



# NERC Lessons Learned

Operating Committee

January 8, 2026

# Load Shed for Voltage Instability

- **Load Shed for Voltage Instability**
  - Operators identified voltage instability for the loss of a designated 345 kV ties line
  - Resources unavailable to mitigate potential voltage instability
  - RC utilized load shedding to mitigate voltage instability

- **Prior To Event**

- 17 forced transmission line outage caused by severe weather
- Peak load exceeded forecasted values
- All dispatchable energy resources operating at maximum capacity
- Upward regulation & contingency reserves were cleared to control transmission system loading

- **Contributing Factors**

- **Critical Power Plant issues** – 350 MWs deviation from expected operating conditions.
- **Solar Ramp Off** – Solar dropped from 200 MW at 6:30 p.m. to 25 MW at 7:30 p.m.
- **Unavailable Generation Resources** – Generating units capable of switching to adjacent areas were under contract and not allowed to transition back to the RC's area.
- **Wind Generation Forecast Error** – Wind generation was lower than forecasted
- **Large Load Forecast Error** – 300 MW of unexpected load in RC's area prior to load shed
- **Exports to Adjacent Areas** – HVDC ties were either exporting, or offline due to issues

- **Event Detail**

- Operating conditions caused the voltage stability analysis to fail
- RC notified the TOP of potential limit exceedance and voltage instability due to unsolved contingencies of designated 345 kV tie lines
- RC started mitigation options, but determined several resources were unavailable
  - The RC asked the TOP about curtailable load in its area, but reported amounts were under the necessary MWs
  - The RC inquired about switchable generation resources but was denied due to capacity concerns
  - The RC inquired about increasing generation from its largest generating unit, but the plant was having issues getting the steam unit on-line
  - The combustion turbines were in manual control status, and the RC concluded that no more MWs were available
  - The RC sought emergency assistance from an adjacent area via a HVDC tie line but was informed that the HVDC tie was also having issues

- **Immediate Measures**
  - Mitigate voltage instability by load shed
  - Return system to a secure operating state

- **Long-Term Fixes**

- Strengthen coordination during emergencies
- Enhance direct communication during urgent situation
- Improve forward-looking studies to account for uncertainties



- **System Design & Operations**

- Ensure accuracy of models vs. real-time contingency analysis results
- Assess all interface flowgates to account for additional outage conditions

- **Process Improvements**

- Utilize TRM in studies to ensure sufficient resources commitments
- Use TLR to cut HVDC tie schedule on a pro-rata basis
- Provide key details to TOP/RC to improve operation of HVDC ties

- The Lesson Learned document published by NERC can be found at the link below

[Load Shed for Voltage Instability](#)

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