

## Synchrophasor Based Voltage Stability Monitoring

Liang Min  
EPRI

### Abstract

Voltage Stability Assessment (VSA) is a key function in system operation to help operators foresee the next critical contingencies that will cause system-wide instability problems. Currently VSA programs rely on the state estimator to provide steady-state solution for further analysis. When the system is close to operating limit, the system estimator may fail to converge, therefore it can not provide a steady-state solution for online VSA. Having recognized the limitations of traditional voltage stability analysis methods, the challenge now is whether substation level measurements can be used to calculate voltage stability margin in real-time and provide adaptive margin information for operators to monitor and control system voltage stability.

This presentation describes a new measurement-based voltage stability monitoring method using synchrophasor data, which is able to continuously calculate real-time contingency-independent voltage stability margin for an interface or a load center. The presentation also introduces a pilot project of utilizing this method to improve system operators' real-time awareness of voltage problem in Entergy's Western region. This will lead to the discussion on how the adaptive margin information calculated by this method can be used to wide area control for voltage stability.