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COURSE BROCHURE

Refinery Fired Heater Efficiency and Reliability Training Course

22 – 26 November 2027
Singapore

Refinery Fired Heater Efficiency and Reliability Training Course

Ref: 2164_79794 **Date:** 22 – 26 November 2027 **Location:** Singapore **Fees:** 9300 GBP

Refinery Fired Heater Efficiency and Reliability is a 1-week training course for heater operators, process engineers and reliability engineers, built around a heater run-length improvement plan for one furnace on their own site. Fired heaters burn much of a refinery's fuel and set the pace of crude, vacuum, reformer and coker units, so small losses in combustion or tube condition quickly erode margin and uptime. The course is delivered by Jupiter Prime Training.

Why Refinery Fired Heater Efficiency and Reliability Matters Now

Three pressures meet at the heater firebox today. Fuel cost and emissions reporting push sites to burn less gas per unit of duty, longer turnaround intervals stretch tube and burner life, and fewer experienced board operators means combustion judgement must be written down. Good control of excess air, draft and tube metal temperature brings fuel savings and predictable run length; poor control brings tube ruptures, unplanned decoking and lost throughput. The course rests on heat balance methods, combustion stoichiometry and damage-mechanism thinking used across the process industries.

Who Gains Most from Refinery Fired Heater Efficiency and Reliability

- Board and field operators who set burner registers, stack dampers and fuel gas pressure on each shift
- Process engineers responsible for heater duty, coil outlet temperature and fuel consumption targets
- Reliability engineers who track tube metal temperature, creep life and coking trends
- Maintenance planners who schedule burner cleaning, refractory repair and decoking windows
- Inspection specialists who judge tube thickness, bulging and oxidation at turnaround

A unit crew sending an operator and both engineers together gains most.

Refinery Fired Heater Efficiency and Reliability Capabilities

Participants leave able to read a heater as one thermal system, from burner tip to stack, and defend each adjustment with logged data.

- Calculate heater thermal efficiency from flue gas oxygen and stack temperature — fuel budget and emissions reporting
- Specify excess air and draft targets for each firing rate — shift operating envelopes
- Assess tube metal temperature trends against design limits — run length and creep life decisions
- Apply coking indicators to schedule spalling or pigging — turnaround planning
- Test burner condition through flame pattern and tip inspection — maintenance priorities
- Build a heater run-length improvement case — unit manager and operations leadership

Key Refinery Fired Heater Efficiency and Reliability Terms

- Excess air — combustion air supplied above the stoichiometric amount, measured as oxygen in the flue gas.
- Draft — the pressure below atmosphere inside the firebox that draws combustion air in and pushes flue gas out.
- Tube metal temperature — the measured or estimated outer wall temperature of a process coil, the main limit on heater firing.
- Coking — the deposit of carbon inside heater tubes that raises wall temperature and pressure drop.
- Bridgewall temperature — flue gas temperature leaving the radiant section, a guide to firebox heat release.
- Flame impingement — flame contact with tubes that causes local overheating, oxidation and early failure.

Refinery Fired Heater Efficiency and Reliability Day by Day

Day 1: Heater Duty and Thermal Balance

- Radiant and Convection Section Heat Duty Split — Where Absorbed Heat Is Lost
- Fuel Gas and Fuel Oil Heating Values — Firing Rate Calculations
- Flue Gas Heat Loss Method — Thermal Efficiency Baseline for Each Heater
- Coil Outlet Temperature Control Loops — Stability Versus Fuel Use
- Heater Data Historian Tags — Which Readings Operators Trust

Day 2: Combustion Air and Draft Control

- Combustion Stoichiometry and Oxygen Analysers — Setting Excess Air Targets
- Arch Draft Measurement and Stack Damper Use — Firebox Pressure Envelope
- Natural, Forced and Balanced Draft Arrangements — Control Strategy Choices
- Carbon Monoxide Monitoring and Oxygen Trim — Safe Low Air Operation
- Air Preheater and Tramp Air Leaks — Recovering Lost Efficiency

Day 3: Tube Integrity and Coking

- Skin Thermocouples and Infrared Surveys — Tube Metal Temperature Picture
- Creep, Carburisation and Oxidation Mechanisms — Remaining Tube Life Estimates
- Coke Laydown Rate and Pressure Drop Trends — Predicting End of Run
- Steam Air Decoking, Spalling and Pigging — Choosing the Cleaning Route
- Flux Rate and Flame Impingement Checks — Firing Limits by Pass

Day 4: Burners, Refractory and Maintenance

- Burner Tip Fouling and Flame Pattern Inspection — Cleaning Frequency
- Low Emission Burner Tuning — Flame Length and Nitrogen Oxides Trade-Off
- Refractory Hot Spot Thermography — Casing Repair Priorities
- Pass Flow Balancing and Low Flow Trips — Protecting Coils During Upsets
- Heater Safe Light-Off and Purge Sequences — Start-Up Readiness

Day 5: Practising the Heater Run-Length Improvement Plan

- Thermal Efficiency Baseline Review — Selecting the Target Heater
- Excess Air and Draft Envelope Setting — Operating Limits for the Plan
- Tube Temperature and Coking Forecast — Expected Run Length Gain
- Burner and Refractory Action List — Maintenance Window Requests
- Heater Run-Length Improvement Plan — Final Case for Unit Leadership

Applying Refinery Fired Heater Efficiency and Reliability After the Course

- Lead a one-week oxygen and draft survey on one heater.
- Run a tube metal temperature and pressure drop trend review to forecast the next decoking date.

Refinery Fired Heater Efficiency and Reliability Questions FAQ

What is refinery fired heater efficiency and reliability, and why does it matter now?

It is the practice of burning less fuel per unit of process duty while keeping tubes, burners and refractory healthy for a full run. Fuel costs and longer turnarounds make both goals urgent.

Which roles gain most from refinery fired heater efficiency and reliability training?

Heater operators, process engineers and reliability engineers gain most. Shared methods let these three groups agree on each firing decision.

How does refinery fired heater efficiency and reliability differ from a refinery energy audit course?

It focuses on one equipment type in depth. An energy audit course surveys a whole site, while this one works inside the firebox on air, draft, tubes and burners.

What do you bring back from refinery fired heater efficiency and reliability training?

You bring back a heater run-length improvement plan for one furnace. It sets air and draft limits, forecasts coking and lists burner actions.

Refinery Fired Heater Efficiency and Reliability: The Way Forward

The heater run-length improvement plan first informs the operating envelope for excess air and draft on the target furnace. Operators use it on shift, process engineers for fuel targets and reliability engineers to time decoking. After its first run, revisit the coking forecast against measured pressure drop and refine the limits for the next heater.