

# Steam Boilers

## INTRODUCTION

- This Steam Boilers training seminar will focus on the study of correct operation and regular routine maintenance to ensure that boiler plant remains at peak efficiency, keeping running costs to a minimum. The training seminar provides participants with the best practices and procedures of boilers operation and maintenance
- The goal of this training seminar is to ensure participants gain a comprehensive understanding of commercial, industrial and utility boiler systems. This Steam Boilers training seminar covers the principle of operation of steam boilers, types and the main components of steam boilers. Boiler inspections, maintenance, operating controls testing, and troubleshooting will all be discussed. Also, the protection and burner management system will be discussed.
- Overall, this Steam Boilers training seminar is designed to help maximize safety, dependability, and efficiency, thus extending boiler life, improving boiler efficiency, saving energy costs for the employer, and establishing a culture of safe work practices among the employees.

This training seminar will highlight:

- Combustion process and draft system for steam boilers
- Boilers types and components
- Boiler control and protection systems
- Routine operation and emergency procedures
- Problems and maintenance of Steam Boilers

## OBJECTIVES

At the end of this training seminar, you will learn to:

- Understand the importance of draft system for proper operation
- Improve understanding of control and protection system
- Understand the best practice operation procedures
- Understand the burner management system
- Understand NDT and maintenance procedures

## **TRAINING METHODOLOGY**

- This Steam Boilers training seminar will be delivered along workshop principles with formal lectures, video clips, multimedia illustrations and interactive worked examples. Group discussions will be followed to enhance the skills of the participants. Relevant case studies will be provided and discussed.

## **ORGANISATIONAL IMPACT**

The organization will benefit from this training seminar by:

- Improving plant reliability by enhancing the staff skills
- Reducing costly downtime
- Improving the performance of plant
- Reducing Repair Cost
- Increasing plant and staff safety
- Saving money and time by enhancing the troubleshooting skills

## **PERSONAL IMPACT**

- Enhancing their basic knowledge related to boiler operation and maintenance
- Improve the understanding of control and protection system of steam boilers
- Utilize best practices in fault finding techniques, inspection and procedures to reduce costly downtime Enhancing their adaptation to changing technology
- Utilize best operation practices to reduce fuel cost
- Contribute to plant emission compliance

## **WHO SHOULD ATTEND?**

- This Steam Boilers training seminar is intended for all employees involved in the operations and maintenance of steam boilers.

This training course is suitable to a wide range of professionals but will greatly benefit:

- Operators
- Operating Engineers
- Supervisory Personnel
- Maintenance Engineers
- Mechanical Technicians

## Course Outline

### Basics of Thermodynamics, Heat Transfer and Combustion

- Introduction to Steam Boilers
- Latent Heat & Sensible Heat
- Steam Properties
- Purity of Steam
- Mass and Energy Balance
- Conduction, Convection, and Radiation
- Combustion Fundamentals
- Excess Air & Flue Gases Relation

### Boiler Description

- Classifications of Steam Boilers
- Main Pressure Parts Components of Steam Boilers
- Burners
- Low NOx Burners
- Draft System
- Water Treatment System

### Boiler Control and Protection

- Safety Valves and Flame Safeguard
- Oxygen Trim
- Burner Management System
- Continuous Blowdown Control
- Drum Level Control

### Operation of Steam Boilers

- Boiler & Combustion Systems Hazards Codes
- Principles of Boiler Operation
- Activities Before Start-up
- Start-up & Shut down Procedures
- Routine Operation During Boiler Service
- Emergency Procedures

### Maintenance of Steam Boilers

- Problems of Steam Boilers
- Preventive Maintenance Program
- Destructive Test of Steam Boilers
- NDT of Steam Boilers
- Steam Boiler Repair