Heat Transfer Equipment

Introduction:

Heat Transfer Equipment or Heat Exchangers simply exchange heat and involves in heat transfer. Fluids or gases are introduced inside the shell side nozzle inlet. Fluids or gases then go through the shell moving through a series of baffles that guides its progress until it finally reaches the shell side outlet. Meanwhile another fluid or gas with a different temperature is pushed through the tube side inlet of the tube bundle. This course reviews the selection, basic design, and operation of heat transfer equipment commonly used in the oil and gas industry with focus on production facilities. Topics will include shell and tube exchangers, compact heat exchangers, brazed aluminum exchangers, air coolers, and fired equipment.

This course provides the participants with a general understanding of the use and operation of various types of heat exchangers. Maintenance problems and troubleshooting procedures associated with heat exchangers are also examined. The course also aimed at the operation of heat transfer equipment to enable participants to obtain the best performance as possible.

Who Should Attend?

Engineers, supervisors, operators, designers, engineering consultants, project engineers and managers, those who involved in design, engineering, maintenance, operation, and safety of the heat transfer & process equipment

Course Objectives:

By the end of this course delegates will be able to:

- Refresh heat transfer knowledge
- Gain an introduction to heat transfer technology
- Learn about heat transfer theory and its applicability in real applications
- Select the correct heat transfer equipment for a particular application with reference to typical facility process flow diagrams (PFDs)
- Apply heat transfer principles to design and specify heat transfer equipment
- Evaluate the performance of heat transfer equipment and recommend solutions to problems
- Learn about the typical instrumentation and control schemes used by the various types of heat transfer equipment
    - Be aware of energy utility effectively and optimum, in real applications
    - Perform heat transfer analysis techniques; modeling, sketching
    - Perform problem solving approaches, correctly select equations selection of energy balance

Course Outline:

Overview & Heat Transfer Principles

- Heat exchanger concepts
- Main types of heat exchangers, Primary components
- Primary process functions of heat exchangers

Introduction to Heat Transfer

The Importance of Heat Transfer in the Industrial Applications and Daily Life

Parameters and Results Considered in the Heat Transfer Process

Samples of Heat Transfer Practice in Our Daily Life

Basic Principles of Heat Transfer and Basic Mechanism Review of Heat Transfer

Practical and Applicable Equations of Heat Transfer

Conduction Heat Transfer, Convection Heat Transfer, Radiation Heat Transfer

Fluid Properties

Compact Heat Exchangers

Brazed Aluminium Exchangers & Fired Equipment

Air Fin (Fin Fan) Cooler

- Principle, Functions, Operations, Troubleshooting, Maintenance

Shell and Tube Heat Exchanger

- Basic design, Main component, Operation
- Problems and potential solutions
- Maintenance procedures, Safety

Water Cooling System

- Main components, Types of Cooling Towers, Key Components
- Safety Issues, Operation, Maintenance
- Common Causes of Poor Performance, P&ID
- Start & shut downs, Troubleshooting

Chillers

- Types of Chillers, Key Components, Safety Issues
- Operation, Maintenance, Relevant Operational issues

Primary Methods of Cleaning Heat Exchangers

- Mechanical Cleaning, Hydraulic Cleaning, Chemical Cleaning

Start Up and Shut Down Operation of Heat Exchangers

Maintenance and Repair of Heat Exchangers

Heat Transfer Technique Analysis

- Modelling, system description, Sketch system, the object
- Energy balance equation, Problem solving approaches
- Correct equations selection

Operating Problems

Typical Instrumentation Control Schemes