Introduction to Frequency Control

Introduction to Frequency Control is a computer-based training module which consists of a video lecture and simulation exercises. The course covers some basic concepts in frequency behavior on interconnected electric systems, including island size and generator setpoints. The students apply those concepts on a hypothetical power system that behaves like actual transmission equipment. Student performs an exercise to assess an islanded system while recognizing islands and boundaries, as they calculate available generation capacity. They will also observe frequency response within different sized islands by manually adjusting generation and shedding load. The second exercise allows them to observe and control frequency changes within an island, while adjusting generator setpoints, observe frequency changes and how frequency affects the load.

Cascadia 3010 Course Objectives

Introduction to Frequency Control

- Explain mechanical system oscillations
- Describe a single-shaft mental model of interconnection characteristics
- List and explain the components in a generic frequency control system
- State energy balance concepts and the relationship of system load to frequency
- Identify graphs of system frequency response upon generator trip
- Recognize that the System has been split into two Islands
- Identify the unique Generation and Frequency features of Islanded Systems
- Apply Generator trip conditions to both Islands and observe the resultant system conditions
- Identify and record the tie lines effectively separating the minor Island from the rest of the system
- Compare Actual and Scheduled Generation in the Islanded System to determine how these parameters directly • impact the System and Island frequencies.
- Evaluate the required increase in generator setpoint to raise system frequency by a specified amount
- Evaluate the sensitivity of load in an island to changes in frequency.



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