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COURSE BROCHURE

# Substation Inspection and Condition-Based Maintenance Training Course

22 – 26 August 2027
Manama

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Registered in the United Kingdom and Saudi Arabia

# Substation Inspection and Condition-Based Maintenance Training Course

**Ref:** 2690_102642 **Date:** 22 – 26 August 2027 **Location:** Manama **Fees:** 5500 GBP

Substation Inspection and Condition-Based Maintenance is a 1-week training course for substation operators, maintenance technicians and electrical supervisors, built around one named work product: a substation condition and maintenance plan. Ageing assets and leaner field crews make disciplined inspection rounds and evidence-led maintenance a priority for asset owners. Jupiter Prime Training delivers this Substation Inspection and Condition-Based Maintenance course.

## Why Substation Inspection and Condition-Based Maintenance Matters Now

Two forces shape substation upkeep today. Much installed equipment is near the end of its design life, so condition rather than age must decide when it is serviced. Retiring field staff take knowledge of alarms and defects with them unless it is captured in records. A site that inspects well catches hot joints and weak battery cells before they fail; a site that inspects badly pays in forced outages and rushed repairs. The course rests on recognised condition-based maintenance practice.

## Who Gains Most from Substation Inspection and Condition-Based Maintenance

- Staff who carry out walk-round inspections in switchyards
- Technicians who test and service transformers, circuit breakers, disconnectors, batteries and earthing
- Shift personnel who acknowledge alarms and give the first response to substation faults
- Supervisors who schedule maintenance work and sign off permits and job records
- Planners who turn findings into maintenance intervals

Maintenance sections in utilities and process plants gain most when operators, technicians and their supervisor attend together.

## Substation Inspection and Condition-Based Maintenance Capabilities

Participants move from noting defects to ranking equipment by condition and setting maintenance by evidence.

- Apply structured inspection routes and checklists to every bay of a substation — consistent defect capture across shifts
- Assess thermographic images, oil results and battery readings against alarm limits — repair-or-monitor decisions
- Communicate alarm and fault information in a clear first report — control room and duty engineer
- Design condition-based maintenance intervals from inspection and test history — maintenance planners and asset owners
- Specify safe work boundaries using interlocks and permits during maintenance — supervisors issuing work
- Build maintenance records that support trend review and audit — reliability engineers and management

## Key Substation Inspection and Condition-Based Maintenance Terms

- Condition-based maintenance — servicing equipment when measured condition shows it is needed, rather than at fixed calendar intervals.
- Inspection round — a planned route through a substation where staff read gauges and record defects on a set sheet.
- Infrared thermography — a thermal camera survey that finds hot spots on joints and terminations while equipment is energised.
- Dissolved gas analysis — laboratory testing of transformer oil for gases that reveal internal overheating or arcing.
- Health index — one score combining test results, age and defects to rank equipment.
- Interlocking — arrangements that stop switching devices operating in an unsafe sequence.

## Substation Inspection and Condition-Based Maintenance Day by Day

### Day 1: Substation Layouts and Inspection Context

- Single-Line Diagrams and Busbar Arrangements — Locating Every Bay on an Inspection Route
- Equipment Ageing and Failure Patterns — Where Inspection Effort Pays Off Most
- Switching Sequences and Interlocking Basics — Recognising Safe Equipment States During Rounds
- Permit-to-Work and Safe Access Rules — Who May Approach Which Equipment
- Maintenance Strategy Choices — Corrective, Time-Based and Condition-Based Compared

### Day 2: Inspecting Primary Equipment

- Power Transformer Visual and Gauge Checks — Oil Level, Temperature and Breather Condition
- Circuit Breaker Operating Mechanism Inspection — Spring, Gas Pressure and Counter Readings
- Disconnector and Earth Switch Contact Condition — Alignment, Corrosion and Operating Effort
- Substation Battery and Charger Checks — Cell Voltage, Electrolyte and Float Current
- Earthing Grid and Connection Inspection — Theft, Corrosion and Continuity Concerns

## Day 3: Condition Monitoring Methods

- Infrared Thermography Surveys — Grading Hot Spots by Temperature Rise
- Transformer Oil Sampling and Dissolved Gas Results — Internal Fault Warning Signs
- Partial Discharge and Acoustic Detection — Insulation Deterioration in Switchgear and Cables
- Circuit Breaker Timing and Contact Resistance Trends — Mechanism and Contact Wear
- Equipment Health Index Scoring — Ranking Assets for Intervention

## Day 4: Alarm Handling, Fault Response and Planning

- Alarm Annunciator and Control Panel Indications — Separating Urgent From Routine Alarms
- First Response to Tripping and Protection Operation — Information the Control Room Needs
- Post-Fault Equipment Checks — Deciding Whether Plant Can Be Restored
- Condition-Based Interval Setting — Moving Tasks From Calendar to Evidence
- Maintenance Work Order and Spares Planning — Matching Crews, Outages and Materials

## Day 5: Practising the Substation Condition and Maintenance Plan

- Inspection Route and Checklist Build — Applying Layout and Equipment Checks
- Condition Findings Ranking Exercise — Applying Thermography, Oil and Battery Results
- Fault Scenario Walk-Through — Applying Alarm Handling and First Response
- Maintenance Record Structure — Capturing History for Trend Review and Audit
- Substation Condition and Maintenance Plan — Completing and Presenting the Work Product

## Applying Substation Inspection and Condition-Based Maintenance After the Course

- Run a revised inspection round on one substation with the bay-by-bay checklist and compare defects with the previous log.
- Review one year of transformer, breaker and battery records, score each asset with a health index and propose new condition-based intervals.

## Substation Inspection and Condition-Based Maintenance Questions FAQ

### What is substation inspection and condition-based maintenance, and why does it matter now?

It is the practice of inspecting substation equipment on set routes and planning maintenance from measured condition. It matters now because ageing equipment and outage pressure leave little room for missed defects.

## Which roles gain most from substation inspection and condition-based maintenance?

Substation operators, maintenance technicians and electrical supervisors gain most. Each gains a shared basis for rounds, test results and maintenance planning.

## How does substation inspection and condition-based maintenance differ from a high-voltage switching course?

A switching course concentrates on isolation and switching authorisation. This course covers the whole substation: inspection rounds, condition monitoring, alarm and fault response, maintenance planning and records.

## What do you bring back from substation inspection and condition-based maintenance training?

You bring back a substation condition and maintenance plan for a site of your choice. It holds an inspection route, a condition ranking of equipment, revised intervals and a record structure.

## Substation Inspection and Condition-Based Maintenance: The Way Forward

The substation condition and maintenance plan first informs which equipment receives attention in the next outage window. Supervisors and planners use it to allocate crews and spares. After its first cycle, revisit the alarm limits and chosen intervals against what the inspections actually found, so operators on every shift follow a route that reflects real equipment condition.