Item 8: Houston Import RPG Project

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ERCOT Public
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Study Overview

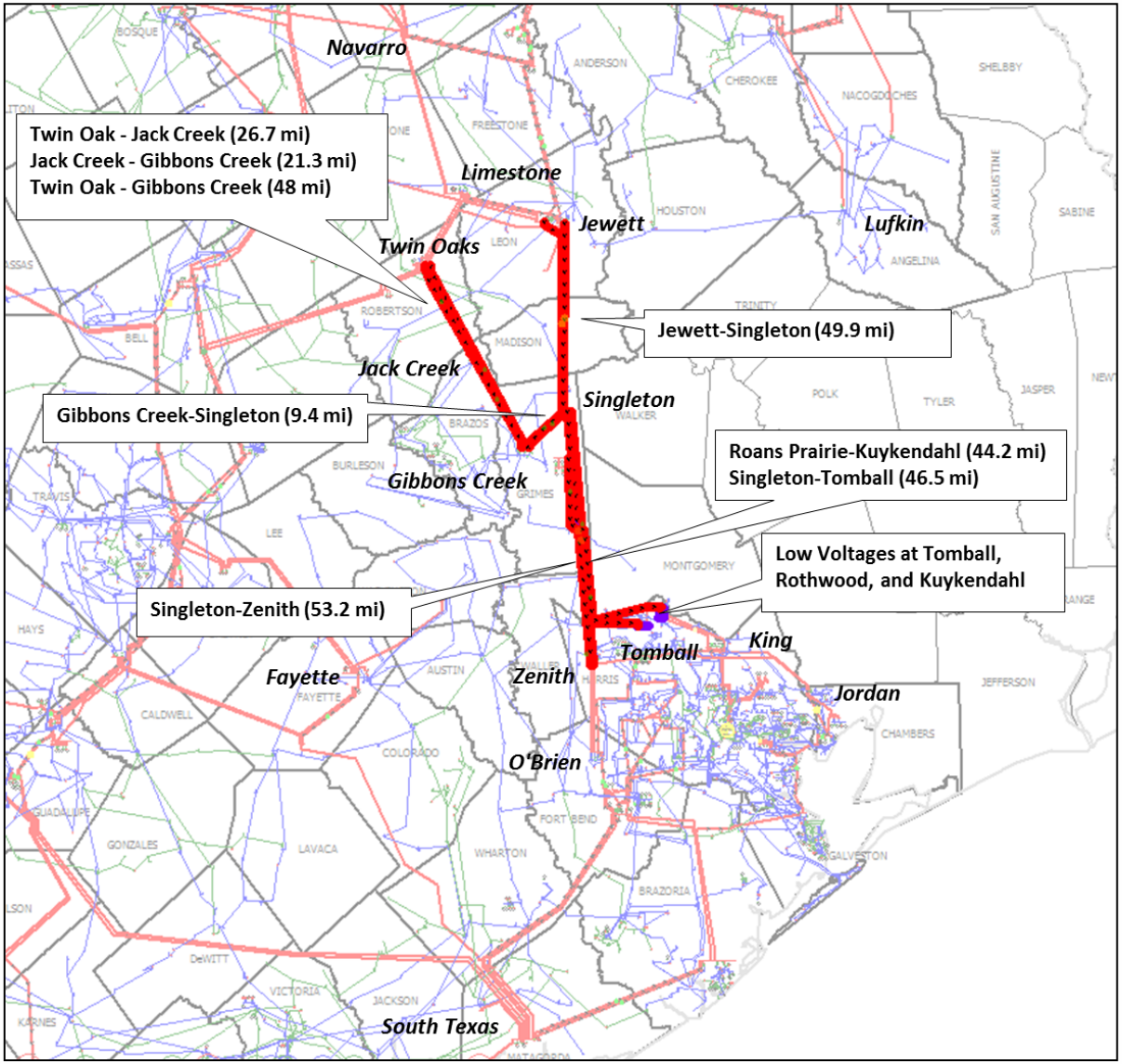
- ERCOT has determined that there will be a need for additional import capacity into the Houston region by 2018
  - Houston is the fifth most populous metropolitan area in the U.S.
  - Population in the Houston region is expected to grow at a rate of over 100,000 new residents per year.
  - Gross area product in the Houston metro area is projected to grow at an average annual rate of 3.5%.
  - The Houston metro area has almost 40% of the nation's petrochemical manufacturing capacity.
  - The Port of Houston has ranked first among U.S. seaports in terms of import tonnage for 22 consecutive years.
  - The Houston region represents approximately ¼ of the total ERCOT peak system load.
  - ERCOT long-term transmission planning has consistently indicated a need for additional import capacity into the Houston region since 2008. A Houston import project was found to be economically justified based on the generator revenue test in 2010.

ERCOT Study Approach

- In mid-2013, CenterPoint Energy, City of Garland and Cross Texas Transmission, and Lone Star Transmission separately identified a reliability need to increase the import capability into the Houston area by 2018
  - Each Transmission Service Provider submitted a project proposal to the Regional Planning Group (RPG) for review and comment
  - ERCOT conducted a single, combined Independent Review of the proposals
- ERCOT Independent Review study assumptions are consistent with the 2013 and previous Regional Transmission Plans
  - Used the 2018 summer peak load transmission planning case
- Generation assumptions followed Planning Guide Section 6.9
- Load assumptions followed Planning Guide Section 4.1.1.1(5)
- ERCOT conducted AC contingency analysis following Planning Guide criteria

Project Need Study Results

- Several ERCOT planning criteria violations were found in the 2018 peak load planning case
- The Singleton-Zenith 345 kV lines are overloaded under N-1 (contingency loss of one transmission element)
- Multiple 345 kV lines are overloaded (total length ~200 miles) and low voltage conditions in G-1 + N-1 analysis (G-1 is the outage of one generation unit)



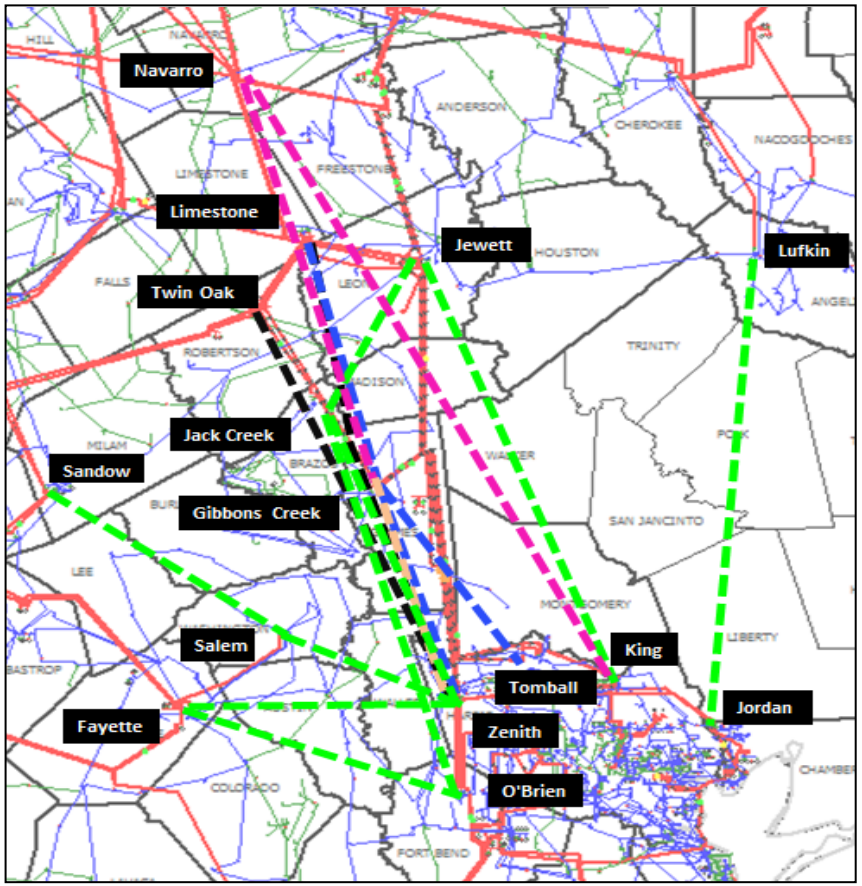
Stakeholder Comments

- Stakeholders had questions regarding the load assumptions for the Houston region used in the study.
  - Loads used in transmission planning include the impact of hot weather (different from the CDR which includes a 50/50 load forecast).
  - Non-coincident regional peak demands can occur at times when system-wide scarcity and resulting price-responsive demand are not present.
- Stakeholders commented on the use of load scaling in the study.
  - ERCOT studied the system with loads outside the study area scaled down to reflect typical non-coincidence of regional loads.
  - Stakeholders asked if ERCOT's load scaling methodology could exacerbate the North-Houston line loading in the 2018 study case.
  - To address stakeholder comments ERCOT ran three sensitivity cases with reasonable variations in load (including a case with no load scaling). Overloaded circuits were noted in all three sensitivity cases.

Worst overload	Case 1	Case 2	Case 3
Singleton-Zenith double circuit	122%	128%	137%

Project Alternatives Evaluation

ERCOT evaluated 21 project alternatives



ERCOT performed the following analysis to determine which option would best meet the long-term needs of the system:

- Assessment of potential future system upgrades and time value of money analysis of those upgrades
- Voltage stability margin analysis
- System needs analysis if older generation in the Houston area were to retire
- NERC Category C and D contingency analysis
- Production cost savings analysis
- System loss analysis

ERCOT Recommendation

- **ERCOT requests Board of Director endorsement of the need for the following project (Study Option #4), which was found to be the best alternative to address both the near-term and long-term reliability needs in the Houston area:**
  - Construction of a new Limestone-Gibbons Creek-Zenith 345 kV double circuit to achieve approximately 2988 MVA of emergency rating for each circuit
  - Upgrade of the substations at Limestone, Gibbons Creek and Zenith to accommodate the terminations of new transmission lines
  - Upgrade of the existing T.H. Wharton-Addicks 345 kV line to achieve approximately 1450 MVA of emergency rating
- **ERCOT requests that the Limestone-Gibbons Creek-Zenith 345 kV line be deemed critical to reliability pursuant to Public Utility Commission of Texas Substantive Rule 25.101(b)(3)(D)**

Questions?