



1-Day Training Course

Dates: 16 October 2023

Developing and Implementing Advanced Reliability Program in Power Plants

Acronym: 'Reliability Program – Oct. 23'



Advanced Reliability Program for Power Plants

This 1-day Training Course will precede the 3-days (17-19 Oct.) MIMA-3 Conference being held at the same venue.



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www.etd-consulting.com BS EN ISO 9001: 2015 Certified VAT No: 733600853

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Introduction

Comprehensive one-day Training Course on ‘Reliability Program/ Framework with embedded asset management program development, implementation and optimization in power plants’ will cover issues such as customer specific equipment reliability considerations for GTs, STs, HRSG, boilers, generators, transformers, heat exchangers, pumps, compressors, motor piping, instrumentation and control systems, MOVs, auxiliaries and BOPs.

The Course will further discuss asset performance management system ISO 55000, maintenance program optimization and cost reduction with risk based maintenance, optimizing PM / PDM / corrective maintenance ratios, reliability tools and applications, guidelines for practical reliability program development and implementation, performance and functional based maintenance & reliability programs, remaining life assessment and evaluations, impact of cyclic operation, major checks, critical equipment assessments and recommendations.

Course Description

Power Plants’ reliable operation and optimized maintenance are of paramount importance to overall effectiveness of plant business objectives ensuring minimum forced outages. The variety of equipment such as gas turbines, HRSGs, boilers, steam turbines, generators, heat exchangers, fired heaters, pumps, compressors, motors, brings certain complexities when identifying problems and conducting the specific maintenance requirements. This one-day Course is designed to assist the maintenance management, engineers and technicians in identifying various power plant operating performance and functional parameters, plant reliability considerations, and reliability tools as part of advanced RCM program development and implementations, criticalities and failure modes, consequences and mitigation characteristics.

The Course is specifically designed for new, medium aged and aged power plants and will help participants in developing and implementing a Proactive Maintenance and Reliability Program with embedded Reliability- RCM fourth generation methodology & specific equipment plans. Also discussed will be the deep understanding of preventive and predictive maintenance strategies, analysis of condition monitoring data, RBIs (Risk Based Inspections) for the optimization of plant maintenance schedule.

Power Plant critical equipment bad actors management programs with emphasis on trips, performance variations, generation load cycling effects and outage scope optimization techniques will supplement the Course discussions.

Additional discussions in GAPs analysis and resolution, maintenance cost and life cycle analysis with specific focus on IEEE 762 reporting guidelines will be carried out.

Who Should Attend

- Power Plant Maintenance Management
 - Managers
 - Engineers
 - Chief Engineers
 - Vice Presidents
- Maintenance Staff
- Maintenance Planning Managers

- Maintenance Program Engineers
- Reliability Engineers / Managers
- Finance and Procurement Managers

Learning Objectives and Benefits

- Power Generation Plant Maintenance and Reliability Program
- Asset Performance Management System
- Performance and Functions GAPS in Power Generation Plants
- Operational Concepts of Power Generation Plants
- Power Plant Major Checks, Rotor, Boiler Assessments, Critical Equipment Plans
- Power Plant Equipment Life Cycle and Obsolescence Management
- Performance Evaluation Concepts in life Cycle
- Life Extension Evaluation and Recommendations
- Reliability and Maintenance Performance Indicators
- Plants Bad Actors Management, Analysis
- Reliability Program Development and Implementation Guidelines.
- Controlling and Monitoring the Reliability Management Framework.
- Challenges, RCM fourth Generation Applications
- Operational Cost Monitoring and Analysis, operations and Maintenance requirements
- Criticality Analysis, RBD Modeling.
- Systems & Equipment Repair vs. Replacement decision
- Development of Asset Plans-Specific Equipment Plans
- Load Cycling Cost Impact Analysis.

Course Programme

Session 1: 0900 – 1030 hrs.

- Understanding Power Plant Types and Designs
- Performance and Functional Variations in Power Plant Equipment
- Understanding Reliability Program in Power Plant Environment
- Plant Reliability Roadmap – Highest Level Strategic KPIs
- Types of Reliabilities, Functional, Performance, Process etc.
- Understanding Layers of Protection in Power Plants, SIL, SIS and SIF.
- Mechanical, Electrical & Instrumentation Systems Reliability
- Understanding of Maintenance Strategies and Philosophies.
- Data Sources, PHD, DCS, operating logs, CMMS, Failure data, Operators and Maintainers.
- Publicly available sources, OREDA, IEEEs

Tea Break (15 mins.)

Session 2: 10:45 AM – 12:30 PM

- Defining Critical Systems/Equipment/Components.
- GTs, Boilers, HRSGs, Generators, Steam Turbines, HES.
- Misc. Control Systems, DCS, PhDs etc
- Identifying Functions of Critical Systems/Equipment/Components.

- Criticality Analysis Review of Power plant, FMECA, DMECA
- Performance vs Functional Reliability
- Calculating Reliability, Availability & Maintainability. Interpretations
- Equipment and Systems MTBF, MTTR, MTTF, MODT, MLDT, MDT, MUT
- Weibull Analysis & Shape Factors

Lunch Break (1230h - 1330h)

Session 3: 1330 – 1515hrs

- Understanding Life Cycle Curve
- EPIC Phases and Obsolescence Management
- Statistical Distribution Fitting to Plant/Equipment Data
- Statistical Reliability Program, Understanding Reliability Alert levels. (Green, Amber, Red)
- Identifying Functional and Performance Failures/Failure Modes, Codes & Consequences.
- 29 Steps RCM Generation 4th Process for a Failure Mode.
- RCFA Studies in Power Plants.
- Maintenance Costing, CAPEX and OPEX Vs LTSAs
- Inventory levels variation with Plant Reliability

Tea Break (15 mins)

Session 4: 1530h – 1700h

- Developing a Reliability Road Map & Framework
- Reliability Improvement in Systems/Equipment/Components
- Systems of Reliability Meetings, Structure
- PM vs PDM vs RTF strategies
- Maintenance and Reliability (KPIs) and GAPS Measurement- Dash Boards
- Understanding Existing CMMs History and Review for GAPS.
- IEEE 762 - Standard Definitions - Reporting Electric Generating Unit RAMs

Power Plant Cyclic Costs understanding

- Approach to estimating cycling costs
- Start-costs Impacts, Reliability Impacts EFOR
- Baseload Variable Operation and Maintenance (VOM) Cost
- Load Following, Ramping Costs, Start-up Fuel Input and other start Costs
- Heat Rate Impacts and Mitigation Strategies
- Redefining maintenance. tasks in maintenance Strategy
- Recommendations for Quality and CM for Reliability Success in Plants.
- Subcontract Repair reliability Vs OEM Repair Reliability
- LTSAs (Long Term Services Agreement) Review

Asset Performance Management System Integration

- APMS Processes, Domains and Elements
- Reliability Analytics and Failure Elimination integrations.
- Maturity Plans, Value Plans KPIs, Master Generation Plans

- ISO 55000 and APMS Integration
- Best Practices in Power Generation Wrap-Ups.
- Course Closure.

THE COURSE PRESENTER



Nadeem Ahmed, ETD Consultant,
Asset Performance Management System Applications Specialist -
RAM/RCM/MSG3/ MSG4
M.Sc. Engg Th.PE / Six Sigma MBB

An experienced Professional Engineer with Six Sigma qualification & demonstrated ability. Over 33 years of experience in Engineering industry in the field of Maintenance and Reliability engineering in Petrochemical, Power Generation and Aviation Engineering. Process & Power Plants Maintenance & Reliability, Risk based analysis and studies, Performance & Remaining Life evaluation, Overhauling, Testing and Performance of Turbo Machinery in Oil & Gas, Petrochemical, Power Generation and Aviation Industry.

Strong technical qualifications with track record comprising of Plant and Equipment Maintenance and Reliability Strategies. Proven ability to successfully analyse an organization's critical engineering requirements, identify GAPS and potential opportunities, development of innovative and cost-effective solutions for enhancing performance efficiency, increasing reliability, Optimizing Maintenance Strategies, Maintenance cost reduction and improving engineering processes.

Highly sought-after Technical Consultant in Petrochemical Process, Power Generation and Aviation for Developing and Implementing an Integrated RMF – Reliability Management Framework & Reliability/Maintenance Program with RCM Fourth Generation implementation Strategies.

Experienced in Developing and Implementing an APMS- Asset Performance Management System in Asset Intensive Industrial setups.

Masters in Thermal Power Plants Engineering with Six Sigma MBB qualification.

Key Consulting with Embedded Training Specialities

- APMS – Asset Performance Management System Meridium Solution Development and Implementation, Maturity Assessment, Value Plan Indicators and Master Generation Plan Integration for Power, Process and Petrochemical Plants.
- Leading RAM/RCM/MSG3/MSG4 based Studies for Industrial Plants and its Equipment, Maintenance Strategy Alignment, Failure Elimination strategies introduction and Reliability Analytics.
- Performance Optimizations Studies for Power, Process and Petrochemical Plants.
- Leading Asset Integrity Assessment, Remaining Life Assessment Study for Petrochemical and Power Generation Plants,
- Process & Petrochemical Plant Debottlenecking and Performance Optimization study
- Maintenance Program, Strategies Development and Implementation in Industrial Plants

- RMF - Reliability Management Frame work & Program development and implementation in Industrial Plants.
- MSG-3 and MSG-4 Maintenance Steering Group Program Integration, Fourth Generation-3 RCM Implementation in Petrochemical & Power Generation Plant.
- Guidelines, Procedures and Work-Processes Development, Criticality and GAP Analysis for Plant and its Equipment.
- GE, Rolls Royce, Snecma, Pratt & Whitney Turbo Machinery Performance, Testing and Evaluations

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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,*

For further information,

Please visit: www.etd-consulting.com Or, write to: enquiries@etd-consulting.com

REGISTRATION FORM (Please email)

One-day Training Course

Advanced Reliability Program in Power Plants

Date: 16 October 2023

Registration Fee: Covers delivery of the course, provision of presentations in pdf format, tea/coffee during the breaks and lunch.

All fees shown are in GB Pounds. VAT is payable by ALL attendees for the events held in the UK.

Please put 'x' in the relevant box and show the total payment.

Reduced Fee (Until 18 Sep. 2023)	Total payable		Full Fee (From 19 Sep. 2023)	Total payable	
£400 + 20% VAT	£480		£450 + 20% VAT	540	
Please show here (no. of attendees x £); Total Amount Payable = £					

How to Pay: When paying please quote reference “**Reliability Program – Oct. 23**” 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 registration)

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

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

Attendee(s) Details

Attendees' **title(s)** and **name(s)**:

Company:

Job Title (optional):

Address:

Phone:

e-mail:

Address for Registration:

Please email the required information/ completed form to: enquiries@etd-consulting.com

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