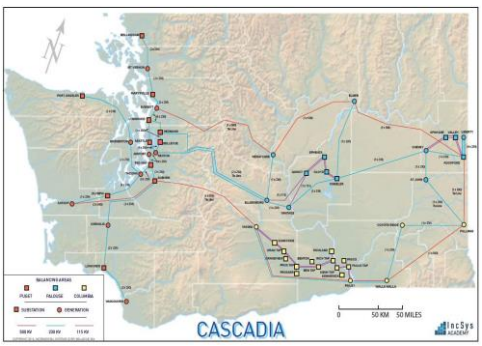
Governor Components & Operation

Governor Components and Operation is a computer-based training module which consists of a video lecture and simulation exercises. The course covers some basic concepts in generator governor behavior on interconnected electric systems, including droop and generation setpoints. The students apply those concepts on a hypothetical power system that behaves like actual transmission equipment. Student operates a simulation of a small islanded system. Students anticipate and observe frequency response on loss of generation and they will calculate and apply generator setpoints to restore island frequency to normal. In the second exercise the student operates a simulation of a small islanded system whre they apply different droop settings to generators and observe their behavior. They will also place generators in isochronous mode and observe system behavior during changes in generation and load.

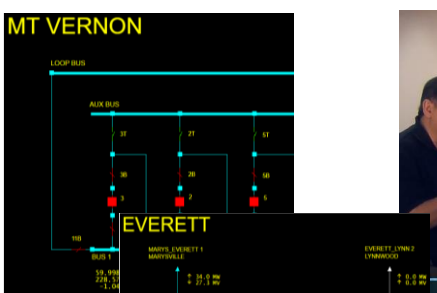


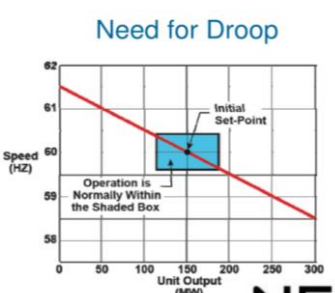
Cascadia 3020 Course Objectives

Governor Components & Operation

COURSE CE HOURS		
OT	STD	SIM
2	0	1.5

- Describe the Purpose and Types of Governors
- Describe droop in comparison to control system gain
- Describe governor droop curves
- Describe governor control in islanded and interconnected systems
- Detect governor response in frequency traces
- Describe how droop affects parallel unit response
- Estimate the frequency drop in the North Puget Island for the loss of a unit in the Island
- Appraise the Island frequency transient response following a trip of a unit in an island
- Estimate the required Generation increase to manually restore Island frequency to 60 Hz
- Experimentally simulate the change of generator set points to manually restore Island frequency to 60 Hz
- Measure simulated frequency drop in an island when a unit trip's
- Contrast the difference between estimate frequency drop and measured frequency drop
- Calculate theoretical machine generation and system frequency conditions for a range of governor droop conditions for a fixed change in system load
- Measure and record generation, load and frequency conditions from the simulator station diagrams and data displays
- Apply similar 5 % droop conditions to machines and observe & measure generator loading conditions
- Apply different (5% & 2.5%) droop conditions to similarly dispatched machines and observe & measure generator loading condition's
- Apply isochronous (0%) & 5% droop condition to similarly dispatched machines and observe & measure generator loading condition's
- Apply transient load changes and allow machine settings to automatically control system frequency in an isolated system
- Observe the oscillations that occur when droop is decreased to 0.5% for all of the machines in the island





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