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Root Cause Analysis Examples for Quality Management Systems

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Example CAR # 1: Vendor Performance Reviews

QMS Type: AS9100

These examples can help QMS auditors, auditees, focals and others discuss and agree on the ideal type of RCA for their needs.

Starting Point: In this example, we provide an actual Corrective Action Request from an AS9100 Certified Company. The root cause analysis in the original CAR is not very detailed.

RCA Examples: These provide a better understanding of causes than the original RCA

- Five Why
- Why-Why using the FreeRCA.com template[1]
- Realitychart, using RealityCharting® Software[2]

Use these RCA examples to discuss the right level of RCA detail for your needs. Here are some questions that can help in this discussion:

1. What is the point of RCA? Do you want to identify a single "rootiest" root cause or do you want to make the problem go away? Consider reviewing the Level 1 training at www.FreeRCA.com for added insight.

2. Does the RCA in the example CAR (starting point) provide enough details to understand the causes of the problem?

3. In the example CAR, do their proposed solutions control one or more causes identified in their RCA? (i.e. is there a clear linkage between their RCA & solutions?).

4. Is it worth a little extra time to conduct better RCA in order to help solve the problem?

5. Which of the three RCA types shown would be a better choice than the original RCA? Is there another type (not shown here) that would be better?

6. If improved RCA is needed, what sort of training & mentoring is needed? Does www.FreeRCA.com provide the training and templates you need? (If not, let www.FreeRCA.com know what you need).

[1] This template can be downloaded at www.FreeRCA.com See training level 2.
[2] A free demo copy of RealityCharting® can be obtained at www.world-interplay.com/rc Select Option 3.

Starting Point: Original CAR (scrubbed of company personnel details)

Surveillance Audit #1	**CORRECTIVE ACTION REPORT**	

Organization: ABC Co. Site: Anytown, USA	Identification : IMA #1 Date issued: 10/15/2010
Reference Standard: AS9100B	Referenced Standard Clause concerned: 7.4.1

Category: MA/mi	**Requirement** **Nonconformance Description**
mi	**REQUIRED CONDITION:** ABC Co., Procedure # PM7 Para., 10 states " A periodic review of the performance of each vendor, in meeting the company's specified requirements will be taken on a regular basis". **ENCOUNTERED CONDITION:** Periodic reviews of vendor's performance are not being conducted as required by PM7, Para. 10.

Auditor Name: I.M. Auditor	Auditor Signature:	Due Date:11/15/2010

Immediate Containment Actions and Correction Taken	
Conducted and immediate review of the approved vendor list for poor performing vendors. Review concluded all vendors were within the threshold stated in the procedure.	Completion Date: 10/25/10

Root Cause Analysis *("why did this happen?")*
The Director of Purchasing did not formally document and recorded this information. The Director of Purchasing did not have knowledge the periodic review was to be documented.

Corrective Action(s) To Prevent Recurrence	
The Director of Purchasing has been instructed on the requirements of PM7. All vendors are now rated for on time delivery (OTD) and quality on a scale from 1-5 based on the number of line items on each purchase order. The data is documented, recorded and charted out. An overall rating is averaged for the two scored and any vendor with a rating of less than three will be audited. The reasons for the performance will be documented and reviewed by upper management. If it is determined that there is no justification for the performance issue, the vendor will be placed on probation and monitored quarterly.	Planned Completion Date: 11/01/2010

Organization Representative Name: John Smith, Quality Manager	Signature:	Date: 11/03/2010

Client Confirmation of Effective Implementation		
Organization Representative Name: Jack Jones, Quality Systems Management Representative	Signature:	Date: 02/03/2011

Auditor Verification of Effective Implementation			
Accepted: Yes ☒ No ❒	Auditor's Name: I.M. Auditor	Signature:	Date: 05/03/2011
Details of Verification and Effectiveness	Process verified during Surveillance Audit #2 on 05/03/2011. Process was found to be effectively implemented. See audit report for references and objective evidence.		

Five Why Analysis

This is the "Five Why - Classic," and it's trained like this: State your problem, then ask why 5 times[3]. The fifth why is your True root cause and thus is where you must apply a solution.

While this approach can provide deeper insight, results are limited and few practitioners actually use it this way. Still, you can see it's a much better analysis than what was provided in CAR #1.

Problem: Periodic Review of Supplier Not Conducted (see details in CAR # 1)

Why 1: Director of Business Development (DBD) did not document (record) this information
Why 2: DBD did not perform the required review per PM7 para. 10
Why 3: DBD did not know periodic review was required
Why 4: Nobody instructed DBD about this procedure
Why 5: QMS implementation requires DBD to be instructed on what applies to them
(The TRUE root cause[4])

Solution: Instruct the DBD on which processes apply to them (note that this solution controls the cause found in why 5).

[3] We stress that this is the "classic" five-why analysis. Because of its limitations, few use it as taught.
[4] It's silly to call the 5th why the "true" root cause. If we asked why of this, we would reveal another cause, and so on. This is why the 5 why method can impede understanding of cause & effect.

Why-Why Analysis

Most users of the "Five Why Classic" (previous example) quickly discover it's limitations, including 1) there's nothing magical about the 5th why and 2) good solutions can be applied to causes other than the last one you discover. Users typically adapt and morph "Five Why" into more useful and accurate forms, which FreeRCA.com calls "Why-Why" analysis. There are many formats for a Why-Why analysis. Provided below is a table based version of a Why-Why analysis based on a template available at www.FreeRCA.com[5].

Problem: Periodic Review of Supplier Not Conducted (see details in CAR # 1)

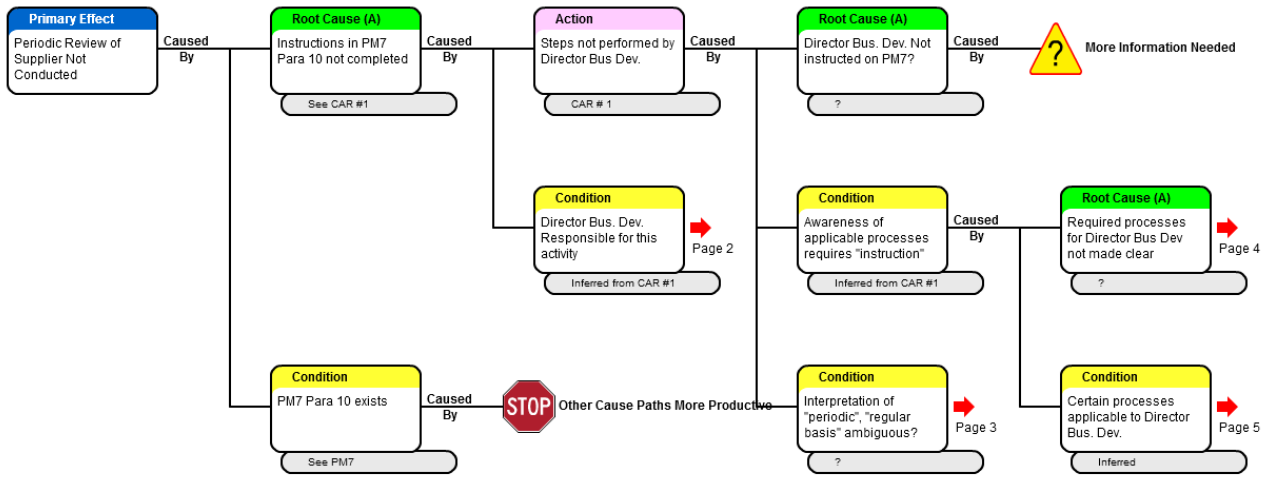
Why	Cause	Possible Solution(s) for this cause
1	Director of Business Development (DBD) did not document (record) this information	
2	DBD did not perform the required review per PM7 para. 10	Conduct the periodic review (already done via finding, CAR # 1.)
3	DBD did not know periodic review was required	Inform DBD that periodic review is required (already done via finding, CAR # 1)
4	Nobody instructed DBD about this procedure	Establish a list that is used when somebody new takes on the DBD position (including temporary or "actor" positions). DBD's manager use this as a checklist.*
5	QMS implementation requires DBD to be instructed on what applies to them	Develop a list of all applicable processes, including PM7, that are applicable to the DBD and ensure the DBD is aware of this list.*
6	Organization relying on training and "tribal knowledge" to do the right things	Ensure QMS intranet site makes it easy for all employees to see which processes apply to them and/or ones they are responsible for. (Good solution, but a bit widely scoped for now. We may consider this in the future.)

Solutions: The ones marked with a * were selected.
This

[5] See www.FreeRCA.com Level 2 training for a free template.

RealityCharting® RCA

This is done using the RealityCharting® Software[6], which provides a more accurate depiction of the cause and effects that culminated in the problem. After you create the cause and effect chart, called a Realitychart, the software helps you use the causes you found to identify effective solutions. After that, the software helps you document the results. You can get a free demo copy of the software at www.world-interplay.com/rc select option 3.



Realitychart (cause and effect chart)

The complete chart can be viewed at www.FreeRCA.com, see "RCA Examples."

Understanding a Realitychart:

- The "Primary Effect", shown on the left, is the problem. The lines going to the right are read as "caused by."
- The boxes labeled "actions" and "condition" are causes. Condition causes are pre-existing causes that act over a longer time than the action causes. It can take a little while to catch on to the action-condition concepts and if it's confusing, just remember that they are both causes. See the videos in www.FreeRCA.com for added insight[7]
- The rounded box below a cause is the evidence for that cause. A "?" indicates we don't have evidence and thus the cause is a hypothesis.
- If we stop a cause & effect chain, we explain why. If we want more information, we show a "?"
- This methodology defines a "Root Cause" is any cause that is acted on by a solution such that the problem (primary effect) won't recur. The root causes are where solutions were applied.

This next page provides a RealityCharting® Software generated incident report, which includes the solutions chosen to identify causes. The solutions link to the causes shown above.

[6] RealityCharting® and its predecessor Apollo RCA was created by Dean Gano. You can get training and a free demo of the software by the certified reseller, www.World-Interplay.com

[7] Videos are at www.FreeRCA.com in the RealityCharting tab.

RealityCharting® Incident Report

Incident Report
Purpose: To prevent recurrence, not place blame.

For Internal Use Only
Report Date: Nov. 8, 2010
Start Date: Nov. 8, 2010
Report Number: 2010-CAR-1

I. Problem Definition
What: Periodic Review of Supplier Not Conducted
When: Found during AS9100B Surveillance audit on 15 October 2010
Where: ABC Company, Anytown USA
Significance: Resulted in non-compliance to AS9100B found during external audit. See Corrective Action Report (CAR) # 1.

II. Realitychart Summary
See attached Realitychart

III. Solutions

Causes	Solutions	Owner	Due Date
Required processes for Director Bus Dev not made clear	Develop list of processes applicable to the Director of Business Development (what they are responsible for). Embed this into QMS document control.	Larry Birddog	Nov. 12, 2010
Director Bus. Dev. Not instructed on PM7?	Instruct business director on PM7 and their responsibility for supporting this.	B. Audinator	Nov. 12, 2010
Instructions in PM7 Para 10 not completed	Add this as a special emphasis item for next 2 years audits, and audit it 2x/year vs. the normal 1x/year	B. Audinator	Nov. 19, 2010

IV. Team Members

Name	Email	Member Information
Larry Birddog		
B. Audinator		

If you were using a CAR form like the one shown in page 2, the RealityCharting® Incident Report and Realitychart would be attached (in .pdf format) to the CAR form.