



## Generator Protection Application and Testing Virtual Class



3 days

English

oCprs17en

Get a thorough introduction to generator protection in a combination of theoretical and demonstration. Get familiar with generator protection relays from different manufacturers. Learn how to efficiently test generator protection relays.

### Objectives

- > Become familiar with synchronous generator types used by utilities and industry
- > Understand the key principals of generator protection
- > Use Test Universe to effectively commission or test modern generator protective relays
- > Learn to avoid common testing and maintenance pitfalls
- > Become familiar with generator protection event record analysis

### Content

- > Generator Introduction
- > Generator grounding and protection connections
- > Stator ground fault protection schemes
- > Stator phase fault protection schemes
- > Abnormal operating conditions
- > System Backup Protection
- > Interpretation of generator oscillography examples

### Solutions

Test Universe Software  
CMC-Family

### Audience

Technical staff from electric utilities or companies involved in commissioning or maintenance of generator relays.

### Prerequisites

Knowledge of protection testing



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### Details

- > Introduction and Basic Concepts
  - > Fundamental concepts
  - > Generator types
  - > Basics of generator operation and control
- > Protection Connections
  - > Generator Grounding
  - > Open delta and wye potential transformer connections
  - > CT polarity conventions
  - > Efficient test connections
  - > Metering checks
- > Stator Phase Fault Protection
  - > Generator phase differential
  - > Split phase differential
- > Stator Ground Fault Protection
  - > Ground fault protection for direct and low impedance grounded machines
  - > Ground fault protection for high impedance grounded machines
- > Abnormal Operating Conditions
  - > Phase over/under voltage
  - > Reverse power
  - > Loss of field
  - > Negative sequence overcurrent protection
  - > Over current protection
  - > Potential fuse loss
  - > Out of step
  - > Over/under frequency protection
- > System Backup Protection
  - > Phase Distance
  - > Phase overcurrent
  - > Neutral overcurrent
- > Laboratory Testing Demonstration
  - > SEL 700G



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### Agenda

#### Day 1:

##### Morning session

- 9:00 AM Welcome, Agenda Overview
- 9:15 AM Introduction and Basic Concepts
- 11:00 AM Protection Connections
- 11:30 AM Break for lunch

##### Afternoon session

- 1:30 PM Protection Connections (continued)
- 2:30 PM Stator Phase Fault Protection
- 4:00 PM Adjourn

#### Day 2:

##### Morning session

- 9:00 AM Stator Ground Fault Protection
- 10:00 AM Abnormal Operating Conditions
- 11:30 AM Break for lunch

##### Afternoon session

- 1:30 PM Abnormal Operating Conditions (continued)
- 4:00 PM Adjourn

#### Day 3:

##### Morning session

- 8:00 AM Abnormal Operating Conditions (continued)
- 11:30 AM Break for lunch

##### Afternoon session

- 1:00 PM System Backup Protection
- 3:30 PM Feedback and Wrap Up
- 4:00 PM Adjourn