TRAINING TITLE

FIRED HEATERS OPERATION AND TROUBLESHOOTING

Training Duration

5 day

Training Venue and Dates

Ref. No. PE211	**Fired heaters operation and troubleshooting**	**5**	**01-05 Sep. 2025**	**$5,500**	**DUBAI, UAE**

In any of the 4 or 5-star hotels. The exact venue will be informed later.

Training Fees

- **$5,500 per participant for Public Training includes Materials/Handouts, tea/coffee breaks, refreshments & Lunch**

Training Certificate

Define Management Consultants Certificate of course completion will be issued to all attendees.

TRAINING DESCRIPTION

This program has been developed to provide an in-depth, yet practical review of the art and science of Combustion Techniques in fuel-fired heaters. Optimization of fired heaters is critical to meet the conflicting requirements of reducing operation costs, increasing production throughput, and meeting environmental requirements. This course introduces the principles and practices associated with combustion techniques in furnaces and boilers with emphasis on enabling participants to improve the thermal efficiency of their furnaces and meeting environmental compliance targets. Different aspects in combustion techniques, fuels characteristics, flame structures, flow and mixing in flames, fuel atomization and combustion of fuel sprays, gaseous combustion, fuel burners, and combustion control systems, measuring techniques in evaluating flame performance, troubleshooting, and guidelines for safe, efficient operation and environmental management of furnaces will be covered. Information on how to properly adjust burners for maximum efficiency, safe operation, and minimum level of emissions is presented.

TRAINING OBJECTIVES

Upon the successful completion of this course, participants will be able to:-

- Explain the principles of combustion, the characteristics of different designs, and methods of operations, including important controls and guidelines to optimize and

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improve heater efficiency, review techniques to operate more safely and meet emission guidelines

- Describe how process fired heaters function.
- Identify and list the applicable codes and standards for fired heaters.
- Understand the operational systems, check-lists and procedures adopted for fired heater start up and shutdown and identify the risks associated with fired heater start up and shutdown and the applicable safety procedures to be followed.
- Gain enough skills to anticipate and avoid all problems associated with process fired heater operation and operate heaters with safety as the prime consideration.
- Identify control and safety issues.
- Explain key operating parameters.
- Recognize typical problems and identify possible causes.
- Discuss key inspection and turnaround items.

WHO SHOULD ATTEND?

Process, Operation, Service, maintenance, or plant/facility engineering staff of processing plant, institution, power plant units, which uses boilers and/or furnaces and the related equipment such as oil and gaseous burners, Managers and technicians at industrial plants responsible for furnaces and boilers performance and efficiency. Also it should give a basic and excellent experience for the maintenance engineers of the thermal units, reliability engineers, anyone interested in Furnace and Boilers combustion techniques.

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 motivating everybody to 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

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COURSE PROGRAM:

DAY 1

1. Basic Principles of Combustion

- Combustion chemistry
- Stoichiometric combustion
- Types of fuels
- Gross and net heating values
- Flue gas analysis
- Emissions level

2. Introduction to Process Fired Heaters

- Fire Box
- Convection
- Stack
- Burners

3. Types of Fired Heaters

- Indirect
- Direct

DAY 2

4. Fired Heater Engineering

- Fluid Flow
- Heat Transfer
- Fuels
- Design Guidelines

5. Gas and Oil Fired Heaters Combustion Techniques

6. Direct fire heater components

- Radiant section
- Shield section
- Convection section
- Flue gas stack
- Fans and blowers
- Dampers, louvers, and diverters

7. Fired Heater Data Sheet Understanding

DAY 3

8. Fuel burning management system

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9. Air flow (primary, secondary, and excess air)

10. Types of draft

- Natural
- Forced
- Induced
- Balanced drafts

11. Air preheating

12. Safe and Effective Commissioning, Start-up and Shutdownof Fired Heaters

- Preparations for start up
- Start-up sequence
- Operating Parameters Follow up
- Operation optimization

13. Revamping Fired Heaters

- Upgrade Convection Section
- Upgrade Instrumentation and Controls
- Maximizing Furnace Life

DAY 4

14. Fired Heater Control

- Instrument Components
- Flow, temperature, and pressure control loops
- Alarms and interlocks
- P&ID Description

15. Fired Heater Inspection

- Types of Tests
- Inspection Procedure
- Inspection Results Evaluation

DAY 5

16. Improve the Efficiency of Fired Heaters

- Excess Air
- Burner Types
- Flame types

17. Fired heaters pre-commissioning and commissioning procedure

18. Calculation of Fired Heater Duty

19. Fired Heater Safety

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20. Fired Heater Problems and Troubleshooting

Post Course Test

NOTE:

Pre-& Post Tests will be conducted.

Case Studies, Group Exercises, Group Discussions, Last Day reviews, and assessments will be carried out.

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