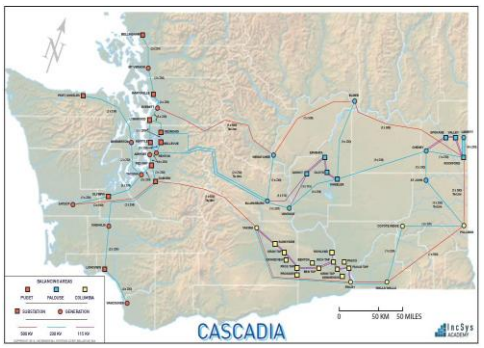
Generator Re-Dispatch



This is a computer-based training module which consists of a video lecture and two simulation exercises. Students watch a video lecture explaining the concept of generation redispatch as a tool for transmission operators to reduced overloaded transmission line conditions as they define generation shift factors (GSF) and how it affects a network and how network topology changes GSFs. In the simulation exercises the student learns how to calculate GSF along with the applicable requirements from TOP-001 and apply the concept of generation redispatch to alleviate SOL violations following a system contingency and respond to a double circuit line outage and observe a SOL violation on remaining parallel lines and review generation resources and determine which candidates to use for the generation redispatch. In the second exercise students will apply generation redispatch and load shedding during an Interconnection Reliability Operating Limit violation and play the roles of TO, BA, and RC. Students review TOP-001 requirements presented in "concept diagram" format and the established operating limits for the hypothetical power system. They will run an event file that leads to a transmission line being overloaded beyond its long-term rating. Based on contingency analysis studies that predict system collapse for the next N-1 contingency, students react to being in an IROL violation condition and choose the best action to stabilize the system. Students calculate the generation shift using power transfer distribution factors, then dump generation and shed load based on their choice and they will also observe the results and compare them to their calculations.

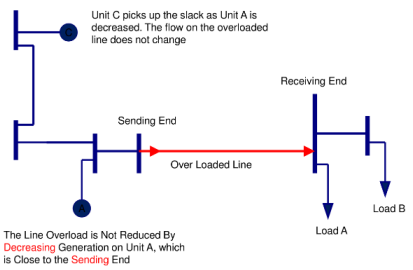
Cascadia 4040 Course Objectives

Generator Re-Dispatch

COURSE CE HOURS		
OT	STD	SIM
2	2	2

- Define generation shift factors (GSF) and generation redispatch.
- Identify conditions where generation redispatch is effective.
- In hypothetical configurations, determine where generation should be increased and where it should be decreased to mitigate a line rating violation.
- State the entities authorized to direct a generation redispatch.
- Calculate generation shift factors that can be used to mitigate line overloads for various transmission system configurations.
- List the conditions that can affect generation shift factors & respond to multiple contingencies that create SOL violations.
- Identify a Generation shift plan when time is available.
- Determine the Power Transfer Distribution Factors (PTDFs) for the generation shift plan.
- Use the PTDF to determine the magnitude of the generation shift to eliminate the SOL violation.
- Use the PTDF to estimate the MW flows on the SOL violation after the Generation Shift.
- Estimate the time to alleviate the SOL violation based on unit ramp rates.
- Implement the Generation Shift Plan and Measure flows after the Generation Shift plan is completed.
- Compare the measured flows with the estimates based on the PTDFs.
- Respond to multiple contingencies that create SOL violations.
- Identify a Generation Shed and Load Shed plan when a Line Load Dump limit is exceeded.
- Determine the PTDFs for Generation and Load Shed plan from the Cascadia Electrical Distance Diagram.
- Use the PTDFs to determine the magnitude of the Generation and Load Shed to eliminate the SOL violation.
- Use the PTDF to estimate the MW flows on the SOL violation after Generation and Load Shed is implemented.
- Implement the Generation and Load Shed Plan.
- Measure flows after the Generation and Load Shed plan.
- Compare the measured flows with the estimates based on the PTDFs.
- Compare the PTDFs calculated from the before and after PowerSimulator measurements with the PTDFs calculated from the Electrical Distance Diagram.

Special Case with Radial Loads



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