

November 13 Wyoming Disturbance Generation Data Collection Efforts

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November 13 Wyoming Disturbance Generation Data Collection Efforts

Greg Park

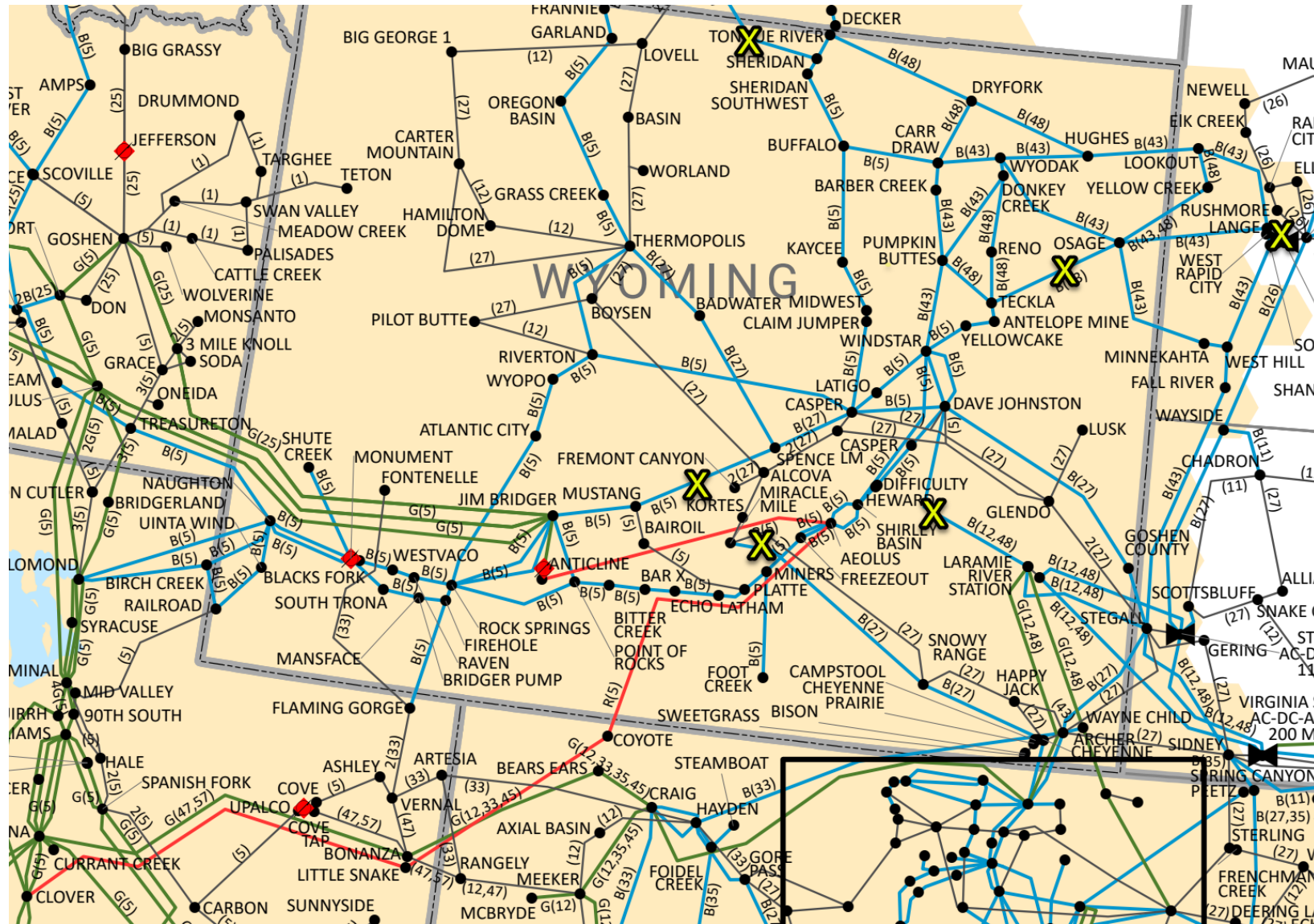
Manager, Risk Analysis & Data Services

Introduction: November 13 Wyoming Disturbance

- On November 13, 2025, at approximately 12:43 p.m. MST, a major disturbance near Wyoming caused the Western Interconnection's frequency to drop sharply to 59.75 Hz.
- The event created a rare imbalance between generation and demand, with an unprecedented rate of frequency change.
- This analysis explores system impacts, generator performance, and the role of Battery Energy Storage Systems.



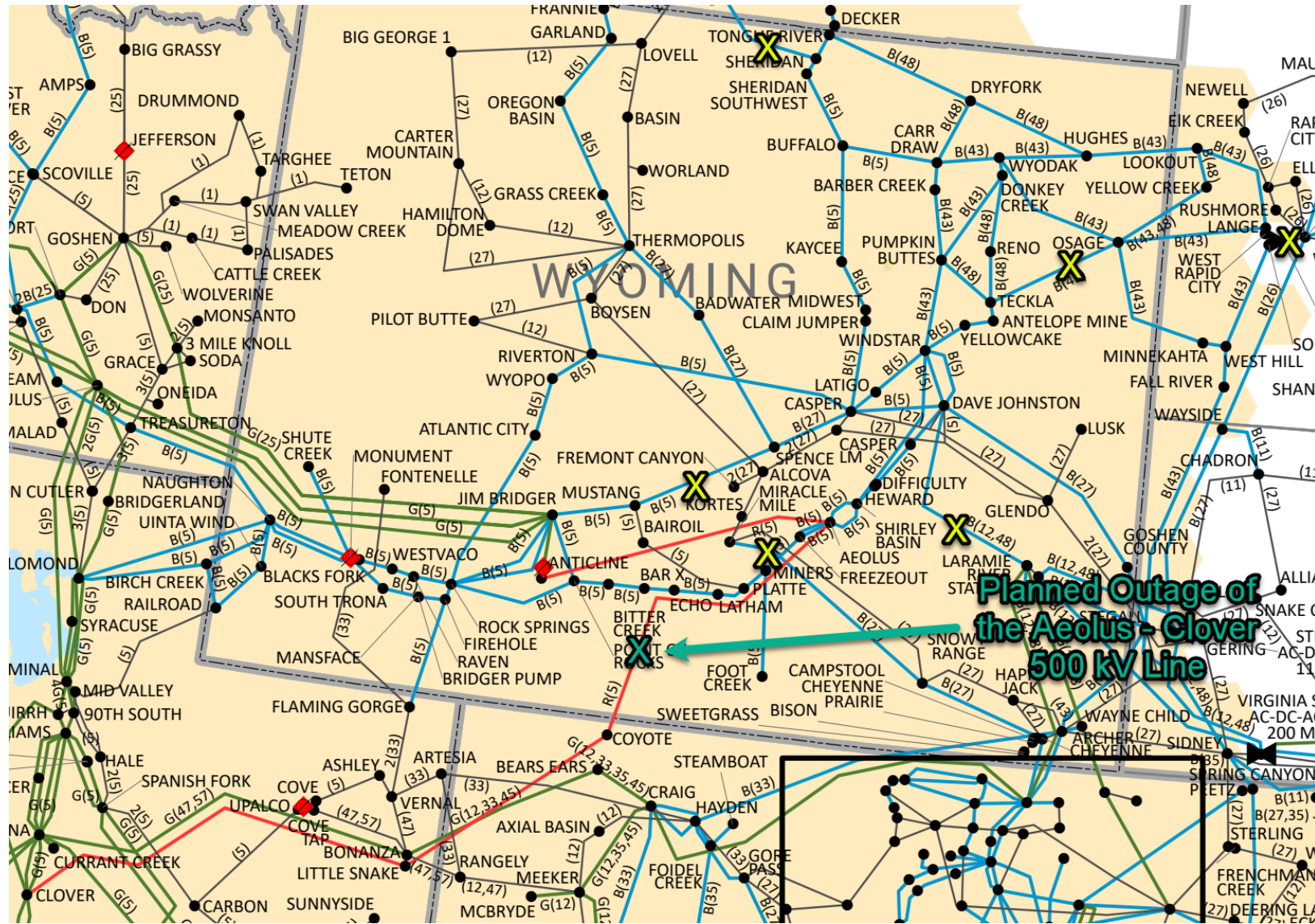
System Conditions Before the Event



Five 230 kV lines and Rapid City DC out of service on planned outages before the event



Planned Switching – Aeolus–Clover 500 kV Line

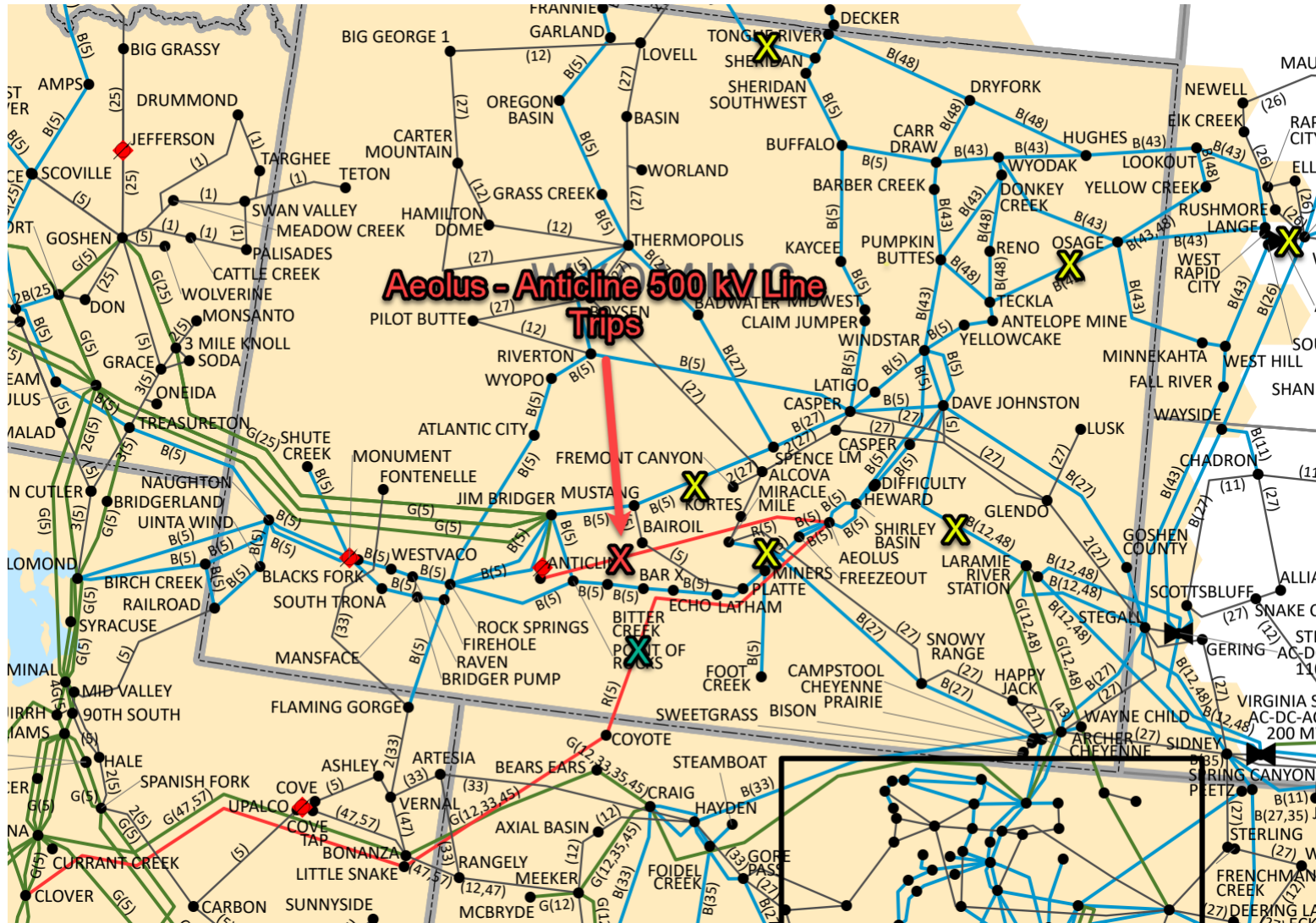


Planned Outage of the Aeolus - Clover 500 kV Line

Aeolus–Clover 500 kV line planned outage

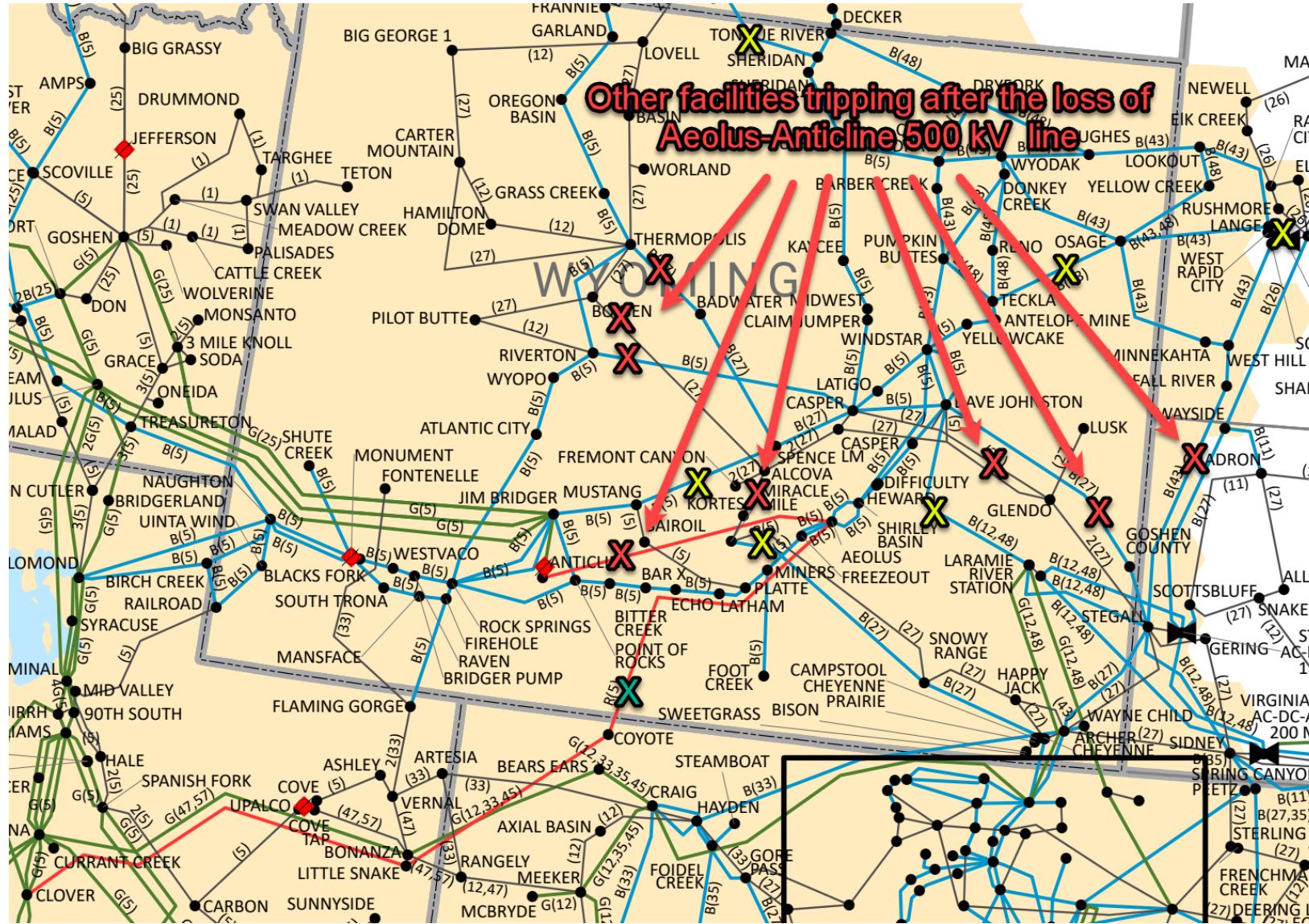
Upon opening of line, 500 kV voltage rapidly declines to .38 PU in 21 cycles (340 Milliseconds)

Aeolus–Anticline 500 kV Line Zone 1 Trip



Aeolus–Anticline 500 kV line trips in 21 cycles after the first line is opened on Zone 1 due to extremely low voltage (impedance relay correct operation).

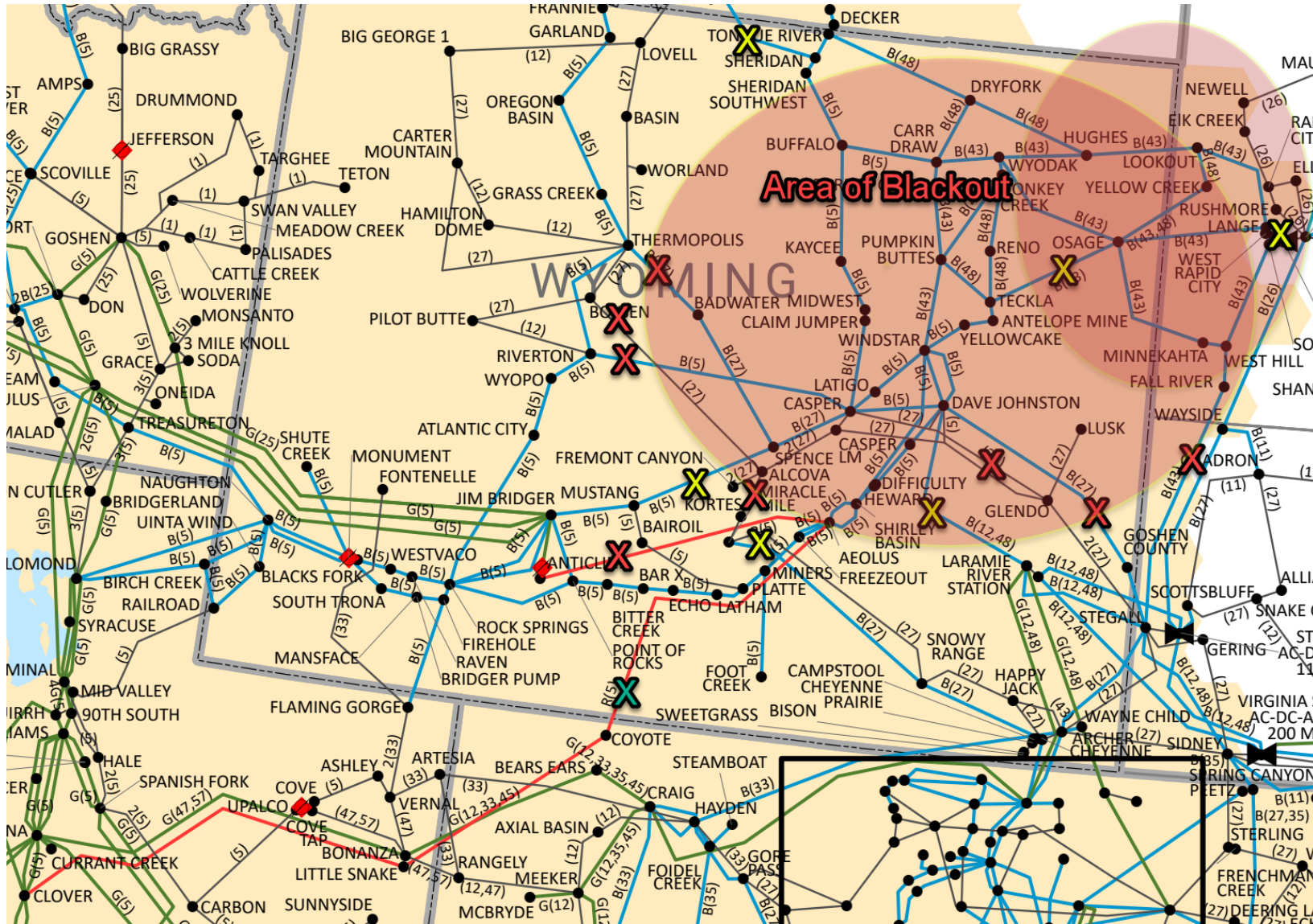
Cascading 230 kV and 115 kV Line Tripping



When the second 500 kV line trips, voltage in the eastern Wyoming load pocket collapses and **seven more 230 & 115 kV lines** trip on Zone 1 due to increased loading and severe low voltage.

The Montana Alberta 230 kV line tripped at the same time, and a small amount of wind generation in Montana was also lost.

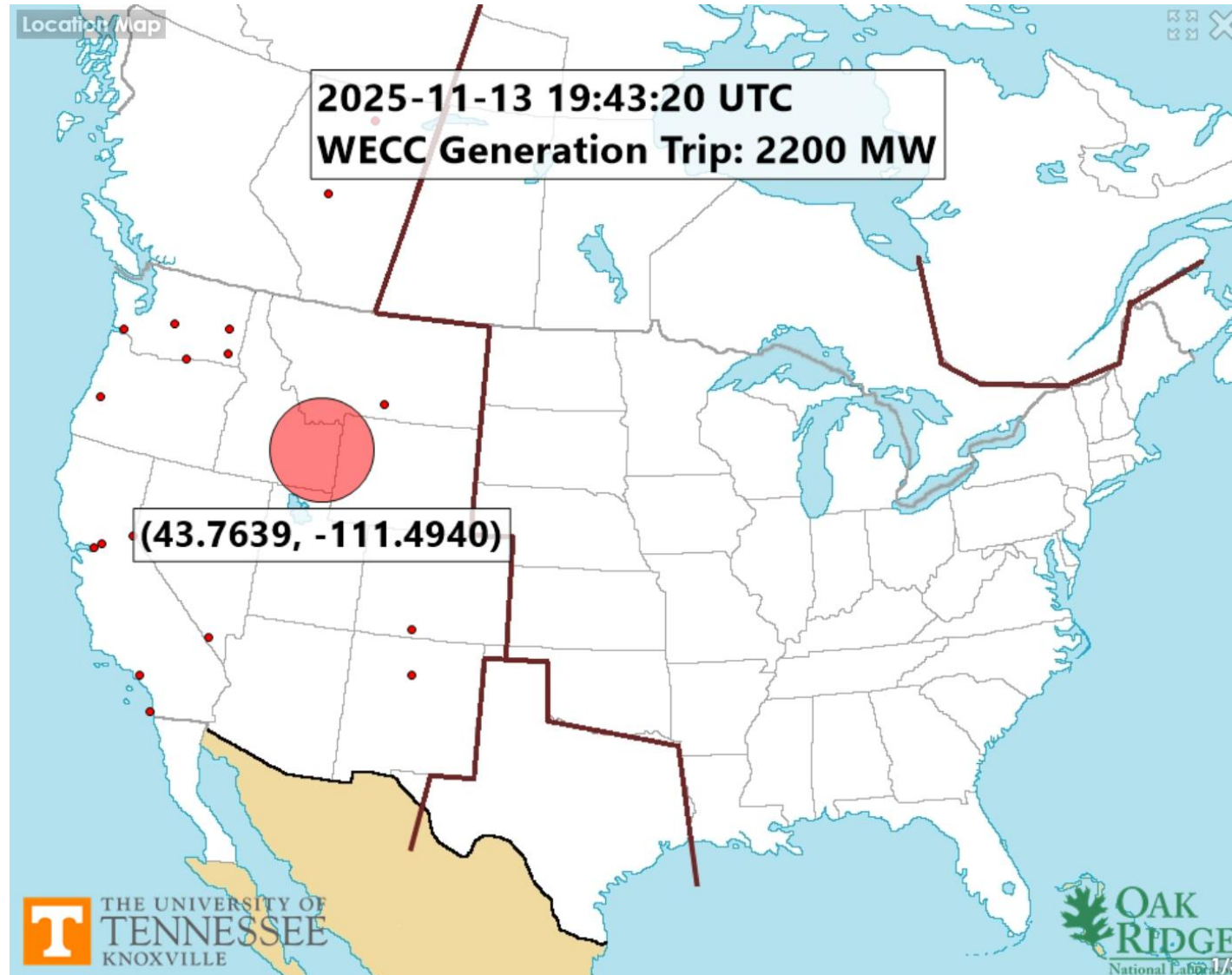
Area of Generation Lost and System Blackout



This correct relay action separates a large part of eastern Wyoming and western South Dakota (Rapid City) from the interconnection, and the area is blacked out with a large generation-demand imbalance.

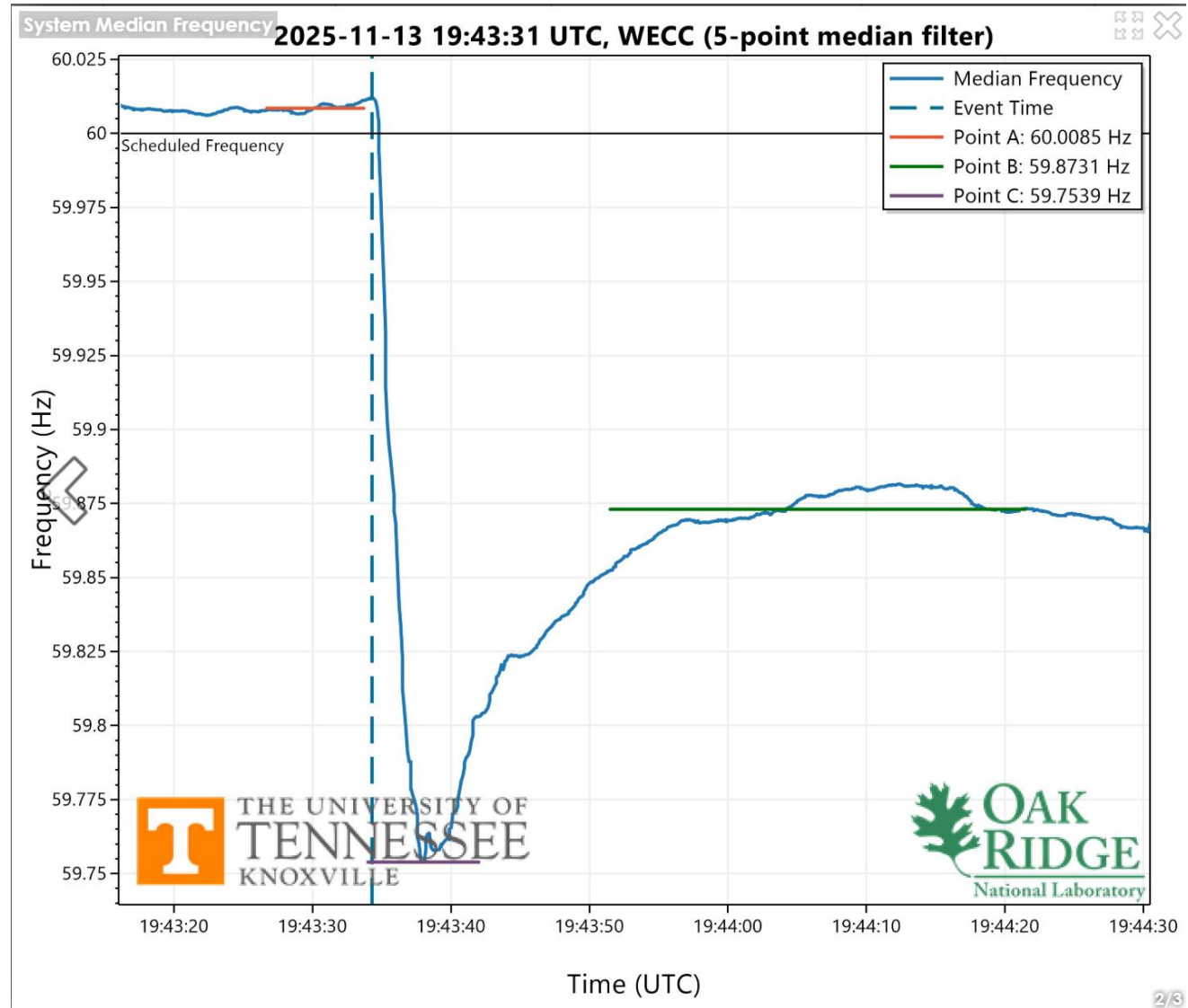
Approximately 4,899 MW of generation and 1,120 MW of demand are lost.

Impact on the Western Interconnection





Impact on the Western Interconnection



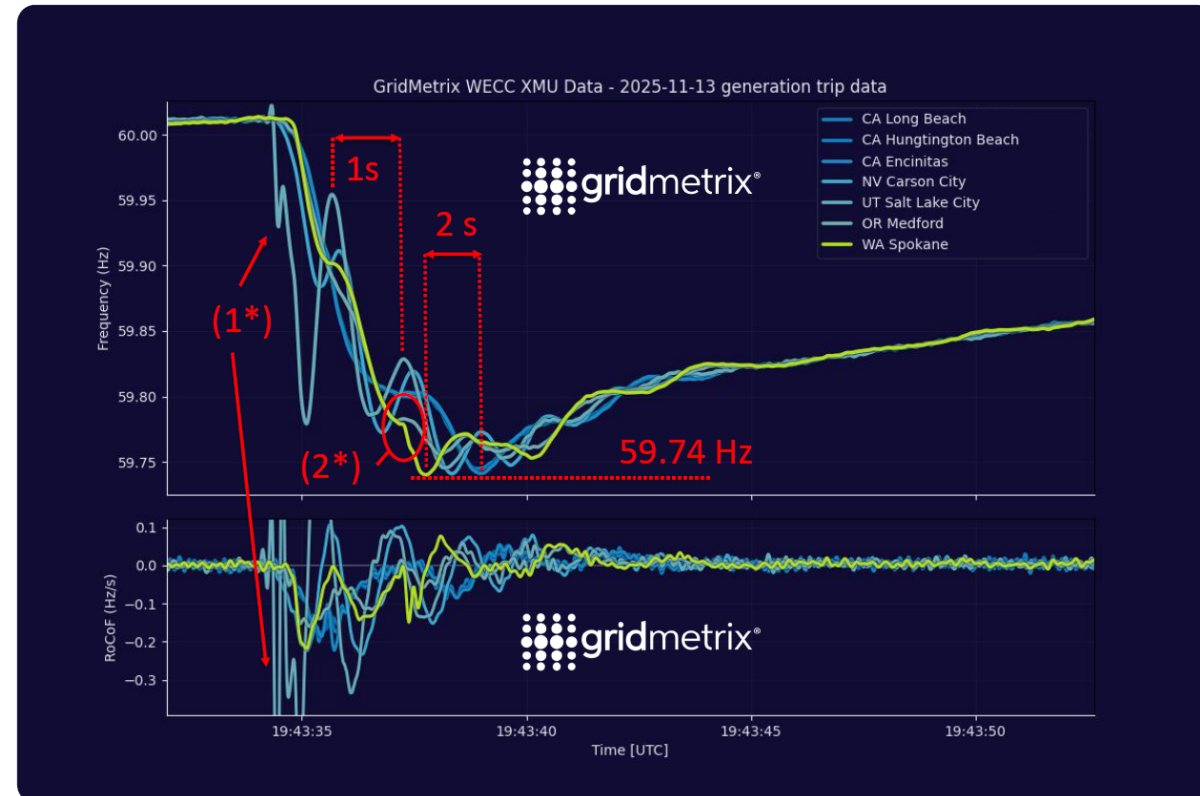
Impact on the Western Interconnection

GridMetrix® Event Analysis Insights



Insights

- The **incoherent transient propagation lasted 11 seconds**, after which the system resumed behaving more similarly across locations.
- (1*) The disturbance was experienced the worst by the Salt Lake City (UT) XMU, with a **local RoCoF exceeding 300 mHz/s** and exciting an approx. **1 Hz oscillation ringdown**.
- There was a **2 seconds delay in the time to reach nadir** between the frequency measured in Spokane and in California.
- (2*) An **indication of potential sympathetic (i.e. cascading) tripping** is visible in the Spokane frequency and RoCoF stream at 19:43:37 UTC, 3 seconds after the original trip.
- **IFRO WI** for operation Year 2025 was 1,042 MW/0.1 Hz



System Frequency Event Analysis

- The event caused a sudden imbalance between generation and demand, resulting in:
 - System frequency dropping to ~59.75 Hz
 - Unprecedented Rate of Change of Frequency (RoCoF)
- RoCoF ranged from 0.200 to 0.300 MHz/sec (previous record: 0.172 MHz/sec)
 - Such large-scale events are rare and offer valuable insights into:
 - Generator performance
 - Frequency response
 - Resource operations, including BES Battery Energy Storage Systems (BESS)
- Western Interconnection Frequency Response:
 - Obligation: -1,220 MW/0.10 Hz
 - Actual measured: > -2,440 MW/0.10 Hz

Action Needed:

- If your facility is **rated above 75 MVA** and connected at **100 kV or greater**, please submit unit-level operational data from one minute before to five minutes after the event.
- Use the spreadsheet provided and follow all instructions.
- **Upload your completed spreadsheets** to the "*November 13 WY Disturbance*" folder in the Secure Workspace in the "*Shared with Me*" section by **June 12, 2026**.



Submitting Data:

- Save a separate spreadsheet for each unit, using the naming convention in the Instruction tab.
- Make sure you have an active wecc.org login and can access the Secure Workspace. Confirm you can see the correct folder.
- If you do not have access, refer to the user guide. If you cannot locate the folder, watch the [Secure Workspace Training Video](#) or contact [WECC Administrative Services](#).



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