AEP Nueces 69 kV Reinforcement Project -ERCOT Independent Review Status Update

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September 18, 2019 – RPG Meeting

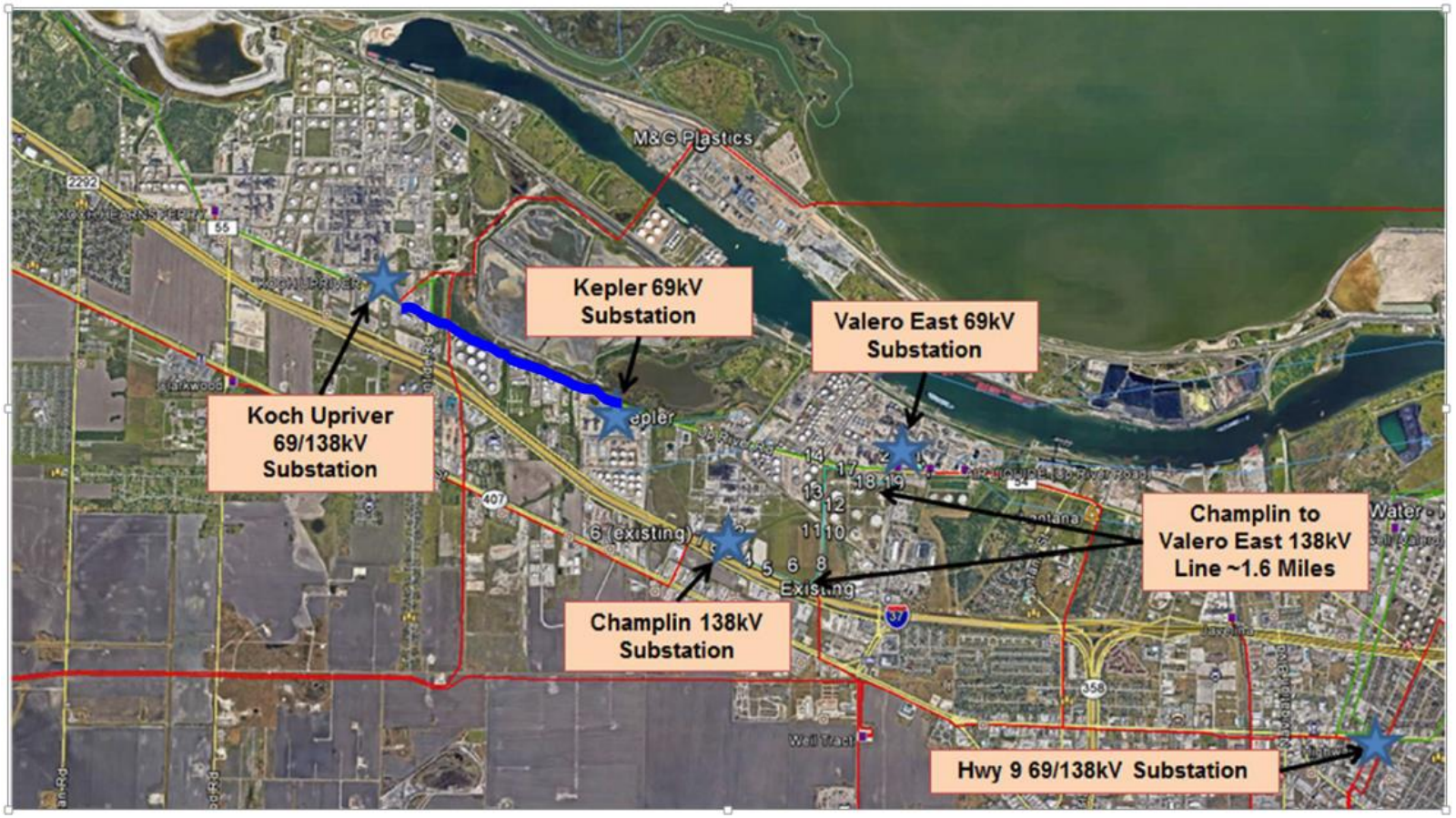
Status Update

- American Electric Power Service Corporation (AEPSC) submitted Nueces 69 kV Reinforcement project for Regional Planning Group review. This is a Tier 2 project that is estimated to cost $17.6 million

  - **Reliability Needs:**
    - Thermal overload of Koch Upriver – Kepler 69 kV line under certain G-1+N-1 condition
  - In-service year of the proposed project: 2021

- The Scope for the Study was presented at the July 2019 RPG meeting
- ERCOT will present the Independent Review results at this RPG meeting

Overview



Corpus Christi Area Transmission Map

Study Case

- **Base Case**
  - The final 2018 RTP 2021 South/South Central (SSC) summer peak case was used to construct the study case
    - Case Name: 18RTP_2021_SUM_SSC_12202018

    (https://mis.ercot.com/pps/tibco/mis/Pages/Grid+Information/Regional Planning)

- **Study Region**
  - South Weather Zone in ERCOT system, focusing on the Corpus Christi Area

Study Case Updates

❑ Generation Update

- New generators in the Study Region that met Planning Guide Section 6.9(1) for inclusion in the planning models were added to the case and dispatched according to 2019 RTP methodology

GINR	Name	MW Capacity
17INR0037	Palmas Atlas Wind	145
18INR0014	Karankawa Wind	206
18INR0035	CityVict	100
19INR0053	Hidalgo II Wind	51
19INR0074	Karankawa 2 Wind	101
19INR0112	Cranel Wind	220
20INR0042	Chalupa Wind	174

- The following units were turned off to be consistent with the 2019 RTP

Name of Unit	MW Capacity
Gibbons Creek	470
Decker G1	315
Decker G2	420
Oklaunion	650

Study Case Updates

- **Transmission Update**
  - 138 kV line from Champlin to Valero (~1.6 miles) and 138/69 kV transformer at Valero were backed out from the case

- **Load Update**
  - The load levels of the study weather zone in the steady-state summer peak case is consistent with the 2019 RTP

Study Methodology

❑ Contingency for Study Region

- NERC TPL-001-4 and ERCOT Planning Criteria (http://www.ercot.com/content/wcm/current_guides/53526/04_050115.doc):
  - Normal system condition (P0)
  - N-1 conditions (P1, P2-1, P7)
  - P2, P4, and P5 (EHV only)
  - X-1 + N-1 (X-1 represents 345/138 kV transformer outage)
  - G-1 + N-1 (G-1 represents generator outage)
  - Certain N-1-1 (P6) events in the region
- **Criteria**:

  Monitor all 60 kV and above transmission lines, and transformers in the study region (excluding generator step-up transformers)
  - Thermal
    - Use Rate A for Normal Conditions
    - Use Rate B for Emergency Conditions
  - Voltages
    - Monitor all 60 kV and above buses in the study region
    - Voltage exceeding their pre-contingency and post-contingency limits
    - Voltage deviations exceeding 8% on non-radial load busses

Reliability Need

- No thermal and voltage problems under N-1 contingency condition
- Thermal overload was identified on a 69 kV line under G-1+N-1 contingency condition.
- No Voltage issues were identified

Contingency	Branch Violations			
	Element	kV	Contingency	Max. Loading (%)
G-1 + N-1	Kepler to Koch Upriver	69	Loss of Valero Unit followed by the loss of Highway-Lantana 69kV line	113

Potential System Impact under Planned Maintenance Outage Condition

- Large industrial loads in the Nueces Bay area are currently served by the 69 kV lines
- N-1-1 contingencies associated with the 69 kV system could result in consequential loss of the large industrial loads (~150 MW)
- ERCOT considered the planned maintenance outage condition during the evaluation of transmission upgrade options to evaluate the benefits of operational flexibility

Project Options

Option 1

- Rebuild Kepler-Koch Upriver 69 kV line
- Rebuild Koch Upriver 138/69 kV transformer
- The total cost estimate for Option 1 is approximately $16.6 million

Option 2

- Construct 1.6 mile Champlin to Valero East 138 kV line
- Construct a 138/69 kV transformer at Valero East substation
- The total cost estimate for Option 2 is approximately $17.6 million
- A new right of way will be required

Project Options Evaluation

❑ Option 1

- Resolves the G-1+N-1 issues
- Does not provide operation flexibility during the planned maintenance outage conditions
- Consequential loss of the large industrial loads in the area due to the isolation of the 69 kV system under planned maintenance conditions

Contingency Category	Violation
P1, P2-1,P7	No Violations
P2-2,P2-3,P4-2,P4-3,P4-4,P4-5,P5	No Violations
P3 (G-1+N-1)	No Violations
Maintenance Outage scenario (N-1)+ N-1	Consequential Load loss (~150 MW) due to system isolation

Project Options Evaluation

- **Option 2**
  - Resolves the G-1+N-1 issues
  - Provide operation flexibility during the planned maintenance outage conditions
  - Prevents the consequential loss of the large industrial loads under planned maintenance conditions as it provides a new transmission source to the existing 69 kV system

Contingency Category	Violation
P1, P2-1,P7	No Violations
P2-2,P2-3,P4-2,P4-3,P4-4,P4-5,P5	No Violations
P3 (G-1+N-1)	No Violations
Maintenance Outage scenario (N-1)+ N-1	No consequential load loss

- ERCOT recommends Option 2 based on the results of the reliability analysis

Other Analyses

❑ Sensitivity Analysis

- Sensitivity analysis was performed with the potential 50 MW Marina Load (TPIT 6774) for the recommended Option 2
- The results of the sensitivity analysis did not show any reliability issues under the recommended Option 2.

❑ Congestion Analysis

- Congestion analysis was conducted to identify potential impact on system congestion related to the addition of the recommended Option 2
- Option 2 does not result in any congestion within the study area

ERCOT Recommendation

- ERCOT recommends Option 2 as the preferred option to meet the reliability need in the area
  - Construct 1.6 miles of a new Champlin - Valero East 138 kV line,
  - Construct a 138/69 kV transformer at Valero East substation
    - Option 2 addresses the reliability criteria violations
    - Provides operational flexibility by introducing a new 138 kV source to the existing 69 kV system
    - Prevents system isolation/loss of the large industrial loads
    - The estimated cost of the recommended project is $17.6 Million
    - A new right of way (1.6 miles) is needed for this project
    - Expected in-service date of the project is 2021

Deliverables

- Timeline
  - EIR Report to be posted in the MIS – September, 2019

Stakeholder Comments Also Welcomed to

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