Root Cause and Corrective Action Process

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11-3-11
Develop a single process to be used by all sites within the SS&C Lane:

- **Single tool for all discrepancies and problems**
  - Process is not only limited to Quality problems/discrepancies
- **Establish common language**
  - Facilitate sharing of lessons learned
  - Common metrics
- **Creation of Standard Work**
  - Helps identify where/when process breaks down
  - Becomes the training document
RCCA Process

Suggested Standard process:

1. Determine problem statement
2. Create Fishbone Diagram (identify symptoms and causes)
3. Perform 5 Why's analysis (determine root cause(s))
4. Implement immediate corrective action
5. Implement long term corrective action
6. Verify outcome of corrective action

- Simple
- Cost effective
- Can be formal or informal
- Can be performed by an individual or by a team
“Go See” the problem at the point of occurrence to truly understand the current condition.

Observe the condition, collect data and facts.

Using the observations, data, and facts state what the current condition is.

The current condition should include

- The *point of cause*
- The time and place at which the abnormality is occurring

The current condition should not imply any causes or solutions

State what the desired condition is.

- What is the standard
- Objective
Once the Current Condition and Desired condition are understood the problem statement can be generated.

The Problem Statement should be:

• Short
• Simple
• Concise
• Focused on one problem

“If you cannot say it simply, you do not understand the problem.”
A Fishbone Diagram attempts to identify all potential causes and symptoms of a non-conformance by following a standard process

• Start with a defined problem statement
  • Identify all potential causes and symptoms by top level categories

Benefits of Fishbone Diagrams include:

• Prevents jumping to conclusions as to a problem’s true root cause
• Identifying that a problem may have more than one root cause
• Helps determine the difference between causes and symptoms
• Understanding interactions between multiple issues
The potential causes identified by a Fishbone Diagram are visually grouped into six distinct top-level categories:

- **Man (People)** – Anyone involved with the process
- **Method** – How the process is performed and the documentation to define the process; including drawings, work instructions, specifications, etc
- **Machine** – Any equipment, tools, computers etc required to perform a task
- **Material** – Raw materials used to produce the final product
- **Measurement** – Data generated from the process that is used to define quality
- **Mother Nature (Environment)** – The conditions, such as time, temperature, humidity, etc in which the process is performed
Fishbone Diagram (Sample)

A premier aerospace and defense company
Creating a Fishbone Diagram

Fishbone diagrams can be done on a blank piece of paper or created electronically.

Microsoft Visio has a built-in template to easily create Fishbone diagrams
Once a Fishbone Diagram has been created it is important to distinguish between symptoms and causes

- **Symptoms** are things that indicate the presence of a problem
  - Machine is down
  - Scrap rate has increased from X to Y
  - FOD in parts
  - Failure to meet requirements

- **Causes** are reasons for the problem
The 5 Why’s is a questions-asking method used to explore the cause/effect relationships underlying a particular problem and/or cause.

The goal of applying the 5 Why’s method is to determine the root cause of a defect or problem.

- Identify the possible causes of the problem (from fishbone) and ask why it happened
- Make assumptions as to why the cause occurred
- Obtain facts to affirm or reject each assumption to enable asking why again
- Test for Cause and Effect
- Repeat the process as many times as needed to achieve true root cause
5 Why Analysis

Start with cause identified by fishbone

Ask Why

Make Assumptions

Prove / Disprove Each Assumption

Identify Root Cause
# Simplified 5 Why Form (Blank)

## The 5 Why’s

<table>
<thead>
<tr>
<th>Why?</th>
<th>Answer:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
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<tr>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

**Root Cause:**

**Corrective Action:**
# Simplified 5 Why Form (Sample)

## The 5 Why’s

<table>
<thead>
<tr>
<th>Why?</th>
<th>Answer:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>There is a crack in the oil filter.</td>
</tr>
<tr>
<td>2</td>
<td>The oil filter gets too hot during use.</td>
</tr>
<tr>
<td>3</td>
<td>The cooling system isn’t working properly.</td>
</tr>
<tr>
<td>4</td>
<td>There is too much dust on the cooling coils.</td>
</tr>
<tr>
<td>5</td>
<td>The air intake filter is missing.</td>
</tr>
</tbody>
</table>

**Root Cause:** The air intake filter was not replaced.

**Corrective Action:** Replace the air intake filter and establish a preventative maintenance program.
For more complex problems where the root cause is not/cannot be determined using 5 why’s the are additional problem solving methods available:

- K-T Analysis (Kepner-Tregoe)
- Decision Focus®
- Design of Experiments
- 6 Sigma - DMAIC
Immediate corrective actions are:

- “Band-aids” that provide temporary relief until a more effective or extensive solution can be implemented.
- Rework to fix the problems found (short-term fix).
- Short-term protection goals
- Best when applied at the point of occurrence of the problem.

Example:

The immediate corrective action can become long term if a more effective solution can not be found.
Factors to consider when creating long term corrective actions:

- **Feasibility** - Must be within company resources and schedule
- **Budget** - Cost to implement must be within budget and appropriate for extent of the problem
- **Employee Involvement** - Departments and personnel affected need to be involved in the actions
- **Focus on Systems** - Focused on systemic issues, not on individuals.

Long Term Corrective Actions incorporate:

- Preventive action to prevent problems recurring (long-term fix)
- Mistake Proofing
- Methods of verification
Verification Questions

In order to verify results of a corrective action there needs to be answers to the following questions:

1. What are the expected results of the corrective action?

2. What metrics are in place to measure the results of the corrective action?

3. How often should the corrective action be monitored to assure sustainability?

4. Who is responsible to monitor the results?

5. What needs to be done to continue to improve the process?
Verification Process

Questions to ask if “No” occurs

1. What is the point of cause, the time and place at which the abnormality is occurring? Is it different from what was identified in the original problem statement?
2. What is the root cause?
3. Have you tested for cause and effect?
4. What are your temporary and permanent corrective actions?
5. How will you confirm your corrective actions?
<table>
<thead>
<tr>
<th>Description:</th>
<th>Current Standard:</th>
<th>Date:</th>
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<tr>
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<table>
<thead>
<tr>
<th>Department/Zone</th>
<th>First observed (date/time):</th>
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<table>
<thead>
<tr>
<th>Problem Investigated By:</th>
<th>Repeat Item: YES NO</th>
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<table>
<thead>
<tr>
<th>Causes:</th>
<th>[Use fishbone diagram on back if necessary]</th>
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</table>

<table>
<thead>
<tr>
<th>Root Causes:</th>
<th>[Use 5 Why’s]</th>
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<table>
<thead>
<tr>
<th>Cause and Effect Confirmed: YES NO</th>
<th>How:</th>
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<table>
<thead>
<tr>
<th>Countermeasures:</th>
<th>Temporary/Immediate</th>
<th>What:</th>
<th>Who:</th>
<th>When:</th>
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<thead>
<tr>
<th></th>
<th>Permanent</th>
<th>What:</th>
<th>Who:</th>
<th>When:</th>
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<table>
<thead>
<tr>
<th>Review Standard Work:</th>
<th>Exists Does not exist</th>
<th>Followed Not followed</th>
<th>Adequate Not adequate</th>
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<table>
<thead>
<tr>
<th>Follow up Action:</th>
<th>Confirm Countermeasures</th>
<th>What:</th>
<th>Who:</th>
<th>When:</th>
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