***Root-Cause Analysis (RCA)***

The purpose of this article is to provide some practical insight into satisfying the DOD requirement to determine the cause, not just the symptom, of deficiencies identified by your internal audit program (IEP). We find this to be a recurring problem that commonly results in a finding in the area of internal audits under operations management or maintenance quality assurance. We hope that by providing some examples of RCA processes that consistently pass inspection, listing some cause analysis resources, and providing one example of an effective RCA tool, we will reduce the number of DOD findings associated with this important requirement.

***Q&S Requirement Concerning RCA:***

Federal Register 32 CFR 861.4 (DOD Air Transportation Quality and Safety Requirements (Q&S)) lists the following as a required feature of an IEP process:

*An internal quality audit program or other method capable of identifying in-house deficiencies … has been implemented. Audit results are analyzed in order to determine the cause, not just the symptom, of any deficiency.*

***RCA Processes that Satisfy the Intent of the Q&S:***

There are a wide range of processes that have satisfied the DOD’s intent for cause analysis. These processes run the gamut from complex and expensive to simple and free. These processes come in three basic forms: 1) Commercially purchased programs, 2) In-house programs that specifically identify the root cause, and 3) In-house programs that informally identify root cause.

1. Commercially Purchased Programs: Formally trained analysts using purchased software, spreadsheets, and scientific methods look at facts, identify problems, and find the most basic or root cause of a deficiency.

2. In-house Specific Process (most commonly observed): An in-house developed tracking form specifically requires root cause be determined during the resolution process. The format obviously varies from company to company, but we typically see the following information:

- Discrepancy: Restatement of deficiency noted during the self inspection

- Root Cause: Most basic cause of the deficiency is identified and documented

- Resolution Plan: Plan to fix or resolve the deficiency is documented

- Follow-up Inspection: Re-evaluation of area to validate effectiveness of the fix

3. In-house Informal Process: Here root cause or the process to find the root cause is not specifically broken out and identified as such with each finding. Rather, the write-up informally identifies the cause in the resolution plan or corrective action. The root-cause identification process is usually spelled out in a manual or set of directions. A drawback to this process is that it is difficult to determine if root cause identification was done, failure of personnel to go through the process, and commonly results in a finding for inconsistent compliance, and potential for the finding to reoccur.

In the end, the cause analysis process does not need to be complicated, it just needs to exist, be documented in a manner that our evaluators can determine it is being conducted, and accurately identify the cause of each deficiency.

***RCA Resources:***

There are countless articles, books, and programs available to help you design and implement an RCA process tailored to the operations of your company. The examples we are about to provide are just examples of root-cause analysis information available. We do not endorse either product, nor are we able to commit that use of this particular model will meet DOD Quality and Safety Requirements in any particular company. By not using another product as an example, we do not intend to imply it would not be as good as the examples we use but in fact might be better. We highly encourage you to conduct your own research to find models that fit your particular operation and company culture.

A. One example is the internet article titled, *What is Root Cause Analysis (RCA)?*, by DECISION systems, Inc., at [http://www.rootcause.com/WhatIsRCADetail.htm](http://www.rootcause.com/%20WhatIsRCADetail.htm). This article identified three essential qualities of an effective and reliable RCA process. It also does a good job of presenting the information without overstating or overcomplicating the subject.

1. The process must take advantage of people’s knowledge while preventing their biases from controlling the direction of the investigation.

2. The process must depict the facts of the case so that the causal relationships are clear and the causal relevance of those facts can be verified.

A process which ensures that all factors contributing to a problem are identified is an exclusive feature of the REASON system. The REASON method orders and displays the facts of the event in a format that makes it easy to check for accuracy and completeness at each step.

3. The process must also help the analyst and management understand what actions must be taken to implement potential solutions and who in the organization needs to take those actions.

Once every possible avenue toward prevention is identified, the analyst must understand what specific actions need to be taken. Is there a policy already on the books that attempts to address the problem or is a new policy needed? If a policy already exists, then why wasn’t it effective, and what steps do we need to take to make it effective in the future? And who in our organization needs to take those steps? If the appropriate action is not taken at the appropriate level in the organization, then a sufficient level of control will not be established to insure prevention into the future. These issues are part of the process of identifying preventative measures and must be integrated into the root-cause analysis system.

The REASON method teaches the principles governing corrective action and integrates them into the root-cause analysis process.

B. Another article titled, *Root-Cause Analysis For Beginners,* by James J. Rooney and Lee N. Vanden Houvol and located at [http://www.asq.org/pub/qualityprogress/past/0704/ qp0704rooney.pdf](http://www.asq.org/pub/qualityprogress/past/0704/%20qp0704rooney.pdf) identified the following qualities as essential for an RCA process:

• Root-cause analysis helps identify what, how, and why something happened, thus preventing recurrence.

• Root causes are underlying, are reasonably identifiable, can be controlled by management, and allow for generation of recommendations.

• The process involves data collection, cause charting, root cause identification, recommendation generation, and recommendation implementation.

Following is one example of an RCA flow chart that is being used effectively at several approved DOD carriers.

**Causal Analysis**

**Describe Solution**

**(START)**

**Determine Cause**

Describe steps taken to evaluate process to identify deficiency leading to violation.

**NO**

**YES**

**YES**

Describe steps taken to prevent employee and supervisory disregard of procedure or policy.

**NO**

Describe steps taken to provide necessary supervisory oversight.

Describe proposed additional procedure or policy

*Was violation done with supervisor’s knowledge?*

**YES**

**YES**

Describe steps taken to prevent employee’s disregard of procedure or policy

*Was violation done routinely?*

**YES**

Had employee performed function correctly in last 90 days?

**NO**

Describe steps taken to establish and maintain employee proficiency.

**YES**

Had employee received communication regarding procedure or policy changes?

**NO**

Describe steps taken to provide employee communication.

**YES**

*Had employee received sufficient OJT and feedback regarding job performance?*

**NO**

Describe steps taken to provide OJT and feedback.

**NO**

**NO**

*Had employee received formal training / information?*

**YES**

**YES**

**NO**

Describe steps taken to maintain trained and informed workforce

*Did employee claim to have knowledge of procedure or policy?*

a. Is an additional procedure or policy necessary?

b. If yes, Describe proposed additional procedure or policy

*Did procedure or policy exist to prevent failure?*

**NO**

Describe proposed additional tools.

*Did tools exist to prevent failure?*