Is Root Cause Failure Analysis (RCFA) the Next Step?

If you ask maintenance professionals across the country if they have a RCFA program most would say, what is a RCFA? Most of us with a little gray hair (or a lot) have been doing RCFA for 30-40 Years. We just never had a fancy name to call solving an ongoing problem and redesigning, changing procedures, or buying a better widget so the problem never happens again. We just thought it was what maintenance professionals where supposed to do when stuff continued to fail and screwing up you day or even worse waking you up at night. RCFA is a process not a tool. And you need to apply some process procedures to ensure the program works properly. A systematic process is what you need to make sure you ask the right questions and gather the right evidence and clues which will allow you to come up with the right answers; which ultimately will lead you to solving the problem.

But the big question is: Is RCFA the next step for your organization? RCFA can be performed in any organization no matter where they are on the path from reactive maintenance to leading class organizations. Even if you don’t have all of the typical best-in-class maintenance activities you can still perform RCFAs. All you need to do is take some time to ask some basic questions: What failed, why did it fail, and what do I need to do to prevent the failure from happening again?

Some of the important definitions you need to remember are:

- **Failure** - The termination of an items ability to perform a function
- **Failure cause** - The physical, chemical, or human process which led to the failure
- **Failure effect** - The consequences of a failure
- **Failure mode** - The effect by which the failure is observed or noticed

There are two (2) types of failure classifications; Chronic and Sporadic. The chronic is the most common failure classification because people who don’t have an active maintenance management program which has a good failure measurement system only remember and notice the problems that occur over and over again. These are great candidates for using the process and searching for the “root” cause.

The other type of failure classification is sporadic. These are typically onetime events which involve significant, unexpected, and severe consequences. The ones that get your facility on the front page of the local newspaper. You will get lots of help solving those problems!

Every problem has “root” causes and you just need to look deep enough with enough data to find it. There are three types of root causes; 1) physical, 2) human, and 3) latent. Physical is a component or material failed (such as a shaft breaking). Human are actions or decisions which lead to failure (an operator made a mistake). And latent reasons are caused by human decisions made incorrectly (no mistake was made but the human followed a bad instruction or process).

One of the key components in the RCFA process is using the “Five Why” process shown below:
Problem Statement: You are on your way home from work and your car stops in the middle of the road.

1. Why did your car stop?
   – Because it ran out of gas.
2. Why did it run out of gas?
   – Because I didn’t buy any gas on my way to work.
3. Why didn’t you buy any gas this morning?
   – Because I didn’t have any money.
4. Why didn’t you have any money?
   – Because I lost it all last night in a poker game.
5. Why did you lose your money in last night’s poker game?
   – Because I’m not very good at “bluffing” when I don’t have a good hand

The key RCFA problem solving steps are:
1. Define the problem
2. Define the team to work on the problem
3. Contain the symptoms
4. Analyze the root causes
5. Corrective actions
6. Evidence of effectiveness
7. Team sign-off

Remember you need to pretend like you are a police investigator.
- Understand the failure
- Gather evidence
- Take pictures
- Understand the process around the failure,
- Ask “why” five times (ask “why” until there are no more answers)
- Keep good notes, and
- test the effectiveness of the changes you make

The RCFA process can be a very simple process or a very complicated one depending on your process level and the severity of the failure.