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Root Cause Analysis: Quality of Process? Part 2

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Part 1 **Part 3**

Abstract: If we reflect twenty plus years ago, we will recall that most of our quality efforts were directed checking the quality of the final product in the finishing and packaging stages. By that point, if something was found defective, we would have to scrap the entire run or lot of products produced. Then came the TPM initiatives that stressed "quality of process" and we started to implement Statistical Process Controls (SPC) and Statistical Quality Control (SQC). We started to look at quality "during" the manufacturing process ensuring that when the finished product came off the line, it was a quality product. Can we do the same with Root Cause Analysis (RCA)?

Taking the TPM parallel described in the abstract above, let's see if it applies to non-manufacturing processes such as RCA. If asked, almost everyone will say they are doing Root Cause Analysis (RCA). And to a large part, they will be correct in their own minds. This is because of how they define RCA versus how the person asking the question defines RCA. This is like if we asked a sample population, "Do you live a healthy life?" The majority would reply with an emphatic YES. However, what does healthy mean to these people? To some if means we are alive, to others it means that we eat right and exercise, to others it means that they are emotionally sound and to others it may mean that they are content in their religious beliefs.

So how many ways cannot someone interpret RCA? Some believe it is 1) having the local expert provide us a solution, some believe it is 2) brainstorming in a room and drawing conclusions from hearsay and some believe in 3) the use of a disciplined thought process to seek true root causes.

When the perceived expert provides a solution as an individual, we are more apt trust their instincts, spend the money and their solution and see if it works. Sometimes it works, but more often that not, it does not work. Checking to see if the solution works is like checking quality only at the finished product stage. It is too late if there is a defect found!

When teams are used to brainstorm using quality techniques such as fishbone and/or 5 WHYS, they will usually draw conclusions based on majority opinion. This means that solutions tend to be implemented based on the consensus of the group's opinions, not on any factual basis where tests prove that these opinions are correct. Again, we are checking quality of the final product and not of the thought process that drew the conclusions.

When teams use a disciplined RCA process that requires hypotheses to be developed as to how something could occur, and then REQUIRE verification with some essence of science as to whether it is true or not, then we are employing quality of process! This is because we are proving our hypotheses with facts rather than relying on hearsay, assumptions and ignorance.

To demonstrate these points, look at the following abbreviated example:

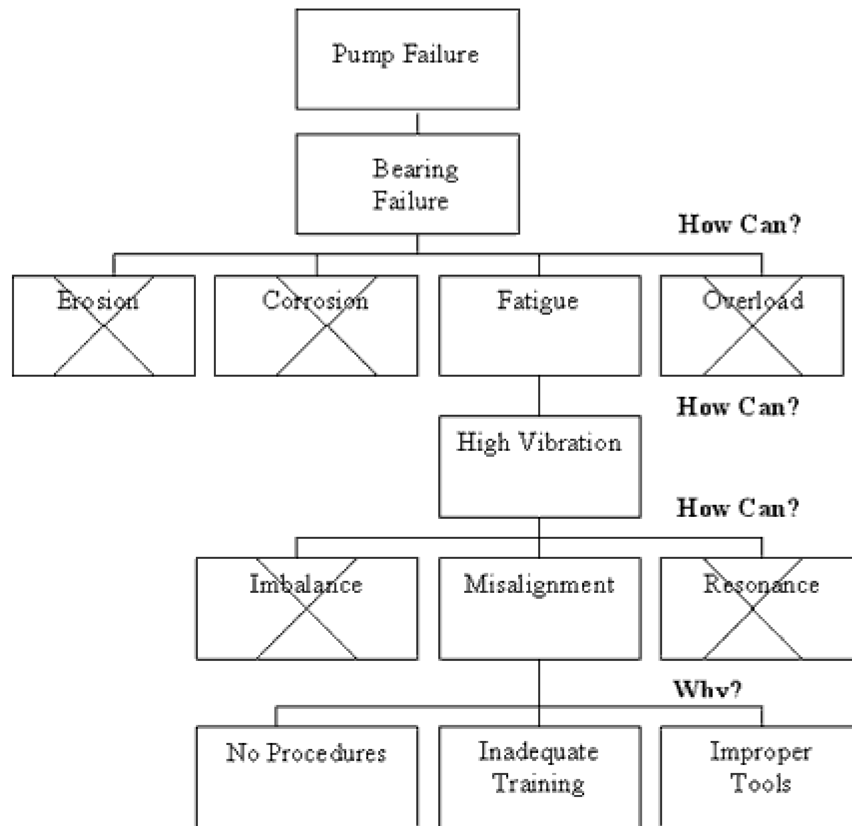

Figure 1.0 - PROACT® RCA Disciplined Logic Tree

The above depicts a disciplined thought process called PROACT®. Let's think back to our RCA scenarios. If a critical pump were to fail, in some cases we would get our best engineers to take a look at it. They would do their engineering magic themselves and may conclude that a different type of bearing (perhaps more heavy duty) should be in this service. We would change out the bearings with the new designed ones. Given the above scenario, would the problem go away?

What about if we get our brainstorming teams together and everyone looks at the past performance of the pump and its maintenance history and concludes that it is a new lubricant they are using and that it should be changed. Under the above scenario, would the problem go away?

Utilizing the disciplined approach above, we are going to have to have the bearing reviewed by metallurgists. They will send back a report concluding (with science) that there is evidence to support the presence of fatigue. We ask ourselves, How can fatigue occur on the bearing? We hypothesize that it can come from high vibration. We check our vibration monitoring records and conclude that there is evidence of excessive vibration. How can we have excessive vibration? We hypothesize that it can come from imbalance, resonance and misalignment. We check our balance certifications and our vibration records for resonance, and find not evidence to support that they are contributors. We ask the mechanic who aligned the pump to align it again and observe his practices. From the observation, we can conclude that he does not know how to properly align.

When we ask, Why would he not align it properly?, we find that he was never trained in how to align, he was using worn alignment tools and no procedure existed to follow. Now we know the REAL root causes, so we can develop solutions, that when implemented, WILL WORK!!

Using the PROACT® disciplined process; we are utilizing quality of process versus quality of product. The facts are leading us to our conclusions, not hearsay. We are not using “trial and error” solutions to see if they work. By the time we get to solutions, we know they will work because we have maintained quality of the RCA process.

While the undisciplined RCA approaches are attractive to organizations because they produce a quick answer, it does not mean that the answer is correct. They are quick approaches because they lack proof that they are correct. True RCA involves taking the time to prove what we say, before we spend money to prove we are wrong!!

Robert J. Latino is CEO of Reliability Center, Inc. Mr. Latino is a practitioner of root cause analysis in the field with his clientele as well as an educator. Mr. Latino is an author of RCI's Root Cause Analysis Methods© training and co-author of Basic Failure Analysis Methods© workshop. Mr. Latino has been published in numerous trade magazines on the topic of root cause analysis as well as a frequent speaker on the topic at trade shows and conferences. His most recent publication is titled "Root Cause Analysis - Improving Performance for Bottom Line Results" He can be contacted at 804/458-0645 or blatino@reliability.com.