



# Advanced Maintenance Leadership & Technology



## Introduction:

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When done well your maintenance strategies deliver the six purposes of maintenance, equipment reliability, failure avoidance, defect elimination, least operating costs, risk reduction and maximum production. Fail to do achieve one of them and your maintenance efforts will not get the big pay-offs that they should. Maintenance that does not make you more production and profit is a poor sort of maintenance. Modern maintenance focuses on maximizing operating profit by driving reliability growth at every stage of the business life-cycle. The training shows and explains how to select and use preventive, predictive and precision maintenance strategy and methods that means your operation has

## Who Should Attend?

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OE champions, Maintenance managers, engineers & planners, reliability and maintenance engineers, facilities and utilities managers, top level maintenance technicians, operations and production managers & engineers, plant engineers, design engineers, reliability engineers & technicians, operators, safety engineers, risk engineers, CMMS and spare parts personnel, safety engineers and anyone who is involved in reliability engineering

## Course Objectives:

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By the end of this course delegates will be able to:

- Consider the total true cost impact of equipment failures
- Review basic equipment design to discover what is necessary for its proper operation
- Look at equipment in a production environment to understand the operating impact
- Investigate expectations for the performance of plant and equipment
- Determine maintenance requirements and the operating environment
- Establish frequencies and a program for PM/PdM
- Identify processes, information, physical resources and job skills required for PM/PdM
- Recognize other business processes and information which link to PM/PdM
- Track and trend PM/PdM performance, outcomes and savings
- Identify necessary documentation, its content and its arrangement for PM/PdM
- Initiate the continuous improvement of PM/PdM systems and processes
- Imbed best practice maintenance into your organization

## Course Outline:

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### Key Design and Engineering Concepts for High Reliability

- Life-cycle Effect on Costs and Profits
- Designing to minimize operating costs
- Operating and maintenance requirements
- Defect and Failure True Costs
- Business-wide impact of breakdowns
- Cost surge from failure
- Variability and Defect Creation
- Defect generation model
- Defect elimination strategy

- Risk and Probability of Failure
- Frequency reduction strategies
- Consequence reduction strategies
- Physics of Failure
- Materials of construction limitations
- Design requirements and selection
- Degradation Curve, Degradation Causes
- Rate of equipment failure
- Condition monitoring frequency
- Reliability Growth Cause Analysis
- Minimizing deformation and stress in parts
- Precision practices for reducing stress
- Reliability Engineering
- Basic reliability concepts
- Improving equipment reliability
- Series and Parallel Reliability
- Series systems, Parallel systems
- Process Mapping for Reliability, Equipment
- Work activities
- FMECA/FMEA/RCM
- Methodologies explained
- Requirements for successful application of the methodologies
- Maintainability and Supportability
- Business processes for minimizing production downtime
- Improving maintenance response
- Failure Root Cause Analysis
- RCFA explained
- 5 Why explained
- Creative Disassembly explained

## Installation, Operating and Maintenance Requirements

- Degradation and Degradation Management
- Condition monitoring for degradation
- Plant operation for maximum reliability
- Maintenance and Reliability Strategy
- Component Failure Curves
- Defect Elimination
- System Reliability
- Life Cycle Costs
- Condition Monitoring and Predictive Maintenance
- Choosing suitable CM technologies
- Selecting parts replacement
- Preventive Maintenance Strategy
- Reliability through PM activities
- Selecting PM frequency
- Maintenance Procedures for Work Quality Assurance
- Accuracy controlled work quality
- Writing accuracy controlled procedures
- Lubrication Standard
- Lubrication cleanliness
- Lubrication management
- Balancing Standard
- Balance limits
- Common errors causing out-of-balance
- Alignment Standard
- Shaft alignment limits
- Common errors causing misalignment
- Bearing Vibration Standard
- Causes of bearing vibration

- Control of bearing vibration
- Precision Maintenance
- 12 requirements for precision maintenance
- Introducing precision maintenance to the workforce
- Stores and Storage Practices
- Storage for parts reliability
- Parts management for PM activities