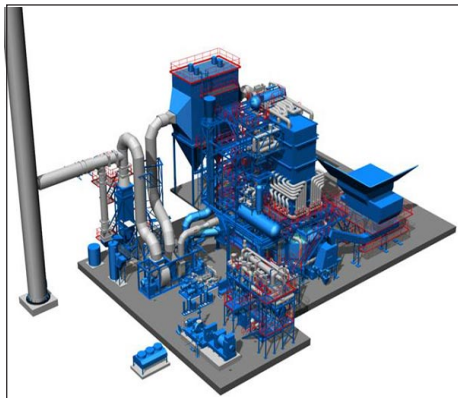


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# PRACTICAL BOILER PLANT OPERATION AND MANAGEMENT FOR ENGINEERS AND TECHNICIANS



## **WHAT YOU WILL LEARN:**

- How to install, operate, maintain and manage boiler plants
- Steam and combustion processes
- Safe boiler operation techniques
- How to use existing technologies to reduce pollution and emission levels
- How to achieve peak boiler plant efficiencies
- Identify and troubleshoot boiler problems quickly and efficiently

## **WHO SHOULD ATTEND:**

- Senior boiler plant operators, repairers and installers
- Boiler plant construction managers
- Plant engineers
- Operation, maintenance, inspection and repair managers, supervisors and engineers
- Mechanical engineers and technicians
- Design engineers
- Insurance company inspectors
- Consulting engineers

## The Workshop

The boiler plant operation and management workshop is an intensive, highly practical two day workshop. You will gain the most up-to-date information and practical understanding of the installation, operation, maintenance and management of boiler plants. The workshop will give you the ability to recognise and solve boiler problems simply, easily and with confidence.

At the end of this workshop participants will be able to:

- Identify the various types of boilers
- Use essential terms and understand their key applications
- Describe the typical characteristics of fuels fired
- Perform basic combustion and process calculations
- Recognise the impact fuels have on the boiler heat transfer surfaces
- Describe the ancillary equipment associated with steam boiler plants and their integral role in the safety of the boiler
- Discuss the correct operation, control sequences and procedures for the safe operation of a typical fire-tube boiler plant
- Outline the applicable pressure part design codes and explain their influence on boiler pressure parts sizing, inspection and non-destructive examination
- Initiate an effective inspection and maintenance program
- Minimise forced outages and prevent serious damage to boiler equipment
- Provide an overview of the legislative requirements plus the essential steps and responsibilities for the repair of boilers
- Recognise the importance of and implement the procedures for the protection of a boiler during cold storage
- Outline the technologies available for the reduction of emission levels and the applicable international legislative controls

## Practical Sessions

This is a practical, hands on workshop enabling you to work through practical exercises which reinforce the concepts discussed.

**To gain full value from this workshop, please bring your laptop/notebook computer.**

## The Program

### INTRODUCTION

- Types of package boilers and their applications
- Boiler components, terminology and definitions

**Practical assignment (workshop)**

### FUEL COMBUSTION AND THE STEAM GENERATION PROCESS

- Overview of the boiler heating and steam generation process
- Influence of the fuel type on the boiler design operation
- Firing appliances
- Basics to theory of combustion
- Thermal efficiency
- Fireside deposits and corrosion

**Practical exercises (calculations)**

### BOILER AUXILIARY PLANT

- Water treatment plant and dosing
- Feedwater pumps
- Valves and steam traps
- Piping
- Fans
- Economisers and heat recovery equipment
- Flue gas cleaning and dust removal

**Practical exercises (quiz questions)**

### OPERATION AND CONTROLS

- Boiler instruments and their purpose
- Typical P&I diagrams for coal and oil/gas fired units
- Control systems and system operating philosophy
- Operational sequences and procedures
- Safety equipment and interlocks
- Safety procedures and emergencies
- Operating records and logs
- Typical operational problems, the reason for the problems and 'trouble shooting'

**Practical exercises (workgroup)**

### PRESSURE CONTAINING COMPONENTS

- Basics to codes calculation theory and assumptions
- Overview of design parameters for shell, furnace, plates and tubing
- Importance of pressure part inspection

**Practical assignment (exercise and quiz questions)**

### PLANNING AND MANAGING BOILER MAINTENANCE

- Critical importance of maintenance policies and programs
- Setting up an inspection program
- Types of boiler inspections
- Involvement of the Authorised Inspection Authority (AIA)
- Maintenance information and procedures
- Developing a preventive maintenance program
- In-house versus contractor repair maintenance

**Practical assignment (workshop)**

### MANAGING BOILER REPAIRS AND MODIFICATIONS

- When does a boiler repair become a boiler modification?
- Importance of historical records
- Understanding the legislative requirements
- Steps to be taken when a 'defect' is identified
- Responsibility of the boiler owner
- Responsibility of the boiler repair contractor
- The AIA and their inspection points

**Practical assignment (workshop)**

### COLD STORAGE OF A BOILER

- Clearly establishing the storage period
- Storage period and critical preservation steps
- Storage instructions and procedures
- Consequences of no storage plan

**Practical exercises (quiz questions)**

### EMISSION CONTROLS AND ENVIRONMENTAL CONSTRAINTS

- Types of emissions for different fuels fired
- Methods used for controlling boiler flue gas emissions
- Effectiveness of various types of cleaning equipment
- What emission levels are specified in international standards or legislation?

**Practical exercises (quiz questions)**

### SUMMARY, OPEN FORUM AND CLOSING