

Course 401

## **Voltage Security Assessment**

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### **Course Objectives**

This course covers various aspects of power system voltage security assessment and controls. The course will include the theory, practical aspects, modeling and analysis. After completing the course, students will be able to understand why voltage control is important, how it is achieved, and study methods used to assess voltage performance. In addition, students will understand the theory of voltage stability, factors that influence stability, how instability can be prevented, and analysis tools and techniques. Upon completion, students should have the appropriate knowledge to perform basic studies to assess voltage stability and control.

### **Course Delivery**

The course will be delivered in classroom presentations, aided by computer software for voltage security assessment. The presentation slides will be handed out to the students as the course notes.

### **Instructor**

To be determined.

### **Recommended Prerequisites**

Courses 101 & 102 – Power System Fundamentals I & II.

### **Course Outline**

#### Session 1

- Background
  - Function and performance requirements of power systems
  - Key concepts in planning and operation
  - Definition of stability
  - Classification of power system stability
- Factors influencing the Transfer of Active and Reactive Power
- Reactive Power and Voltage Control
- Voltage Security Overview
- Production and Absorption of Reactive Power

#### Session 2

- Introduction to Voltage Stability
- Factors Influencing Voltage Stability
  - Transmission line characteristics
  - Generator characteristics

- Reactive compensating devices
- Under-load tap changers
- Loads
  
- Practical Aspects of Voltage Collapse and Incidents

Session 3

- Methods of Voltage Stability Analysis
  - Large disturbance voltage stability analysis
  - Small disturbance voltage stability
  
- Practical Issues in Load Modeling

Note that the actual contents of this course offered on specific dates may be customized from the above. Please check with Powertech for details.