



PE236: Advanced Refinery Operations, Plant Process & Troubleshooting

Training Description:

Refinery processes consist of many complex apparatuses involving both moving and static parts as well as interconnecting pipes, control mechanisms and electronics, mechanical and thermal stages, heat exchangers, waste and side product processing units, power ducts and many others. Bringing such a complicated unit online and ensuring its continued productivity requires substantial skill at anticipating, detecting and solving acute problems. Failure to identify and resolve these problems quickly can lead to lost production, off-spec product, equipment loss, and even catastrophic accidents. Therefore, the ability to troubleshoot refinery operations is one of the most valuable skills operations personnel can possess.

Typical refineries operate about 26 days of the month to cover costs. The remaining days in the month they operate to make a profit. If the process is down for five days, then the company cannot cover costs and no profit has been made. Engineers must quickly and successfully solve any troublesome problems that occur. Sometimes the problems occur during startup; sometimes, just after a maintenance turn-around; and sometimes unexpectedly during usual operation. A troubleshooting problem is one where something occurs that is unexpected to such an extent that it is perceived that some corrective action may be needed. The trouble usually occurs somewhere in a system that consists of various pieces of interacting equipment run by people.

Troubleshooting is the process used to diagnose the fault safely and efficiently, decide on corrective action and prevent the fault from reoccurring. Process engineering, especially troubleshooting, is different from most other branches of technology in another respect: It is not advancing very quickly. The principles of distillation, hydraulics, phase separation, and heat transfer, as they apply to process applications, have been well known for quite some time. The challenge in troubleshooting consists of untangling the influence that human error, mechanical failure, and corrosion have on these well-known principles. The aspect of the job that makes it so difficult is that most refinery problems are initiated by human error – a never-ending source of surprise.

Most Refinery troubles have a simple origin. However, this simple origin is clouded by false data, misconceptions, superficial observations, and third-hand reports. The error that most engineers often make is that they develop a theory, usually with process computer simulations, as to the cause of the malfunction. The theory is then reviewed with management and other technical personnel at a large meeting. If no one objects to the theory, it is accepted as the solution to the problem. Technical training is one tool that should be taken into the field to reveal the underlying problem but confining the investigation to technical areas only will severely limit the chances of success.

Training Objectives:

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

- ✓ Apply and gain an in-depth knowledge on advanced refinery operations plants process and troubleshooting
- ✓ Discuss petroleum refinery process including crude processing, desalting, atmospheric distillation and vacuum distillation
- ✓ Explain heavy oils processing and bottom of the barrel upgrading covering the coking and thermal processes, delayed coking, fluid coking, flexicoking and visbreaking
- ✓ Carryout process of production that covers the fluid catalytic cracking, hydrocracking, cat cracking, isomerization, alkylation, hydrotreating and catalytic reforming

- ✓ Review process operations key operational conditions and factors as well as discuss blending for product specifications, hydrogen production, refinery gas plants and acid gas treating
- ✓ Identify process troubleshooting including troubleshooting concepts and techniques, troubleshooting tools, typical problems, flooding and its detection
- ✓ Determine refinery economics comprising of residue reduction, asphalt and residual fuel, refinery complexity and netback

Training Designed for:

This course is intended for Process Engineers, Process Technical Staff, Plant Managers, Team Leaders, Section Heads, Production Managers, Production Engineers, Operations Managers, Operations Engineers, Refinery Managers, Engineers, Superintendents, Supervisors, Shift Superintendents & Foremen, Plant Supervisors, Operators, Lead Operators, Area Superintendents and Technical Staff to improve their knowledge on refinery process unit operation and equipments used in operation and handling of process and equipments during any problem and emergency.

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:

- ❖ PRE-TEST
- ❖ Petroleum Refinery Process
- ❖ Crude Processing
- ❖ Desalting
- ❖ Atmospheric Distillation
- ❖ Vacuum Distillation
- ❖ Heavy Oils Processing/Bottom of the Barrel Upgrading (Cocking & Thermal Processes, Delayed Coking, Fluid Coking, Flexicoking, Visbreaking)
- ❖ Process of Production

DAY TWO:

- ❖ Fluid Catalytic Cracking
- ❖ Hydrocracking
- ❖ Cat Cracking
- ❖ Isomerization
- ❖ Alkylolation
- ❖ Hydrotreating
- ❖ Catalytic Reforming

DAY THREE:

- ❖ Process Key Operational Conditions & Factors



- ❖ Blending for Product Specifications
- ❖ Hydrogen Production
- ❖ Refinery Gas Plants
- ❖ Acid Gas Treating
- ❖ Utilities
- ❖ Sulfur Recovery Plants

DAY FOUR:

- ❖ Utilities
- ❖ Oil & Gas Measurement & Control
- ❖ Process Troubleshooting Concepts & Techniques
- ❖ Troubleshooting Tools
- ❖ Typical Problems
- ❖ Flooding & its Detection
- ❖ Interaction of Process & Equipment
- ❖ **Practical Sessions**
 - This hands-on, highly-interactive course includes real-life case studies and exercises

DAY FIVE:

- ❖ Saltation & Entrapment
- ❖ Tower Scan & Inspection
- ❖ Refinery Economics
- ❖ Residue Reduction
- ❖ Asphalt & Residual Fuel
- ❖ Refinery Complexity & Netback
- ❖ Economic Evaluation
- ❖ Cost Estimation
- ❖ 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 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 Certificate(s):

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

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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