JUPITER PRIME

Consulting • Training • Advisory

جوبيتر برايم للاستشارات والتدريب

COURSE BROCHURE

Steam Cracking Furnace Operation and Naphtha Feed Training Course

24 – 28 January 2027
Sharm El-Sheikh

jupiterprime.uk

info@jupiterprime.uk

Registered in the United Kingdom and Saudi Arabia

Steam Cracking Furnace Operation and Naphtha Feed Training Course

Ref: 2926_111285 **Date:** 24 – 28 January 2027 **Location:** Sharm El-Sheikh **Fees:** 5500 GBP

Steam Cracking Furnace Operation and Naphtha Feed is a 1-week training course for process engineers, shift supervisors and panel operators in olefin plants, built around a furnace run length and yield improvement plan for one cracking furnace. Feed slates now shift between naphtha and lighter gases, and extra run length lifts ethylene output. Jupiter Prime Training delivers this course on steam cracking furnace operation.

Why Steam Cracking Furnace Operation Matters Now

Three forces shape steam cracking furnace operation today. Feed flexibility is rising, so a single furnace may see full-range naphtha one month and ethane-propane mixtures the next, each with its own coking behaviour. Energy pressure pushes plants to recover more heat from the convection section and the transfer line exchangers. Experienced board operators are retiring, and their judgement on firing and steam dilution must be captured. A plant that reads its furnaces well gains longer campaigns and steadier ethylene and propylene yields; one that does not loses throughput to unplanned decokes and tube damage.

Who Gains Most from Steam Cracking Furnace Operation

- Furnace area engineers responsible for coil outlet temperature targets, severity setting and campaign length
- Panel operators who adjust firing, dilution steam and feed rates from the control room
- Process engineers who assess feed changes and predict yields across the cracking slate
- Shift supervisors who plan decoking, furnace swings and hot standby periods
- Inspection and reliability staff who track tube metal temperature and carburisation

A furnace area team of engineers, operators and inspectors gains most attending together.

Steam Cracking Furnace Operation Capabilities

The outcomes below connect firebox, coil and quench behaviour to the choices made on each shift and at each feed change.

- Assess coil outlet temperature and steam-to-hydrocarbon ratio against a target yield pattern — severity setting by the furnace engineer
- Weigh naphtha against ethane and propane feeds for a given furnace design — feed allocation by planning and operations
- Calculate coking rate trends from tube metal temperature and pressure drop — the timing of the next decoke
- Design a decoking sequence with steam and air that limits tube stress — the shift supervisor's furnace swing
- Specify transfer line exchanger and quench tower checks that protect product recovery — downstream compressor and fractionation teams
-

Build a furnace run length and yield case for one coil set — the plant manager's improvement budget

Key Steam Cracking Furnace Operation Terms

- Coil outlet temperature — cracked gas temperature leaving the radiant coil, the main severity lever.
- Dilution steam ratio — steam added per mass of feed, lowering partial pressure and slowing coking.
- Propylene-to-ethylene ratio — a yield measure used to judge severity; it falls as severity rises on liquid feeds.
- Tube metal temperature — outer wall temperature of a radiant tube, watched for coke build-up.
- Transfer line exchanger — the exchanger that rapidly cools cracked gas and raises high-pressure steam.
- Decoking — controlled burn-off of coke from coils using steam and air, off feed.

Steam Cracking Furnace Operation Day by Day

Day 1: The Cracking Furnace in the Olefin Plant

- Radiant and Convection Section Layout — Where Heat Goes and Why It Matters
- Free Radical Cracking Chemistry — Linking Residence Time to Primary Yields
- Furnace Heat Balance Sheet — Firing Duty Versus Feed Preheat Choices
- Cracked Gas Composition Profile — Expectations for Downstream Recovery Units
- Furnace Operating Envelope Chart — Limits Panel Operators Must Respect

Day 2: Naphtha and Lighter Feeds

- Naphtha Characterisation by Paraffin, Naphthene and Aromatic Content — Feed Value Ranking
- Ethane and Propane Cracking Behaviour — Severity Window for Gas Feeds
- Co-Cracking and Recycle Streams — Coil Allocation Across Mixed Feeds
- Yield Prediction Tables — Comparing Feed Cases Before a Slate Change
- Feed Contaminant Screening for Sulphur and Metals — Coking and Fouling Risk

Day 3: Severity, Coking and Tube Health

- Coil Outlet Temperature and Dilution Steam Targets — Balancing Yield and Run Length
- Coke Formation Mechanisms in Radiant Coils — Choosing Antifoulant Dosing
- Tube Metal Temperature Surveys with Pyrometers — Spotting Hot Tubes Early
- Coil Pressure Drop Trending — Forecasting the End of Campaign
- Carburisation and Creep Indicators — Deciding on Tube Inspection Scope

Day 4: Decoking, Quench and Product Recovery

- Steam-Air Decoking Procedure — Burn Rate, Temperature and Carbon Dioxide Monitoring
- Furnace Swing and Hot Standby Sequence — Protecting Plant Throughput
- Transfer Line Exchanger Fouling Checks — Steam Generation and Outlet Temperature
- Quench Oil and Quench Water Tower Operation — Heavy Ends and Fouling Control
- Cracked Gas Compressor Feed Conditions — Signals Passed Downstream from the Furnace

Day 5: Practising the Furnace Run Length and Yield Plan

- Feed Case Comparison from Day Two — Selecting the Target Slate
- Severity and Steam Targets from Day Three — Setting Campaign Operating Points
- Decoking Schedule from Day Four — Aligning Furnace Swings with Production
- Tube Health Watch List — Agreeing Alarm Points with Inspection Staff
- Furnace Run Length and Yield Improvement Plan — Presenting the Final Case

Applying Steam Cracking Furnace Operation After the Course

- Lead a two-week tube metal temperature and coil pressure drop review on one furnace.
- Run a feed case comparison for the next slate change and agree coil outlet temperature and dilution steam targets.

Steam Cracking Furnace Operation Questions FAQ

What is steam cracking furnace operation and why does it matter now?

Steam cracking furnace operation is the control of firing, feed, steam and decoking in the furnaces that make ethylene and propylene. It matters now because feeds change more often and longer campaigns directly raise olefin output.

Which roles gain most from steam cracking furnace operation training?

Furnace engineers, panel operators, process engineers and shift supervisors gain most. Inspection staff who track tube health also benefit.

How does steam cracking furnace operation differ from an olefins value chain course?

Steam cracking furnace operation stays inside the furnace area: coils, firing, coking, decoking and quench. A value chain course looks at product margins and pricing across polymers and derivatives.

What do you bring back from steam cracking furnace operation training?

You bring back a furnace run length and yield improvement plan for one furnace, with severity targets, a decoking schedule and a tube health watch list.

Steam Cracking Furnace Operation: The Way Forward

The furnace run length and yield improvement plan first informs the operating point for the next campaign on one furnace. Furnace engineers, panel operators and inspection staff use it together at the start of each run. After its first campaign, the plan is worth revisiting against actual coking rates and yields before the next feed change.