



FROM YOUR PARTNER IN ENERGY EDUCATION

BEST GLOBAL PRACTICES
WORLD-CLASS
MAINTENANCE

EXPERT COURSE TRAINER
ROLLY ANGELES



World-Class Maintenance

COURSE OVERVIEW

Being World Class means the ability to compete anywhere in the world. World Class Maintenance Management simply means the art and science of managing maintenance resources performed by best in class industries from around the world.

This 3 day program will be about the 12 Disciplines and how they will lead to better equipment reliability. Learn what these Disciplines - that most World Class Companies perform.

COURSE OBJECTIVES

This 3 day program will provide the participants with:

- An understanding of the need for an effective and World Class Maintenance Management structure in our plant.
- Information about the importance of “establish the basics of maintenance” before adopting any improvement strategy
- Awareness on when to effectively use each of the different maintenance strategies in order to fully improve the equipment reliability
- Abilities to develop a Corporate Strategy for maintenance function
- A basic understanding on the 12 Disciplines of Maintenance Management
- Knowledge about the real focus of a true and meaningful Maintenance Structure
- Skills to achieve a World Class Maintenance stage in their industries

WHO SHOULD ATTEND

- Maintenance Managers
- Facilities and Utilities Managers
- Preventive/Predictive Maintenance Group
- Reliability Engineers and Managers
- Operations and Production Managers
- Management and Decision Makers
- Continuous Improvement Groups
- People in charge of their assets
- CMMS and Spare Parts Group
- People in charge of their asset management
- Maintenance Planners, CMMS Groups



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.



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.

WHAT FORMER PARTICIPANTS SAY ABOUT THE RCM COURSE

“The facilitator’s lessons about lubrication, RCFA and RCM allowed us to see things from a different perspective.”

MP Agrawal, DY Maintenance Manager Bharat Petroleum Corporation Ltd.

“The way he explained things about the topic was magnificent. He was able to thoroughly explain while entertaining us! We wish you all the best!”

Ninan, CS Chief Manager Bharat Petroleum Corporation Ltd.

“Mr. Rolly delivers his extensive knowledge very well. It was easy for us to understand the concepts. I feel like this training will be the spark for our company in embarking on a world class management journey.”

Izdinar Abd Hapiz, Assistant E & I Engineer, Makhostia Sdn, Bhd, Malaysia



COURSE OUTLINE

World-Class Maintenance

DAY 1

Module 1: Understanding Equipment Failures

- The Truth About Machinery and Equipment
- Is It Really Possible to Eliminate Failures and Breakdowns on Our Equipment
- What Is Maintenance
- Common Belief on Maintenance – Does All Parts Eventually Wear Out
- What Stanley Nowlan and Howard Heap Discovered About Maintenance
- Limitations of Preventive Maintenance
- Understanding What Maintenance Can and Cannot Do
- Understanding Infant Mortality, Random and Age-Related Failures
- 6 Types of Failure Patterns
- Classification of Failures – Hidden and Evident Failures
- Types of Failures – Function Loss and Function Reduction Failures
- Occurrences of Failures – Sporadic and Chronic Failures

Module 2: Changing the Culture from Reactive to Proactive

- Reactive and Proactive Maintenance Explained
- Flowchart of a Reactive Maintenance Environment
- Learning the Correct Paradigm on Maintenance

Module 3: Understanding World Class Maintenance Management

- World Class Maintenance Management Explained
- 12 Disciplines of Maintenance – Basics, Intermediate and Advanced Discipline

Module 4: Basic Discipline

- Discipline 1: The Need for Training and Skills on Maintenance
 - Training and Skills Assessment
 - Steps to Improve Your Current Training Needs
 - Reflections and Lessons Learned from the 1st Discipline
- Discipline 2: Measurements and Maintenance of KPIs
 - Most Common Mean Time Indicators
 - Understanding Mean Time Between Failure (MTBF)
 - Understanding Mean Time to Failure (MTTF)
 - Setting Maintenance Goals and KPI
 - Reflections and Lessons Learned from the 2nd Discipline

DAY 2

Continuation of Module 4

- Discipline 3: The Need for Autonomous Maintenance
 - Autonomous Maintenance is Important
 - Autonomous Maintenance Basic Concept
 - Maintenance Guidance and Support for Autonomous Maintenance
- Discipline 4: Addressing Basic Equipment Condition
 - Importance of Going Back to the Basics
 - Cleaning, Proper Lubrication and Tightening of Bolts
 - Role of Operators in Establishing Basic Equipment Condition
- Discipline 5: Addressing Basic Equipment Condition
 - Preventive Maintenance Definition and Objective
 - What Preventive Maintenance Activities Include
 - Feasibility of Using Preventive Maintenance for Age-Related Failures
 - Survey of Top 10 Problems on Preventive Maintenance

Module 5: Maintenance Management Strategies

- Discipline 6: Lubrication Strategy and Management

- Functions of Oil and Its Composition
- Causes of Oil Breakdown
- How Contamination Occurs
- Our Belief on Contamination and Contamination Control Awareness
- Absolute and Nominal Filtration
- Filtration Efficiency and Beta Rating of Filters
- Oil Analysis – Level 1 Testing Oil's Health and Cleanliness
- Removing Contaminants from Oil
- Discipline 7: Understanding Life Cycle Management
 - Concept of Life Cycle Costing
 - Study of Life Cycle Costing and its Importance
- Discipline 8: Spare Parts Management
 - Spare Parts Management Explained
 - Importance of Physical Inventory and Systems Inventory
 - Problems and Issues on Spare Parts
 - Importance of a Spare Parts Management Strategy

DAY 3

Continuation of Module 5

- Discipline 9: Root Cause Failure Analysis
 - Root Cause Failure Analysis Defined
 - Evidence – The Lifeblood of Any Root Cause Failure Analysis
 - Difference between Failure Analysis RCA and RCFA
 - Levels of Root Cause – Physical Cause, Human Cause and Latent Cause
 - RCFA Case Study – Pump Failures
 - Reflections and Lessons Learned from the 9th Discipline
- Discipline 10: Reliability Strategies
 - Understanding Reactive, Preventive, Predictive & Proactive Maintenance
 - Concept of Reliability-Centered Maintenance
 - How RCM Is Being Performed
 - Comparing TPM and RCM and what they believe in
 - Reflections and Lessons Learned from the 10th Discipline

Module 6: Maintenance Management Advance Discipline

- Discipline 11: Understanding Condition Based Maintenance
 - Predictive Maintenance
 - Understanding the P-F Interval
 - Potential and Functional Failure
 - Importance of Determining Potential Failures
- Discipline 12: Computerized Maintenance Management Software
 - Purpose of CMMS
 - Application of CMMS
 - Role of CMMS in Maintenance Management
 - Considerations in Selecting CMMS

Module 7: How to Apply the 12 Disciplines of Maintenance

- Determine Where Your Maintenance Is Right Now
- Understand Where You Want to Go
- Understand How You Will Go There
- Determine If You Have Finally Arrived

Module 8: Lessons learned from the 12 Disciplines

- Closing Remarks on World Class Maintenance