# Fluid Catalytic Cracking and Catalytic Reforming: FCC and Reformer Troubleshooting

5 – 16 July 2027
Dubai - Five-star CBD venue



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**Ref:** 620_18063 **Date:** 5 – 16 July 2027 **Location:** Dubai - Five-star CBD venue **Fees:** 35100 SAR

## Introduction:

Fluid catalytic cracking and catalytic reforming decide how much gasoline, propylene and H2 a site can sell, yet many FCCs and reformers lose barrels to afterburn, cyclone losses, standpipe instability, chloride drift and a poorly chosen ROT or octane target that nobody traces to root cause. This Core Concept course takes specialists deep into riser, stripper and regenerator behaviour, heat budget, Delta P surveys and zeolite health, then into platinum reforming chemistry, chloride management, visbreaking and delayed coking. Participants finish with an FCC and Reformer Health Check and Improvement Roadmap.

## Course Objectives:

- Diagnose riser, stripper and regenerator behaviour from VGO quality, combustion mode and flue gas analysis
- Calculate the FCC heat budget, circulation rate and standpipe Delta P survey to locate hydraulic and thermal bottlenecks
- Troubleshoot afterburn, cyclone losses, vapour line deposits and circulation upsets using DCS trends and equilibrium zeolite results
- Set reformer WAIT, separator pressure and H2/HC ratio and manage chloride and water to hold octane, aromatics and net H2 make
- Evaluate visbreaker and delayed coker settings against fuel oil stability, heater tube fouling and drum switching limits
- Produce an FCC and Reformer Health Check and Improvement Roadmap with ranked moves, test campaigns and barrel value estimates

## Target Audience:

- Process specialists accountable for FCC and naphtha reformer settings, stream slate and on-stream time
- Operations leads and shift supervisors who run riser, regenerator, reformer reactors and coke drums from the DCS console
- Technical-service specialists who organise test campaigns, mass surveys and equilibrium zeolite tracking
- Zeolite and additive specialists who judge fresh and circulating inventory and platinum health
- Thermal route specialists who manage visbroken residue stability and drum switching
- Improvement specialists who turn bottleneck removal into barrel value

## Course Outline:

### Day 1: VGO and Residue Quality and Riser Chemistry

- VGO and Residue Characterisation: Conradson Carbon, Nickel, Vanadium, Basic Nitrogen and Watson K Factor
- Carbenium Ion Scission, H2 Transfer and Thermal Side Reactions in the Riser
- Injection Nozzle Atomisation, Dispersion Steam and Mix Zone Heat Pickup
- Riser Contact Time, ROT Setpoint and Gasoline Overcracking
- Riser Termination Devices, Disengager Dilute Phase and Post-Riser Vapour Residence

### Day 2: Regenerator Combustion and Standpipe Hydraulics

- Regenerator Air Grid, Dense Bed Fluidisation and Carbon Burn Kinetics
- Partial Burn Versus Full Burn: CO to CO2 Ratio, Excess Oxygen and Platinum Combustion Promoter
- Spent Stripper Efficiency: Stripping Steam Rate and H2 on Spent E-Cat
- Standpipe Aeration, Slide Valve Differential and Riser-Regenerator Delta P Survey
- Circulation Rate Estimation from Air Blower Rate and Delta Carbon

### Day 3: FCC Heat Budget, Zeolite Properties and Additives

- Heat Budget Calculation: Delta Carbon, Regenerator Dense Bed Heat and Cat-to-Oil Ratio
- Catalyst Cooler and VGO Preheat Levers for Residue-Rich Blends
- Zeolite Y Cell Size, Rare Earth Exchange, Matrix Activity and Kaolin Filler Roles
- Equilibrium Zeolite Analysis: Microactivity, Metals, Surface Area and Particle Size Distribution
- Shape-Selective Olefin Additive, Vanadium Trap and SOx Transfer Additive Dosing

### Day 4: Main Fractionator, Wet Gas Recovery and Cracked Streams

- Main Fractionator Slurry Pumparound, Bottoms Heat and Fouling Risk
- Light Cycle Oil and Heavy Cracked Naphtha Draw Cut Points and Quality Tests
- Wet Gas Compressor, Sponge Absorber and Debutaniser Recovery of Propylene and Butylenes
- Test Campaign Mass Closure and 430 Minus Definition
- Cracked Naphtha Octane, Olefin and Sulphur Response to ROT

### Day 5: Week-One Scenario: FCC Troubleshooting from DCS Trends

- Afterburn Diagnosis: Dilute Phase and Flue Gas Heat Rise Patterns
- Cyclone Loss Investigation: Dipleg Failure, Attrition and Fines in Slurry Trends
- Reactor Vapour Line and Riser Deposit Symptoms and Root Causes
- Circulation Upset and Slide Valve Reversal Scenario Walkthrough
- Guided Troubleshooting Report on an FCC DCS Log

## Day 6: Naphtha Reforming Chemistry and Reformer Configurations

- Reforming Reaction Set: Naphthene Dehydrogenation, Paraffin Dehydrocyclisation, Isomerisation and Hydrocracking Loss
- Reformer Naphtha Specification: Boiling Range, Naphthene and Aromatic Content and Poison Limits
- Semi-Regenerative, Cyclic Swing Reactor and Continuous Regeneration Configurations
- Reactor Delta T Profile Across Radial-Flow Reactors in Series
- Platinum and Platinum-Rhenium Bimetallic Formulation on Chlorided Alumina

## Day 7: Platinum Reformer Chloride Management and Operating Variables

- Chloride and Water Management: Recycle Stream Moisture and Organic Chloride Injection
- Continuous Regenerator Burn Zone, Oxychlorination and Reduction Zone Checks
- Weighted Average Inlet Temperature, Separator Pressure and H2/HC Molar Ratio Effects
- Research Octane Target, Reformate Aromatics and C5-Plus Liquid Recovery Trade-Off
- Net H2 Make, Recycle Purity and Hydrotreater Supply

## Day 8: Thermal Routes: Visbreaking and Delayed Coking

- Free Radical Scission Mechanism and Thermal Severity Index
- Coil Versus Soaker Visbreaker Design and Fuel Oil Stability Limit
- Visbroken Tar Sediment, Asphaltene Precipitation and Diluent Compatibility Tests
- Coker Heater Outlet Setpoint, Velocity Steam and Tube Fouling Management
- Drum Switch, Steam-Out, Water Quench and Hydraulic Cutting Sequence

## Day 9: Monitoring Dashboards, Bottleneck Removal and Barrel Value

- FCC and Reformer KPI Dashboard: 430 Minus, Delta Carbon, Octane Barrels and On-Stream Days
- Bottleneck Mapping: Air Blower, Wet Gas Compressor, Regenerator Metallurgy Limit and Heater Duty
- Test Campaign Design and Before-After Stream Slate Comparison
- Value Uplift and Gross Barrel Worth Estimation
- Additive and Formulation Change Cost Versus Value Benefit

## Day 10: Capstone: FCC and Reformer Health Check and Improvement Roadmap

- FCC Baseline: Heat Budget, Delta P Survey and Test Campaign Results
- Reformer Baseline: Delta T, Octane, Net H2 Make and Chloride State
- Troubleshooting Findings Ranked by Barrel Value and Reliability Impact
- Improvement Moves, Test Campaign Schedule and Monitoring Indicators
- Roadmap Presentation and Challenge by a Technical Panel

## Skills You Will Gain:

- Riser and Regenerator Diagnostics
- Standpipe Delta P Surveying
- Equilibrium Zeolite Interpretation
- Afterburn and Cyclone Loss Troubleshooting
- Reformer Chloride and Water Management
- Octane and Net H2 Trade-Offs
- Coke Drum Switching Management
- Barrel Value Estimation

## Why Attend This Course:

- Return with an FCC and Reformer Health Check and Improvement Roadmap built on a scenario site
- Read flue gas, standpipe and reactor Delta T trends early enough to stop afterburn, circulation upsets and platinum decline
- Move from a week of FCC depth to naphtha reforming, visbreaking and delayed coking in week two
- Compare FCC and reformer practice with specialists from sites of different configurations and crude diets

## Conclusion:

FCCs and reformers gain or lose barrel value through a few levers: ROT, regenerator combustion, zeolite health, reformer octane target and thermal route limits. Week one covers VGO quality, riser, regenerator, heat budget and Delta P survey, zeolite and additives, fractionation and troubleshooting, closing with a guided scenario. Week two adds naphtha reforming chemistry and chloride management, visbreaking and delayed coking, monitoring dashboards and barrel value. The final day produces an FCC and Reformer Health Check and Improvement Roadmap ready for technical challenge.