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COURSE BROCHURE

# Combined Cycle Shift Operation and Heat Rate Monitoring Training Course

26 – 30 April 2027
London

# Combined Cycle Shift Operation and Heat Rate Monitoring Training Course

**Ref:** 2599_98859 **Date:** 26 – 30 April 2027 **Location:** London **Fees:** 5900 GBP

Combined Cycle Shift Operation and Heat Rate Monitoring is a 1-week training course for power plant operators and shift engineers who run gas turbine, heat recovery steam generator and steam turbine trains, and who leave with a shift performance check sheet. Faster cycling, tighter fuel budgets and ageing hot-gas-path parts make every shift decision show up in the heat rate. Jupiter Prime Training presents this subject from the control desk outwards.

## Why Combined Cycle Shift Operation and Heat Rate Monitoring Matters Now

Combined cycle units once ran at base load; many now start daily, follow variable renewable output and park at minimum load overnight. Each extra start consumes turbine life and stresses drums and headers. Fuel cost remains the largest operating expense, so a small rise in heat rate erodes margin. Owners and dispatch centres depend on crews who notice degradation early. A crew that tracks corrected output and fouling trends protects efficiency and component life; a crew that does not hides losses until an outage reveals them.

## Who Gains Most from Combined Cycle Shift Operation and Heat Rate Monitoring

- Control room operators who execute start-up, loading and shutdown sequences on each train
- Shift engineers who log readings, judge alarms and decide when to call for maintenance
- Performance engineers who correct test data and report heat rate to plant management
- Field operators who walk down steam generator, condenser and auxiliary equipment each shift
- Commissioning staff who hand new or overhauled units back to operations

Complete shift crews from one station gain most, because shared check routines only stick when every rota uses them the same way.

## Combined Cycle Shift Operation and Heat Rate Monitoring Capabilities

These outcomes link each control desk action to fuel burned and component life consumed.

- Apply hot, warm and cold start sequences with correct hold points — dispatch readiness
- Calculate gross and net heat rate from shift readings — the fuel efficiency report
- Assess compressor fouling, inlet filter loss and exhaust temperature spread — wash and inspection timing
- Test steam generator pinch and approach trends — tube cleaning and attemperation decisions

- Weigh condenser vacuum and cooling water losses — back-end performance priorities
- Communicate deviations at shift handover — the next crew and maintenance planners

## Key Combined Cycle Shift Operation and Heat Rate Monitoring Terms

- Heat Rate — fuel energy needed per unit of electricity; lower means more efficient.
- Heat Recovery Steam Generator — the boiler that turns gas turbine exhaust heat into steam.
- Pinch Point — the smallest temperature difference between exhaust gas and evaporating water inside the steam generator.
- Corrected Output — measured power adjusted to reference ambient conditions for fair comparison.
- Equivalent Operating Hours — running hours plus start and trip penalties, used to track part life.
- Condenser Back Pressure — the absolute pressure at the steam turbine exhaust, which strongly affects output and heat rate.

## Combined Cycle Shift Operation and Heat Rate Monitoring Day by Day

## Day 1: The Combined Cycle Train and Its Operating Regimes

- Brayton and Rankine Cycle Pairing — Where Each Stage Gains Efficiency
- Single-Shaft and Multi-Shaft Arrangements — Start Flexibility and Bypass Options
- Base Load, Load Following and Two-Shift Regimes — Wear Versus Revenue
- Equivalent Operating Hours Counting — Effect of Starts on Part Life
- Control Room Displays and Alarm Hierarchy — What the Crew Watches First

## Day 2: Gas Turbine Operation on Shift

- Purge, Ignition and Run-Up Sequence — Safe Light-Off Conditions
- Inlet Air Filtration and Cooling — Output Loss on Hot Days
- Compressor Online and Offline Washing — Fouling Recovery Timing
- Exhaust Temperature Spread Monitoring — Early Combustion Fault Signals
- Dry Low Emission Combustion Modes — Load Range and Emission Limits

## Day 3: Steam Generator and Steam Turbine Operation

- Drum Level Control and Swell Behaviour — Trip Avoidance During Start-Up
- Pinch and Approach Temperature Trending — Tube Fouling Detection
- Attemperator and Steam Temperature Control — Metal Temperature Protection
- Steam Turbine Warming and Rotor Stress Limits — Loading Rate Choice
- Condenser Vacuum and Air Ingress Checks — Back-End Loss Recovery

## Day 4: Heat Rate Calculation and Performance Correction

- Gross and Net Heat Rate Calculation — Auxiliary Load Effect
- Ambient Correction Curves — Fair Comparison Between Shifts
- Fuel Flow and Calorific Value Checks — Measurement Error Sources
- Degradation Trend Charts — Recoverable Versus Permanent Losses
- Controllable Loss Accounts — Ranking Fixes by Fuel Saved

## Day 5: Practising the Shift Performance Check Sheet

- Simulated Warm Start With Hold Points — Applying Run-Up Sequences
- Gas Turbine Readings Review — Applying Fouling and Spread Checks
- Steam Side Readings Review — Applying Pinch and Vacuum Trends
- Shift Handover Log Exercise — Passing Deviations to Maintenance
- Shift Performance Check Sheet Assembly — Completing the Work Product

## Applying Combined Cycle Shift Operation and Heat Rate Monitoring After the Course

- Introduce the corrected heat rate calculation into every shift log and compare trends across rotas for one month
- Run a controllable loss review of compressor fouling and condenser vacuum with the maintenance planner

## Combined Cycle Shift Operation and Heat Rate Monitoring Questions FAQ

### What is Combined Cycle Shift Operation and Heat Rate Monitoring and why does it matter now?

It is the day-to-day running of gas turbine, steam generator and steam turbine trains while tracking fuel efficiency. It matters now because frequent cycling and fuel costs make each shift decision visible in heat rate and part life.

### Which roles gain most from Combined Cycle Shift Operation and Heat Rate Monitoring?

Control room operators, shift engineers and performance engineers gain most. You benefit most if you run start-ups or report efficiency.

### How does Combined Cycle Shift Operation and Heat Rate Monitoring differ from a combined cycle design course?

It focuses on operating and monitoring an existing plant rather than sizing or matching cycle stages.

### What do you bring back from Combined Cycle Shift Operation and Heat Rate Monitoring?

You bring back a shift performance check sheet built during the course. It lists readings, limits and handover notes your crew can adopt.

## Combined Cycle Shift Operation and Heat Rate Monitoring: The Way Forward

The shift performance check sheet first informs whether a unit needs a compressor wash, tube cleaning or vacuum repair before the next outage. Shift crews fill it, performance engineers trend it and maintenance planners act on it. After its first month, revisit the alarm limits and correction curves as cycling patterns and fuel quality shift.