



PE218: Refinery System Process Analysis and Testing Using Agent Based Simulation: *Connecting the System in Virtual World to Optimize the Real World*

Training Description:

The oil refining process is one of the most complex processes in today's industry, as it incorporates catalyst systems, complex reactor designs, sophisticated computer control hardware and software, and advanced safety and environmental controls. Due to the sheer size and complexity of the refineries, having an overview of the system as a whole is very difficult, and predicting the influence of different behavior of the pumps, machines, assets and personnel is almost impossible without the help of the adequate software tools. However, only the **simulation and process modeling software** that has the ability to incorporate and connect agent-based simulation, system dynamics simulation and discrete event simulation can analyze the behavior of a system as a whole based on the interaction of the agents.

In order to optimize these complex systems and their interactions approach to single point or single system optimizing cannot work as effectively as we hope, as the refinery has to be considered as a system, rather than connection of its parts. Here is where the multi-method simulation comes to play as we incorporate all the refinery systems into one and be able to have the outputs from the system, as well as its components, rather than just having an output from one of the components.

Training Objectives:

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

- ✓ Acquire the knowledge to consider the refinery as a system, not a sum off its parts
- ✓ Make a substantial, positive impact on the Refinery Process Optimization best practices within their organization
- ✓ Incorporate optimizing models into a simulation package
- ✓ Create and run simulations of complex systems
- ✓ Harness the possibilities of testing change options in virtual environment
- ✓ Learn how to perform Multi-method modeling and apply it to refinery process

Training Designed for:

This course is intended for all professionals working in the field of data analysis, oil and gas exploration, geology and reservoir modelling, process improvement, refinery. This course is suitable for Process Engineers, Refinery Schedulers, Planners, and Managers, Data Scientists, Data Analysts, Petroleum Engineers, Refinery Plant Engineers, and Consultants in Data Science, Optimization and Petroleum Engineering.

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:

FIVE DAYS

- ❖ PRE-TEST
- ❖ Mathematical Programming in Refining Industry
- ❖ Characterization, Physical and Thermodynamic Properties of Oil Fractions
- ❖ Artificial-Neural-Network-Based Modelling for Oil Refining Process
- ❖ Planning Under Uncertainty for a Single Refinery
- ❖ Refinery and Petrochemical Synergy Benefits
- ❖ Concepts and Methods of Selecting Feedstocks and Product Slates
- ❖ Incorporating the Fluid Dynamics into the Process Optimization
- ❖ Planning for Work Stoppages, Interruptions and Recoveries
- ❖ Simulation of An Upstream and Midstream Process as A Whole
- ❖ IoT and Refinery Process Optimization
- ❖ Course Conclusion
- ❖ POST-TEST 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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