2014 Long-Term System Assessment Scope and Process

1. Long-Term System Assessment Goals
   1.1. Meet ERCOT's obligations under PURA Section 39.904
   1.2. Develop a path for identifying long-term transmission needs on the ERCOT System
   1.3. Develop DC study cases for 2024 and 2029 covering a range of scenarios for the use of near-term planners in the evaluation of large transmission additions to the ERCOT System
   1.4. Facilitate communication and understanding of transmission project needs and additions among market participants

2. Assumptions
   2.1. Scenarios
      2.1.1. Based on stakeholder input up to ten scenarios will be developed to describe a range of possible futures in regards to ERCOT generation, load and transmission for 2024 and 2029. One of these scenarios will assume "current trends" conditions
      2.1.2. At least three, but up to eight scenarios will be developed to determine load growth
      2.1.3. At least three, but up to eight scenarios will be developed to determine generation expansion
      2.1.4. At least three, but up to eight scenarios will be developed for transmission expansion as described in Section 3
      2.1.5. Sensitivities to the scenarios may be run as necessary
   2.2. Transmission Topology
      2.2.1. The final 2018 case from the 2013 Regional Transmission Plan (RTP) will serve as the starting point for the study
      2.2.2. Dynamic ratings will be used for the economic portion of the analysis, but will not be used for the reliability portion since the reliability portion uses summer peak base cases
      2.2.3. Transmission interface limits will be used if there are stability-related constraints expected to be limiting during the timeframe of the analysis
   2.3. Generation
      2.3.1. A generation expansion plan will be developed for each scenario based on the assumptions specified in the scenario
      2.3.2. All hydro-electric units will be turned off for all studies
      2.3.3. Wind plants will be dispatched as follows:
         - Summer peak reliability analysis: Wind plants in the North and West area will be at zero MW. Wind plants in the Coastal area will be dispatched at 10% output
         - Economic analysis: Wind plants will be dispatched according to AWS Truepower profiles selected for each plant
      2.3.4. The following fuel price related assumptions will be used:
         - Wind production cost = $0/ MWh
         - A natural gas price assumption will be developed for each scenario

2.3.5. In the economic analysis, generation dispatch will include 1400 MW of responsive reserve requirements along with regulation requirements

2.4. Load

2.4.1. The load will be evaluated by weather zone. The ERCOT 90th percentile weather zone load forecast for each scenario will be used for the summer peak reliability portion of the analysis. Load will be scaled from the 2018 levels in the 2013 RTP to the load levels identified for each scenario on a per weather zone basis unless stated otherwise

2.4.2. The ERCOT 50th percentile load forecast for each scenario plus self-serve load will be used for the economic portion of the analysis

2.5. The contingency list will be the same as that used in the 2013 RTP

2.5.1. Pre-contingency conditions will be studied

2.5.2. The following post-contingency conditions will be studied for the summer peak reliability analysis:

2.5.2.1. Single transmission line or transformer (60 kV and above) – including breaker to breaker contingencies

2.5.2.2. Two circuits sharing towers for 0.5 miles or more

2.5.2.3. Single generation unit

2.5.2.4. Single generation unit plus any contingency listed in 2.4.2.1 and 2.4.2.2

2.6. Limits

2.6.1. The following limits will be monitored in the summer peak reliability analysis:

2.6.1.1. Rate A under pre-contingency conditions for 60 kV and above transmission lines and transformers with a low side voltage of 60 kV and above

2.6.1.2. Rate B under post-contingency conditions for 60 kV and above transmission lines and transformers with a low side voltage of 60 kV and above

2.6.2. The following limits will be monitored in the economic analysis:

2.6.2.1. Rate A under pre-contingency conditions for 345 kV and above transmission lines

2.6.2.2. Rate B under post-contingency conditions for 345 kV and above transmission lines

2.6.2.3. Transmission lines and transformers with voltages lower than 345 kV may be monitored if deemed significant to the analysis

2.7. DC ties

2.7.1. All of the existing DC ties will be modeled and dispatched based on historical data

3. Method of Study

3.1. Case preparation

3.1.1. The final 2018 case from the 2013 RTP will be modified by scaling load and adding generation per scenario in accordance with the assumptions listed in Section 2

3.2. Summer Peak Reliability Analysis

3.2.1. Perform DC Powerworld SCOPF or TARA redispatch to identify unresolvable constraints in the case. Work with TPs to find projects to solve constraints on transmission lines 345 kV or higher for each scenario or to solve constraints on transmission lines or transformers at voltages less than 345 kV for areas that have a high amount of overloads in multiple scenarios

3.2.2. Run generation outage analysis on the case to screen for generator unit outages that may cause unresolvable constraints. Create Powerworld or TARA case for each generator identified in the screening with that generator placed out of service. Work with TPs to find projects to solve constraints on transmission lines 345 kV or higher for each scenario or to solve constraints on transmission lines or transformers at voltages less than 345 kV for areas that have a high amount of overloads in multiple scenarios

3.3. Stability Analysis

3.3.1. Stability analysis will be run if a stability limit is expected, based on engineering judgment, to be limiting during the timeframe of the analysis

3.4. Economic Analysis

3.4.1. Import the final reliability cases for each year into UPLAN or PROMOD as the starting economic cases. Update the load to the ERCOT forecast plus self-serve load. Add dynamic ratings to transmission lines

3.4.2. Organize congestion in each case by rank and shadow price. Work with TPs to develop projects to solve the highest congested elements

4. Deliverables

4.1. A final report with documentation of long-term transmission needs is targeted to be completed by 11/15/2014

4.2. Post intermediate cases and binding constraints and proposed reliability and economic projects as they become available.

4.3. Steady-State DC base cases at yearly peak that include all reliability projects for each case (SCED) will be posted

4.4. Steady-State DC base cases at yearly peak that include all reliability and economic projects for each case (SCED) will be posted

4.5. A final congestion table will be posted for each study year in the Economic analysis