Heat Exchanger Inspection And Cleaning Techniques

Introduction:

A heat exchanger is a component that allows the transfer of heat from one fluid (liquid or gas) to another fluid. Reasons for heat transfer include the following:

- To heat a cooler fluid by means of a hotter fluid
- To reduce the temperature of hot fluid by means of a cooler fluid
- To boil a liquid by means of a hotter fluid
- To condense a gaseous fluid by means of a cooler fluid
- To boil a liquid while condensing a hotter gaseous fluid

Who Should Attend?

This course is recommended for anyone involved with the selection, operation, maintenance and troubleshooting of Heat Exchangers. Such as Mechanical Maintenance Engineers, Under Development Engineers, Mechanical Maintenance Supervisors &Technicians and Operation Engineer

Methodolgy:

This interactive Training will be highly interactive, with opportunities to advance your opinions and ideas and will include:

- Lectures
- Workshop & Work Presentation
- Case Studies and Practical Exercise
- Videos and General Discussions

Certificate:

BTS attendance certificate will be issued to all attendees completing minimum of 80% of the total course duration.

Course objectives:

By the end of this course the participants will:

- Know more information about heat exchanger classification.
- Know the heat Transfer Heat Transfer Methods
- Know the Factors affecting in heat Transfer system
- Know and understanding the heat exchanger Selection and Performance.
- Know and Understanding Heat Exchanger Inspection and Cleaning Techniques
- Know and Understand Heat Exchanger Troubleshooting
- Know and understanding Heat Exchanger Maintenance Problems

Course outline:

Chapter (01) Heat Exchangers

- Heat Exchangers and How They Work?
- Types and Functions
- Heat Transfer Methods
- Categories of Heat Exchangers
- Common Types of Heat Exchangers
- Shell and Tube Heat Exchangers
- Arrangement and Flow

Module (02) Direct Contact Heat Exchangers

- Types Shell and Storage Tank Arrangements
- Typical Heat Exchanger Maintenance Problems
- Heat Transfer
- Radiation
- Conduction
- Convection
- Heat Exchanger Equipment
- Tube Bundle – Tube sheets
- Tube Joints – Tube sheet Lay-out
- Classification of Heat Exchangers

Module (03) Heat Transfer through Tubes

- Heat Exchanger Applications

- Large Steam System Condenser
- Air Conditioner Evaporator And Condenser
- Radiator
- Pre heater
- Boiler
- Gas Heaters
- Liquid Heaters
- Newer Design of Shell and Tube Exchangers

Module (04) Heat Exchanger Operation and Troubleshooting

- Fouling, Corrosion, and Vibration
- Cavitation and Recirculation
- Flow Turbulance
- Blockage – Leakage – Using Sacrificial Anodes
- Removing Blockage – Stopping Leaks

Module (05) Heat Exchanger Inspection and Cleaning Techniques

- Inspection and Repairs
- Cleaning out Blockage
- Stopping Leaks
- Maintenance Preparation
- Choosing the Proper Tools and Equipments
- Working tools
- Safety Equipments
- Cleaning Large Heat Exchanger
- Tube Side Cleaning
- Shell Side Cleaning
- Automatic Cleaning

- ✓ Mechanical System
- ✓ Chemical System

- Inspection Method for Leaks in Large Heat Exchanger
- Vacuum Test
- Dye Test
- Sealing or Stopping Leakage
- Plugging
- Welding
- Tube Replacement
- Summarize Lesson Learnt
- Evaluation / Examination
- Course Closeout