



AEPSC Brownsville Area Improvements Transmission Project – ERCOT Independent Review Status Update

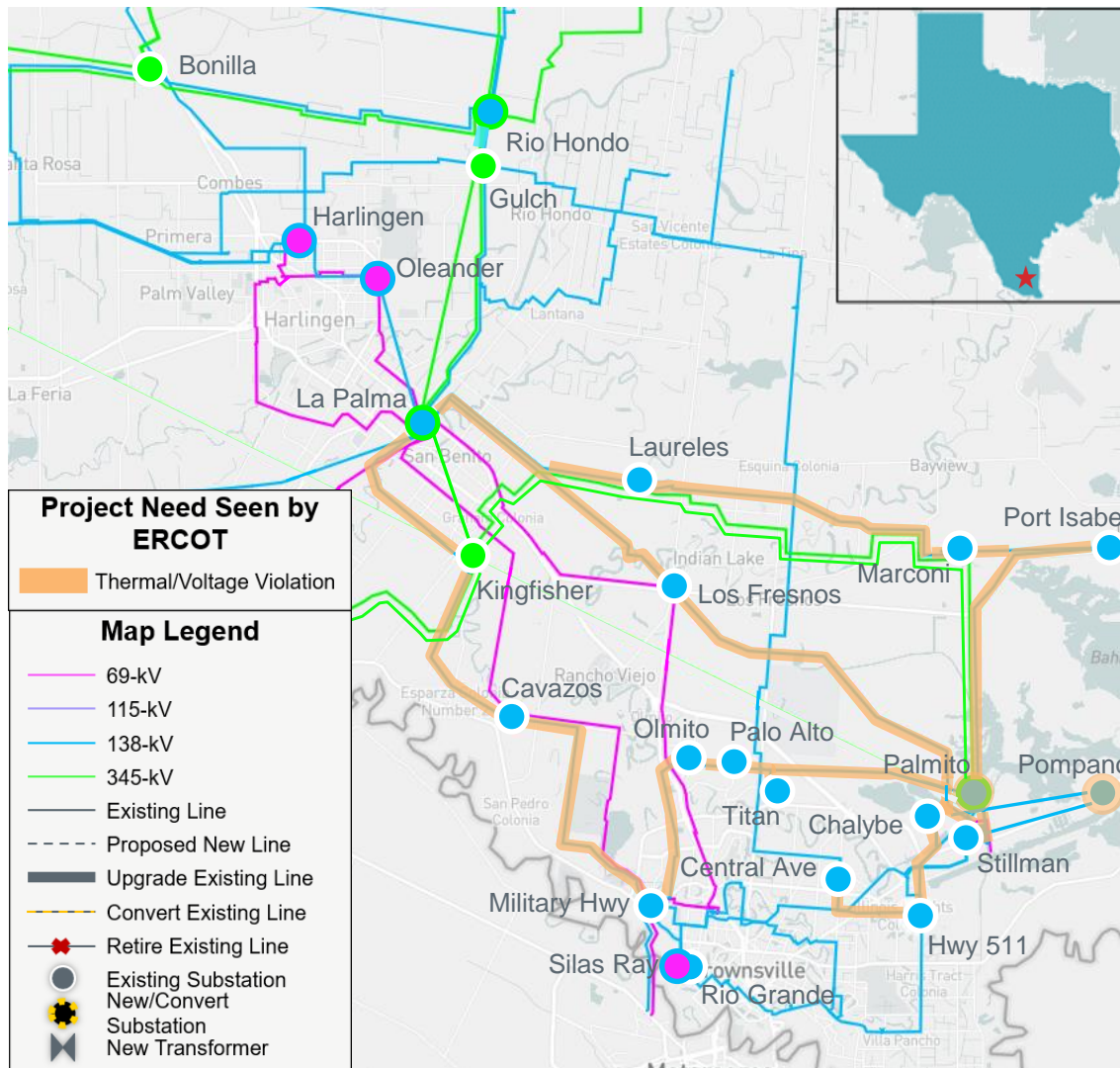
Caleb Holland

RPG Meeting
September 25, 2024

Recap

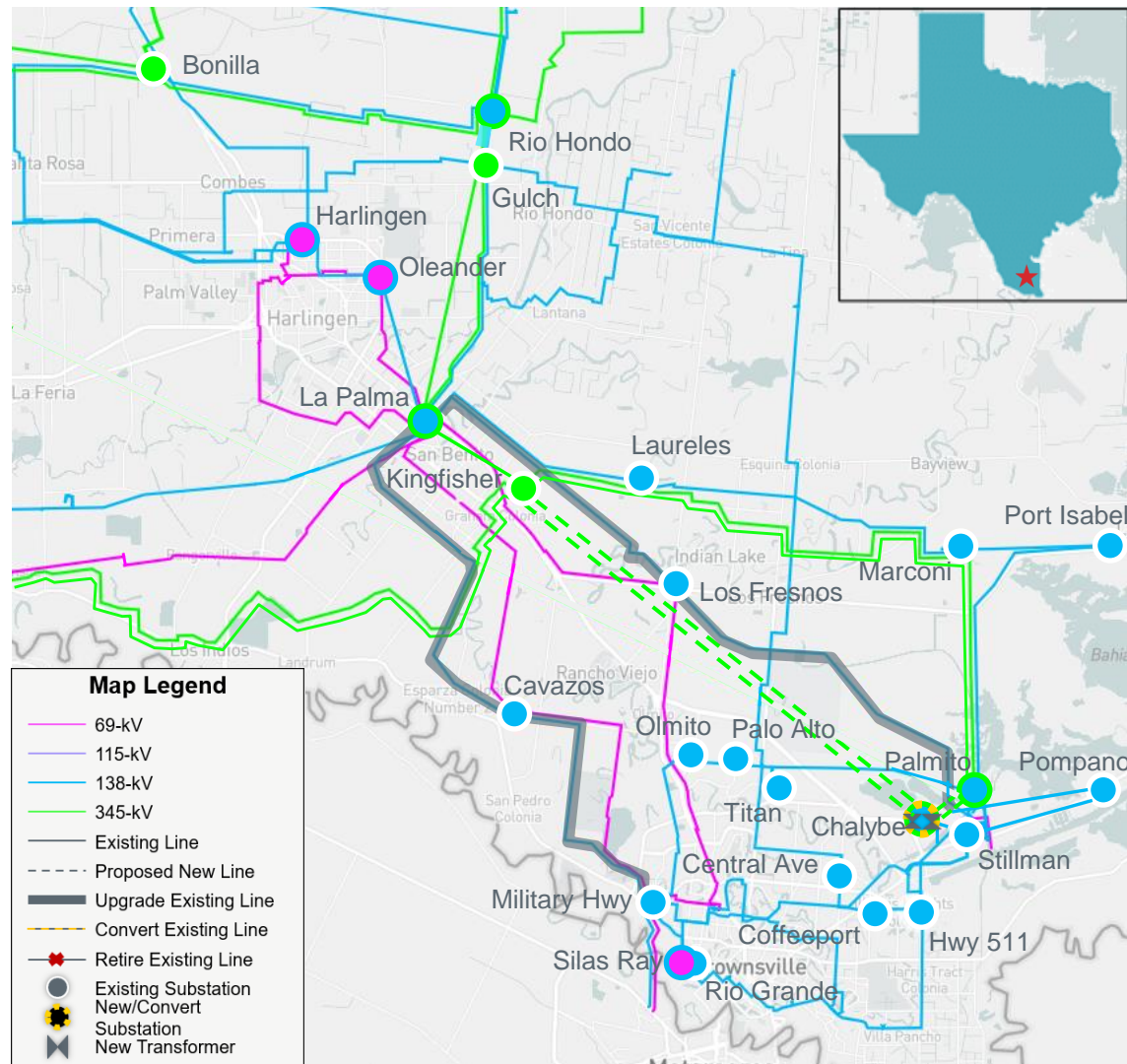
- American Electric Power Service Corporation (AEPSC) submitted the Brownsville Area Improvements Transmission Project for Regional Planning Group (RPG) review in March 2024
 - This Tier 1 project was estimated to cost \$387.7 million and would require a Certificate of Convenience and Necessity (CCN)
 - The estimated in-service date was May 2027
 - Addressed both thermal overloads and voltage violations in the Brownsville area upon addition of new large load
- AEPSC presented a project overview and ERCOT provided the study scope for this ERCOT Independent Review (EIR) at the June RPG meeting
 - <https://www.ercot.com/calendar/06112024-RPG-Meeting>
- ERCOT provided status updates at the July and August RPG meetings
 - <https://www.ercot.com/calendar/07162024-RPG-Meeting>
 - <https://www.ercot.com/calendar/08132024-RPG-Meeting>
- This project is currently under ERCOT Independent Review (EIR)

Recap – Project Need as Seen by ERCOT



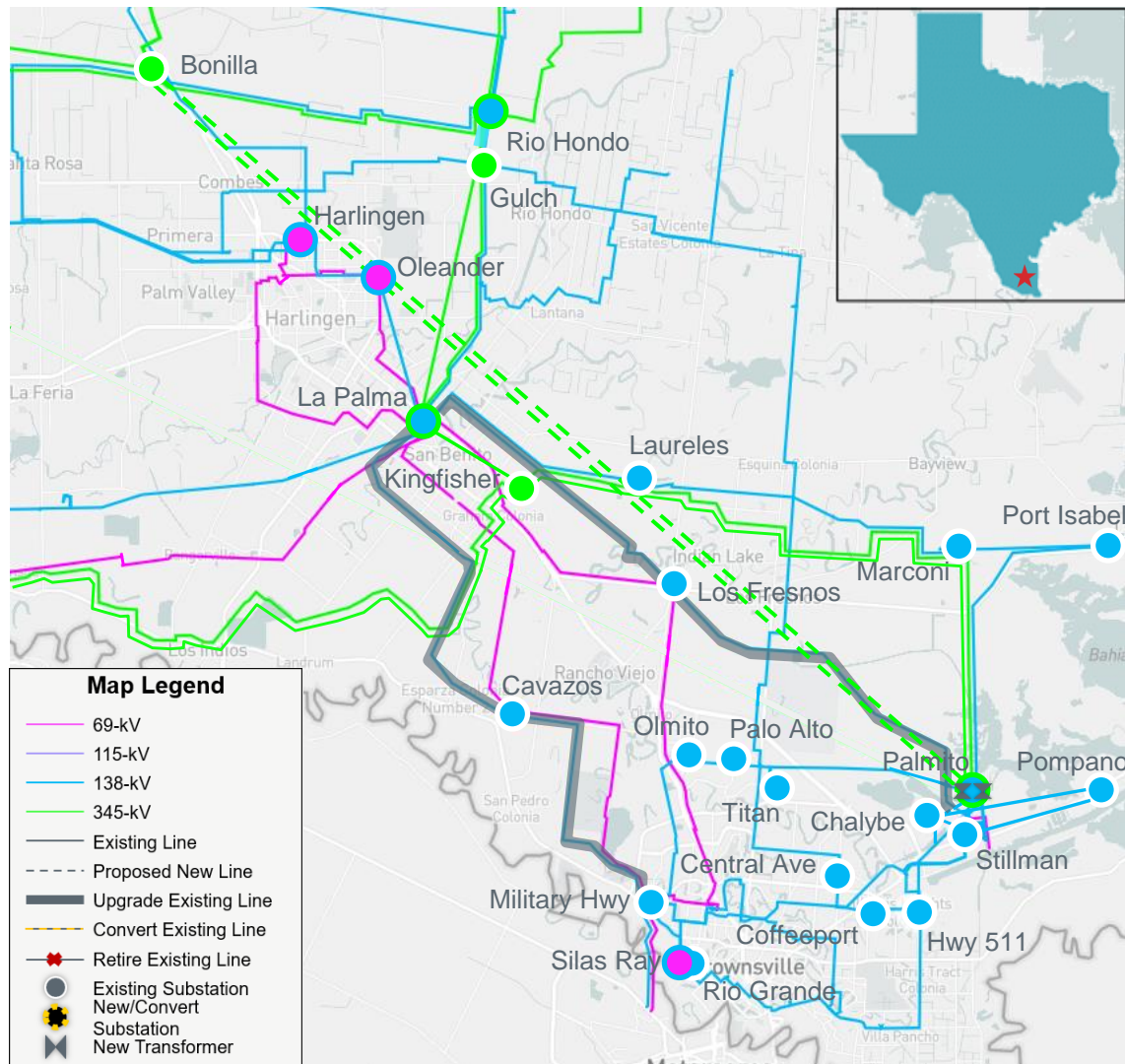
Recap – Option 2A – Modified Preferred Option Proposed by AEPSC

- Install two 345/138-kV autotransformers at Chalybe rated 675 MVA
- Construct a new 22.0-mile 345-kV double circuit transmission line from Chalybe to Kingfisher rated 2668 MVA
- Construct a new 2.0-mile 345-kV double circuit transmission line from Chalybe to Palmito rated 2668 MVA
- Construct a new 2.0-mile 138-kV single circuit transmission line from Chalybe to Stillman rated 987 MVA
- Rebuild the 10.3-mile 138-kV single circuit transmission line from La Palma to Fresno rated 535 MVA
- Rebuild the 12.0-mile 138-kV single circuit transmission line from Fresno to Stillman rated 717 MVA
- Rebuild the 10.0-mile 138-kV single circuit transmission line from Military to Villa Cavazos rated 717 MVA
- Rebuild the 12.2-mile 138-kV single circuit transmission line from La Palma to Villa Cavazos rated 535 MVA
- Install two +/-150 MVAR STATCOMs at Chalybe



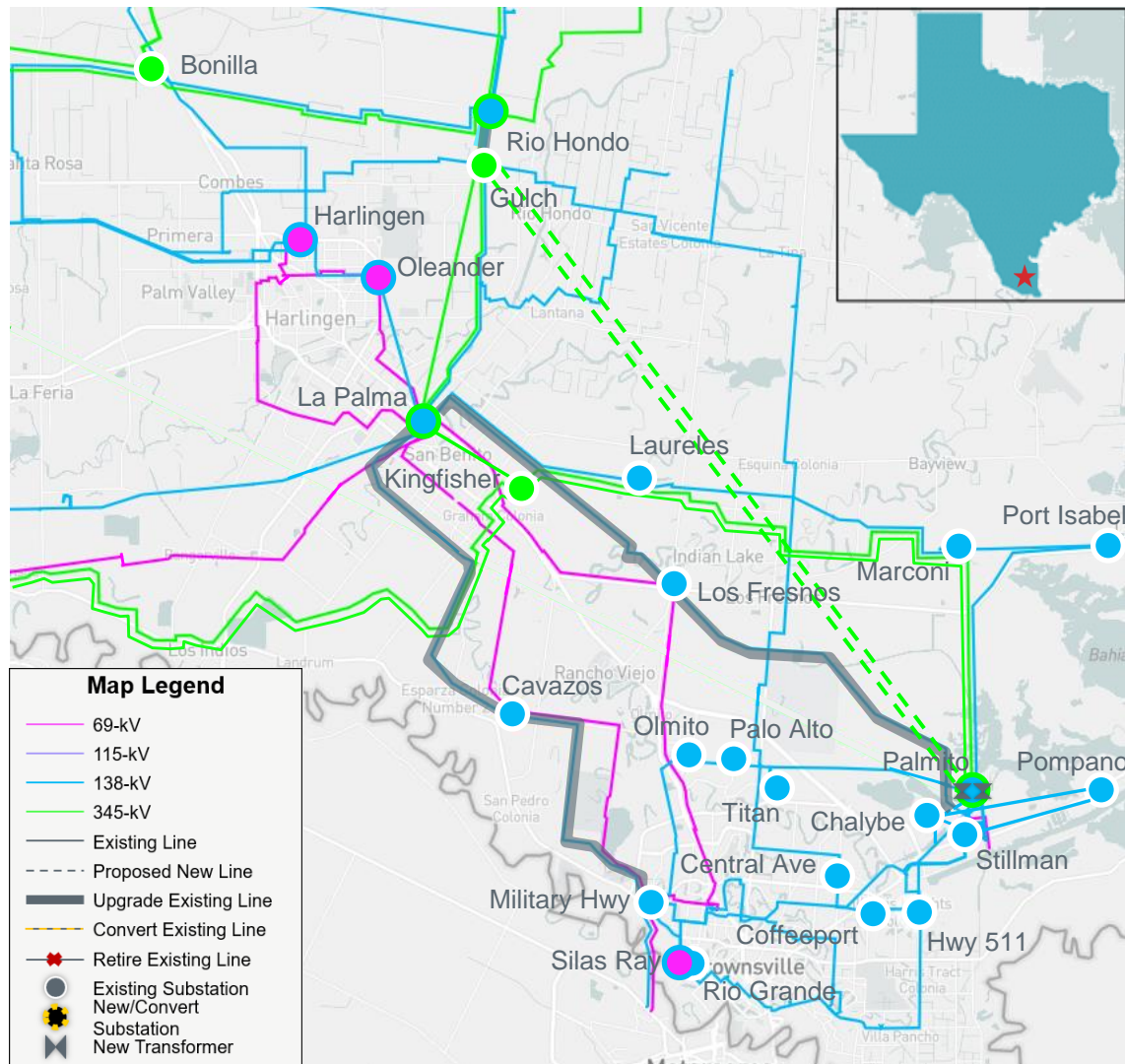
Recap – Option 5A – ERCOT Option

- Install two additional 345/138-kV 3-winding autotransformers at Palmito rated 450 MVA
- Construct a new 39.0-mile 345-kV double circuit transmission line from Palmito to Bonilla rated 2668 MVA
- Construct a new 2.0-mile 138-kV single circuit transmission line from Chalybe to Palmito rated 956 MVA
- Construct a new 0.4-mile 138-kV single circuit transmission line from Palmito to Stillman rated 516 MVA
- Rebuild the 10.0-mile 138-kV single circuit transmission line from Military to Villa Cavazos rated 717 MVA
- Rebuild the 12.0-mile 138-kV single circuit transmission line from Fresno to Stillman rated 717 MVA
- Rebuild the 10.3-mile 138-kV single circuit transmission line from La Palma to Fresno rated 535 MVA
- Rebuild the 12.2-mile 138-kV single circuit transmission line from La Palma to Villa Cavazos rated 535 MVA
- Construct a new 2.0-mile 138-kV single circuit transmission line from Chalybe to Stillman rated 987 MVA
- Install two +/-150 MVAR STATCOMs at Chalybe



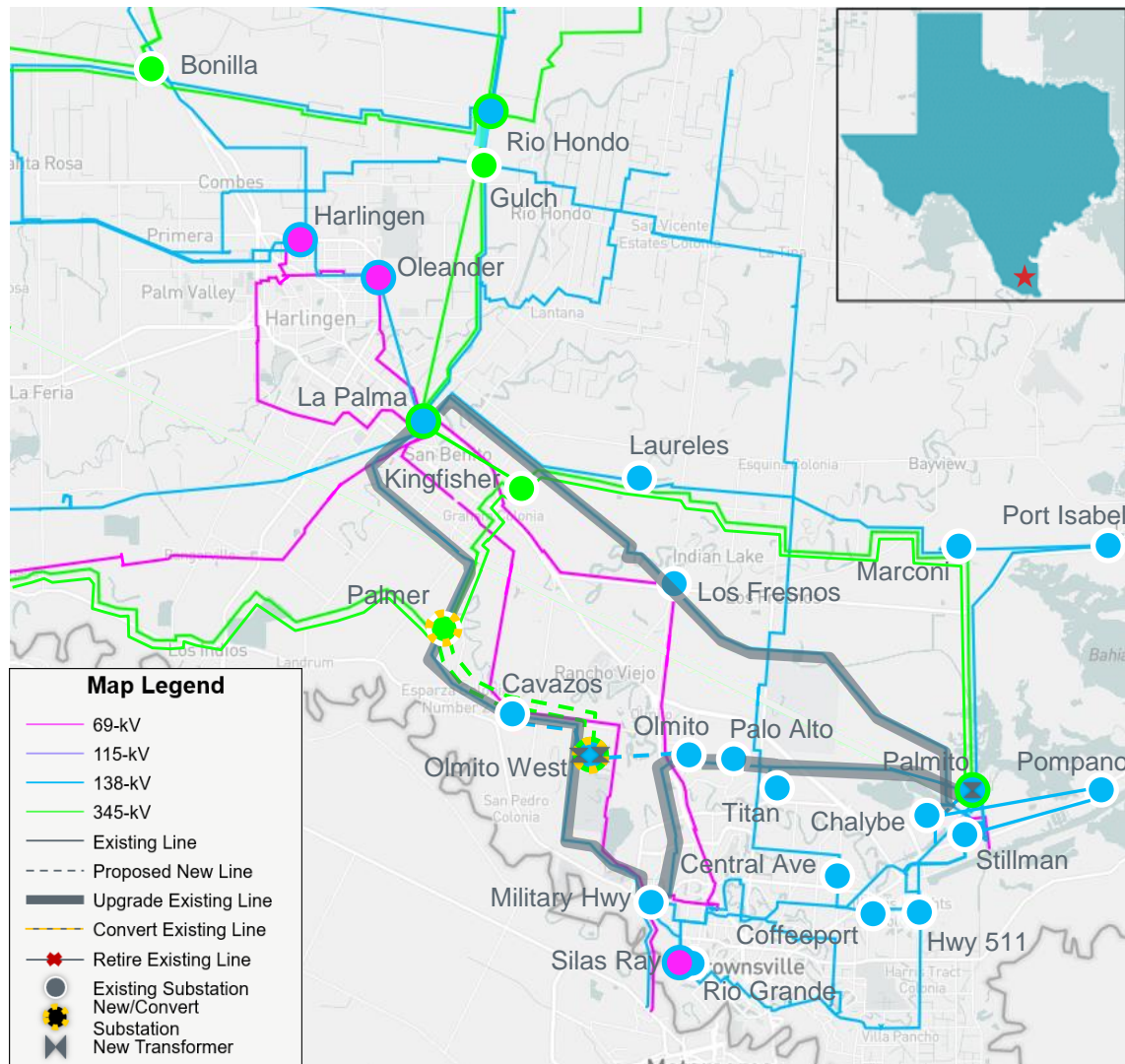
Recap – Option 7 – ERCOT Option

- Install two additional 345/138-kV 3-winding autotransformers at Palmito rated 450 MVA
- Construct a new 28.9-mile 345-kV double circuit transmission line from Palmito to Gulch rated 2668 MVA
- Rebuild the 1.0-mile 345-kV single circuit transmission line from Rio Hondo to Gulch rated 2668 MVA
- Construct a new 2.0-mile 138-kV single circuit transmission line from Chalybe to Palmito rated 956 MVA
- Construct a new 0.4-mile 138-kV single circuit transmission line from Palmito to Stillman rated 516 MVA
- Rebuild the 10.0-mile 138-kV single circuit transmission line from Military to Villa Cavazos rated 717 MVA
- Rebuild the 12.0-mile 138-kV single circuit transmission line from Fresno to Stillman rated 717 MVA
- Rebuild the 10.3-mile 138-kV single circuit transmission line from La Palma to Fresno rated 535 MVA
- Rebuild the 12.2-mile 138-kV single circuit transmission line from La Palma to Villa Cavazos rated 535 MVA
- Construct a new 2.0-mile 138-kV single circuit transmission line from Chalybe to Stillman rated 987 MVA
- Install two +/-150 MVAR STATCOMs at Chalybe



Recap – Option 8 – ERCOT Option

- Install one additional 345/138-kV 3-winding autotransformer at Palmito rated 450 MVA
- Add a 345-kV substation on the 345-kV double circuit transmission line from North Edinburg to Kingfisher named Palmer
- Add a 345-kV and 138-kV substation between Cavazos and Olmito named Olmito West and install two 345/138-kV autotransformers rated 675 MVA
- Construct a new 8.1-mile 345-kV double circuit transmission line from Palmer to Olmito West rated 2668 MVA
- Construct a new 2.7-mile 138-kV single circuit transmission line from Olmito West to Olmito rated 956 MVA
- Construct a new 4.0-mile 138-kV single circuit transmission line from Olmito West to Cavazos rated 956 MVA
- Construct a new 2.0-mile 138-kV single circuit transmission line from Chalybe to Palmito rated 956 MVA
- Construct a new 2.0-mile 138-kV single circuit transmission line from Chalybe to Stillman rated 987 MVA
- Rebuild the 5.5-mile 138-kV single circuit transmission line from Military to Olmito rated 717 MVA
- Rebuild the 0.4-mile 138-kV single circuit transmission line from Palo Alto to Olmito rated 717 MVA
- Rebuild the 2.5-mile 138-kV single circuit transmission line from Titan to Palo Alto rated 717 MVA
- Rebuild the 7.3-mile 138-kV single circuit transmission line from Titan to Chalybe rated 717 MVA
- Rebuild the 10.0-mile 138-kV single circuit transmission line from Military to Villa Cavazos rated 717 MVA
- Rebuild the 12.0-mile 138-kV single circuit transmission line from Fresno to Stillman rated 717 MVA
- Rebuild the 10.3-mile 138-kV single circuit transmission line from La Palma to Fresno rated 535 MVA
- Rebuild the 12.2-mile 138-kV single circuit transmission line from La Palma to Villa Cavazos rated 535 MVA
- Install two +/-150 MVAR STATCOMs at Chalybe



Planned Maintenance Outage Evaluation – Updated Results

- ERCOT conducted planned maintenance on the options
 - Load level in the South Weather Zone was scaled down to 90.1% of the summer peak load in the study base case based on ERCOT load forecast, historical load, and ratio of residential/commercial load from TSP, to mimic the non-summer peak load condition
 - Based on a review of system topology of the Cameron County area, ERCOT tested N-2 contingency combinations, and then tested all applicable contingency violations with system adjustments (N-1-1)
- Planned maintenance outage analysis results

Option	Voltage Violations	Thermal Overloads	Unsolved Power Flow
1	7	3	6
2	0	2	0
2A	0	0	0
3	1	2	0
5	0	5	0
5A	0	0	0
7	0	0	0
8	0	0	0

Long-Term Load-Serving Capability Assessment

- Methodology
 - Adjusted load up in substations in the Study Area (Cameron County)
 - Adjusted conforming load down outside of the South Weather Zone to balance power
- Based on N-1 contingency

Option	Incremental Load-Serving Capability (~MW)
2A	637
5A	651
7	650
8	615

Comparison of Short-listed Options

	Option 2A	Option 5A	Option 7	Option 8
Meets ERCOT and NERC Reliability Criteria	Yes	Yes	Yes	Yes
Improves Long-Term Load-Serving Capability	Yes	Yes	Yes	Yes
Improves Operational Flexibility	Yes	Yes	Yes	Yes
Required CCN (~miles)	26.0	43.4	33.3	18.8
Project Feasibility	Yes	Yes	Yes	Yes
Cost Estimate* (~\$M)	423.8	458.3	427.0	501.6

* Cost estimates were provided by Transmission Service Providers (TSPs)

Preferred Option

- Option 2A is selected as the preferred option because it
 - Addresses the reliability violations
 - Is the least expensive option
 - Requires less CCN mileage than options 5A or 7
 - Provides additional operational flexibility
 - Improves Long-Term Load-Serving Capability

Additional Sensitivity Analyses

- Generation Addition Sensitivity Analysis
 - Per Planning Guide Section 3.1.3(4)(a), ERCOT performed a generation addition sensitivity by adding the generation listed below to the Option 2A case. The additional resources were modeled following the 2024 RTP methodology. ERCOT determined relevant generators do not impact Option 2A

GINR	Project Name	Fuel Type	Capacity (~MW)	County
19INR0022	Monte Alto I	WIN	141.5	Willacy
19INR0023	Monte Alto 2 Wind	WIN	307.9	Willacy
20INR0086	Arroyo Solar	SOL	180.0	Cameron
22INR0401	Eval Storage	OTH	255.0	Cameron
22INR0468	Lower Rio BESS	OTH	60.4	Hidalgo
24INR0294	Citrus Flatts BESS	OTH	100.8	Cameron
24INR0306	Arroyo Storage	OTH	183.8	Cameron
24INR0491	Gunnar BESS	OTH	203.0	Hidalgo

- Load Scaling Sensitivity Analysis
 - Per Planning Guide Section 3.1.3(4)(b), ERCOT performed a load scaling sensitivity and concluded that the load scaling did not have a material impact on project need

Congestion Analyses

- Congestion Analysis was performed based on Option 2A (ERCOT-preferred option) to determine if the proposed transmission upgrades resulted in new congestion within the study area
- Option 2A resulted in one newly congested line

Congested line	Mileage (~mi)	Passed Generator Revenue Reduction Test	Passed Production Cost Savings Test
Lon Hill to White Point 345-kV single circuit transmission line	20.5	No	No

- Upgrading the new congested line did not yield sufficient economic benefit and therefore will not be recommended for upgrade as part of this project

Sub-Synchronous Resonance (SSR) Assessment

- Sub-Synchronous Resonance (SSR) Assessment was conducted for the preferred Option 2A per Nodal Protocol Section 3.22.1.3
 - ERCOT found no adverse SSR impacts to the existing and planned generation resources at the time of this study

Next Steps and Tentative Timeline

- Tentative timeline
 - EIR Report to be posted in the MIS
 - September 2024
 - EIR recommendation to TAC
 - October 2024
 - Seek ERCOT Board of Directors endorsement
 - December 2024

Thank you!



Stakeholder comments also welcomed through:

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