
VELCO's Transmission Planning Criteria

Southern Loop Community Working Group meeting

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What does VELCO use for its planning design standards?

- NERC (North American Electric Reliability Council)
 - Standards found on NERC website (http://www.nerc.com/~filez/standards/Reliability_Standards.html#Transmission_Planning)
 - These are the minimum level of standards the system must meet
 - These standards have been filed with FERC as part of NERC's submission to become the ERO (Energy Reliability Organization)
- NPCC (Northeast Power Coordinating Council)
 - Standards found on NPCC website (<http://www.npcc.org/criteria.asp>)
 - New England by way of the ISO-NE reliability standards is and must be compliant with these criteria, which are more specific than NERC's criteria

What are the New England (ISO-NE) reliability standards?

- ISO-NE's planning criteria are located at http://www.iso-ne.com/rules_proceeds/isone_plan/index.html
- Planning Procedure #3 is the key document
 - A key excerpt from PP3 . . .

3. AREA TRANSMISSION REQUIREMENTS

The New England **bulk power supply system** shall be designed with sufficient transmission capacity to integrate all **resources** and serve **area** loads under the conditions noted in Sections 3.1 and 3.2. These requirements will also apply after any critical generator, transmission circuit, transformer, phase angle regulating transformer, HVDC pole, series or shunt compensating device has already been lost, assuming that the **area resources** and power flows are adjusted between outages, using all appropriate reserve **resources** available in ten minutes and where applicable, any phase angle regulator control, and HVDC control.

VELCO's design standard for transmission planning . . .

- Conforms to NERC, NPCC and ISO-NE planning standards
- We consider the unavailability of system elements that have potential long duration outages (many months to a year) during forecasted peak load periods (90/10 forecast) with representative, but conservative, local generation dispatch and with the transmission network stressed with regional energy transfers
 - Vermont electric infrastructure elements with long term outage exposure
 - Highgate DC converter
 - Underground (or underwater) cables
 - Transformers
 - Generators
- After system adjustment following the first (long term) outage, VELCO tests all other potential outages

Why does VELCO use these design standards for planning?

- VELCO has experienced many long term outages within the past decade that confirm the usefulness of this design standard
 - Multi-month PV20 outage in 1994 due to ice damage in Lake Champlain
 - 18+ months of repair on unique transformers needed for Highgate DC station
 - Ice storm of 1998 which removed Highgate DC converter from import use for two+ months
 - Three different failures of phase shifting transformer at Plattsburgh, commencing in 2000
- VELCO determined that many of these long term outages occurred with insufficient local generation resources available for reliable system operation
 - Implemented automatic load shedding schemes to augment system reliability
 - The load shedding schemes, if activated during an outage, have the potential to shed tens of thousands of customers to preclude the reliability problem from cascading into neighboring systems
 - The use of these schemes can be essentially eliminated through the use of robust design standards

What other standards would apply to any new transmission lines?

- Standards exist that determine the size of the structures for any new lines
 - Example : National Electric Safety Code (NESC)
- Standards exist that determine clearing requirements for transmission line rights of way
 - These standards are provided by NERC (North American Electric Reliability Council) and were part of their filings with the FERC to become the ERO (Energy Reliability Organization)
 - Standards were strengthened after 8/14/03 blackout, which was caused in part by poor right of way maintenance