Boiler Operations and Maintenance Training Course

Professional Development Training Course Outline

Category	General Training	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Boiler Operations and Maintenance Training is designed to equip participants with advanced skills in industrial boiler systems, steam generation technology, energy efficiency optimization, predictive maintenance, and plant safety compliance. In today's competitive industrial landscape, efficient boiler operation is critical for reducing operational costs, improving energy utilization, and ensuring uninterrupted production in sectors such as manufacturing, power generation, food processing, petrochemicals, and textiles.

This training focuses on modern boiler control systems, combustion efficiency, water treatment, emissions reduction, and preventive maintenance strategies aligned with global safety standards. Participants will gain hands-on knowledge of troubleshooting boiler faults, improving thermal efficiency, reducing fuel consumption, and implementing digital monitoring systems for smart plant operations. The course is designed to bridge the skills gap between traditional boiler handling and advanced Industry 4.0-enabled maintenance practices, ensuring operational excellence and regulatory compliance.

Programme Curriculum

Boiler Operations and Maintenance Training Course

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Course Objectives

1. Master industrial boiler operations optimization
2. Understand steam generation and heat transfer efficiency
3. Apply predictive maintenance and condition monitoring
4. Improve energy efficiency and fuel cost reduction
5. Implement boiler safety and risk assessment protocols
6. Analyze combustion performance and emission control
7. Develop skills in water treatment and scaling prevention
8. Perform fault diagnosis and troubleshooting techniques
9. Understand automation in boiler control systems
10. Ensure regulatory compliance and ISO safety standards
11. Reduce downtime using preventive maintenance strategies
12. Optimize thermal performance in industrial boilers
13. Integrate smart monitoring and IoT-based boiler systems

Target Audience

1. Boiler operators and technicians
2. Maintenance engineers and supervisors
3. Mechanical and industrial engineers
4. Power plant operators
5. Facility and utilities managers
6. Energy auditors and consultants
7. HVAC and plant maintenance staff
8. Technical trainees in industrial operations

Course Modules

Module 1: Boiler Fundamentals & Thermodynamics

- Basics of steam generation and heat transfer
- Types of industrial boilers
- Boiler efficiency principles
- Fuel combustion fundamentals
- Pressure, temperature, and energy balance
- **Case Study:** Analysis of efficiency loss in a textile factory boiler system due to poor heat exchange.

Module 2: Boiler Operation Systems

- Start-up and shutdown procedures
- Load variation handling techniques
- Steam distribution systems

- Operational safety checks
- Control panel operations
- **Case Study:** Power plant shutdown caused by improper boiler start-up sequence.

Module 3: Combustion Technology & Fuel Efficiency

- Fuel types and combustion reactions
- Burner management systems
- Air-fuel ratio optimization
- Emission control technologies
- Carbon footprint reduction
- **Case Study:** Cement plant reducing fuel consumption by 18% through burner tuning.

Module 4: Water Treatment & Scaling Control

- Boiler feedwater treatment
- Chemical dosing systems
- Scale and corrosion prevention
- Blowdown techniques
- Water quality testing
- **Case Study:** Food processing plant boiler failure due to untreated hard water scaling.

Module 5: Boiler Maintenance Strategies

- Preventive maintenance planning
- Predictive maintenance tools
- Inspection and cleaning procedures
- Mechanical wear detection
- Maintenance scheduling optimization
- **Case Study:** Manufacturing plant reducing downtime by 40% using predictive maintenance.

Module 6: Automation & Control Systems

- PLC and SCADA in boiler systems
- Sensors and instrumentation
- Real-time monitoring systems
- Alarm and safety interlocks
- Smart control optimization
- **Case Study:** Oil refinery improving safety through automated boiler control integration.

Module 7: Boiler Safety & Risk Management

- Hazard identification and risk analysis
- Explosion prevention systems
- Pressure safety valves and controls
- Emergency shutdown procedures
- Occupational safety standards
- **Case Study:** Accident prevention in a chemical plant through improved safety valve calibration.

Module 8: Energy Efficiency & Sustainability

- Heat recovery systems

- Waste heat utilization
- Energy audits and benchmarking
- Green boiler technologies
- Carbon reduction strategies
- **Case Study:** Steel plant achieving 25% energy savings using waste heat recovery system.

Training Methodology

This course employs a participatory and hands-on approach to ensure practical learning, including:

- Interactive lectures and presentations.
- Group discussions and brainstorming sessions.
- Hands-on exercises using real-world datasets.
- Role-playing and scenario-based simulations.
- Analysis of case studies to bridge theory and practice.
- Peer-to-peer learning and networking.
- Expert-led Q&A sessions.
- Continuous feedback and personalized guidance.

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price

23 Nov 2026	27 Nov 2026	Online	$1,000
23 Nov 2026	27 Nov 2026	Physical	$1,500
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$4,500
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

Ready to enroll or request a customized program? Book online or contact us:

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