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COURSE BROCHURE

# Boiler and Steam System Operations Training Course

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Registered in the United Kingdom and Saudi Arabia

# Boiler and Steam System Operations Training Course

Boiler and Steam System Operations is a 1-week training course for boiler operators and utility supervisors who run steam plant shift by shift, and it ends with a boiler house operating round sheet for their own site. Fuel cost, tighter emissions limits and an ageing operator workforce now make disciplined steam plant practice a direct driver of uptime and safety. The course is delivered by Jupiter Prime Training.

## Why Boiler and Steam System Operations Matters Now

Steam remains the workhorse utility of refineries, food plants, hospitals and district heating. Fuel is the largest running cost of a steam system, so poor combustion, failed traps and lost condensate drain budgets quietly. Inspectors look harder at low-water incidents and furnace explosions. Experienced firemen are leaving faster than new operators arrive. A plant that operates boilers with discipline protects people, pressure parts and production. The course draws on maintenance terminology from EN 13306 and on asset life thinking from ISO 55001 for asset management.

## Who Gains Most from Boiler and Steam System Operations

- Shift operators who light, load and shut down fire-tube and water-tube boilers
- Utility supervisors who allocate steam between process users and approve operating changes
- Water treatment technicians who sample feedwater and dose chemicals
- Energy coordinators who track fuel use, blowdown losses and condensate recovery
- Maintenance planners who schedule boiler outages around steam demand

The greatest return comes when a whole boiler house crew attends together, so every shift follows the same start-up and alarm response routine.

## Boiler and Steam System Operations Capabilities

Participants turn the daily round into readings that predict trouble before a burner trips.

- Apply a staged cold start and warm-up curve — protecting drums, tubes and refractory from thermal shock
- Test low-water cut-outs and safety valves on a routine — assuring the supervisor that protective devices work
- Calculate blowdown rate from conductivity readings — balancing water quality against heat loss
- Assess steam trap and condensate return condition — deciding which repairs recover the most energy
- Weigh flue gas oxygen and stack temperature results — adjusting air-fuel ratio with the burner technician
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Communicate abnormal readings in a clear shift handover — keeping the next crew informed

## Key Boiler and Steam System Operations Terms

- Priming and carryover — water droplets and dissolved solids leaving the drum with steam, fouling superheaters and process equipment.
- Bottom blowdown — a short, intermittent discharge from the lowest point of a boiler to remove settled sludge.
- Deaerator — a vessel that heats feedwater with steam to strip dissolved oxygen and carbon dioxide before it enters the boiler.
- Steam trap — an automatic valve that releases condensate and non-condensable gases while holding live steam in the line.
- Water hammer — a violent pressure shock caused when slugs of condensate are driven along a steam main.
- Turndown ratio — the span between maximum and minimum stable firing rate of a burner.

## Boiler and Steam System Operations Day by Day

### Day 1: Steam Plant Layout and Boiler Types

- Fire-Tube and Water-Tube Boiler Construction — Matching Design to Steam Demand
- Steam Tables and Saturation Pressure — Reading Plant Conditions Correctly
- Boiler Mountings and Fittings — Locating Every Protective Device
- Feedwater, Fuel and Flue Gas Circuits — Tracing Flows Around the Boiler House
- EN 13306 Failure Terminology — Recording Boiler Faults in Common Language

### Day 2: Start-Up, Loading and Shutdown Routines

- Pre-Firing Checklist and Furnace Purge — Preventing Ignition of Unburnt Fuel
- Cold Start Warm-Up Curve — Limiting Thermal Stress on Pressure Parts
- Bringing a Boiler Online in Parallel — Avoiding Header Pressure Upsets
- Planned and Emergency Shutdown Sequence — Securing Fuel, Water and Steam
- Wet and Dry Lay-Up Methods — Protecting an Idle Boiler From Corrosion

### Day 3: Feedwater Chemistry and Blowdown Control

- Softening and Reverse Osmosis Pretreatment — Choosing Makeup Water Quality
- Deaerator Operation and Oxygen Scavenging — Stopping Pitting in Tubes
- Conductivity, pH and Alkalinity Testing — Setting Chemical Dosing
- Continuous and Bottom Blowdown Control — Limiting Solids Without Wasting Heat
- Carryover Detection and Prevention — Protecting Turbines and Process Users

## Day 4: Steam Distribution and Condensate Recovery

- Steam Main Sizing, Drainage and Venting — Preventing Water Hammer
- Steam Trap Types and Survey Methods — Ranking Failed Traps for Repair
- Condensate Return and Flash Steam Recovery — Cutting Fuel and Water Use
- Flue Gas Analysis and Combustion Efficiency — Adjusting Excess Air
- Case Studies From Food Plants and Refineries — Lessons From Low-Water Incidents

## Day 5: Practising the Boiler House Operating Round

- Start-Up Simulation Exercise — Applying the Day 2 Purge and Warm-Up Sequence
- Water Chemistry Log Exercise — Applying Day 3 Blowdown Decisions
- Trap and Condensate Walkdown Exercise — Applying Day 4 Survey Methods
- ISO 55001 Criticality Ranking — Prioritising Boiler House Equipment for Attention
- Boiler House Operating Round Sheet — Completing Readings, Limits and Actions

## Applying Boiler and Steam System Operations After the Course

- Run a steam trap survey on one distribution header and rank failed traps by steam loss.
- Rewrite the shift start-up checklist for one boiler with purge, warm-up and low-water test steps.

## Boiler and Steam System Operations Questions FAQ

### What is boiler and steam system operations and why does it matter now?

It is the daily practice of firing, loading, treating and shutting down boilers and distributing their steam safely. Fuel costs, emissions limits and fewer experienced operators make written, consistent routines essential for safety and efficiency.

### Which roles gain most from boiler and steam system operations?

Shift boiler operators and utility supervisors gain most. Water treatment technicians and energy coordinators also benefit.

### How does boiler and steam system operations differ from a boiler engineering course?

This course focuses on operating routines, water chemistry and steam distribution at the plant. An engineering course concentrates on design calculations instead.

### What do you bring back from boiler and steam system operations?

You bring back an operating round sheet for your own boiler house, with readings, limits and actions. You also return with a clear start-up sequence.

## Boiler and Steam System Operations: The Way Forward

The boiler house operating round sheet first informs which reading demands action on the next shift and which can wait. Operators complete it on every round, and supervisors review it at handover. After a month of use, revisit the limits and alarm thresholds against real readings, because actual plant behaviour shows where the sheet needs tightening.