Heat Exchangers & Fired Heaters operation & Maintenance

Course Description

INTRODUCTION

This Fired Heaters and Heat Exchangers: Operation & Troubleshooting training reviews the operation and troubleshooting of heat transfer equipment commonly used in the oil and gas industry. Heat transfer equipment discussed will include shell and tube exchangers, compact heat exchangers and fired heaters.

This training will enable to improve heat exchanger effectiveness and extend equipment's life span by teaching you the basic principles of fluid flow and heat transfer. Participants will also learn about the operation and troubleshooting of shell and tube heat exchangers, as well as air-cooled and plate exchangers.

This training will provide insight to the design parameters of fired process heaters and ancillary equipment. Additional major topics include instrumentation and controls, operations and troubleshooting, mitigation of emissions, corrosion and fouling. The covers techniques to improve efficiency, run lengths, and safety. The modern diagnosis and control tools in a process heater to control draft or any other important variable will be covered.

This training will highlight:

- Design, operation and troubleshooting of shell and tube heat exchangers
- Design, operation and troubleshooting of plate heat exchangers
- Design, operation and troubleshooting of air-cooled heat exchangers
- Types, operation and troubleshooting of fired heaters
- Factors affecting the performance of fired heaters

OBJECTIVES

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

- Evaluate the performance of heat transfer equipment
- Identify the best practice operation procedures of heat exchangers
- Identify the problems of heat exchangers and recommended solutions
- Identify the safe operation procedures for fired heaters
- Identify the problems of fired heaters and recommended solutions

TRAINING METHODOLOGY

This Fired Heaters and Heat Exchangers training will be taught in interactive lecture format, with round table discussions for certain topics. Extensive use is made of case study material and appropriate video material to underline the key aspects of the course and to give the delegates exposure to current best practice.

This training incorporates exercises and discussion sessions that help refinery delegates to develop a valuable understanding of heater variables, operational conditions and troubleshooting.

ORGANISATIONAL IMPACT

The organization will benefit from this training by:

- Improving plant reliability by enhancing the staff skills
- Minimizing pollutant emissions by optimal operation
- Improve the performance of the plant
- Extending the life of heat transfer equipment
- Safe working practices being stressed
- Save money and time by enhancing the troubleshooting skills

PERSONAL IMPACT

On a personal level, participants will benefit in the following ways:

- Extending their knowledge of heat transfer equipment
- Minimizing loss and increase Fiscal Gains
- Contributing to superior plant safety records and emission compliance

- Improving their ability to solve the problems of heat transfer equipment
- Enhancing their adaptation to changing technology
- Enhancing their basic knowledge related to modern control system of heat transfer equipment

WHO SHOULD ATTEND?

This training is intended for all employees involved in the operations and troubleshooting of heat exchangers and fired heaters.

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

- Supervisors and Operators
- Process Plant Shift Leaders
- Environmental and Safety Technicians
- Mechanical Technicians
- Maintenance Engineers

Course Outline

DAY 1

Basics of Heat Transfer and Combustion

- Conduction, Convection and Radiation
- Fouling and Heat Transfer
- Combustion Reactions
- Lean, Rich and Stoichiometric Combustion
- Excess Air and Combustion Efficiency
- Premixed and Diffusion Combustion
- Techniques for NOx Control

DAY 2

Shell and Tube Heat Exchangers

- Types of Heat Exchangers
- Main Components of Shell and Tube Heat Exchangers
- Operation of Shell and Tube Heat Exchangers
- Factors Affecting the Performance of Shell and Tube Heat Exchangers
- Troubleshooting of Shell and Tube Heat Exchangers

DAY 3

Compact Heat Exchangers

- Main Components of Air-Cooled Heat Exchangers
- Operation of Air-Cooled Heat Exchangers
- Troubleshooting of Air-Cooled Heat Exchangers
- Types of Plate Heat Exchangers
- Main Components of Plate Heat Exchangers
- Factors Affecting the Performance of Compact Heat Exchangers
- Operation of Plate Heat Exchangers
- Troubleshooting of Plate Heat Exchangers

DAY 4

Components and Operation of Fired Heaters

- Classification of Fired Heaters
- Application of Fired Heaters
- Parts of Fired Heaters
- Control of a Fired Heater
- Operating a Fired Heater
- Responding to Abnormal Operating Conditions

DAY 5

Monitoring and Troubleshooting of Fired Heaters

- Factors Affecting the Performance of Fired Heaters
- Optimizing Fired Heater Operation
- Performance Monitoring
- Draft, Coking and Skin Temperature
- Troubleshooting of Fired Heaters
