

Training Title

BOILER AND STEAM GENERATION SYSTEM

Training Duration

5 days

Training Venue and Dates

PE165	BOILER AND STEAM GENERATION SYSTEM	5	08 – 12 September, 2019	\$4,250	Dubai, UAE
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In any of the 5 star hotels. The exact venue will be informed once finalized.

Training Fees

- 4,250 US\$ per participant for Public Training includes Materials/Handouts, tea/coffee breaks, refreshments & Buffet Lunch.

Training Certificate

Define Management Consultancy & Training Certificate of course completion will be issued to all attendees.

TRAINING DESCRIPTION

Boilers are one of the most common emission sources and range in use from small fire tube boilers to large utility boilers associated with power plant facilities. The course discusses uses of boilers, heat transfer methods and fundamentals of operation of modern industrial and utility boilers including those fired by natural gas, biomass, municipal waste and coal (circulating fluidized bed units). The course also discusses steam turbines and power generation. This is followed by a detailed discussion on emissions and control techniques such as Low-NO_x burners, FGR, staged combustion, SCR and SNCR. New technologies such as Ultra Low-NO_x 9 ppm burners, applicable federal and local BACT regulations, permitting requirements and agency inspection procedures and safety concerns are thoroughly discussed.

TRAINING OBJECTIVES

- **To Learn Fundamental of steam Equipment**
- **All Practical understanding of boiler , steam generating system**
- **Inspection and maintenance aspects , Selection aspects**
 - Fundamental of steam Equipment
 - Selection of boilers types / steam system
 - Operation conditions , fuels and space constraints
 - Inspection of the equipment to ensure maintenance and risk / failures
 - are proactively minimized via typical solution

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WHO SHOULD ATTEND?

- Inspection Engineer
- Mechanical Design Engineer
- Experienced boiler operators who need to fill knowledge gaps or to help prove competence., Boiler Supervisees, process Engineers and Inspection Engineer
- Mechanical Design Engineer and utility Engineers as they will collect information covering the following topics:

TRAINING METHODOLOGY:

A highly interactive combination of lectures and discussion sessions will be managed to maximize the amount and quality of information and knowledge transfer. The sessions will start by raising the most relevant questions, and motivate everybody find the right answers. You will also be encouraged to raise your own questions and to share in the development of the right answers using your own analysis and experiences. Tests of multiple-choice type will be made available on daily basis to examine the effectiveness of delivering the course. Very useful Course Materials will be given.

- 30% Lectures
- 30% Workshops and work presentation
- 20% Group Work& Practical Exercises
- 20% Videos& General Discussions

DAILY OUTLINE

Day One

- **Steam Boilers**
 - Steam Boiler Types
 - Package Boilers
 - Field-Erected Boilers
 - Electric Boilers
 - ASME Code Standards
- **Steam Boilers and Fittings**
 - Fittings
 - Accessories
- **Boiler Room Systems**
 - Steam System
 - Feedwater System
 - Fuel Systems
 - Draft Systems
- **Steam and Water Accessories**
 - Feedwater Heaters

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- Feedwater Pumps
- Surge Tank
- Condensate Tank and Pump Unit
- Main Feedwater Line
- Feedwater Regulators
- Steam Traps
- Desuperheating and Pressure-Reducing Station
- **Fuel Burning Equipment**
 - Fuel Oil Burners
 - Gas Burners
 - Combination Gas/Fuel Oil Burners
 - Stokers (Coal Burners)
 - Utilizing Waste Heat

Day Two

- **Draft**
 - Measurement of Draft
 - Natural Draft
 - Mechanical Draft
 - Air Heaters
 - Gas and Fuel Oil Draft System
 - Chain (Traveling) Grate Stoker Draft System
 - Pulverized Coal Draft System
 - Scrubber
- **Combustion**
 - Fuels For Combustion
 - Combustion of Fuels
- **Combustion Controls**
 - Automatic Combustion Controls
 - Building/Plant Automation Systems
 - Recorders Smoke Indicators
- **Instruments**
 - Pressure Gauges
 - Temperature-Measuring Devices & Flow Meters

Water Level Control Systems

1. Water control levels
2. Hydraulic Test Devices
3. Float controls
4. On/Off Water Control Systems

Automatic TDS Control Systems

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Day Three

▪ **Steam Boiler Operation**

- Operator Duties and Responsibilities
- Boiler Start-Up and Shut-Down Procedures
- Boiler Inspection
- Boiler Lay-up
- Emergency Procedures in Boiler Operation
- Routine Boiler Maintenance
- Boiler Room Safety

Combustion Check Lists

1. Visual checks
2. Measurements
3. Readings
4. Thermal efficiency checks
5. Boiler efficiency
6. Heat balance at full load
7. Combustion curves all fuels

Combustion Practice and Efficiency

1. Atmospheric pollution
2. Sulphur dioxide
3. Carbon Monoxide
4. Combustion performance

Essential Routines

1. Daily checks
2. Weekly checks

Actions in Emergencies

Day Four

OPERATION

1. Preparation
2. Raising Pressure
3. Special Precautions
4. Bringing on Load
5. on-Load Operations

Day Five

- **Water Alarms & Flame Failure Equipment**
- **Procedures during Banking & Shutdown Periods**

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- **Inspection on Plant Whilst Not in Operation**
- **Abnormal Conditions**
- **Actions to Be Taken**
- **Loss of Fuel**
- **Loss of Electrical Supply**
- **Failure of ID or FD Fans or Auto Flue Damper, Where Fitted**
- **Failure of Auto System**
- **Loss of Pressure in Fully Flooded Boiler Systems**
- **Awareness of The Time to Enter a Dangerous Condition Following an Alarm**

NOTE:

Pre & Post Tests will be conducted

Case Studies, Group Exercises, Group Discussions, Last Day Review & Assessments will be carried out.



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