Proposed Solution for Performing Detailed Voltage Flicker Assessment

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Background - Voltage Flicker Assessment

- Where are we now?
  - Moving from GE Flicker Approach to IEEE-1453
  - Voltage Flicker Supplemental Screen based on IEEE-1453

- What's Next?
  - If an applicant fails flicker screen, then detailed voltage flicker assessment is recommended prior committing to significant upgrades such as reconductoring

Detailed Voltage Flicker Assessment for CESIR

- Conventional power flow tool is not sufficient:
  - Generally used for snapshots of critical time period (e.g. peak and minimum load points) – This only gives the magnitude of an impact at one instant in time.
  - PV output is highly variable and its impact may not be properly analyzed with traditional snapshot power flow approach

- Need power flow with "Time Series" simulation feature:
  - Able to capture time-dependent aspects of power flow: e.g. interaction between the daily changes in load and PV output and distribution control systems
  - Produce sequential steady state power flow solutions where the converged state of an iteration is used as the beginning state of the next (1-second resolution is typically used)
  - Able to capture magnitude as well as the duration and frequency of the impact

Detailed Voltage Flicker Assessment for CESIR

Challenges

- Requires more data than the traditional flicker curve method
  - Irradiance data (1 – 2 seconds resolution)
  - Feeder load data
    - might not be available or typically available in lower resolution (15 min – 1 hour resolution)

Proposed Solution

- Improve future data collection
- Use conservative irradiance data, if data is not available
- Load data may be linearly interpolated

Detailed Voltage Flicker Assessment for CESIR

Challenges

- Non-Familiarity with the methodology and necessary tools to perform the analysis for detailed analysis (CESIR)

- Need to convert circuit model data to EPRI OpenDSS format – Milsoft Windmill has conversion feature to OpenDSS

Proposed Solution

- Provide training and documentation describing the methodology and a step-by-step process on how to conduct a detailed study

- Develop a software tool that can be used by utilities

Detailed Voltage Flicker Assessment for CESIR

Proposed Solution Cont'd

- Develop a software tool

  - OpenDSS as the calculation engine, an open source program at no cost to utilities

- Develop a Matlab or Python program to drive OpenDSS Engine

  - Reduce time-consuming setup of OpenDSS

  - Process results, calculate Pst and Plt, provide plots and summary report.

  - Allow batch mode to process daily, monthly, or annual calculation for Pst and Plt

  - The developed tool will be provided to NY utilities with step by step instruction on how to use the software

Questions

THANK YOU!