even better, you may find a more important cause than previously considered. At the very least, you will have avoided the "straight-line causation" trap.

Visit www.bill-wilson.net for more information on the Five-by-Five Whys and root cause analysis. MSC

The Five Whys in Action

Let's say a customer calls a fabricator and complains that the sophisticated painting the fabricator performed in its shop has failed: the paint is peeling from the steel.

Taking this problem through the root cause analysis (RCA) process will show that due diligence was taken on the fabricator's part to prepare the material and apply the coatings according to the manufacturer's and customer's specifications.

Using the Management, Man, Method, Measurement, Machine, Material and Environment (MMMMMME) model, the **Management** ensured that they understood the customer requirements with a thorough contract and specification review. The **Methods** were in place and followed with documented procedure. The process was performed according to the documented procedures by the **Man** (or woman), and inspection of the process and final product took place and were recorded. The required **Measurements** were recorded and reviewed for correctness. The **Environmental** elements were adhered to, and records kept and reviewed. The **Machine** (equipment) was maintained and in confident working order; preventive maintenance and calibration records indicate this.

At this point, five M's and the E are accounted for, leaving only one M: **Material**. Reviewing the data sheets may show that the material was within specification, but in this case the fabricator did not have the means to test it in-house. With all of the due diligence taken in the other MMMMMME areas the fabricator now has the confidence to consider that the material may be the problem. If this proves true and the fabricator can show due diligence, the problem now is external and the cost of repair shifts.

This is just one example of using a fishbone diagram for RCA. The diagram on QMC's web site is set up as a simple version of this exercise. You can imagine how much more information could be derived if this diagram were expanded upon. Why not apply it to a problem you might have within your business and see how it goes? We'd love to hear whether it was useful.