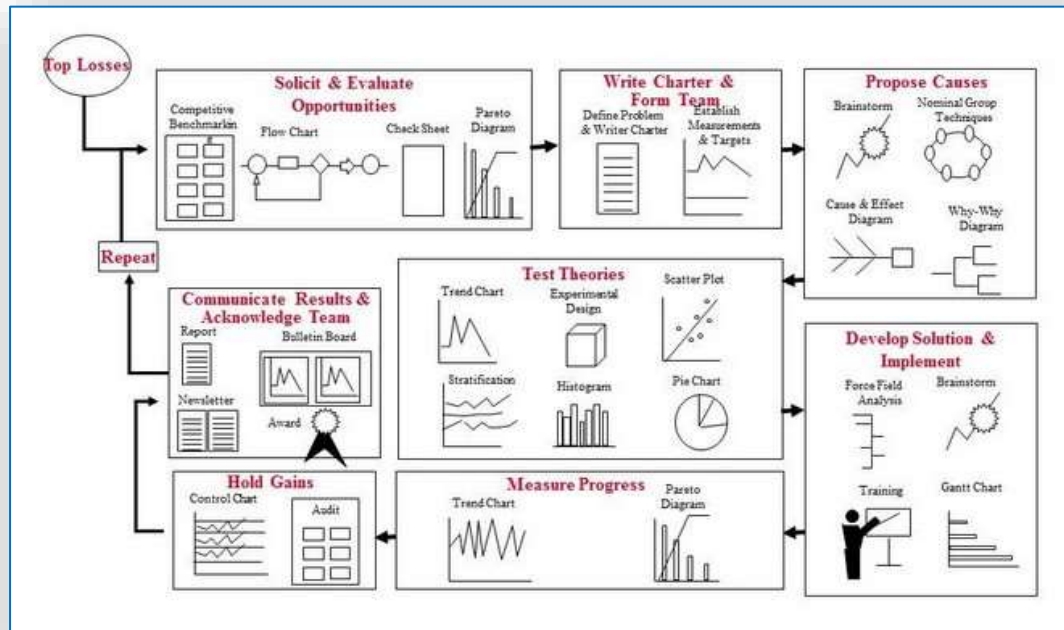




PCE006

Process Plant

Performance & Efficiency

Course Introduction:

This course will outline the step by step process of designing, installing and commissioning photovoltaic and wind powered systems. This comprehensive workshop covers the important issues enabling you to do simple designs and then to investigate the design and installation issues in more detail after the workshop either by further study or in conjunction with experts in the field. In recent years the annual growth rate of the solar and wind energy industry has consistently exceeded 30% with 3 digit growth figures in many regional markets. So in these rather challenging economic times; this is a good industry in which to focus one's career on.

Course Objectives:

Upon successful completion of this course, the delegates will be able to:

- ✓ Apply and gain an in-depth knowledge on various elements of process plant performance in order to improve the efficiency
- ✓ Enumerate the characterization of catalyst and the ideal reactor and identify their performance
- ✓ Discuss the various thermal and mechanical separation processes and determine the performance of crystallization, adsorption, chemisorptions, and ion exchange
- ✓ Recognize the performance of pipelines, pumps and compressors as well as the efficiency of off-site utilities such as the electrical energy, cooling water, steam, and refrigeration
- ✓ Discuss the importance of proper waste disposal and its impact performance and efficiency
- ✓ Employ systematic methodology in measurements and control technology and their major role in plant performance and efficiency.
- ✓ Enhance knowledge on collecting various data as chemical data, mass balance, physicochemical data and processing variables as inputs for process optimization procedure.
- ✓ Identify the various optimization tools used in process plant performance and determine the refinery and process plant optimization trends.
- ✓ Discuss the continuous improvement, benchmarking and best practices for process plant performance and efficiency
- ✓ Carryout troubleshooting procedures and identify the different performance analysis software used in process plant performance in relation to process optimization and performance monitoring

Who Should Attend?

This course is intended for all those concerned with the process plant performance and efficiency including planning staff, instrumentation & control staff, production & operation staff, process, electrical, mechanical and project engineers, panel operator, engineer and supervisor. Management

can also appreciate the importance of the new tools available to achieve the plant objectives of today and meet the challenges of tomorrow.

Course Outline:

Day 1:

Chemical Engineering Principles

- Equipment Design
- Heat Transfer & Heat Exchangers, Evaporators, Heaters
- Mass Transfer & Distillation Towers
- Separator Vessels Sizing & Design Considerations
- Liquid Settling Space Velocity & General Tips
- Air Coolers
- Pump Sizing
- Tank Sizing, Drum Types & Pressure Storage Vessel Design Considerations
- Batch Heating/Cooling Time Estimation
- Reboiler Heat Load Calculation
- Heating Coil in Storage Tanks
- Estimation of Number of Stages for Crude/Condensate Stabilization

Day 2:

Hydraulics & Fluid Mechanic Calculations

- Hydraulics of Fluids and Pressure Drop
- Pipeline /Piping Design
- Pipe Thickness and Schedule
- Estimation of Pressure Drop
- Hydrate Formation Temperatures and Pressures
- Pipeline Design - Quick Estimates
- Hydrate Inhibitor Injection

Day 3:

Valves Sizing

- Control Valve Sizing – Gas Service
- Control Valve Sizing – Liquid Service
- Control Valve Sizing – Steam Service

Pressure Relief, Flare and Blowdown

- Pressure Relief Valve Sizing -Gas Service
- Pressure Relief Valve Sizing – Liquid Service
- Pressure Relief Valve Sizing – Thermal Expansion

- Relieve Valve (PSV) Calculations
- Flare KO Drum Sizing
- Flare Network Capacity Checks and Calculations
- Estimation of Flare Radiation and Sizing of Flare Utilities
- Estimation of Blow-Down

Day 4:

Utilities

- Cooling Water Summary and Calculations
- Chilling Medium Summary and Calculations
- Instrument Air Summary and Calculations

Oil & Gas

- Pump Calculations
- Compressor Calculations
- Heat Exchanger Calculations
- Flow Line/Pipeline Sizing
- Crude Oil Assay Characterization
- Heat and Mass Balance

Day 5:

- Estimation of Losses from Storage Tanks
- Heating Value & Combustion Temperature of Fuels
- Crude Oil Heating Value Estimation
- References for Software Calculations
- Course Conclusion

Course Certificate:

International Center for Training & Development (ICTD) will award an internationally recognized certificate(s) for each delegate on completion of training.

Course Methodology:

A variety of methodologies will be used during the course that includes:

- (30%) Based on Case Studies
- (30%) Techniques

- (30%) Role Play
- (10%) Concepts
- Pre-test and Post-test
- Variety of Learning Methods
- Lectures
- Case Studies and Self Questionnaires
- Group Work
- Discussion
- Presentation

Course Fees:

To be advised as per course location. This rate includes participant's manual, and-Outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Course Timings:

Daily Course Timings:

08:00 - 08:20	Morning Coffee/Tea
08:20 - 10:00	First Session
10:00 - 10:20	Recess (Coffee/Tea/Snacks)
10:20 - 12:20	Second Session
12:20 - 13:30	Recess (Coffee/Tea/Snacks)
13:30 - 15:00	Last Session