MAWA EVENTS

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

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

BOILER PLANT & WATER TREATMENT

""Ensuring Safe, Efficient Boiler Operation and Water Quality for Industrial Systems""

Schedule

Date	Venue	Fees (Face-to-Face)
08 – 12 Feb 2026	Manama, Bahrain	USD 3495 per delegate

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

Introduction

Boiler plants are vital for providing steam and heat energy in industrial operations, power generation, and HVAC systems. The reliability and efficiency of boilers are heavily influenced by both operating practices and the quality of feedwater used. Inadequate water treatment can lead to scaling, corrosion, energy loss, and even catastrophic equipment failure.

This comprehensive five-day training program equips participants with the technical knowledge and practical tools needed to operate and maintain boiler systems safely and efficiently. Special focus is placed on water treatment technologies, steam system optimization, boiler chemistry, and troubleshooting common operational issues.

Objectives

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

- Understand the principles of boiler operation and steam generation
- Identify key components and types of industrial boilers
- Apply effective water treatment practices to prevent scaling and corrosion
- Monitor and maintain boiler efficiency and performance
- Troubleshoot and resolve common boiler plant and water system issues

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Why Attend

- Improve boiler efficiency and lower operating costs through effective water treatment
- Minimize downtime and equipment damage caused by poor water chemistry
- Learn to interpret water quality data and take corrective actions
- Ensure compliance with safety, environmental, and industry standards
- Build confidence in handling daily and emergency boiler plant operations

Target Audience

This program is designed for:

- Boiler plant operators and technicians
- Mechanical, maintenance, and utility engineers
- Facilities and energy managers
- Water treatment and chemical technicians
- Professionals involved in the design, inspection, or management of boiler systems

Individual Benefits

Key competencies that will be developed include:

- Boiler operating principles and safety procedures
- Water testing, analysis, and chemical treatment skills
- Steam system balancing and control
- Preventive maintenance and fault diagnosis
- Data interpretation for boiler performance monitoring

Organizational Benefits

Upon completing the training course, participants will demonstrate:

- Increased boiler system reliability and reduced downtime
- Enhanced energy efficiency and operational performance
- Lower maintenance costs through proactive water treatment
- Improved compliance with industry and regulatory standards
- Safer working environment for plant personnel

Instructional Methodology

The course follows a blended learning approach combining theory with practice:

- Strategy Briefings – Technical insights into boiler design, chemistry, and plant operation
- Case Studies – Real-world failure scenarios and maintenance challenges
- Workshops – Water analysis interpretation, treatment plan development, and efficiency calculations
- Peer Exchange – Group discussions on plant operation and troubleshooting experiences
- Tools – Templates for water testing logs, maintenance checklists, and boiler operation records

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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: Boiler Plant Fundamentals

- Module 1: Types and Components of Industrial Boilers (07:30 – 09:30) • Fire-tube, water-tube, and electric boiler designs • Key components: burners, drums, economizers, superheaters • Boiler classifications and selection criteria
- Module 2: Principles of Steam Generation (09:45 – 11:15) • Heat transfer and thermodynamics in boiler systems • Steam properties and enthalpy concepts • Boiler efficiency and energy conversion
- Module 3: Boiler Codes and Safety Requirements (11:30 – 01:00) • Operating pressure and temperature limits • Safety valves, interlocks, and emergency shutdown systems • Applicable standards (ASME, NFPA, API)
- Module 4: Daily Operation and Monitoring (02:00 – 03:30) • Boiler start-up and shutdown sequences • Routine checks and logkeeping • Operator responsibilities

Day 2: Boiler Water Chemistry & Treatment Essentials

- Module 1: Boiler Water Problems and Their Effects (07:30 – 09:30) • Scaling, corrosion, foaming, and carryover • Mechanisms and consequences of poor water quality • Cost and safety impacts
- Module 2: Feedwater and Makeup Water Quality (09:45 – 11:15) • Hardness, dissolved oxygen, alkalinity, and TDS • Raw water treatment methods: filtration, softening, RO • Deaeration principles and equipment
- Module 3: Internal and External Water Treatment Programs (11:30 – 01:00) • Phosphate, chelate, and polymer treatment programs • Oxygen scavengers, pH control, and condensate protection • Treatment chemical selection and dosing methods
- Module 4: Water Testing and Analysis (02:00 – 03:30) • Onsite test procedures and lab coordination • Interpreting results and adjusting treatment plans • Sample collection and record-keeping best practices

Day 3: Boiler Efficiency, Energy Recovery & Control Systems

- Module 1: Boiler Efficiency Fundamentals (07:30 – 09:30) • Calculating combustion and thermal efficiency • Factors affecting fuel usage and loss analysis • Heat recovery strategies and economizer use
- Module 2: Combustion Control and Burner Management (09:45 – 11:15) • Air-fuel ratio control • Burner safety management systems (BMS) • Emissions control and monitoring
- Module 3: Steam System Optimization (11:30 – 01:00) • Steam traps, condensate return, and pressure control • Load balancing and demand matching • Distribution losses and insulation
- Module 4: Case Study – Improving Boiler Plant Efficiency (02:00 – 03:30) • Energy audit findings • Actions taken and outcomes measured • Lessons learned

Day 4: Troubleshooting and Maintenance

- Module 1: Boiler Plant Troubleshooting Techniques (07:30 – 09:30) • Common fault symptoms and root cause analysis • Pressure fluctuation, abnormal noise, loss of efficiency • Step-by-step troubleshooting logic
- Module 2: Preventive and Predictive Maintenance (09:45 – 11:15) • Inspection intervals and task scheduling • Mechanical, electrical, and chemical maintenance • CMMS integration and spare parts planning
- Module 3: Boiler Cleaning and Shutdown Maintenance (11:30 – 01:00) • Chemical cleaning procedures and safety • Lay-up and preservation techniques • Post-maintenance inspection
- Module 4: Workshop – Developing a Maintenance Checklist (02:00 – 03:30) • Drafting daily, weekly, and shutdown task lists • Assigning roles and responsibilities • Sample review and peer input

Day 5: Integration, Compliance, and Final Review

- Module 1: Risk Management and Regulatory Compliance (07:30 – 09:30) • Hazard identification and boiler risk assessment • Documentation and reporting requirements • Legal responsibilities and audit preparation

- Module 2: Emergency Handling and Incident Response (09:45 – 11:15) • Boiler explosion case studies and root causes • Emergency procedures and drills • Communication and response planning
- Module 3: Final Review and Learning Integration (11:30 – 01:00) • Summary of key technical takeaways • Linking water treatment with plant reliability • Self-assessment and learning reinforcement
- Module 4: Action Plan and Certification (02:00 – 03:30) • Individual implementation planning • Group presentations and feedback • Course wrap-up and certificate distribution

Certification

Participants will receive a Certificate of Completion in Boiler Plant & Water Treatment, validating their competence in boiler operation, water treatment practices, troubleshooting, and energy efficiency management in industrial and utility environments.

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.

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