






Generator Protection Application and Testing



 4 days

 English

 Cprs17en

Get a thorough introduction to generator protection in a combination of theoretical and hands-on sessions. 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 phase fault protection schemes
- > Stator ground 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 control
- > Protection connections
 - > Generator Grounding
 - > Open delta and wye potential transformer connections
 - > CT polarity conventions
 - > Efficient test connections
 - > Metering checks
- > Stator phase fault protection schemes
 - > Generator phase differential
 - > Split phase differential
- > Overcurrent protection 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
 - > Beckwith M-3425A
 - > SEL 700G, 300G



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Agenda

Day 1:

Afternoon session

- 1:00 PM Welcome, Agenda Overview
- 1:15 PM Introduction and Basic Concepts
- 3:00 PM Protection Connections and Laboratory Practice
- 5:00 PM Adjourn

Day 2:

Morning session

- 8:00 AM Phase Fault Protection Theory and Laboratory Practice
- 10:00 AM Stator Ground Fault Protection Theory and Laboratory Practice
- 12:00 PM Lunch Break

Afternoon session

- 1:00 PM Abnormal Operating Condition Theory and Laboratory Practice
- 4:00 PM Adjourn

Day 3:

Morning session

- 8:00 AM Abnormal Operating Condition Theory and Laboratory Practice (Continued)
- 12:00 PM Lunch Break

Afternoon session

- 1:00 PM System Backup Protection and Laboratory Practice
- 4:00 PM Adjourn

Day 4:

Morning session

- 8:00 AM System Backup Protection and Laboratory Practice (Continued)
- 11:30 AM Feedback and Wrap Up,
- 12:00 PM Adjourn