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# RELIABILITY CENTERED MAINTENANCE



## WHAT YOU WILL LEARN:

- Understand the history of RCM, i.e. Classical, RCM 2 and streamlined RCM
- Paradigm changes in industry due to the implementation of RCM
- Benefits of RCM to your organisation
- Planning the RCM process
- RCM working groups
- Integration of Maintenance Management with overall business objectives
- Building the RCM principles into new designs
- Development of a Maintenance Strategy Blueprint
- Key Performance Indicators for RCM

## WHO SHOULD ATTEND:

This course is intended for all maintenance managers, Reliability engineers and - technicians directly involved in maintaining and preserving the function of assets. Since the RCM process makes use of cross – functional groups as well as the fact that a lasting maintenance program can only be developed by maintainers and users of the assets, it is also recommended that operation/production personnel attend this workshop to ensure an effective RCM program. These should comprise:

- Maintenance Managers/Supervisors
- Reliability Engineers/Technicians
- Plant Managers
- Planners
- Operation Specialists
- Key leaders from each Maintenance craft
- Consulting engineers

## The Workshop

The primary objective of the maintenance function is no longer only to focus on optimising plant availability at minimum cost. In modern day, maintenance affects all aspects of business effectiveness and risk, i.e. safety, environmental integrity, energy efficiency, product quality, customer service, plant availability and cost. Further to this maintenance is about preserving the functions of assets, as well as avoiding, reducing or eliminating the consequence of failure.

The modern Maintenance Manager is faced with the following key challenges, selecting the most appropriate technique, deal with each type of failure process, fulfil all the expectations of all the stakeholders for that specific asset, in the most cost effective and enduring manner and with the active support and cooperation of all the people involved.

RCM finds its roots in the early 1960s, when the initial development work was performed by the North American civil aviation industry. "Maintenance Steering Groups" was put together to formulate maintenance strategies that was cost effective, and able to keep their aircraft in a safe operable condition. Over the centuries this technique was formulated and refined into the principle of "Reliability Centred Maintenance" which is today widely used in industries such as petroleum, chemical and pharmaceutical companies, electric utilities, food processing, railways, government agencies, armed forces, facilities and other firms and industries.

RCM is a systematic and structured process used to decide what must be done to ensure that any physical asset, system or process continues to do whatever its users want it to do. It is taking into consideration the primary performance parameters of the asset, possible failure mode and consequence and lastly a suitable failure management policy.

This workshop is designed to familiarise you with the principles and the process of implementing a RCM program. It will help you to apply the rules of RCM through cross-functional review groups in order to produce robust and cost effective asset management programs, by applying the 4 maintenance strategies, i.e. Corrective, Preventive, Predictive and Pro-active.

### Pre-requisites

All the principles of RCM will be covered, including the type of strategies, as well as the tools that are used to facilitate the process. A basic knowledge of maintenance management as well as the practical operations and maintenance of assets would be an advantage. This practical experience will enable the workshop to be placed in context.

No special knowledge or skills are required – only a technical background so that there is a better understanding of issues related to RCM and the application thereof.

## The Program

### RELIABILITY CENTRED MAINTENANCE – AN OVERVIEW

- Evolution of Maintenance
- History of RCM
- Classical RCM
- RCM2
- Streamlined RCM

### WHY RCM FOR MY ORGANISATION

- Why RCM is different
- The new paradigms in maintaining assets
- What you should expect from RCM
- Who should do RCM

### PROJECT INITIATION

- Planning and preparation
- Setting up Review Groups
- Selecting Facilitators
- Selecting the systems for RCM Analysis

### GATHERING AND BREAKDOWN OF THE BASIC INFORMATION

- Defining functions and performance standards
- Defining failure – Functional Failure
- Establish root cause of failures – Failure Modes
- Identify what happens if failure occurs – Failure Effect
- What is the consequence of failure (cost, throughput, quality, safety, environment & customer)
- FMECA

### SELECTING MAINTENANCE TASKS THROUGH PRO – ACTIVE MAINTENANCE (PDM, PM)

- Scheduled restoration tasks
- Scheduled discard tasks
- Scheduled on-condition tasks

### TYPES OF PREDICTIVE TECHNIQUES AVAILABLE

- "The Human"
- Vibration Monitoring and Analysis
- Thermography
- Oil Analysis – rotating & Transformers
- Ultrasonic
- Magnetic Flux
- Dye penetrant
- Radiography
- MPI
- Eddy current

### IF NO PROACTIVE TASK IS AVAILABLE?

- When and how to do failure-finding (including RCA's)
- When to redesign
- When to run to failure

### IMPLEMENTATION

- Auditing the analysis
- Developing the Maintenance Program
- Continuous Improvement
- KPI's to measure success

### PRACTICAL EXERCISE

- Breakdown of plant into systems
- Completing a FMECA
- Selecting the appropriate tasks for different scenarios
- Developing the Maintenance program – Blue print

### SUMMARY, OPEN FORUM AND CLOSING

## Practical Sessions

This is a practical, hands on workshop enabling you to work through practical exercises which reinforce the concepts discussed.

***To gain full value from this workshop, please bring your laptop/notebook computer.***