€TRAINING

Heat Exchangers: Types & Application, Design, Operation & Maintenance

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Introduction:

This course will feature the importance and relevance of the important and expensive items of equipment known as heat exchangers that are used in a wide variety of industries. It will familiarise engineers and technicians with the various standards and practices used for the design, manufacture, operation, and maintenance of heat exchangers.

To all these engineers with diverse backgrounds and expertise, the principle of heat exchangers design and codes will allow them to understand the recommended practices. This course will cover all these aspects with respect to engineering design in general and shell and tube exchangers in particular.

Course Objectives:

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

- Understand heat transfer fundamentals
- Analyze exchanger operational parameters
- Determine correct troubleshooting techniques
- Determine the correct selection criteria for heat exchangers
- Troubleshoot exchange problems

Targeted Audience:

- Maintenance Professionals
- Inspection Personnel
- Process Supervisors
- Plant Operators
- Plant/Technical Managers

Course Outlines:

Unit 1: Types and Applications of Heat Exchangers:

- Overview and Basic Fundamentals
- Heat Transfer Fundamentals and Heat Transfer Coefficients
- Heat Exchanger Types and Application
- Geometry Of Shell & Tube Heat Exchangers STHE
- Double Pipes TEMA Nomenclature, Front End Head Types, Shell Types
- Rear End Types, Double Pipe Units, Selection Guidelines

Unit 2: Thermal and Hydraulic Design of Heat Exchangers:

- Sizing and Specifying the Heat Exchanger
- Flow vs. Temperature Difference in STHE
- Temperature Difference in STHE
- Condensers and Reboilers

Unit 3: Mechanical Design of Heat Exchangers:

- Mechanical Design Of Heat Exchangers
- Basic Design Of Heat Exchangers
- Special Design Considerations
- Piping Loads on Exchanger Nozzles
- Materials of Construction On Heat Exchangers
- Fabrication of Heat Exchangers

Unit 4: Operation and Maintenance of Heat Exchangers:

- Fouling in Heat Exchangers
- Corrosion and Erosion in Heat Exchangers
- Heat Exchanger Inspection Methods
- Operation and Troubleshooting
- Performance Monitoring and Testing
- Cost-Effective Maintenance and Repair of Heat Exchangers

Unit 5: Performance Enhancement and Optimisation of Heat Exchangers:

- Heat Transfer Augmentation Techniques
- Finned Tubes
- Heat Integration Basics
- Pinch Technology
- Heat Exchanger Train Optimisation
- Tube Bundle Replacement - Alternative Enhanced Tube Bundle Designs