

Course No. 1805

Mastering Operations in Oil Refineries Training Course

**DOWNSTREAM OPERATIONS, REFINING, PETROCHEMICALS &
INDUSTRIAL OPERATIONS
OIL & GAS**

DURATION

5 Days

DELIVERY

Classroom



Course Overview

The Mastering Operations in Oil Refineries Training Course is an advanced professional program designed to develop the operational, technical, analytical, and managerial capabilities required to manage modern refinery operations safely, efficiently, and reliably. The course provides a comprehensive understanding of refinery process operations, production systems, process units, operational controls, product quality, energy efficiency, and performance optimization.

Modern oil refineries operate within increasingly demanding environments where safety, reliability, production efficiency, energy consumption, environmental compliance, and product quality must be managed simultaneously. Effective refinery operations therefore require professionals who can understand process interactions, identify operational risks, respond to process deviations, and make sound decisions under both normal and abnormal operating conditions.

The program covers the major principles of refinery operations, crude oil processing, atmospheric and vacuum distillation, conversion processes, treating and blending operations, utilities, process control, equipment performance, energy management, operational troubleshooting, maintenance coordination, and refinery performance optimization. Strong emphasis is placed on practical operational decision-making and the integration of process, equipment, safety, and production considerations.

The course is particularly suitable for professionals working in oil refineries, petroleum processing facilities, energy companies, and downstream operations. It is designed for refinery managers, operations managers, process engineers, shift supervisors, production specialists, control-room personnel, maintenance professionals, technical specialists, and other professionals involved in refinery performance and operational excellence.

Objectives

- By the end of the course, participants will be able to:
- Analyze the overall configuration and operational relationships of major refinery process units.
- Evaluate crude oil characteristics and their influence on refinery processing and product yields.
- Apply operational principles for atmospheric and vacuum distillation processes.
- Analyze the operating requirements of major conversion and upgrading processes.

- Evaluate process conditions, equipment performance, and operational constraints affecting refinery productivity.
- Apply systematic troubleshooting techniques to identify and address refinery operating problems.
- Optimize refinery operating parameters to improve production efficiency, product quality, and energy performance.
- Strengthen coordination between operations, maintenance, process engineering, laboratory, and safety functions.
- Assess operational risks associated with process deviations, equipment failures, and abnormal conditions.
- Apply effective process monitoring and performance indicators to support operational decision-making.
- Develop approaches for improving energy efficiency, reliability, throughput, and operational stability.
- Prepare a practical refinery operations improvement plan focused on safety, reliability, efficiency, and sustainable performance.

Who Should Attend

This course is designed for professionals involved in refinery operations and downstream petroleum processing. It is particularly suitable for Refinery Operations Managers, Production Managers, Shift Supervisors, Process Engineers, Operations Engineers, Process Technologists, Control Room Operators, Production Engineers, Technical Services Professionals, and Refinery Performance Specialists.

The program is also valuable for maintenance engineers, reliability professionals, inspection specialists, laboratory and quality personnel, HSE professionals, and managers responsible for coordinating refinery production and operational performance. It is suitable for both experienced professionals seeking advanced operational perspectives and professionals preparing for broader refinery management responsibilities.

Learning Outcomes

- Upon completion of the course, participants will be able to:
- Explain the overall refinery process configuration and interactions between major process units.
- Evaluate crude oil properties and their impact on refinery processing.
- Understand and monitor atmospheric and vacuum distillation operations.
- Analyze the operational principles of major refinery conversion processes.
- Evaluate process conditions and identify deviations that may affect production or product quality.
- Apply structured troubleshooting approaches to refinery operating problems.
- Assess the interaction between process conditions and equipment performance.
- Improve coordination between refinery operations and maintenance activities.
- Monitor key refinery operating and performance indicators.
- Identify opportunities to improve throughput, energy efficiency, reliability, and product quality.
- Respond more effectively to abnormal and changing operating conditions.
- Apply operational risk-management principles within refinery environments.
- Develop practical improvement initiatives for refinery operational performance.
- Prepare an integrated refinery operations improvement plan.

Course Outline

DAY 01

Refinery Operations Fundamentals & Crude Oil Processing

- Understanding the role and structure of modern oil refineries.
- Refinery configurations and major processing pathways.
- Crude oil properties and crude assay fundamentals.
- Relationship between crude characteristics and refinery economics.
- Crude oil receipt, storage, blending, and feed preparation.
- Crude desalting and pre-treatment operations.
- Fundamentals of heat integration in refinery operations.
- Introduction to refinery process flow and material balance.
- Understanding production objectives and refinery operating constraints.

DAY 01 — CONTINUED

- Key operating parameters and refinery performance indicators.
- Coordination between operations, technical services, laboratory, and maintenance.

PRACTICAL APPLICATION

Analyze a simplified refinery process configuration and identify critical operational interfaces and performance drivers.

DAY 02

Distillation Operations & Process Optimization

- Principles of atmospheric crude distillation.
- Main equipment and operational functions within the crude distillation unit.
- Feed preheating and furnace operation.
- Column temperature, pressure, and reflux management.
- Product draw management and separation efficiency.
- Understanding operating constraints and process limitations.
- Atmospheric distillation troubleshooting.
- Principles of vacuum distillation.
- Vacuum generation and operating considerations.
- Optimizing vacuum tower performance and product recovery.
- Managing fouling, pressure-drop, and heat-transfer challenges.

PRACTICAL APPLICATION

Evaluate distillation operating conditions, identify performance deviations, and develop corrective operating actions.

DAY 03

Conversion, Upgrading, Treating & Product Quality

- Overview of refinery conversion and upgrading processes.
- Fundamentals of catalytic cracking operations.
- Hydroprocessing and hydrotreating principles.

DAY 03 — CONTINUED

- Hydrocracking process fundamentals and operating considerations.
- Reforming and octane improvement.
- Sulfur removal and product treating processes.
- Gas processing and recovery operations.
- Hydrogen management within refinery operations.
- Product blending principles and specification control.
- Managing product quality and laboratory-operational coordination.
- Identifying operational factors affecting yield and product quality.

PRACTICAL APPLICATION

Analyze process-unit interactions and determine how operating conditions can influence product yield, quality, and refinery profitability.

DAY 04

Operational Control, Reliability, Safety & Troubleshooting

- Principles of refinery process control and monitoring.
- Understanding distributed control and operational instrumentation.
- Monitoring critical operating parameters and process trends.
- Detecting abnormal process conditions.
- Systematic refinery troubleshooting methodologies.
- Identifying root causes of process deviations.
- Equipment reliability and operational integrity.
- Coordination between operations and maintenance.
- Managing equipment-related operating constraints.
- Process safety principles in refinery operations.
- Managing abnormal, emergency, and upset operating conditions.

PRACTICAL APPLICATION

Conduct a refinery troubleshooting exercise involving process deviation, equipment constraints, operational risks, and corrective actions.

DAY 05

Refinery Performance Optimization & Operational Excellence

- Measuring refinery operational performance.
- Throughput, yield, utilization, reliability, and efficiency indicators.
- Energy management and refinery energy efficiency.
- Heat recovery and process integration opportunities.
- Reducing energy losses and operational inefficiencies.
- Optimizing refinery operating conditions and production constraints.
- Improving equipment availability and operational reliability.
- Integrating operations, maintenance, engineering, and HSE objectives.
- Developing continuous improvement initiatives.
- Operational risk assessment and performance improvement.
- Establishing effective operational review and performance-management mechanisms.
- Final practical workshop: Develop an integrated Refinery Operations Improvement Plan covering process performance, operating parameters, throughput, energy efficiency, product quality, reliability, troubleshooting, safety, operational risks, performance indicators, and continuous improvement initiatives.

Register or Request More Information

Course page: <https://quest-training.com/courses/mastering-operations-in-oil-refineries-training-course>

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