



PE053:

Operation of Process Equipment: Fired Heaters, Air Coolers, Heat Exchangers, Pumps, Compressors, Crude Desalter, Pressure Vessels & Valves Operation and Maintenance

Training Description:

This training course is designed to provide participants with a detailed and up-to-date overview on the operation of process equipment that includes fired heaters, air coolers, heat exchangers, pumps, compressors, crude desalter, pressure vessels and valves.

It covers the characteristics of crude oil and function of chemicals used in the process such as composition of petroleum, hydrocarbon properties, salt concentration and emulsions.

At the completion of this training course, participants will be able to apply oil treating; dehydration and desalting; process and equipment operations; and employ the sequence of desalter plant start-up.

The training course will also cover the different types and function of direct fired heaters; safety aspects; air coolers; heat exchangers; pumps; compressors; process vessels; valves; maintenance and troubleshooting of different equipment and processes.

Training Objectives:

By the end of the training, participants will be able to:

- ✓ Apply proper techniques and procedures on the operation of process equipment such as fired heaters, air coolers, heat exchangers, pumps, compressors, crude desalter, pressure vessels and valves
- ✓ Enumerate the characteristics of crude oil and identify the function of chemicals used in the process such as composition of petroleum, hydrocarbon properties, salt concentration and emulsions
- ✓ Discuss oil treating, dehydration and desalting including the process and equipment operations
- ✓ Employ the sequence of desalter plant start-up and identify the different types and function of direct fired heaters including the safety aspects
- ✓ Differentiate the various types of air coolers, heat exchangers, pumps and compressors
- ✓ Describe the types and functions of process vessels and valves including the troubleshooting of different equipment and processes

Training Designed for:

This course is intended for process engineers (process equipment) and other technical staff who are involved in the operation and troubleshooting of various process equipment including fired heaters, air coolers, heat exchangers, pumps, compressors, crude desalter, pressure vessels and valves. The course is also beneficial for design engineers and maintenance staff.

Training Requirement:

"Hand's on practical sessions, equipment and software will be applied during the course if required and as per the client's request."

Contents can be adapted to your specific wishes. It is therefore possible to focus on specific modules of the training course as per client's learning needs and objectives. Further, it should be forwarded to us a month prior to the course dates.

Training Program:

DAY ONE:

- ❖ Introduction
- ❖ Characteristics of Crude Oil
 - Composition of Petroleum
 - Hydrocarbon Gases Properties
 - Salts Concentration
 - Emulsions
 - Function of Chemicals Used in the Process

DAY TWO:

- ❖ Oil Treating, Dehydration & Desalting
 - Emulsion Formation & Breaking
 - Vertical & Horizontal Theater Operation
 - Electrostatic Theatre Design/Operation
 - The Desalting Process/Equipment
 - Emulsion Treating
 - Separators – Free Water Knockout
 - Heater Theatres – Other Treating Methods
 - Chemical – Electrical – Crude Oil Coolers (Heat Exchangers)
 - Control Valves Principles
 - Pumps Operation
 - Air Compressor Operation
- ❖ Sequence of Desalter Plant Start-up
- ❖ Direct-Fired Heaters
 - Design Considerations – Process & Combustion
- ❖ Control System
- ❖ Case Studies

DAY THREE:

- ❖ Air Coolers
 - Types – Forced and Induced Air
 - Key Operational Considerations
 - Air vs Water Cooling
 - Troubleshooting
- ❖ Heat Exchangers
 - Types
 - Shell-and-Tube
 - Heat Transfer Relation
- ❖ Exercises - Simulator

DAY FOUR:

- ❖ Pumps

- Development of Static and Dynamic Head in the Operating Volume of Pumps for Efficiency and Control Operation
- The Affinity Laws as Tools for Efficient Operation
- Pump Auxiliaries
- Wear Components
- Canned Motor and Magnetic Drive Pumps
- High Speed/Low Flow Pumps
- Servicing and Condition Monitoring

❖ Compressors

- Types, Styles and Configurations of Centrifugal and Axial Compressors
- Construction Features
- Mode of Operation
- Compressor Auxiliaries and Support Systems
- Analyse Operating Curves for Surge, Stall and Choke
- Define Appropriate Equipment for Safe Operation

DAY FIVE:

❖ Process Vessels

- Types and Functions
- Safety Aspects

❖ Valves

- Valve Theory
- Valve Types
- Applications
- Function
- Operation
- Maintenance
- Troubleshooting

❖ Troubleshooting of Different Equipment and Processes

❖ Course Conclusion

❖ POST-ASSESSMENT and EVALUATION

Training Methodology:

This interactive training course includes the following training methodologies as a percentage of the total tuition hours:

- 30% Lectures, Concepts, Role Play
- 70% Workshops & Work Presentations, Techniques, Based on Case Studies & Practical Exercises, Gamification, Software & General Discussions
- Pre and Post Test

Training Certificate(s):

CMCT Internationally recognized certificate(s) will be issued to each participant who completed the course.

Training Fees:

TBA as per the course location - This rate includes participant's manual, hand-outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Note: The 5% VAT (Value Added Tax), will be effective starting 01st of January 2018 as per the new regulation from the UAE Government. The VAT applies for all quotation both for local and abroad.

Training Timings:

Daily Timings:

07:45 - 08:00	Morning Coffee / Tea
08:00 - 10:00	First Session
10:00 - 10:20	Recess (Coffee/Tea/Snacks)
10:20 - 12:20	Second Session
12:20 - 13:00	Recess (Prayer Break & Lunch)
13:00 - 14:00	Last Session

For training registrations or in-house enquiries, please contact:

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