



FROM YOUR PARTNER IN ENERGY EDUCATION

BEST GLOBAL PRACTICES
Reliability
Centered Maintenance



EXPERT COURSE TRAINER
ROLLY ANGELES

Reliability Centered Maintenance

BACKGROUND

Almost every industry has some form of Preventive Maintenance where they schedule their equipment for some replacement and overhauling activities on a time-dominated pattern. Despite the best and noble efforts, a lot of unexpected problems, breakdowns and failures still occur. At times, the Preventive Maintenance group may have worsened the equipment's condition after the routine PM overhauling. There is a detailed and thorough technical explanation behind this

COURSE OVERVIEW

This course covers the principles of RCM which is a process used to determine the maintenance requirements of any physical asset in its present operating context. RCM is done by asking seven questions about our asset or system that is being maintained

- What are the functions and associated performance standards of the asset in its present operating context?
- In what ways does it fail to fulfill its functions?
- What causes each functional failure?
- What happens when each failure occurs?
- In what ways does each failure matter?
- What can be done to predict or prevent each failure?
- What should be done if a suitable proactive task cannot be found?

RCM was discovered by Stanley Nowlan and Howard Heap from the airline industry and came up with the most important piece of research ever done on an equipment. RCM explains the capabilities as well as the limitations of scheduled Preventive Maintenance. RCM is a process to determine what should be done in order to ensure that our physical assets continue to do whatever the user wants them to do in its present operating context.

COURSE OBJECTIVES

This 3 day program will provide the participants with:

- A deeper understanding on the most effective and efficient maintenance program.
- Awareness on how maintenance tasks are based from the consequences of the failure itself
- Knowledge when to use the different maintenance tasks at hand with the aid of a Decision Diagram
- An understanding of the 6 failure patterns and how it affects us in our daily maintenance activities
- Skills on applying Reliability-Centered Maintenance in their daily activities

WHO SHOULD ATTEND

- All Maintenance Professionals
- Facilities Managers
- Reliability Engineers and Managers
- Maintenance Planners
- Operations and Production Managers
- Management and Decision Makers
- Continuous Improvement Groups
- Asset Managers and Custodians



EXPERT COURSE TRAINER

ROLLY ANGELES

Rolly Angeles is a seasoned international reliability and maintenance consultant with 28 years of solid experience in the field. He has conducted reliability and maintenance training programs in United Arab Emirates, India, Malaysia, Indonesia, Nigeria, Bangladesh and South Africa. A former TPM Senior Engineer at Amkor Technology Phils, he now carries a portfolio of reliability & maintenance training programs that include Maintenance Management courses on TPM, Lubrication, Tribology, Condition-Based Maintenance, RCM, RCFA, Planned Maintenance, World Class Maintenance Management, The 12 Disciplines, Maintenance KPI's and Indices, Oil Contamination Control, TPM Planned Maintenance and Autonomous Maintenance and many more.



ABOUT THE MERALCO POWER ACADEMY

Meralco Power Academy (MPA) is a premier training and energy education provider that leverages on Meralco's 113 years of industry experience, expertise and network. Its array of technical programs lend industry practitioners a competitive edge through top of the line learning solutions which are delivered in a variety of methods. MPA provides the learning platforms and coalitions for leaders, decision makers, managers and advocates by facilitating technical exchanges on global innovations and technologies on power and energy.

WHAT FORMER PARTICIPANTS SAY ABOUT THE RCM COURSE

"The examples given by the facilitator are very practical. Rolly Angeles is not only very knowledgeable on the topic, he is also very encouraging"
Flordeliza Aldaya, TQP/TPM Manager
ST Microelectronics

"RCM enlightened me on the different failure modes. In that way, it provided me to further dig on failure findings and more reliable solutions to be brought out with the aid of the RCM tool"
Anselma Cobcobo, Plant Operator
Hedcor Inc.

"I can see the difference between preventive and predictive maintenance. The training points out clearly that maintenance will not eliminate and zero out all breakdowns on the equipment but the best maintenance we can do is to control the timing of failure. Keep it up and continue to inspire others"
Hans Geoffrey Alandeo
Maintenance Engineer

COURSE OUTLINE

Reliability Centered Maintenance

DAY 1

Module 1: Changing The Maintenance Culture

Module 2:

Introduction to RCM Course

- Overview and origin of RCM
- 7 Basic Questions on RCM
- Traditional Concept about PM
- Limitation of Preventive Maintenance
- Evolvement of RCM in airline industries
- Six Failure Patterns
- Comparing RCM and TPM strength
- Benefits of RCM

Module 3:

RCM Information Worksheet (FMEA)

- Preparing Functions
- Functional Failures
- Failure Modes
- Failure Effects
- RCM Information Worksheet
- FMEA Workshop

Module 4: Understanding Failure Consequences

- Failure Consequence
- Hidden and Evident Failures
- Safety and Environmental Consequences
- Operational Consequences
- Non-operational Consequences
- Exercise on Failure

DAY 2

Continuation of Module 4

- Failure Consequences Exercise
- Hidden and Evident Failure Exercise

Module 5:

Different Maintenance Tasks Defined

- No Scheduled Maintenance
- Preventive Maintenance Tasks
- On-Condition Tasks
- Failure Finding Tasks
- Redesign and Modification

Module 6:

RCM Decision Worksheet

- RCM Decision Worksheet Form
- Applying the Decision Diagram

DAY 3

RCM Workshop

- Prepare RCM Information and Decision Worksheet
- Team Presentation on RCM
- RCM Roadmap of Activities
- RCM Forms to be used for Analysis
- Applying the RCM Process
- Starting an RCM Analysis
- Tips on conducting RCM Analysis