

Stability and Voltage Control in Electrical Power Networks

Course overview

This course discusses the fundamental principles of stability and voltage and how these principles relate to real networks with distributed generation (DG).

You will learn about existing operational practices and the emerging need to refine these practices to address stability and voltage control issues resulting from the connection of additional DG to distribution networks.

This course will give you an understanding of a range of generator types and why they become unstable, types of instability, and how stability can be enhanced including stability studies and stability modelling.

Delegates will be able to apply their learning through a series of graded worked examples, created to represent actual rural and urban networks with various mixes of load, fault levels and numbers and sizes of DG.

Cost: Two-day course: £935 + VAT

Location: EA Technology, Capenhurst, Chester, CH1 6ES

Who should attend?

You should attend this course if you are an engineer or technician with responsibility for ensuring stability and voltage control, particularly on networks featuring DG.

This course will also benefit other managers, engineers and technicians working for users and owner/operators of electricity networks, plant and equipment. Engineers working in operations, planning and design sections, and newly qualified engineers will also find this course of benefit.

Benefits of attending this course

- Develop your ability to assess and enhance network stability
- Enhance your ability to protect critical components on networks
- Minimise supply interruptions
- Develop specialist skills in Network Asset Management that are in short supply
- Develop your knowledge of stability and voltage control principles
- Gain experience of how these principles apply to DG
- Update your knowledge of the latest developments in stability and voltage control in DG

Substations Courses

Specialist Courses

Cables Courses

Power Networks Courses

Protection Courses

Tailored Programmes

Stability and Voltage Control in Electrical Power Networks

Course programme

Day one

Basic Principles

- Background
- Physical Laws
- Machine principles
- Stability principles

Stability and Definitions

- Operation of generation on an infinite bus
- Steady state stability
- Swing equation
- Equal area criterion
- Fault types
- Factors influencing stability

Stability Exercise

- Power angle stability – calculation steps
- Group exercise – power angle calculation
- Power angle stability exercise - solution

What Affects Stability

- Types of stability
- Types of disturbance
- Transient stability
- Effects of protection
- Stability enhancement
- Machine modelling

Day two

Methods of Analysis

- Solving the network
- Solving the differential equations
- Dynamic Modelling (Laplace)
- Numeric integration
- Frequency domain solution

Standards and Industry Guidelines

- Legislation and Standards
- Distribution network voltage control
- Distribution network stability

Voltage Stability

- Reactive power and voltage stability
- Voltage stability analysis
- PV and QV characteristics
- Effects of loading
- Voltage stability dynamics
- Voltage collapse

Principle and Application of Computer Modelling

- Specifying a stability study
- Obtaining data
- Interpreting the results
- Modelling the workshop example into IPSA

Distribution Network Design

- Connection of generation
- Technical issues
- Active network management

Open Discussion

Programme may be subject to amendment



Safer, Stronger,
Smarter Networks

www.eatechnology.com

Australia | China | Europe | Singapore | UAE | USA

Main reception: +44 (0) 151 339 4181
EA Technology, Capenhurst Technology Park
Capenhurst, Chester, CH1 6ES, United Kingdom