MAWA EVENTS

Address: No. 857, Block A2. Leisure Commerce Square - No 9., 46150 Petaling Jaya, Selangor, Malaysia

Phone: +601116373203 | **Email:** info@mawaevents.net

THERMAL AND COMBINED CYCLE POWER PLANTS PERFORMANCE.

"Boost Efficiency, Reliability, and Output in Thermal & Combined Cycle Power Plants"

Schedule

Date	Venue	Fees (Face-to-Face)
13 – 17 Sep 2026	Manama, Bahrain	USD 3495 per delegate

► **Available delivery methods:** Face-to-Face & Online Training

Introduction

Thermal and combined cycle power plants are critical components of the global energy mix. Their performance, efficiency, and reliability have a direct impact on operational costs, energy output, and environmental compliance. With rising fuel prices and tighter regulations, optimizing plant performance has never been more important.

This intensive 5-day training program is designed to enhance the technical understanding of plant systems, performance metrics, maintenance practices, and operational best practices. Participants will gain the skills needed to improve efficiency, reduce downtime, and manage the reliability of thermal and combined cycle plants effectively.

Objectives

By the end of this course, participants will be able to:

- Understand the working principles of thermal and combined cycle power plants
- Analyze heat rate, cycle efficiency, and energy losses
- Identify key performance indicators (KPIs) for plant assessment
- Apply diagnostic techniques to improve plant output
- Implement condition-based and predictive maintenance strategies
- Address common operational challenges and failure modes

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Why Attend

- Gain comprehensive knowledge of thermal and combined cycle power generation
- Learn techniques to monitor, analyze, and enhance plant performance
- Use real-world diagnostic tools and performance models
- Reduce fuel consumption and emissions while maximizing output
- Apply international standards and best practices for maintenance and operations

Target Audience

This program is ideal for:

- Plant Engineers and Operators
- Maintenance and Reliability Engineers
- Power Generation Specialists
- Performance Analysts and Utility Engineers
- Project and Technical Managers in the power sector
- Energy Consultants and Auditors

Individual Benefits

Participants will gain skills in:

- Thermal cycle efficiency and performance assessment
- Root cause analysis of common faults and inefficiencies
- Optimizing combustion, steam, and HRSG performance
- Maintenance planning based on performance indicators
- Using software and tools for diagnostics and reporting

Organizational Benefits

Your organization will benefit from:

- Increased energy output and operational efficiency
- Reduced maintenance costs and forced outages
- Improved asset reliability and life expectancy
- Compliance with environmental and performance standards
- Enhanced technical capability of plant personnel

Instructional Methodology

This course combines practical tools and theory through:

- Strategy Briefings – Key concepts in thermal and combined cycle performance
- Case Studies – Real-life examples of performance gains and failures
- Workshops – Calculations, simulations, and performance troubleshooting
- Peer Exchange – Industry insights, benchmarking, and solution sharing
- Tools – Templates for performance analysis, maintenance logs, and inspection checklists

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Course Outline

Detailed 5-Day Course Outline

Training Hours: 07:30 AM – 3:30 PM **Daily Format:** 3–4 Learning Modules | Coffee breaks: 09:30 & 11:15 | Lunch Buffet: 01:00 – 02:00

Day 1: Fundamentals of Thermal and Combined Cycle Plants

- Module 1: Thermal Power Generation Principles (07:30 – 09:30)
- Energy conversion process and plant layout
- Steam cycle basics and Rankine cycle overview
- Module 2: Combined Cycle Basics (09:45 – 11:15)
- Integration of gas and steam cycles
- Overview of Brayton cycle and HRSG
- Module 3: Main Equipment and System Components (11:30 – 01:00)
- Boilers, turbines, condensers, and auxiliaries
- Module 4: Workshop – Cycle Schematic Mapping (02:00 – 03:30)

Day 2: Performance Monitoring & Heat Rate Analysis

- Module 1: Understanding Heat Rate and Efficiency (07:30 – 09:30)
- Definitions, formulas, and real-world values
- Module 2: Thermodynamic Losses and Deviations (09:45 – 11:15)
- Loss analysis: stack, condenser, friction, etc.
- Module 3: Instrumentation and Measurement (11:30 – 01:00)
- Sensors, data validation, and calibration
- Module 4: Workshop – Heat Rate Calculation (02:00 – 03:30)

Day 3: Maintenance, Reliability, and Diagnostics

- Module 1: Condition-Based and Predictive Maintenance (07:30 – 09:30)
- Monitoring vibration, temperature, and wear
- Module 2: Reliability-Centered Maintenance (RCM) (09:45 – 11:15)
- Criticality analysis and PM optimization
- Module 3: Root Cause Analysis of Failures (11:30 – 01:00)
- Systematic RCA tools and methods
- Module 4: Case Study – Turbine Fault Diagnostics (02:00 – 03:30)

Day 4: Combined Cycle Optimization & Emission Control

- Module 1: HRSG & Steam Cycle Optimization (07:30 – 09:30)
- Heat transfer, steam quality, and deaeration
- Module 2: Gas Turbine Performance Tuning (09:45 – 11:15)
- Compressor, combustor, and turbine efficiency
- Module 3: Emission Standards and Reduction Techniques (11:30 – 01:00)
- NOx, CO, and CO_2 management strategies
- Module 4: Workshop – Emissions & Efficiency Audit (02:00 – 03:30)

Day 5: Performance Benchmarking and Final Project

- Module 1: KPIs and Benchmarking in Power Plants (07:30 – 09:30)
- Metrics for internal improvement and external comparison
- Module 2: Software Tools and Digital Twin Concepts (09:45 – 11:15)
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Data analytics in performance engineering

- Module 3: Final Group Projects & Presentation (11:30 – 01:00)
- Performance improvement action plan
- Module 4: Review, Q&A & Certificate Distribution (02:00 – 03:30)

Certification

Participants will receive a Certificate of Completion in Thermal and Combined Cycle Power Plant Performance, certifying their proficiency in monitoring, optimizing, and maintaining high-efficiency power generation systems.

Why Choose MAWA Events

- **Global Expertise:** More than 17 years of experience in professional training and consulting.
- **Industry-Leading Faculty:** Courses delivered by seasoned professionals with hands-on experience.
- **Practical Insights:** Learn to turn theory into actionable strategies for real-world business impact.
- **Client-Focused Solutions:** Customized programs designed to achieve your organisation’s unique goals.

In-House / Customized Training Interested in running this course for your team? Please contact us:	TEL: **+601116373203**	EMAIL: **info@mawaevents.net**