

The VELCO logo is displayed in a bold, white, sans-serif font. It is positioned in the upper left corner of the slide, set against a background image of a Vermont landscape with rolling hills and power lines.

VERMONT'S TRANSMISSION RELIABILITY RESOURCE

Arc Hazard Update

June 19, 2014

Work Done To Date

- In 2010 and 2011, VELCO performed an Arc Flash Hazard analysis on all of its equipment operated at 1,000kV and above, at all of its substations and lines.
 - ARCPRO was used for equipment operated at 1kV and above.
 - IEEE 1584 was used for equipment operated below 1kV.
 - Studies on 120/240 volt equipment were deemed unnecessary based on self-extinguishing clearing times of a few seconds.
 - Assumptions were made regarding work practices and positions based on interviews with line workers, relay technicians and substation personnel.
 - Analysis was based on primary (fastest) protection systems being in service. Hazards for alternative configurations require specific engineering studies and are done on an as-needed basis.

What's Changed

- New OSHA 29CFR1910.269 requires that the employer make a reasonable estimate of the incident energy to which the employee would be exposed.
- Under the previous requirements, the employer was only required to establish best practices.
- Effective compliance date is January 1, 2015.

What's Happening Now

- VELCO is re-analyzing all equipment at all substations using the following methods:
 - Fault studies for systems operating at 15 KV and above - ARCPRO.
 - Single phase fault studies for systems operating at 1kV up to 15kV – ARCPRO.
 - Three phase fault studies for systems operating at 1kV up to 15kV - IEEE 1584 B 2011
 - Fault studies for all systems below 1kV – IEEE 1584 B 2011
- All work practice assumptions used in the original studies are being reviewed to determine and validate the previous assumptions.
- All fault currents are being reviewed and validated.
- All clearing times are being reviewed and validated.

What Will Happen Next

- Work procedures and practices will be revised if necessary.
- Training will be provided to all switchmen and utility personnel performing work on VELCO substations and lines.
- A process will be developed for ensuring continued compliance as changes are made to VELCO's system.

Minimum Approach Distance (MAD)

- OSHA Requirements for determining Minimum Approach Distances changed from a tabular reference method to a calculation method for voltages over 72.5 kV.
- VELCO engineering will perform Minimum Approach Distance calculations for all lines using the method prescribed in 1910.269.

Assistance for Distribution Utilities

- VELCO engineering will provide each distribution utility with available fault current and source-end clearing times for all interface locations on the system.