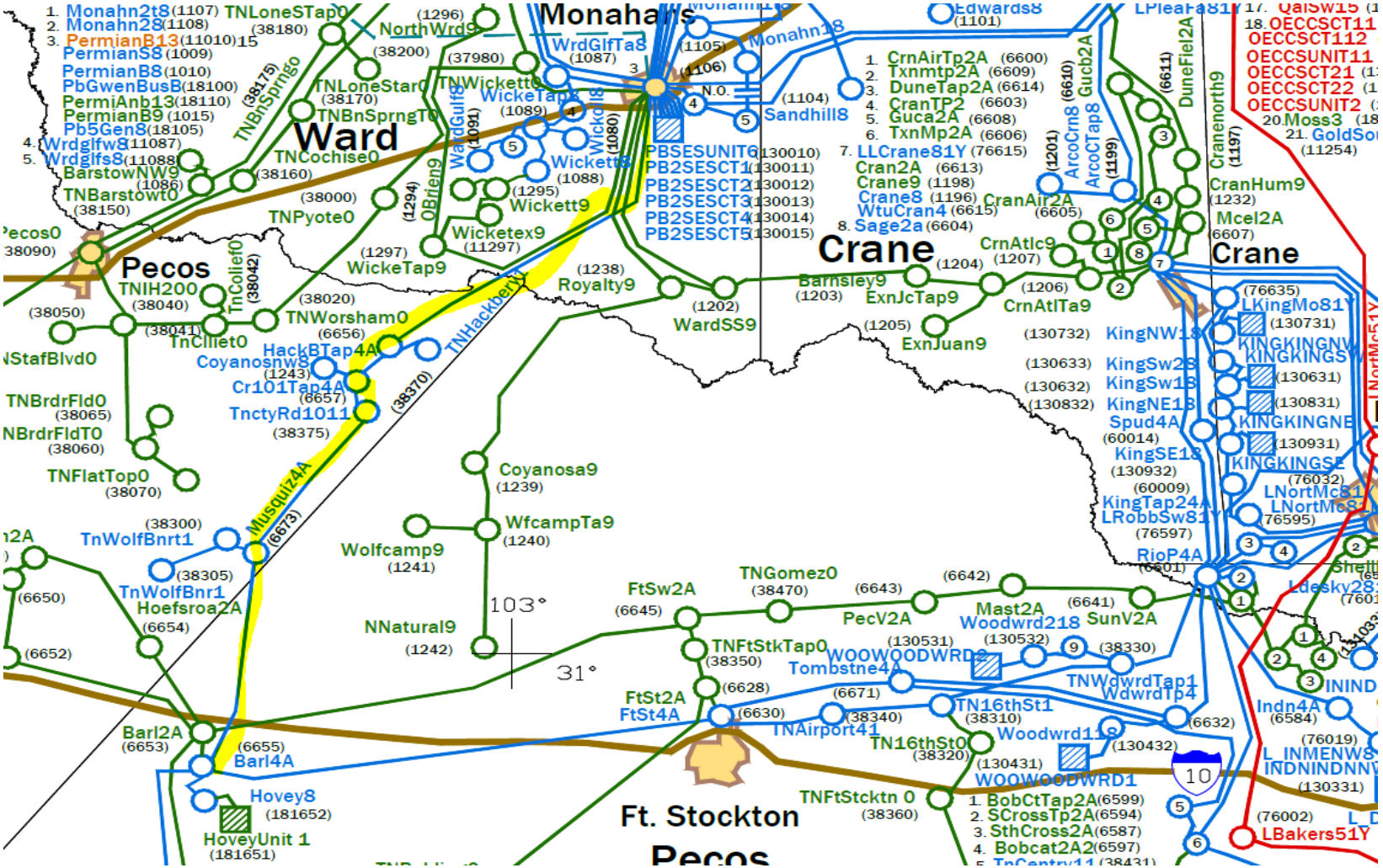
AEPSC and Oncor Barilla Junction Transmission Project – ERCOT Independent Review Update

RPG Meeting
June 21, 2016

Status of AEPSC and Oncor Barilla Junction Transmission Project RPG Review

- ERCOT is conducting an Independent Review of the need to address the reliability issues that are present along the Barilla Junction/Solstice to Permian Basin 138 kV transmission line.
  - Current status:
    - ERCOT completed the need analysis.
    - ERCOT is in the process of evaluating different options.

Study Region



Study Assumption

- Base Case:
  - The 2021 West/Far West (WFW) summer peak case from the 2016 Regional Transmission Plan (RTP).

- The total load along the Barilla Junction/Solstice to Permian Basin 138kV line is round 98MW in the base case. It was modified based on the AEP submission, which makes the total load along the line around 150 MW.

- Two solar projects (Castle Gap Solar-117MW and Castle Gap Solar 2-63MW) that met Planning Guide Section 6.9 requirements were added.

Study Assumption

- The following model corrections were made based on the information provided by AEP.
  - Line limits and parameters correction for the Fort Stockton Switch to TNMP Fort Stockton Plant 69 kV line and the AEP Fort Stockton Plant to TNMP Fort Stockton Plant 69 kV line.
  - Connect Roserock and Hovey solar to Solstice instead of Barilla Junction.

- Transmission projects removed from the RTP case.
  - TNMP 69H Rebuild and Conversion Project.
  - Oncor Riverton-Sand Lake 138 kV Upgrade Project.

Study Assumption

- Contingencies and criteria of reliability analysis.
  - NERC TPL-001-4 contingency events (P0, P1, P2-1, P3, P6 and P7) were analyzed.

- Based on the discussion with AEP, sensitivity studies were performed with higher level load forecast. The total load along the line is around 210MW in the sensitivity studies.

- In the sensitivity studies, the following transmission projects that are currently under RPG review were added back in.
  - TNMP 69H rebuild and conversion project.
  - Oncor Riverton-Sand Lake 138 kV Upgrade Project.

Reliability Analysis Results

- N-1 Results:

Branch	Rate B (MVA)	Max % Loading Cont.
Yucca Drive to Gas Pad 138 kV ckt 1	155	178.2
Lotebush to Gas Pad 138 kV ckt 1	155	162.6
Musquiz to Pig Creek 138 kV ckt 1	151	133.2
Hackberry Tap to Lotebush 138 kV ckt 1	151	127.1
Hackberry Tap to County Rd 101 138 kV ckt 1	151	118.2
Musquiz to County Rd 101 138 kV ckt 1	151	102.8

Reliability Analysis Results

- N-1 Results:

Name	Nom kV	Min Voltage Cont.
Hackberry Tap	138	0.77
Musquiz	138	0.78
County Rd 101	138	0.77
Solstice	138	0.9
Lotebush	138	0.77
Pig Creek	138	0.84
Gas Pad	138	0.76

Options Evaluated

- ERCOT evaluated several options including AEP/Oncor's preferred option, different variations of the preferred option, and other options to connect 138 kV paths to the Barilla Junction/Solstice to Permian Basin line.

- Based on the initial screening, the following three options were selected for further detailed analysis:

  - Option A (AEP/Oncor's preferred option)
    - Rebuild the existing Barrilla Junction/Solstice to Permian Basin AEP-TNC/Oncor 138 kV transmission line.
    - Hackberry Tap – Install a dynamic reactive device.
    - Ft. Stockton plant – Install a dynamic reactive device.

    Estimated Cost: $81.91 million

Options Evaluated

- Option B:
  - Rebuild the existing Barrilla Junction/Solstice to Permian Basin AEP-TNC/Oncor 138 kV transmission line.
  - Install reactive device at Hackberry Tap.

  Estimated Cost: TBD

- Option C:
  - Build a new 138 kV line from Rio Pecos to Musquiz.
  - Build a new 138 kV line from Permian Basin to Lotebush.
  - Install reactive device at Hackberry Tap.

  Estimated Cost: TBD

Options Evaluation

- All three options can resolve the steady state reliability issues identified in the need analysis. However, Option C has line loaded above 99% of Rate B.

- Sensitivity study results:
  - Sensitivity case with higher load projection and the two recently submitted RPG project (currently under review); TNMP 69H rebuild conversion project and the Oncor Riverton-Sand Lake 138 kV Upgrade Project.

  - All three options can resolve the steady state reliability issues.

Next Steps

- ERCOT will evaluate the need for dynamic reactive devices, and determine if further analysis are needed.
- ERCOT will work with AEP and Oncor to update the cost estimate for all the options.
- Tentative timeline - final recommendation to the TAC (in July) and BOD meeting (in August).

Questions?