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# Refinery Planning, Crude Selection and LP Optimisation Training Course

14 – 18 March 2027  
Doha





## Refinery Planning, Crude Selection and LP Optimisation Training Course

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### Programme Summary

Refinery planning, crude selection and LP optimisation is a one-week training course for planning, economics and supply leaders at managerial level, culminating in a margin capture plan that links the crude slate, the monthly plan and the schedule at their own site. Refinery margin depends on which crudes are bought, how units are loaded and whether the schedule delivers the plan. The approach joins linear programming models, crude valuation and scheduling into one decision chain. Mars Training Centre UK delivers this programme in refinery planning and crude selection.

### The Business Case

Each month a refinery commits large sums to crude purchases on the basis of a planning model, then asks schedulers to make the result work with real tanks and liftings. When the model is stale or the schedule drifts from the plan, margin is lost quietly and rarely traced to its cause.

- Gross Refining Margin: Improves as crude choices rest on calibrated models.
- Plan Attainment: Rises as gaps between plan and schedule are measured and removed.
- Inventory and Demurrage Cost: Falls as crude receipts, tank use and product dispatch are scheduled against a single agreed plan.

### Principles and Evidence Base

- Linear Programming and Aspen PIMS Planning Models: Frame how yields and blending constraints are optimised in Session 1.
- Delta-Base Vectors and Marginal Shadow Values: Explain how constraint values guide decisions in Session 2.
- Crude Netback Valuation: Underpins crude ranking in Session 3.
- Plan-Versus-Actual Backcasting Analysis and Sales and Operations Planning S&OP: Structure governance in Session 4 and Session 5.

### Intended Participants

- Leaders accountable for the monthly refinery plan, unit loadings and the product slate.
- Managers, including supply and trading heads, who approve crude purchases and term supply commitments.
- Heads of scheduling responsible for crude receipts, tank allocation, blending and product liftings.
- Economics and performance managers who own the planning model and its calibration.

The programme serves fuels refineries, integrated refining and petrochemical complexes, national oil companies and international trading and supply organisations.



## Learning Outcomes

1. Participants will be able to evaluate a refinery LP planning model for structure and calibration.
2. Participants will be able to interpret marginal values and constraint reports to justify unit loading decisions.
3. Participants will be able to rank candidate crudes using netback valuation and breakeven pricing.
4. Participants will be able to diagnose where executed schedules depart from the monthly plan and quantify the margin effect.
5. Participants will be able to design a planning and scheduling governance cycle linked to sales and operations planning.
6. Participants will be able to construct a margin capture plan for their own refinery.

## Programme Structure

### Day 1: Refinery Planning Economics and the Planning Cycle

How does the planning cycle turn market prices and unit capability into a refinery plan?

- Refinery Margin Drivers and Gross Product Worth
- Annual, Monthly and Weekly Planning Horizons
- Linear Programming Principles for Refinery Planning
- Planning Model Structure: Units, Pools and Blends
- Planning Data Ownership and Price Sets

### Day 2: LP Optimisation and Model Interpretation

How are planning model results read, challenged and kept accurate?

- Aspen PIMS Case Structure and Solution Reports
- Delta-Base Vectors for Yield and Property Shifts
- Marginal Values, Active Constraints and Ranging
- Model Calibration Against Test Runs and Actuals
- Non-Linear Effects, Recursion and Local Optima

### Day 3: Crude Selection and Valuation

Which crudes add the most margin, and at what price do they stop doing so?

- Crude Assays, Cut Points and Quality Constraints
- Crude Netback and Incremental Margin Valuation
- Breakeven Pricing and Crude Displacement Studies
- Opportunity Crudes, Contaminants and Unit Risk
- Term Versus Spot Supply Decisions



## Day 4: Short-Term Scheduling and Plan Attainment

How is the monthly plan turned into a workable schedule, and where does value leak?

- Crude Receipt, Tankage and Charging Schedules
- Unit Mode Changes and Intermediate Inventory
- Product Blending Recipes and Giveaway Control
- Product Dispatch, Liftings and Demurrage Exposure
- Plan-Versus-Actual Backcasting Analysis

## Day 5: Applying the Refinery Margin Capture Plan

How are planning, crude selection and scheduling governed as one decision chain?

- Planning Model Health Review of a Participant Site
- Crude Slate Opportunity Ranking
- Sales and Operations Planning S&OP Governance Cycle
- Peer Challenge of Plan Attainment Findings
- Margin Capture Plan Presentation

## Methodology

The programme relies on a data workshop supported by case analysis. Participants work with model outputs, crude assays and schedule records from fuels refineries and petrochemical sites, test crude and loading decisions and trace margin losses from plan to execution.

- Suggested activity: Reading a planning model solution to explain why a unit is constrained.
- Suggested activity: Valuing two candidate crudes against the current slate with netback and breakeven methods.
- Suggested activity: Reconciling a month of executed schedules with the plan to locate lost margin.

## Capstone Output

Each participant completes a margin capture plan for their refinery. It covers planning model health, ranked crude slate opportunities, the causes of plan-versus-actual gaps and a governance cycle linking planning, scheduling and supply.

## Frequently Asked Questions

### Is refinery planning and crude selection training suitable for managers who do not build LP models?

Yes. It suits managers who use planning model results to make crude, loading and supply decisions. It assumes refinery experience but no modelling skills.



## **Which models underpin refinery planning, crude selection and LP optimisation?**

It draws on linear programming and Aspen PIMS planning models, delta-base vectors and marginal values, crude netback valuation, and plan-versus-actual analysis within a sales and operations planning cycle.

## **How is the refinery margin capture plan used at work?**

You take back a plan leadership can approve, setting out model fixes, priority crude opportunities and actions to close plan attainment gaps.

## **How does refinery planning and crude selection differ from refinery operations management?**

It concentrates on the economic decisions behind the plan and schedule, not on running units or plant safety.