JUPITER PRIME

Consulting • Training • Advisory

جوبيتر برايم للاستشارات والتدريب

COURSE BROCHURE

Process Plant Troubleshooting and Problem Solving Training Course

17 – 21 May 2027
Rome

jupiterprime.uk

info@jupiterprime.uk

Registered in the United Kingdom and Saudi Arabia

Process Plant Troubleshooting and Problem Solving Training Course

Ref: 845_32066 **Date:** 17 – 21 May 2027 **Location:** Rome **Fees:** 7200 GBP

Process Plant Troubleshooting and Problem Solving is a 1-week training course for process engineers, shift supervisors and maintenance engineers who must respond quickly when a pump cavitates, an exchanger fouls, a column floods or a reactor drifts, and who leave with a Shift Troubleshooting Logbook of symptom checks and first responses for their own unit. Leaner shift crews and higher plant utilisation now leave less time to diagnose faults before output is lost. Jupiter Prime Training delivers this course for the people first on the scene.

Why Process Plant Troubleshooting and Problem Solving Matter Now

Three pressures make first-response troubleshooting more important today: smaller shift crews that cover more equipment, plants running nearer nameplate capacity so that small faults quickly cost output, and growing amounts of historian data that few people on shift are trained to read. A crew that diagnoses correctly in the first hours avoids unnecessary shutdowns, repeat failures and unsafe improvisation, while one that guesses swaps parts, loses product and repeats the same incident. The course draws on Kepner-Tregoe Problem Analysis KT, the 5 Whys, the Ishikawa fishbone diagram and fault tree analysis FTA.

Who Gains Most from Process Plant Troubleshooting and Problem Solving

- Supervisors who decide on shift whether to slow, bypass or stop a unit when symptoms appear
- Process engineers who are called in to interpret abnormal temperatures, pressures and flows
- Maintenance engineers who inspect pumps, seals and exchangers after an upset
- Senior operators who read trends and alarms and give the first account of an event
- Reliability coordinators who track repeat failures across a site

A shift crew whose supervisor, process engineer and maintenance engineer attend together gains most, because each fault can then be traced from first alarm to verified fix without hand-over gaps between disciplines.

Process Plant Troubleshooting and Problem Solving Capabilities

Participants practise moving from an alarm or operator report to a tested explanation within one shift, and they learn when to stop guessing and gather more evidence.

- Apply a symptom-cause matrix to pumps, exchangers, columns and reactors — first-response decisions on shift
- Build historian trend sets that separate cause from consequence — engineers called to an upset
- Test competing hypotheses with KT Problem Analysis — the choice of corrective action
- Design simple field checks such as pressure surveys and temperature profiles — maintenance work requests
- Weigh run, slow or stop options against safety and production risk — shift supervisor and operations manager
- Communicate a concise fault account to the next shift and to management — hand-over quality

Key Process Plant Troubleshooting and Problem Solving Terms

- Symptom-cause matrix — a table linking observable symptoms such as noise, vibration or temperature change to their likely causes.
- Cavitation — vapour bubbles forming and collapsing in a pump when suction pressure falls too low, causing noise and damage.
- Fouling factor — the added resistance to heat transfer caused by deposits building on exchanger surfaces.
- Column flooding — liquid build-up inside a distillation column that reduces separation and raises pressure drop.
- Is and Is Not analysis — a KT step comparing where a problem occurs with where it could occur but does not.
- Fault tree analysis — a top-down diagram tracing an undesired event back through combinations of contributing failures.

Process Plant Troubleshooting and Problem Solving Day by Day

Day 1: First Response on Shift

- Upset Recognition From Alarms and Operator Rounds — When to Escalate
- Safe Operating Limits Check — Run, Slow or Stop Choice
- Event Timeline Capture — Preserving Evidence Before It Disappears
- Historian Trend Set Building — Separating Cause From Consequence
- Shift Hand-Over Fault Note — Clear Account for the Next Crew

Day 2: Structured Problem-Solving Methods

- Kepner-Tregoe Problem Analysis — Defining Deviation Before Proposing Causes
- Is and Is Not Comparison — Narrowing the Possible Causes
- 5 Whys Questioning — Reaching Actionable Causes Without Blame
- Ishikawa Fishbone Diagram — Grouping Causes by Equipment, Method and Material
- Fault Tree Construction — Combined Failures Behind a Trip

Day 3: Rotating and Heat Transfer Equipment

- Pump Curve and NPSH Margin Check — Cavitation and Low-Flow Diagnosis
- Mechanical Seal Failure Patterns — Leak, Wear and Flush Problems
- Exchanger Performance Calculation — Fouling Versus Bypassing Versus Leaking
- Furnace Draft and Flame Observation — Uneven Heating and Tube Hot Spots
- Vibration and Temperature Field Checks — Maintenance Request Priority

Day 4: Columns and Reactors

- Column Pressure Drop Profile — Flooding, Weeping and Foaming Signs
- Tray and Packing Damage Indicators — Inspection or Gamma Scan Request
- Reactor Temperature Profile Review — Hot Spots and Runaway Warnings
- Catalyst Activity Decline Tracking — Poisoning, Coking or Channelling
- Instrument Error Screening — False Readings Behind Apparent Process Faults

Day 5: Practising the Shift Troubleshooting Logbook

- Pump and Exchanger Upset Simulation — Applying Symptom-Cause Matrix and Field Checks
- Column Upset Simulation — Applying Pressure Profile and Trend Reading
- Hypothesis Test Exercise — Applying KT and Fault Tree Methods
- Corrective Action Verification Criteria — Proving the Fault Has Gone
- Shift Troubleshooting Logbook — Symptom Checks, First Responses and Escalation Routes

Applying Process Plant Troubleshooting and Problem Solving After the Course

- Build a symptom-cause matrix for the three most troublesome pumps or exchangers on the unit and brief each shift on it.
- Run a KT Problem Analysis on the latest repeat trip and present the tested cause at the next operations meeting.

Process Plant Troubleshooting and Problem Solving Questions FAQ

What is process plant troubleshooting and problem solving and why does it matter now?

It is the structured diagnosis of faults in pumps, exchangers, columns and reactors, from first alarm to verified fix. It matters now because leaner crews run plants harder, so refineries and chemical sites lose output quickly when faults are misdiagnosed.

Which roles gain most from process plant troubleshooting training?

Shift supervisors, process engineers and maintenance engineers gain most. Senior operators and reliability coordinators also benefit, especially when they attend with the supervisors who make run or stop decisions.

How does this process plant troubleshooting course differ from a longer advanced troubleshooting course?

It concentrates on first response within a shift over one week. A longer advanced course spends more time on deep equipment investigations, utilities and start-up transients, while this course builds fast symptom checks, structured hypothesis testing and clear hand-over.

What do you bring back from process plant troubleshooting and problem solving training?

You bring back a logbook of symptom checks, first responses and escalation routes for your own unit. It is ready for shift crews to use and for engineers to extend after each new incident.

Process Plant Troubleshooting and Problem Solving: The Way Forward

The Shift Troubleshooting Logbook first informs what the crew checks in the first hour of the next upset. Supervisors use it to decide whether to run, slow or stop; engineers use it to frame hypotheses; maintenance uses its field checks. After the first real incident, revisit the escalation routes, since actual events show where hand-overs between disciplines still slow diagnosis.