



شركة ميرك العربية السعودية
MEIRC Saudi Arabia

Boiler Operation, Maintenance and Safety

Duration 5 Days

Objectives:

- How/When to Schedule Preventive Maintenance Procedures
- Differences between High Pressure and Low Pressure boilers
- Differences between Firetube and Watertube boilers
- Primary boiler components
- Operating pressures and temperatures of cast iron boilers
- Differences between steam boilers and hot water boilers
- Applications for Electric Boilers
- Four major perils associated with boilers
- Common boiler accidents to avoid
- All about furnace explosions
- Dangers of low water conditions
- How to inspect your Boiler
- Conducting efficiency tests
- Maintenance troubleshooting tips
- Waterside and Fireside maintenance
- Boiler design and construction codes and standards
- How to safely and efficiently operate your boiler
- Burner operations and combustion control systems

Outline Course:

I. BOILER FUNDAMENTALS

- A. Firetube Boilers
- B. Watertube Boilers
- C. Cast Iron Boilers
- D. High Pressure Boilers
- E. Low Pressure Boilers
- F. Steam Boilers
- G. Hydronic Boilers

II. FUNDAMENTALS OF COMBUSTION and HEAT TRANSFER

- A. Theory of Combustion
- B. Thermodynamics
- C. Steam Tables

III. BURNER OPERATION & CONTROL

- A. Gas Train
- B. Oil Train
- C. Standard Burner
- D. High Turndown Burner
- E. Burner Controls

IV. BOILER OPERATION and TESTING

- A. Operator Licensing and Certification
- B. Start-Up and Shut-Down



- C. Normal Operation
- D. Valve Types
- E. Safety Valves
- F. Low Water Cutoff Controls

V. BOILER ROOM SAFETY

- A. Boiler Accidents
- B. Cause and Effect

VI. CAUSE and EFFECT CASE STUDY

- A. Safety Valves
- B. Confined Spaces
- C. Lockout/Tagout

VII. CONSTRUCTION & DESIGN STANDARDS

- A. ASME Codes
- B. NFPA Codes
- C. NBIC Code

VIII. CONTROLS and SAFETY DEVICES for AUTOMATICALLY FIRED BOILERS

- A. Water Level Control
- B. Temperature Control
- C. Pressure Control
- D. Fuel Trains

IX. INSPECTION and MAINTENANCE of COMMERCIAL and INDUSTRIAL BOILERS

- A. Fireside
- B. Waterside
- C. Burner
- D. Auxiliary Equipment

X. BOILER & BURNER EFFICIENCY

- A. Heat Exchanger Efficiency
- B. Combustion Efficiency
- C. Efficiency Tests
- D. Condensate Return
- E. Steam Traps

XI. TROUBLESHOOTING

- A. Burner
- B. Controls
- C. Additional Tips

XII. BOILER OPERATOR LICENSING EXAM