Determining Corrective Actions using Root Cause Analysis (RCA)

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Determining the root cause of a Nonconformity or problem is an ISO 9001:2000 requirement!

8.5.2 Corrective action

The organization shall take action to eliminate the cause of nonconformities in order to prevent recurrence. Corrective actions shall be appropriate to the effects of the nonconformities encountered.

A documented procedure shall be established to define requirements for

a) reviewing nonconformities (including customer complaints),
b) determining the causes of nonconformities,
c) evaluating the need for action to ensure that nonconformities do not recur,
d) determining and implementing action needed,
e) records of the results of action taken (see 4.2.4), and
f) reviewing corrective action taken.
Root cause analysis (RCA) is a class of problem solving methods aimed at identifying the root causes of problems or events.

RCA is predicated on the belief that problems are best solved by attempting to correct or eliminate root causes, as opposed to merely addressing the immediately obvious symptoms.
• RCA helps identify what, how and why the problem occurred thus preventing it from recurring again.

• Root causes are underlying and they can be identified, can be controlled by management and they result in recommendations for improvement.
• Underlying Causes: The goal should be to identify specific underlying causes. The more specific the underlying causes identified, the easier it will be to determine the actual root cause(s);

• By directing corrective measures at root causes, it is hoped that the likelihood of problem recurrence will be minimized.
It is recognized that complete prevention of recurrence by a single corrective action is not always possible. Thus, RCA is often considered to be an repetitive process, and is frequently viewed as one of many tools of continuous improvement.
What is Root Cause?

- Management Control: Avoid conclusions such as operator error, equipment failure, external factors since they are not specific and management can not address these issues. The root cause must address issues that management can initiate corrective action.

- “Severe Weather” is not an appropriate root cause for a late delivery.
• Aiming corrective actions at root causes is more effective than merely treating the symptoms of a problem.
• To be effective, RCA must be performed systematically and conclusions must be backed up by evidence.
• There is usually more than one root cause for any given problem and therefore there may be more than one corrective action.
RCA should not be used to determine blame and fault and should not result in employee discipline.
Research has repeatedly proven that problems within organizations are about 95% related to processes and only 5% related to personnel. Yet, most organizations spend far more time looking personnel rather than processes and because of this misdirected effort seldom really gain the benefit they could gain from addressing the Root Cause.
A company can not be expected to solve all existing problems immediately and must plan and assign reasonable resources to be continually used for problem solving (RCA). It is advisable to consider the overall cost of problems to prioritize candidates for a RCA that ultimately will expend company resources with an expected ROI.
Determining candidates for a root cause analysis
Determining candidates for a root cause analysis
General process for performing root cause analysis

1. Define the problem.
2. Gather data/evidence.
3. Identify issues that contributed to the problem.
4. Find root causes.
5. Develop solution recommendations.
6. Implement the recommendations.
7. Observe the recommended solutions to ensure effectiveness.
• Defining the problem is the beginning and a very important step to determining the root cause.
• We often define a problem too quickly which results in more work and a lack of focus when trying to determine the root cause.
When defining the focus, try to pin-point the actual failure when performing a RCA.

Example

Complaint: Customer called and complained that their parts are late and they need them now!
Our first reaction is to define the problem in a simple term such as “LATE DELIVERY”. The typical response to this is to expedite the order. Often, this results in disruption of the shipping process and almost ensures that other orders may have to be expedited as well.

In addition, this approach costs money!
This solution is a typical formula for failure and in reality the business becomes addicted to expediting shipments.
• However, by understanding our processes and spending more than a minute to define the problem, we could define the problem as “Product Arrived Late at the Shipping Department” or “Shipping Due Date did not match the Customer’s Requested Date”.

• These definitions better define the problem and will result in a more effective RCA.
Once a problem is defined as a candidate for a RCA, it is important to investigate the problem by collecting as much data as possible. The following are guidelines of data collection areas:

- Materials
  - Defective Raw Material
  - Wrong type for job
  - Lack of raw material
Gather evidence and facts

- **Machine/Equipment**
  - Incorrect tool selection
  - Poor maintenance or design
  - Poor equipment or tool placement
  - Defective Equipment or tool

- **Environment**
  - Orderly workplace
  - Job design or layout of work
  - Surfaces poorly maintained
  - Physical demands of the task
  - Forces of Nature
• Man
  ◦ No or poor management involvement
  ◦ Inattention to task
  ◦ Other (horseplay, inattention....)
  ◦ Stress demands

• Methods
  ◦ No or poor procedures
  ◦ Practices are not the same as written procedures
  ◦ Poor communication

Gather evidence and facts
- Management System
  - Training or education lacking
  - Poor employee involvement
  - Poor recognition of problem
  - Previously identified problems were not eliminated

Gather evidence and facts
Once the data is collected, we can begin to analyze the data to identify potential root causes.

There are many different methods used to identify the root causes. One simple yet effective method is called the “WHY TREE ANALYSIS”.

Identify issues that contributed to the problem.
In the technique known as “why tree analysis”, an undesired effect is taken as the root ('top event') of a tree of logic. Then, each situation that could cause that effect is added to the tree as a series of logic expressions.
In order to drill down the why tree, we analyze the process and ask "Why did this happen?" and start drilling down into "Who does what", "How things get done", and "Why the issue behaved in this manner".

The creation of a why tree will later serve well as a process flow chart and is never a wasted effort.
The why tree is created using the following symbols (Gates):

Definition (Main Issue)

Any failure lower than Main Issue

Lowest level – Ending Point
Connecting faults that must occur in combination for the higher level to fail (And Gate)

Connecting faults that may occur individually for the higher level to fail (Or Gate)

Why Tree Analysis
Example of the difference between “And gates” and “Or Gates”.

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**Why Tree Analysis**
Exercise

Inside Diameter: 0.256 +/- 0.002
Undersize in first inspection

A

First Article Sample
Set-Up Error

B

Bit Diameter Incorrect

C

Selected Wrong Bit

D

Bit worn Calibration Error

Skipped Inspection

Inspector Error

First Article Inspection Error

Bit Worn during Drilling Process

E

Exercise 1
Complete E
Once the why tree is completed for the process and all the analysis of the data collected is complete, we can then begin to determine the actual cause(s) by elimination and establish corrective actions.
When establishing the corrective action(s) we must include the following:

- Description of the corrective action including actions taken to prevent recurrence;
- Ensure that the corrective action(s) taken continue to be effective;
- Establish a re-evaluation date or time to take a final look at the process and confidently close the corrective action because it is determined to be effective.
• A questionnaire will be handed out to be completed. Please hand in this questionnaire with your name and mailing address.

• The results will be mailed with your certificate.