JUPITER PRIME

Consulting • Training • Advisory

جوبيتر برايم للاستشارات والتدريب

COURSE BROCHURE

Power Plant Troubleshooting and Generating Unit Fault Diagnosis Training Course

4 – 8 January 2027
Dar es Salaam

Power Plant Troubleshooting and Generating Unit Fault Diagnosis Training Course

Ref: 3228_122853 **Date:** 4 – 8 January 2027 **Location:** Dar es Salaam **Fees:** 7900 GBP

Power Plant Troubleshooting and Generating Unit Fault Diagnosis is a 1-week training course for power plant engineers, shift supervisors and maintenance leads who must trace why a turbine, generator, boiler or auxiliary system has tripped or degraded, and who leave with a generating unit fault investigation report. Forced outages now cost more as fleets age and run more flexibly. Jupiter Prime Training sets power plant troubleshooting within the wider work of keeping units available.

Why Power Plant Troubleshooting Matters Now

Three forces shape power plant troubleshooting today. Older units are cycled harder to follow variable demand and renewable output, so thermal stress, vibration and control faults appear more often. Experienced operators are retiring, taking unwritten fault knowledge with them. Owners also expect faster, clearer returns to service. A station that diagnoses well restores output quickly and stops repeat failures; one that guesses replaces healthy parts and suffers the same trip again. The course rests on recognised practice for evidence-based failure investigation and equipment condition assessment, described in general terms.

Who Gains Most from Power Plant Troubleshooting

- Engineers responsible for turbine, generator and boiler performance on operating units
- Shift supervisors who lead first response when a unit trips or alarms
- Maintenance leads who plan corrective work and approve parts replacement
- Electrical engineers who own excitation, protection and station auxiliary supplies
- Reliability staff who track repeat failures and forced outage causes

A station team that sends operations, maintenance and electrical members together gains most, because each discipline sees a different part of the same fault evidence.

Power Plant Troubleshooting Capabilities

Participants move from reacting to alarms towards reading trip evidence, testing fault hypotheses and choosing repairs that remove the cause.

- Apply a structured fault isolation sequence to a unit trip — shift supervisor restart decision
- Assess trend records, sequence of events logs and alarm floods — engineering fault hypothesis
- Test competing fault causes against physical evidence — maintenance work scope
- Weigh corrective actions by risk, cost and outage time — station manager approval
- Specify checks that confirm a repair has worked — return to service sign-off
- Communicate findings in a clear investigation record — asset owner and insurer

Key Power Plant Troubleshooting Terms

- Forced outage — an unplanned removal of a generating unit from service because of equipment failure or an unsafe condition.
- Sequence of events record — a time-stamped log of breaker, relay and control actions used to rebuild what happened during a trip.
- First-out alarm — the indication showing which protection or process condition initiated a trip before the cascade of later alarms.
- Fault hypothesis — a testable statement of a possible cause, checked against evidence before any repair is ordered.
- Repeat failure — a fault that returns because the earlier repair treated a symptom rather than the underlying cause.
- Return to service test — the checks and limits a unit must meet before it is loaded again after a repair.

Power Plant Troubleshooting Day by Day

Day 1: Generating Unit Behaviour and Fault Patterns

- Unit Operating Envelope — Recognising Abnormal Conditions Early
- Common Trip Causes Across Steam and Gas Units — Investigation Priorities
- Cycling and Ageing Effects on Equipment — Inspection Focus
- Safe First Response After a Trip — Restart or Hold Decision
- Evidence Preservation on Shift — Quality of Later Diagnosis

Day 2: Reading Trip Evidence

- First-Out Alarm Interpretation — Locating the Initiating Event
- Sequence of Events Reconstruction — Timeline of Protection Actions
- Historian Trend Comparison — Separating Cause From Consequence
- Operator Interviews and Shift Logs — Filling Gaps in Records
- Fault Tree Sketching — Narrowing Possible Failure Paths

Day 3: Mechanical and Thermal Faults

- Turbine Vibration and Bearing Temperature Patterns — Rotor Condition Judgement
- Boiler Tube Leaks and Combustion Upsets — Firing and Repair Choices
- Condenser and Cooling Water Problems — Vacuum Loss Response
- Feed Pump and Fan Failures — Auxiliary Redundancy Decisions
- Lubrication and Seal Oil Faults — Protection of Rotating Plant

Day 4: Electrical and Control Faults

- Generator Excitation and Voltage Faults — Field Equipment Diagnosis
- Protection Relay Operations — Genuine Fault or Spurious Trip
- Station Auxiliary Supply Loss — Transfer Scheme Performance
- Control Loop and Instrument Failures — Signal Validation Steps
- Corrective Action Ranking Matrix — Risk, Cost and Outage Time

Day 5: Practising the Fault Investigation Report

- Combined Trip Case Using Earlier Evidence Methods — Cause Confirmation
- Hypothesis Testing on Mixed Mechanical and Electrical Faults — Repair Scope
- Return to Service Test Plan — Loading Approval
- Repeat Failure Prevention Measures — Maintenance Strategy Change
- Generating Unit Fault Investigation Report — Station Management Briefing

Applying Power Plant Troubleshooting After the Course

- Lead a review of the last three unit trips using first-out alarms, sequence of events records and trends to confirm or correct the recorded causes.
- Introduce a shift evidence checklist so that logs, trends and relay records are kept before any reset after a trip.

Power Plant Troubleshooting Questions FAQ

What is power plant troubleshooting and why does it matter now?

Power plant troubleshooting is the structured tracing of a unit trip or degradation to its real cause. It matters now because ageing units are cycled harder, experienced staff are leaving and owners expect faster, well-explained returns to service after every forced outage.

Which roles gain most from power plant troubleshooting?

Plant engineers, shift supervisors, maintenance leads and electrical engineers on operating generating units gain most. The evidence methods apply to utility stations and industrial captive plant alike.

How does power plant troubleshooting differ from process plant fault finding?

Power plant troubleshooting centres on generating equipment: turbines, generators, boilers, excitation and protection. Process plant courses deal with columns and reactors. The evidence here comes from relay records, generator data and unit trip logic.

What do you bring back from power plant troubleshooting?

You bring back a generating unit fault investigation report built on a realistic trip case. It shows the evidence timeline, tested hypotheses, the confirmed cause, ranked corrective actions and return to service checks your station can reuse.

Power Plant Troubleshooting: The Way Forward

The generating unit fault investigation report first informs whether a tripped unit can be safely restarted or needs repair. Shift supervisors, maintenance planners and station managers use it to agree repair scope and outage time. After its first use, revisit how evidence was kept on shift, since diagnosis depends on records captured in the first minutes.