



Reliability Center, Inc.
www.Reliability.com
804-458-0645
info@reliability.com

Analysis: RCM Versus RCA

Ronald L. Hughes, Senior Consultant, RCI
Maintenance Resources On-Line Magazine, May 2002

There is a basic but very real misconception concerning the roles of RCM (Reliability Centered Maintenance) and RCA (Root Cause Analysis) in today's operating facility. This is due primarily to the fact the most people think that the two programs do virtually the same thing – nothing could be further from the truth. Although both programs are extremely beneficial if implemented properly, the purpose of each is entirely different. When implemented together they compliment each other and provide the greatest overall benefit to the facility.

The purpose of RCM is *“to determine the maintenance requirements of any physical assets (EQUIPMENT) in its operating context.”*¹ This is accomplished by answering seven questions about the equipment in order to determine what type of maintenance strategy to employ for the asset. RCM provides a flow diagram that tells you what type of maintenance to use based on the answers to the questions. By answering the seven questions all of the potential modes of failure are uncovered and a predictive maintenance strategy is devised to mitigate the consequences of the failure based on the criticality of the failure mode. In RCM, these failure modes are identified as the root cause(s) of the failure. This is where the main difference lies.

The purpose of RCA is *“to uncover the underlying reasons (root causes) why an event (not just equipment related events, but any type of event) is occurring so that the necessary steps can be taken to eliminate the event in its entirety.”* This is accomplished by analyzing the modes (the point at which RCM stops). RCA uses a logic tree that stresses verification at every level. The advantage is that the actual root causes that are uncovered are facts that have been derived from the verification process. The comparison between the two programs is striking – RCM is driven by preventive maintenance strategies while RCA is driven by maintenance prevention strategies.

It should be clear that the difference between RCM and RCA is that RCM treats the symptom while RCA finds and corrects the cause. For example, consider a person who has chronic headaches for some unknown reason. RCM would analyze all the possible reasons or modes (stress, disease, allergies, loud noise, bright light, lack of rest, etc.) that this person was having headaches. RCM would then tell this person to do anything from taking aspirin to performing more complicated forms of treatments, at designated intervals, in order to mitigate the consequences of the headache in its primary state. By comparison, RCA would uncover the reasons why the headache is recurring and provide resolutions for its complete elimination. Both techniques would solve the immediate problem of headache pain, but only RCA would uncover and eliminate the actual cause of the headache.

The question becomes what is important to your facility. Do you want to take pills to relieve the symptoms of your headaches (failures), or do you want to eliminate the headaches in their entirety!

Mr. Hughes, a mechanical engineer, is a member of the American Society of Mechanical Engineers (ASME) & the American Society of Training and Development (ASTD). He is currently a Senior Training and Reliability Consultant with Reliability Center, Inc. (an engineering and consulting firm). His expertise encompasses all areas of Human and Plant Reliability including the training/mentoring and facilitation of Root Cause and Opportunity Analysis efforts worldwide for client companies. rhughes@reliability.com

¹ Reliability-Centered Maintenance published by Industrial Press Inc.©, New York, New York 1992