AEPSC Panhandle RPG 26RPG008

July 2026

Summary

- American Electric Power Texas (AEP Texas) has executed Letters of Agreement (LOA's) to connect over 25GW of large loads in the Texas Panhandle region with approximately 20GW of that total concentrated in the Childress and Abilene area around the ETT Riley, ETT Tesla, and AEP Mulberry Creek stations
- **Option 3**, the preferred option, establishes a new 765-kV loop connecting AEP Texas Mulberry Creek to Oncor Bell East, AEP Texas Mulberry Creek to ETT Edith Clarke, ETT Edith Clarke to ETT Nikola, ETT Nikola to ETT Riley and ETT Riley to Oncor Dinosaur 765-kV stations. The estimated cost of this option is $11.485 billion. Total new 765-kV mileage is approximately 632 miles. This will require new right of way and a certificate of convenience and necessity (CCN). The rating of the new lines will be 6625 MVA normal and emergency.

Load Additions	
Total	**26.945 GW**
Mulberry (includes AB NW as well) 345 kV	8.2 GW
Telsa (includes Salvare) 345 KV	7.75 GW
Riley 345 kV	3.25 GW
Other Stations	7.745 GW

765 KV	**345 KV**
632 miles	**175 miles**

TOTAL 2026 DOLLARS	
Total	**$11.485B**
ETT	$5.160 B
AEP Texas	$3.146 B
ONCOR	$3.178 B

765 KV	345 KV
632 miles	**175 miles**

Breakers	Count
765 kV	58
345 kV	90
Transformers	
765/345 kV	13
Reactive devices	
Shunt reactors - 100 Mvar	12
Shunt capacitors- 150 Mvar	9
STATCOM -300 Mvar (3 each at Riley, Tesla and AEP Mulberry 345 kV stations)	9

Option 3 Details

Below is a summary of the preferred Option 3 765 kV plan:

Stations

- Construct a new 765 kV station called Oncor Dino Long on the Oncor Long Shore to Dinosaur 765 kV line.
- Expand the existing AEP Texas Mulberry Creek 345 kV station by adding a 765 kV high side, three 765/345 kV autotransformers and two 765 kV shunt reactors.
- Expand the existing ETT Tesla 345 kV station by adding a 765 kV high side, four 765/345 kV auto transformers and two 765 kV shunt reactors.
- Expand the existing ETT Riley 345 kV station by adding a 765 kV high side, three new 765/345 kV auto transformers and two 765 kV shunt reactors. Expand the existing ETT Edith Clarke 345 kV station by adding a 765 kV high side, three new 765/345 kV auto transformers and two 765 kV shunt reactors.

Note: The rating of the 765/345 kV autotransformers used in the study is 2250 MVA normal and 2588 MVA emergency.

Lines

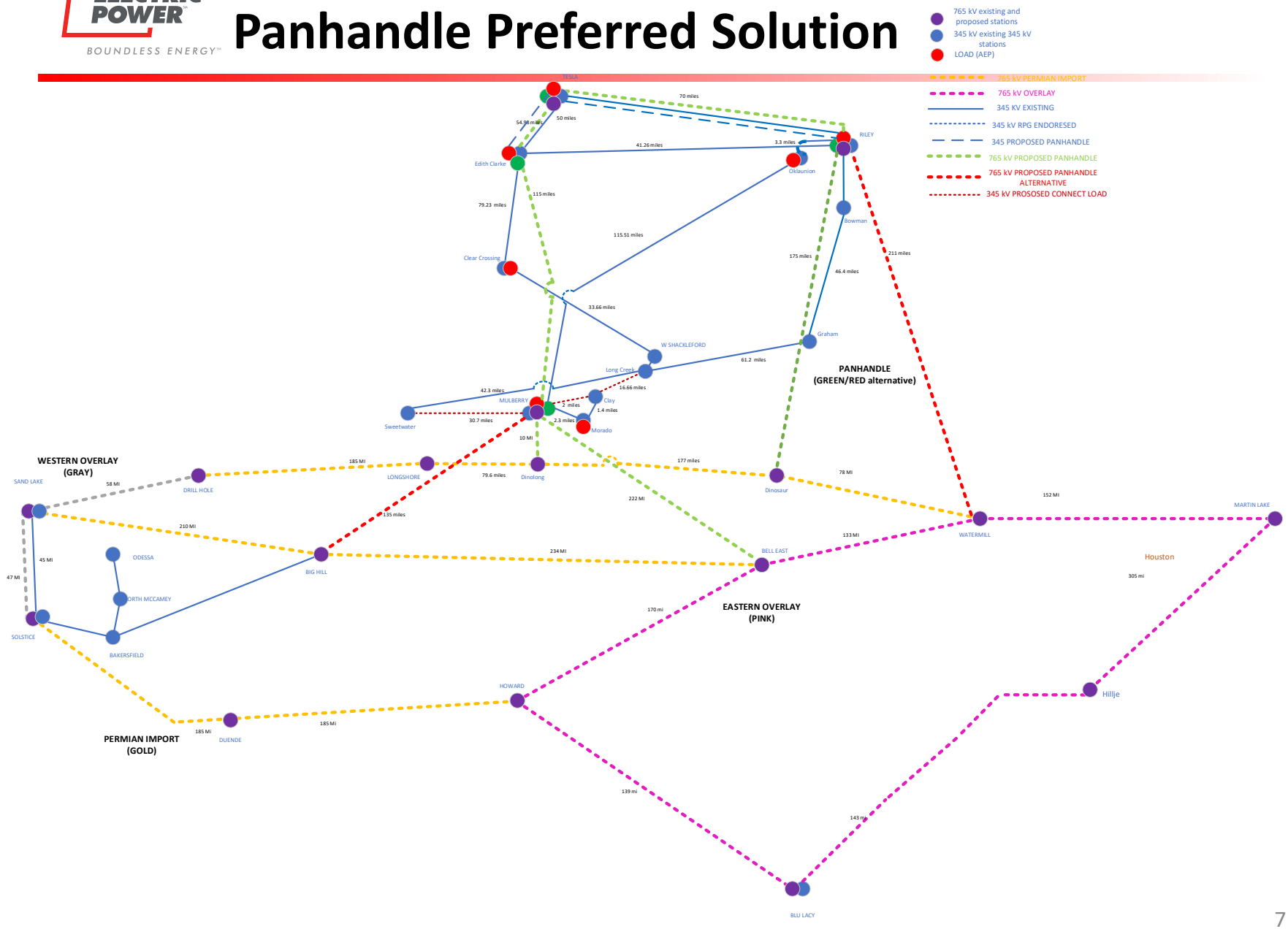
- Construct new 765 kV line from AEP Texas Mulberry Creek to Oncor Bell East (approximately 222 miles).
- Construct new 765 kV line from AEP Texas Mulberry Creek to ETT Edith Clarke (approximately 80 miles).
- Construct a new 765 kV line from ETT Edith Clarke to ETT Nikola (adjacent to Tesla; approximately 55 miles).
- Construct new 765 kV line from ETT Nikola to ETT Riley (approximately 70 miles).
- Construct new 765 kV line from ETT Riley to Oncor Dinosaur station (approximately 175 miles).
- Build a new 765 kV line between the new Oncor Dino Long 765 kV station and AEP Texas Mulberry Creek 765 kV station (approximately 10 miles).

Note : All lines will require new right of way and a certificate of convenience and necessity (CCN). The rating of the new lines will be 6625 MVA normal and emergency. Approximate costs for CCN are included in the line estimates.

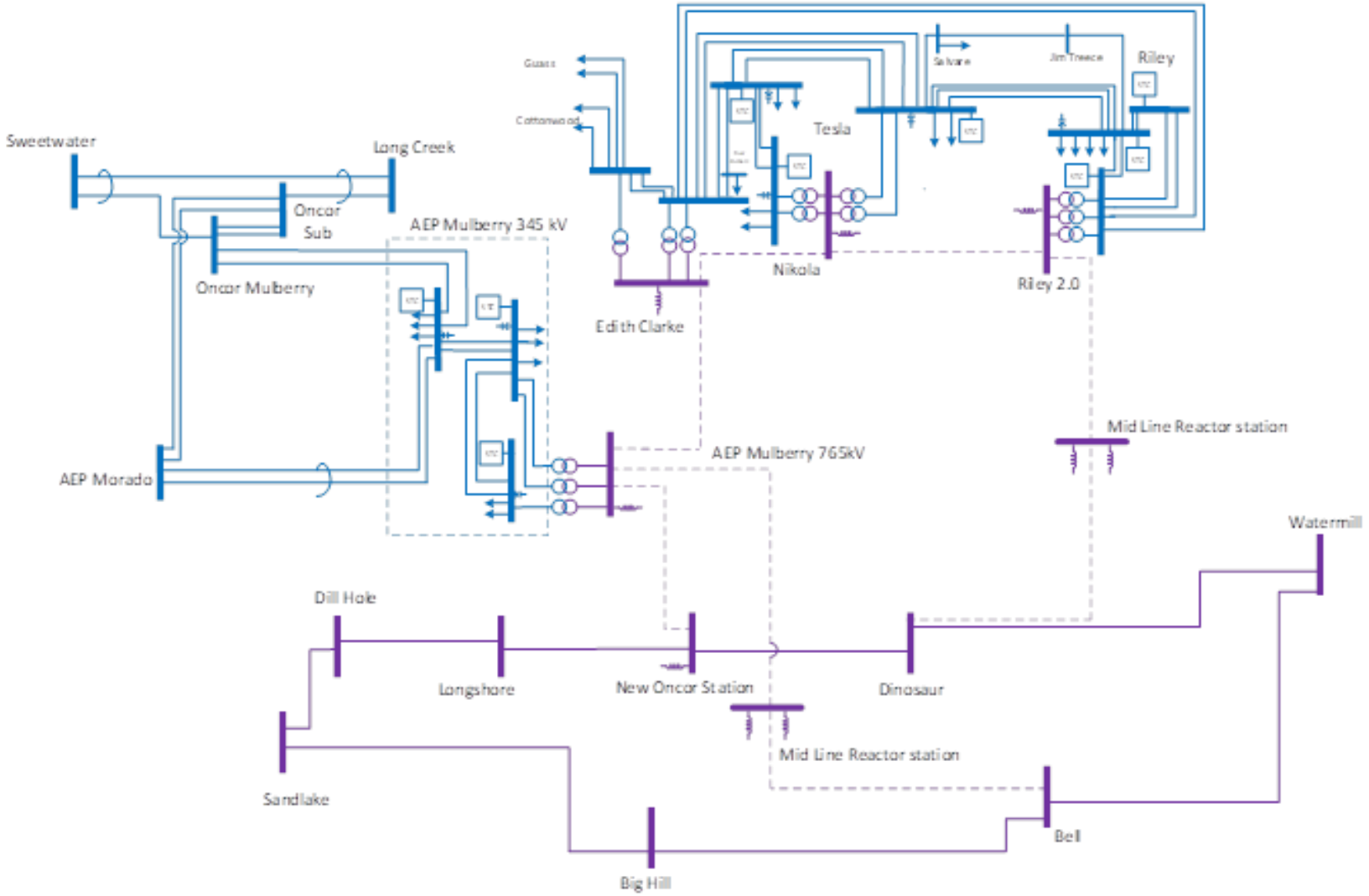
- Add a midline 765 kV station on the AEP Texas Mulberry Creek to Oncor Bell East 765 kV line and add two 765 kV shunt reactors. The midline station will have four 765 kV breakers: two on the high side of the shunts and two in-line breakers.
- Add a midline 765 kV station on the ETT Riley to Oncor Dinosaur 765 kV and add two 765 kV shunt reactors. The midline station will have four 765 kV breakers: two on the high side of the shunts and two in-line breakers.
- In addition, to support system performance under critical P6 contingency conditions, approximately 120 miles of new double circuit 345 kV transmission lines were added between the ETT Edith Clarke, ETT Tesla, and ETT Riley stations, along with STATCOM installations at the AEP Texas Mulberry Creek, ETT Tesla and ETT Riley stations. Collectively, these transmission additions are required to provide adequate post-fault voltage recovery, mitigate post-fault load drop and improve system stability at the AEP Texas Mulberry Creek, ETT Tesla and ETT Riley stations.

Note: The midline stations are needed on long EHV transmission lines to mitigate the Ferranti effect. Voltages can rise significantly especially in open ended and low load conditions; therefore, reactors are needed to bring voltages within operating limits.

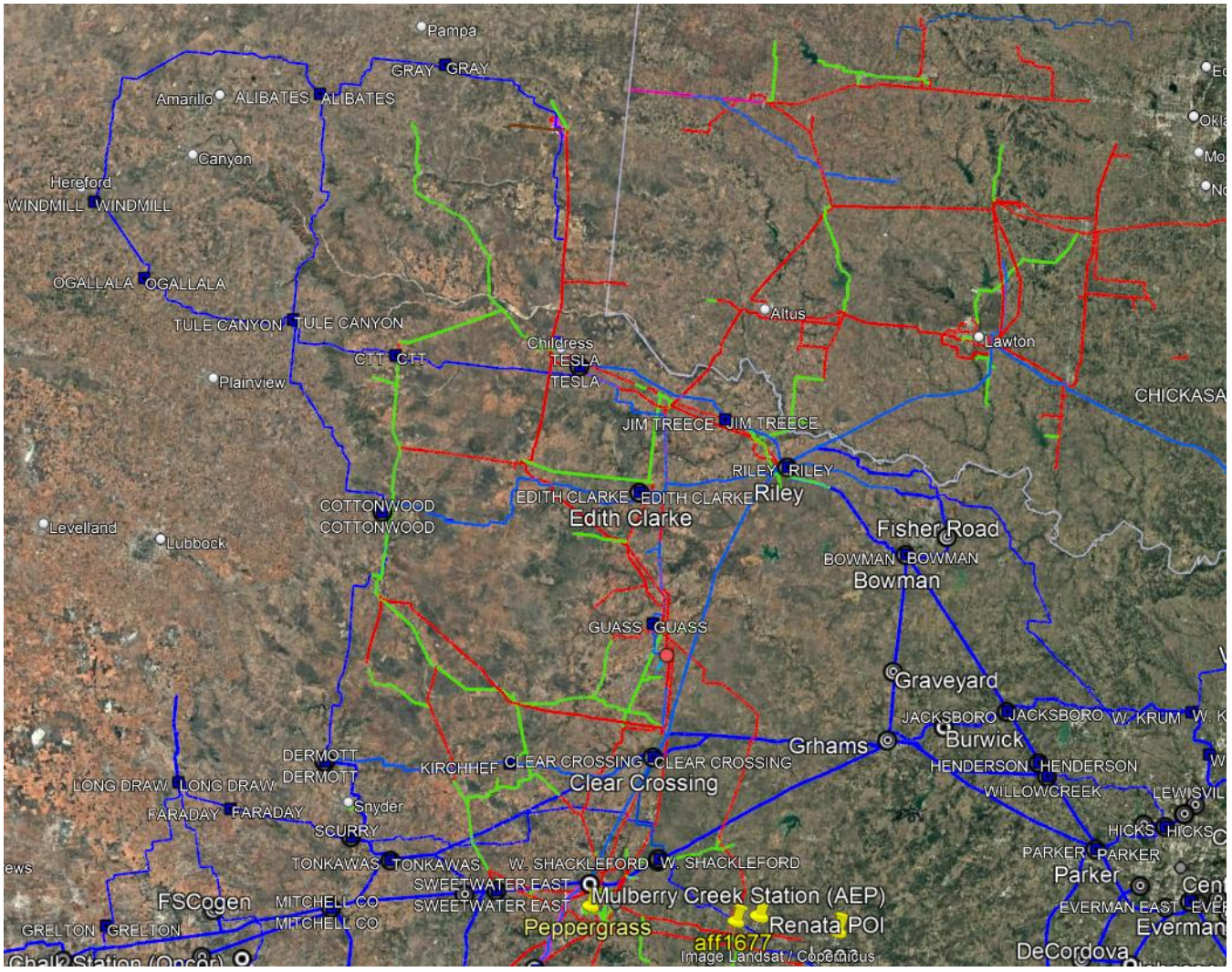
Panhandle Preferred Solution



One-line of Option 3



Geographic of 345 kV



Steady State Analysis

- ERCOT 2031 RTP initial case posted August 5th ,2025 was the starting base case.
- Loads with signed contracts and Generation following PGRR 127 guidelines were added to the case.
- Solar dispatch 73% of summer peak, Wind dispatch 28% in the Panhandle, 55% Coastal and 21% in the other areas.
- Additional 17.6 GW of load added in the base case.
- The initial cases had several thermal constraints even before the addition of the study-area loads. Some of these constraints were mitigated by the solutions provided in RPG.
- The analysis focused on branches and buses that were significantly impacted by the addition of the study-area loads. In addition, some of the solar and wind generation additions caused thermal constraints and required re-dispatch to relieve those constraints.
- Initial solutions focused on direct improvements that were needed to serve the large loads at AEP Mulberry, ETT Tesla and ETT Riley stations.

Short Circuit Analysis

- Symmetrical three phase faults were applied to different buses in the study area.
- With the 765 kV loop, fault currents were 40 kA at the AEP Mulberry 345 kV , Morado 345 kV ad Lancium 138 kV stations.
- Fault currents exceeding 60 kA are anticipated at the Oncor Watermill, Bell East and Dinosaur 345 kV stations. The elevated breaker duty requirements are likely attributed to the 765 kV STEP Eastern Backbone project and were present without the proposed 765 kV Panhandle RPG loop.

Stability Analysis

- This study utilized a modified 2024/2025 series DWG 2031 Summer Peak (SP) case to create the on-peak and maintenance cases to evaluate the impact of the Panhandle RPG on the dynamic performance of the study area generators and loads.
- A selected subset of dynamic events capturing the following categories of contingencies considered to be most impactful to generator stability, transient voltage recovery and power oscillations in the study area were considered for analysis:
  - NERC Category P1
  - NERC Category P4
  - NERC Category P6
  - NERC Category P7
  - ERCOT Category 1
- Requirements in the NERC TPL-001-5.1 reliability standard were used determine whether the results of dynamic simulation was stable.
- Voltage and frequency at select transmission buses along with generator characteristics were monitored in the study area to assess the impact of dynamic events (faults).

Stability Analysis

- Study results indicated a need to add STATCOMs at AEP Texas Mulberry, ETT Tesla and ETT Riley stations to enhance post fault voltage support, mitigate potential post-fault load drop and improve overall system stability.
- Generation resources were added to the DWG 2031SP case in the following order to balance the swing bus:
  - Generators marked FIS completed with signed SGIA in RIOO
  - Generators marked FIS completed with no signed SGIA in RIOO
  - Generators marked FIS started with signed SGIA in RIOO
- Results of the Dynamic Stability Analysis indicate no stability concerns were identified with the system improvements identified in the RPG, and the project meets the requirements of the NERC Reliability Standards and ERCOT as well as AEP Transmission planning Criteria.