Course Content

Title: Heat Transfer

Potential PDH: 16 **Code:** BTT072

Description:

This course is intended for engineers based at refinery and petrochemical operating plants who deal with heat transfer equipment – mechanical / pressure equipment, inspection, reliability, maintenance, projects, debottlenecking. It can also serve as a refresher course or as the first broad exposure to heat transfer equipment for those are in the 0-5 year experience range.

The objective is to enable plant-based engineers to understand operation, mechanical and thermal design choices, failure mechanisms and remedies, applicable codes & standards, repair plans and rerates. While Shell & Tube Exchangers, Air Cooled Heat Exchangers, and Process Heaters will be the primary focus, all types of heat transfer equipment will be covered (Plate type, etc.).

The focus will be on understanding of the components of the equipment and how it works, typical problems and repairs, and not on thermal design formulas.

Outline:

1. Heat Transfer Fundamentals (targeted for Plant Engineers)
2. Industry Specifications, Standards, and Documentation
3. Shell & Tube Heat Exchangers
    a. TEMA Types
    b. Components & Typical Design Considerations
    c. Gasketed joints
    d. Addressing Problems (flange leaks, tube leaks, vibration, fouling, etc.)
    e. Maintenance
    f. Rerates
4. Air Cooled Heat Exchangers
    a. Types
    b. Components & Typical Design Considerations
    c. Addressing Problems (plug leaks, tube leaks, etc.)
    d. Maintenance
5. Other Exchanger Types used in Refineries / Petrochemical Plants
    a. Plate type
    b. Hairpin
    c. Novel designs
    d. Enhancements
6. Monitoring Performance
    a. Fouling and impact on performance
7. Fired Heaters

a. Types
b. Components & Typical Design Considerations
c. Burners
d. Air Preheaters
e. Refractory
f. Tubes and typical corrosion mechanisms
g. Inspection / Maintenance

8. Working examples (example of problems / issues to be provided by attendees at least two weeks

Instructor:

Louis Pasnik has 25 years' experience as a thermal and mechanical engineer with specific emphasis on heat exchangers, furnaces, and combustion equipment. Thirteen of those years were spent as a plant based "boots-on-the-ground" heat transfer engineer for a Major Owner/Operator supporting multiple refineries & petrochemical plants with troubleshooting and planning repairs on heat transfer equipment. In addition, he has worked on large and small capital projects both as an EPC and as an Owner/Operator. Mr. Pasnik currently serves as the vice-chair of API 660, Shell & Tube Heat Exchangers.