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Why Root Cause Analysis Never Stops Problems

or, "Why You Cannot Stop Your Problems From Here."

Abstract: To not have a problem you must prevent its creation. Once a problem exists you can never stop it repeating until all its roots are eliminated. Doing Root Cause Analysis (RCA) on a problem to try and prevent it has a miniscule chance of working because you can never find all the roots of its cause. The roots you do not eliminate will let the problem grow again.

Keywords: failure cause removal, root cause failure analysis, RCA, RCFA

Multiple events must coincide for a problem to arise. There is never just one cause of equipment failure. There are at least four, and usually more, contributing factors to a machine failure event. Using Root Cause Failure Analysis will not discover all of the contributing factors because many of them are hidden in the distant past, while others started in other places far from your operation.

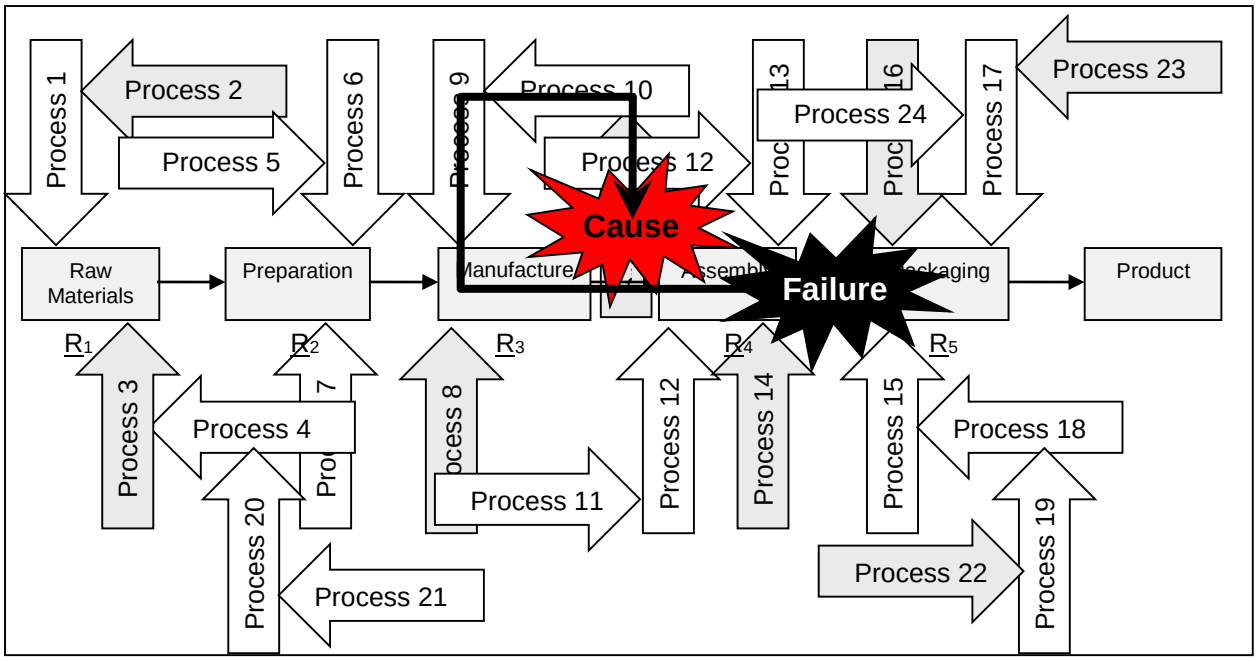

Figure 1 Failures Occur throughout the Process Chain

Figure 1 shows a failure in product assembly. The defective item started its life elsewhere and ended up causing problems during assembly. The failure is the last event in a long chain of causes and effects. The many contributing causes that came together to fail the part passed through the processes undetected until they combined to initiate the failure. The root cause traces back to its manufacture, when it leaves the process and enters another, then a second and a third. There are innumerable opportunities for errors and defects to occur in all processes. Process after process connects with others, causing a tangled web of interaction. Errors, mistakes, and defects can come from everywhere. Any process that goes wrong has an impact on numerous others downstream. Much time, money, and resources will be wasted. If you want an operation in which good results are natural and excellence abounds, ensure that your processes permit no defects.

Solving the real problem means finding its true causes. Today's failures started in the past when their causes were initiated in previous processes. The technique used to investigate plant and equipment failures is known as Root Cause Failure Analysis (RCFA). RCFA is manpower and time intensive, and so it is only applied after a serious incident justifies it use. Reserving RCFA for investigating major failures ensures that major failures will continue to occur. You might find

and remove some contributing causes, but thousands of defects in your business processes and the processes of your vendors and suppliers will stay behind to create more future catastrophes. Failures are the result of multiple failed processes.

Gathering historic data and doing RCA or RCFA using the data is the standard approach applied in industry and business. But it's terribly unsuccessful. The track record of RCA is poor, with many organizations training their people in the methodology and then giving up on its use when it does not improve performance and profitability.

There is an insightful story told of the late Sir Ernest Shackleton, one of the great early South Pole explorers. On board his ship bound for Antarctica, he watched a man tie a knot in a rope that was holding down vital supplies. Shackleton saw that it was the wrong knot for the job. In wild seas, it would come loose and all the goods and supplies would be lost. Shackleton went to the man and asked him about his experience at sea. He learned that the man was new to seafaring. With patience and thoroughness, Shackleton taught him how to tie the correct knot, one that would be secure in all weather and sea conditions. His comment to the new seafarer is insightful for all of us who want successful outcomes: "There is always only one knot that is right for the situation."

Shackleton's method of failure prevention is the technique used in the Plant Wellness Way: do what stops the causes of failures from starting. First, put the right practices into your processes and make sure they are done right every time. In the Plant Wellness Way, when things fail, the first question you should ask is, what is wrong with the process? You can skip the RCFA, but you cannot skip finding and fixing the design faults and missing quality controls in your processes.

The necessities for high equipment reliability cannot be left to luck. If Shackleton had left it to the new seafarer to realize that he was using the wrong knot for the job, the expedition would have failed. Like Shackleton, you must find and remove the risks in your processes before they destroy your operation. Do the same for your business that Shackleton did for the Antarctic Expedition: look for where troubles will start in your processes, then introduce, teach and use the right practices.

World-class operations recognize the interconnectivity of their processes and work hard to ensure the right results at every stage in every process.

Highly reliable organizations proactively focus on preventing problems from entering their operation and not just trying to remove those problems that they suffer. They set control mechanisms, standards, and checkpoints in all processes to spot and stop the defects that turn into future failures. They look for what can go wrong before it does and prevent its causes from happening. Instead of having problems and then investigating their causes, they imagine their problems and proactively act to eliminate their possibility across the life cycle. If your operation is suffering equipment and production problems, don't try to discover why they happen and figure out how to solve them. First, look at your processes. The vast majority of your production problems are caused by bad business process design. Fix your process weaknesses and do the new training, then put the answers to use. The problems disappear because they no longer can exist in your company.

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