



ONLINE TRAINING COURSE

RCM III

## RCM III: Asset Performance Based Maintenance - Reliability Program Development & Implementation

**Acronym:** RCM III Course

**Dates:** 9-11 November 2021

**Venue:** Online

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A comprehensive practical course on RCM-III APMS program development, implementation and optimization in power generation industry and customer specific equipment discussions in Generation and Distribution

### Key Focus:

- RCM III Philosophy
- FMECA Approach, Maintenance Strategies Optimization
- Mitigating Assets Threats to Opportunities
- Equipment Care Program
- BAP- Bad Actor Program
- Proactive CBM – Condition Based Maintenance
- RRM – Risk and Reliability Management Roadmap
- Maintenance and Reliability KPIs
- Maintenance Efficiency Index
- Reliability Framework Development and Implementation
- Performance and Functional Based M&R program
- Critical Equipment Discussions
- RLA- Remaining Life Assessment



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## **Course Description**

Assets operations and maintenance are paramount to overall effectiveness of business objectives ensuring minimum downtimes and maintenance cost optimization. The variety of Power Generation Equipment such as Gas Turbines, HRSGs, Boilers, Steam Turbines, Generators, Boilers, Control System and Distribution Grids bring certain complexities when identifying problems and conducting the specific maintenance requirements.

This 3-day program is designed to assist the maintenance management, engineers and technicians in identifying the various Operating Performance and Functional parameters, Generation Reliability considerations as part of RCM-III Program development and implementation, Criticalities and Failure modes, consequences and mitigation characteristics.

The program is specifically designed for discussion on New, Medium Aged and Aged Power Generation Assets and will help participants in developing a Proactive Maintenance and Reliability program with embedded RCM-III methodology & implementation for the whole Assets with emphasis on Specific Equipment plans. Participants will also be provided understanding of Preventive and Predictive Maintenance programs with analysis of Condition Monitoring data and further corrections in Maintenance Program, introduction of RRM – Risk and Reliability Management for optimization of the Generation Assets Maintenance schedule.

Generation Assets Bad actors management programs with emphasis on Trips, Performance variations, Load Cycling its effects, Forced Outages, Turn Around Work-Scopes Optimization techniques will supplement the course with practical exercises.

A thorough insight into the Reliability Framework Current Practices GAPS and resolution, Maintenance cost and life cycle analysis will supplement the course. Remaining Life Assessment, Evaluations and Recommendations and Equipment Repair and Replacement decisions as part of Generation and Distribution process will be discussed in depth.

The Asset management model as applied to Power Generation Assets equipment as part of RCM-III strategies will be discussed in detail with reference to PAS-55 / ISO 55000 recommendations.

## **Who Should Attend**

- Power Generation and Distribution Operations and Maintenance Management
  - Managers
  - Engineers
  - Chief Engineers
  - Vice Presidents
- Maintenance Staff
- Maintenance Planning Managers
- Maintenance Program Engineers
- Reliability Engineers / Managers
- Finance and Procurement Managers

## **Course Benefits**

- Understanding Performance and Functions GAPS in PG Assets
- RCM-III Understanding & Standards ISO55000, SAE JA1011/2
- 29 Steps RCM-III Process
- FMECA Approach in Optimizing PMRs- Preventive Maintenance Routines
- Criticality Analysis and RBD Modelling
- RCM-III based Reliability Program Development and Implementation Guidelines.
- Power Plant Performance GAP Analysis
- Power Plant Major Checks, Rotor, Boiler Assessments

- Equipment performance Evaluation throughout life Cycle
- Understanding Life Extension Evaluation and Recommendations
- Understanding Equipment Key Maintenance Performance Indicators
- Power Plants Bad Actors Management, Analysis
- Issues in Implementing RCM in a Generation Setup
- Operational Cost Monitoring and Analysis
- IEEE 762 Reporting Guidelines
- Systems & Equipment Repair vs. Replacement decision
- Improved job performance, Decision making capabilities
- Technology transfer between participants.

## Learning Objectives

After completing this course, participants will be able to understand:

- Generation Performance and Functional Standards
- Advance Maintenance Management in Power Plant
- Eliminate UPDT unplanned down time
- Optimization of Maintenance program
- Latest innovations in RCM, FMECA, RCFA and CM for Generation
- RCM Implementation strategies and issues resolutions for success
- Implement Solutions that reduce the cost per hour of operation
- Optimize performance and efficiency using CBM & Diagnostics Approach
- Effective reliability program to optimize the performance of the assets
- RCM based Reliability Program Design, Implementation and Control for Assets
  - Practical case studies to evaluate and adopt solutions in Generation Setup
  - Appropriate analytical tools for maintenance decision making.

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## Training Methodology

The training will be facilitated using modern techniques, supported by case studies from real Power Generation environment and videos. The Analysis tools application to maintenance, reliability and failure analysis will be exercised with mini workshop within the sessions.

***Note: Participants are requested to use their laptops to exercise analysis software with their own Asset data. Repair vs. replacement decisions on specific equipment will be exercised during the course.***

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## ABOUT THE ORGANISER

### European Technology Development Ltd. (ETD), UK

ETD is a UK based engineering and consulting company specialising in life assessment/ extension, maintenance, materials and engineering issues in all types of power generating and process plant. In addition to its ***main business of technical consulting, plant inspection and their condition and life assessment***, ETD regularly organises training courses in power, petrochemical, oil, gas and other industrial sectors as a part of its programme on ***technology transfer to industry worldwide***. In the recent past ETD has organised various international workshops/ courses/ conferences in the UK, a number of other European countries (Germany, France, Portugal), Middle East, Far East, South East Asia, Canada and the USA. *For further information,*  
Please visit: [www.etd-consulting.com](http://www.etd-consulting.com) Or, write to: [enquiries@etd-consulting.com](mailto:enquiries@etd-consulting.com)

**We have added optional 30 minutes at the end of each day for discussion and question/answer session.**

## **DAY 1** (Tues. 9<sup>th</sup>)

**Join Zoom at: 0745h -- using the Zoom link provided before the course start date.**  
Times shown are UK, please make sure that you know the right time in your zone.

(0745-0800h UK Time) **Welcome and Introduction to the Day's Proceedings**

**0800-1130h (UK time) + 30 mins. optional at the end for discussion**

- Understanding Generation Types and Designs
- Performance and Functional Variations on PP Assets
- Understanding RCM-III Program and its Historical Development
- Identifying the PG Asset for RCM Implementation
- Power Plant Performance GAP Analysis, Functional and Financial Gains through RCM.
- Complete Understanding of Maintenance Strategies and Philosophies.
- Defining Critical Systems / Equipment / Components.
- GTs, Boilers, HRSGs, Generators, Steam Turbines, Miscellaneous Systems
- Identifying Functions of Critical Systems / Equipment / Components
- Criticality Analysis, Review of PG Asset, FMECA, RAMs
- Performance vs. Functional Reliability
- Calculating Reliability, Availability & Maintainability (Practical Exercises).

**15 mins. Break** (0900-0915h)

**15 mins. Break** (1015-1030h)

(1130 to 1200h) – **Optional: Discussion and Question /Answer Session**

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## **DAY-2** (Wed. 10<sup>th</sup>)

**Join Zoom at: 0745h (UK time)**

(0745-0800h) **Welcome and Introduction to the Day's Proceedings**

**0800-1130h (UK time) + 30 mins. optional at the end for discussion.**

- Identifying Functional and Performance Failures / Failure Modes, Consequences
- 29 Steps RCM Process for Failure Modes
- Failure Modes, Consequences and Categorisation
- P-F Intervals Analysis
- Reviewing the RCFA Studies, Recommendations Management
- Identifying Critical TAGS on Power Generation Assets
- Maintenance Costing, **CAPEX** and **OPEX** Vs LTSAs
- Understanding Mitigations Like Additional PM (Preventive Maintenance) Tasks & RBIs
- Reliability Framework Development & Implementation
- Auditing the Existing PM Program and Reliability Program
- Developing a Reliability Block Diagram (RBD Modelling)
- Critical Performance and Condition Monitoring TAGs identification for PG Assets
- Understanding Existing Maintenance and Reliability Programs
- Developing of Maintenance and Reliability (KPIs) and GAPS Measurement
- Weibull Analysis, MTBF, MTTR, MTTF for PG Systems/ Equipment
- RAM / RBD Model Parameters Evaluation
- Understanding Existing CMMS History and Review for GAPS
- IEEE 762 Reporting on RAMs & Productivity.

**15 mins. Break** (0900-0915h)

**15 mins. Break** (1015-1030h)

(1130 to 1200h) – **Optional: Discussion and Question /Answer Session**

## **DAY-3** (Thurs. 11<sup>th</sup>)

**Join Zoom at: 0745h (UK time)**

(0745-0800h) **Welcome and Introduction to the Day's Proceedings**

**0800-1130h (UK time) + 30 mins. optional at the end for discussion.**

- Mechanical, Electrical, Instrumentation and Condition Monitoring PM Task Analysis
- Effective use of Maintenance Historical Data Base
- Use of Software Systems in RCM/RAM Analysis
- RCM-III Equipment Specific Case Studies (Mini Workshops)
- Redefining Maintenance Tasks in Maintenance Strategy for Reliability Improvement in PG Systems/ Equipments/ Components.
- Making RCM-III a Success Asset-wide, Developing a Culture.
- Extending RCM-III study into RLA study for Plant Systems/ Equipment/ Components
- Additional Specific recommendations for Quality and Condition Monitoring for RCM Success in PG Assets
- Review of LTSAs

**15 mins. Break** (0900-0915h)

**15 mins. Break** (1015-1030h)

(1130 to 1200h) – **Optional: Discussion and Question /Answer Session**

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### **COURSE PRESENTER**

**Syed Nadeem Ahmed**

Asset Performance Management System  
RAM/RCM-III/ MSG-3 Applications Specialist  
M.Sc. Engg Th.PE / Six Sigma MBB



Syed Nadeem Ahmed has diverse professional engineering experience of more than 30 Years with demonstrated ability to Develop and Implement an Asset Performance Management System in Power Generation, Process & Petrochemical and Aviation Industry. Plant Performance Benchmarking and Improvement studies.

He has a Masters degree in Thermal Power Plants Engineering with Six Sigma MBB Analyst qualification. Qualified Reliability Program Development MSG3 Certified.

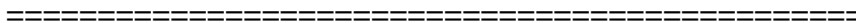
Mr Ahmed has facilitated more than 200 Events on Maintenance and Reliability Programs, RCM-III, Plant Performance and APMS across the globe in Power Generation, Process /Petrochemical and Aviation Industry.

**Key Specialities include**

- APMS – Asset Performance Management System development and implementation for power, process and petrochemical plants
- Leading RAM/RCM/MSG3 based Studies for Plant and its Equipment, Maintenance Strategy deployment, Failure Elimination strategies and Reliability Analytics
- Performance optimizations studies for Power, Process and Petrochemical Plants
- Asset Integrity Assessment/ Remaining Life Assessment (RLA) study of Petrochemical and Power Generation Plants
- Process & Petrochemical Plant Debottlenecking and Performance Optimization study
- Maintenance and Reliability Program Development and Implementation in Industrial Plants
- RMF - Reliability Management Framework development and implementation in Industrial Plants
- MSG -3 Maintenance Steering Group Program Implementation in Industrial Plants
- Work-Processes development, Procedures and Guidelines development, Criticality and GAP Analysis for plant and its equipment.
- Technical Training Development and Facilitations- Plant and Equipment Specific
- Generation – 3 RCM Integrator with MSG3 program for Aircraft & its Systems.

**Key Competencies**

- Plant Life Cycle Asset Management Strategies.
- Plant Asset Performance Management Standards Implementations, Reliability Analysis & Risk Based Studies.
- Generation-3 RCM based Maintenance & RMF - Reliability Program Development and Implementation.
- Work-scope Optimization on Plant Equipment Maintenance. Repair & Overhaul
- Equipment Failure Analysis RCAs, RBD Modelling, FMECA, Generation -3 RCM Program etc.
- Advanced RAM / Generation - 3 RCM Study for Plant, Systems, etc. PM Program optimization
- Focused Lean Six Sigma Trainings (Black Belt Level) for Plant Maintenance and Reliability Professionals.



## REGISTRATION FORM

(Please email the Form or simply email your details, days of attendance and amount paid/to pay)

### Online Training Course

### RCM III (Reliability Centred Maintenance)

**Dates: 9 – 11 November 2021**

**Registration Fee:** Covers delivery of the course & provision of presentations in pdf format (all fees shown are in GB Pounds). Please put 'x' in the relevant box and show the total payment.

<b>Reduced Fee</b> (Until 25 Oct. 2021)		<b>Full Fee</b> (From 26 Oct. 2021)	
£200 per day		£250 per day	
Please show here (no. of attendees x no. of days x £200 or £250) = £			
Please specify which days you are attending (if attending less than 3 days) =			
<b>Total Amount Payable = £</b>			

**How to Pay:** *When paying please quote reference 'RCM III' and the ETD invoice number (if this was issued):*

**1) By bank to bank transfer to:** European Technology Development Ltd.

*(ETD bank account details will be provided on request)*

**2) Credit Cards:** Payment information will be provided on request.

*When registering, please state here how you paid or intend to pay:*

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All Registration & Payment enquiries to: [enquiries@etd-consulting.com](mailto:enquiries@etd-consulting.com)

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#### **Attendee(s) Details**

Your **title** and **name:**

Company:

Job Title (optional):

Address:

Phone:

E-mail:

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#### **Address for Registration:**

Please email the required information/ completed form to: [enquiries@etd-consulting.com](mailto:enquiries@etd-consulting.com)