High Voltage Switching Safety: Switching Programmes, Earthing and Safety Documents

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Dubai - Five-star CBD venue



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Introduction:

High voltage switching safety breaks down at predictable points: a switching instruction carried out on the wrong circuit, an earth applied before the point of isolation was secured, a sanction-for-test left open while a permit-to-work was issued on the same apparatus. This Core Concept course trains engineers and technicians who switch, isolate and earth HV systems to work within safety rules, prepare and check switching programmes, prove dead, apply primary and additional earths and issue the correct safety document. Participants produce a Switching Programme and Safety Document Set for a case substation outage.

Course Objectives:

- Explain HV hazards and the duties of authorised, competent and control persons under a set of electrical safety rules
- Establish safe isolation on HV apparatus, prove dead and apply primary and additional earths in the correct order
- Prepare, check and execute switching programmes using clear instructions and repeat-back communication
- Issue, receive and cancel permit-to-work, sanction-for-test and limitation of access documents without conflicts between them
- Operate HV switchgear, interlocks and key systems while limiting operator exposure to arc flash
- Produce a switching programme and safety document set for a planned substation outage

Target Audience:

- Electrical engineers who authorise HV switching and issue safety documents
- Authorised persons who carry out switching, isolation and earthing on HV networks
- Competent persons and HV technicians who receive safety documents and work on isolated apparatus
- Control room engineers who instruct and record switching from a network control centre
- Maintenance supervisors who plan outages on HV plant in utilities and industrial sites

Course Outline:

Day 1: HV Hazards, Safety Rules and the Authorisation Structure

- Induced Voltage, Step and Touch Potential and Capacitive Charge Hazards on HV Circuits
- Electrical Safety Rules Structure: Rules, Supporting Procedures and Local Instructions
- Authorised Person, Competent Person and Control Person Duties and Appointment Records
- Substation Entry Controls: Access Keys, Escorting and Visitor Procedures
- Current-State Review of a Site HV Safety Rule Book Using a Gap Checklist

Day 2: Isolation, Proving Dead, Earthing and Interlocks

- EN 50110-1 Five-Step Procedure: Disconnect, Secure, Verify, Earth and Screen
- Points of Isolation: Disconnector Locking, Breaker Rack-Out and Caution Notices
- Proving Dead with Approved HV Voltage Indicators and Proving Unit Checks
- Primary Earths Versus Additional Drain Earths: Placement Rules and Earth Schedules
- Mechanical Interlocks and Trapped-Key Systems Between Breakers, Disconnectors and Earth Switches

Day 3: Switching Programmes, Instructions and Safety Documents

- Switching Programme Drafting from the Operational Diagram: Sequence, Checks and Hold Points
- Independent Programme Checking and Approval Sign-Off
- Control Engineer Instructions and Repeat-Back Communication Protocol
- Permit-to-Work for HV Apparatus: Issue, Receipt, Transfer and Cancellation
- Sanction-for-Test and Limitation of Access: Scope, Conflicts and Cross-Referencing

Day 4: Operating Switchgear Safely and Learning from Switching Incidents

- Closed-Door Earth Switch Operation and Remote Racking to Reduce Operator Exposure
- Arc Flash Exposure Points in HV Switching: Racking, Closing onto Faults and Cable Box Access
- Switching Error Patterns: Wrong Circuit, Wrong Sequence and Conflicting Safety Documents
- Incident Case Studies: Earthing onto a Live Circuit and Backfeed Through a Voltage Transformer
- Human Factors in Switching: Situational Awareness, Distraction and Stop-Work Authority

Day 5: Simulation: Case Substation Outage Switching and Documentation

- Case Substation Operational Diagram Mark-Up and Outage Boundary Definition
- Outage Switching Programme Drafting with Isolation and Earth Schedules
- Control Desk Simulation: Issuing Instructions, Repeat-Back and Unplanned Trip Response
- Safety Document Set Completion for the Case Outage Work Parties
- Peer Challenge of the Programme and Restoration Sequence Review

Skills You Will Gain:

- HV Hazard Recognition
- Point of Isolation Selection
- HV Voltage Indication
- Earth Schedule Preparation
- Switching Programme Checking
- Safety Document Administration
- Switching Communication Discipline
- Switching Incident Analysis

Why Attend This Course:

- Leave with a Switching Programme and Safety Document Set for a case substation outage, tested in a control desk simulation
- Spot the conflicts between open safety documents that lead to earthing onto live equipment
- Give and take switching instructions with a repeat-back discipline that holds under pressure
- Compare HV switching practice with engineers and technicians from utilities, oil and gas, petrochemicals and heavy industry

Conclusion:

Safe HV work depends on switching that follows a checked programme and safety documents that match the isolation and earths actually in place. The course moves from HV hazards, safety rules and the authorisation structure, through isolation, proving dead, earthing and interlocks, to switching programmes, instructions and safety documents, and then to safe switchgear operation, arc flash exposure and incident lessons. The final day applies this in a control desk simulation and produces a Switching Programme and Safety Document Set for a case substation outage.