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| PGRR Number | [042](http://www.ercot.com/mktrules/issues/PGRR042) | PGRR Title | Regional Transmission Plan Model Reserve Requirement and Load-Generation Imbalance Methodology |

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| Date | September 7, 2016 |

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| Comments |

NRG Texas Power LLC (NRG) submits these comments on Planning Guide Revision Request (PGRR) 042, Regional Transmission Plan Model Reserve Requirement and Load-Generation Imbalance Methodology. These comments are in response to the 9/2/16 ERCOT comments to PGRR042.

NRG appreciates the consideration of these comments by the Reliability and Operations Subcommittee (ROS) with such short notice at its meeting September 8, 2016, where ROS will consider PGRR 042; such delay in submission was unavoidable because the 9/2/16 ERCOT comments were submitted on the Friday before a long Holiday weekend.

NRG and other stakeholders have been working on this PGRR since early last year, and there has been a great deal of discussion on these issues. The need for this PGRR to move forward, and in a form that meaningfully provides reforms in the ERCOT transmission planning process, is as urgent as ever.

**Load Forecasts**

As a preliminary matter, NRG addresses a point in the ERCOT September 2 comments where ERCOT asserts that “[a]t this time, ERCOT does not believe it would be prudent to ***exclusively*** rely on ERCOT’s 90/10 Weather Zone Load forecast for transmission planning reliability analysis.” *[Emphasis added.]* NRG points out that this does not describe the NRG position. NRG proposes that the 90/10 ERCOT independent forecast should be the ***starting point*** for the planning cases – and that there be an opportunity for parties to comment, and for ERCOT to make modifications if needed and justified:

[*Proposed language from NRG/Calpine comments April 19, 2016*]

3.1.1.2 Load Forecast and Regional Transmission Plan

(1) ERCOT shall create ERCOT 90/10 Forecasts to establish Regional Transmission Plan base cases for use in Regional Transmission Plan activities and RPG Project Review. On an annual basis, ERCOT shall prepare and present for RPG comment the planned release of the ERCOT 90/10 Forecast regarding future planning years. **ERCOT shall consider comments from stakeholders and may make modifications to the ERCOT 90/10 Forecast for specific, documented, and measurable future Load additions.** ERCOT must ensure that any such adjustments to forecasted Load are not duplicative of assumptions of Load growth already a part of the ERCOT 90/10 Forecast, and must minimize any Load modifications accordingly. [*Emphasis added*]

Thus, the approach urged by NRG clearly addresses the concern raised by ERCOT. Nonetheless, as described below, NRG is willing to work with the approach that ERCOT now proposes, if it can be made in a form that is meaningful.

In order to address concerns repeatedly expressed by the Public Utility Commission of Texas (PUCT), it is imperative that this PGRR capture, in clear and solid terms, how to address:

(1) a transmission planning process that is “broken,”[[1]](#footnote-1) and

(2) to reconcile the extreme inconsistency between ERCOT transmission planning and resource adequacy reporting.

To those ends, NRG recognizes and appreciates the efforts that ERCOT has made towards middle ground on the forecasting and load scaling issues, as reflected in ERCOT’s September 2 comments. As to forecasting, ERCOT’s position has moved in a positive direction, whereby additional guidance would be applied to the “higher of” methodology when the SSWG forecast is higher than the ERCOT independent 90/10 forecast. However, ERCOT’s proposal has two important shortcomings. ***First***, ERCOT’s approach is not to place these requirements in the Planning Guides themselves – but instead ERCOT expresses a commitment to using this approach in the scope of the 2017 Regional Transmission Plan (RTP). While positive, this would be an insufficient response to the clarity needed to address the concerns of the PUCT. NRG urges that this requirement, which NRG recognizes is a positive compromise position, must be in the terms of the Planning Guides themselves in order to be meaningful. Below NRG proposes language to accomplish that result.

***Second***, the amount of the “cap” that would apply to an SSWG forecast that exceeds the independent ERCOT 90/10 forecast is left to a yet to be determined “X%,” to be vetted in the Regional Planning Group process. This is also insufficient to ensure that this important limitation, to ensure independence in the transmission planning process, is clearly established – this value should be fixed in the Planning Guides. As an initial matter, NRG fully expects the percentage cap must be a very, very low value in order to be consistent with a reasonable approach to transmission planning.

However, NRG recognizes that this is a new concept that stakeholders have not yet vetted, so addition discussion is in order***. NRG suggests that ROS remand this item to the Planning Working Group (PLWG) for a recommendation as to the appropriate percentage, and defer final action on PGRR 042 to the October ROS meeting.***

**Load Scaling**

In its September 2 comments, ERCOT accepts the Morgan Stanley concept of adding sensitivity analysis regarding the impact of load scaling on the project need determination. NRG acknowledges this is a good addition to the process, but it does not fully address the potential that the use of scaling techniques could lead to planning scenarios that could not occur in reality.

To address this problem, NRG suggests reinstating, with some modifications, the limitations suggested in prior comments – many of which, earlier in this process, ERCOT was willing to include in PGRR 042.[[2]](#footnote-2) In summary, NRG urges allowing ERCOT specific techniques to achieve a balance case, in order of priority:

* + Increase the dispatch level of wind generation up to the seasonal peak average.
  + Increase the dispatch level of (utility scale) solar to 100%.
  + Increase the import from DC ties to their full seasonal net maximum.
  + Add mothballed generation that have not announced their return to service during the study period.
  + Add any or all proposed generation resources that have signed an interconnection agreement but have not met other requirements.
  + Scaling as last resort – using multiple study regions (but in no case less than four) scale down Load in weather zones (outside study area) -
    - only to the point still necessary to solve the model,
    - but never reduce Load in a zone below its average percentage of peak Load during the top ten hourly peak Load conditions of the study area weather zone.

However, given the movement ERCOT has made on the forecast issues (assuming they are incorporated in the Planning Guide itself), NRG suggests that ERCOT should have the opportunity to suggest revisions to the scope and details of these scaling limitations *prior to* finalizing PGRR 042. Therefore, ***NRG proposes that this issue also be remanded to the PLWG for a recommendation based on further feedback from ERCOT and other parties – for final action at the October ROS meeting.***

Finally, in Section 3.1.3, Project Evaluation, NRG proposes (as NRG suggested in its April 19 comments) that if Generation Resources are added back in to any planning analysis, they should be added in *regardless of location* - not just “in or near” the study area. This will help ensure a balanced view of the overall ERCOT system in regards to transmission planning. Such sensitivity analysis is highly relevant to the planning process and should be considered in the assessment of need for any project.

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| Revised Cover Page Language |

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| Planning Guide Sections Requiring Revision | 2.1, Definitions  3.1.1, Overview of Major Transmission Planning Activities  3.1.1.2, Regional Transmission Plan  3.1.2.1, All Projects  3.1.3, Project Evaluation  3.1.3.1, Definitions of Reliability-Driven and Economic-Driven Projects  3.1.4.1, Development of Regional Transmission Plan  3.1.4.1.1, Regional Transmission Plan Cases (new)  3.1.4.2, Use of Regional Transmission Plan |

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| Revised Proposed Guide Language |

***2.1 DEFINITIONS***

**ERCOT 90/10 Forecast**

The non-coincident peak Load forecast developed independently by ERCOT delineating, by Weather Zone, the peak demand forecast having a 10% probability of being exceeded by the actual peak demand; and that such forecast is derived from the same underlying independent ERCOT Load forecast used by ERCOT for resource adequacy planning and reporting.

***3.1.1 Overview of Major Transmission Planning Activities***

(1) The process of planning a reliable and efficient transmission system for the ERCOT Region is composed of several types of activities and studies.

(2) Consideration of the Year 6 case in the Regional Transmission Plan is required.

**3.1.1.2 Regional Transmission Plan**

(1) ERCOT shall create ERCOT 90/10 Forecasts to establish Regional Transmission Plan base cases for use in Regional Transmission Plan activities and RPG Project Review. On an annual basis, ERCOT shall prepare and present for RPG comment the planned release of the ERCOT 90/10 Forecast regarding future planning years. Starting with the 2017 Regional Transmission Plan (RTP), ERCOT will compare the ERCOT 90/10 Load forecast with the summed Steady State Working Group (SSWG) Bus Load Forecast for each Weather Zone. If the ERCOT 90/10 Load forecast is higher, ERCOT will use this forecast. If the SSWG Load forecast is higher than the ERCOT 90/10 Load forecast, ERCOT will use the ERCOT 90/10 Load forecast plus no more than X% above that peak value. [***X to be determined after consultation with and recommendation from the Planning Working Group (to be discussed at the September PLWG meeting) to be presented at the October Reliability and Operations Subcommittee meeting, for final action on this PGRR***.] .

(2) The Regional Transmission Plan is developed annually by ERCOT, in coordination with the RPG and Transmission Service Providers (TSPs). The Regional Transmission Plan addresses regional and ERCOT-wide reliability and economic transmission needs and the planned improvements to meet those needs for the upcoming six years starting with the ERCOT 90/10 Forecast base cases. These planned improvements include projects previously approved by the ERCOT Board, projects previously reviewed by the RPG, new projects that will be refined at the appropriate time by TSPs in order to complete RPG review, and the local projects currently planned by TSPs. Combined, these projects represent ERCOT’s plan which addresses the reliability and efficiency of the ERCOT System in order to meet North American Electric Reliability Corporation (NERC) Reliability Standards, the Protocols, Operating Guides and this Planning Guide. Projects that are included in the Regional Transmission Plan are not considered to have been endorsed by ERCOT until they have undergone the appropriate level of RPG Project Review as outlined in Protocol Section 3.11.4, Regional Planning Group Project Review Process, if required. The process used by ERCOT to develop the Regional Transmission Plan is outlined in Section 3.1.4, Regional Transmission Plan Development Process.

(2) ERCOT shall post the Regional Transmission Plan to the Market Information System (MIS) Secure Area by December 31 of each year.

(3) ERCOT shall include in the Regional Transmission Plan report a list of Transmission Facilities that are loaded above 95% of their applicable Ratings for the following conditions:

(a) Normal system conditions; or

(b) Following the contingency loss of a single generating unit, transmission circuit, transformer, or common tower outage.

**3.1.2.1 All Projects**

The submittal of each transmission project (60 kV and above) for RPG Project Review should include the following elements:

(a) The proposed project description including expected cost, feasible alternative(s) considered, transmission topology and Transmission Facility modeling parameter data, and all study cases used to generate results supporting the need for the project in electronic format (powerflow data should be in PTI PSS/E RAWD format). Also, the submission should include accurate maps and one-line diagrams showing locations of the proposed project and feasible alternatives (AutoCad-compatible format preferred);

(b) Identification of the ERCOT 90/10 Forecast base cases or Regional Transmission Plan powerflow cases used as a basis for the study and any associated changes that describe and allow accurate modeling of the proposed project;

(c) Description and data for all changes made to the ERCOT 90/10 Forecastbase cases or Regional Transmission Plan cases used to identify the need for the project, such as Generation Resource unavailability and area peak Load forecast;

(d) A description of the reliability and/or economic problem that is being solved;

(e) Desired/needed in-service date for the project, and feasible in-service date, if different; and

(f) The phone number and email address of the single point of contact who can respond to ERCOT and RPG participant questions or requests for additional information necessary for stakeholder review.

***3.1.3 Project Evaluation***

(1) ERCOT and the RPG shall evaluate proposed transmission projects using a variety of tools and techniques as needed to ensure that the system is able to meet applicable reliability criteria in a cost-effective manner. For most proposed projects, several alternatives will be identified to meet the reliability criteria or other performance improvement objectives that the proposed project is designed to meet. The project alternative with the expected lowest cost over the life of the project is generally recommended, subject to consideration of the expected long-term system needs in the area, and consideration of the relative operational impacts of the alternatives.

(2) In some cases, one alternative may be to dispatch the system in such a way that all reliability requirements are met, even without the proposed transmission project or any transmission alternative, resulting in a less efficient dispatch than what would be required to meet the reliability requirements if the proposed project was in place. Consideration of the merits of this alternative relative to the proposed transmission project is more complex. To facilitate the discussion and consideration of these alternatives, ERCOT has adopted certain definitions and practices, described in paragraph (4) of Protocol Section 3.11.2, Planning Criteria, and Sections 3.1.3.1, Definitions of Reliability-Driven and Economic-Driven Projects, and 3.1.3.2, Reliability-Driven Project Evaluation below.

(3) In its independent review of reliability-driven projects classified as Tier 1 or 2 pursuant to Protocol Section 3.11.4, Regional Planning Group Project Review Process, ERCOT shall utilize the following procedures to satisfy Load/generation imbalances for projects intended to solve the identified reliability criteria violation of a transmission circuit that crosses at least one Weather Zone boundary:

(i) ERCOT shall not decrease the Load from the forecasted level in any of the Weather Zones in which a transmission circuit with an identified reliability criteria violation is located.

(ii) ERCOT may utilize the following in the order listed below to satisfy Load/generation imbalances:

1. Increase the Dispatch level of each Wind-powered Generation Resource (WGR) up to the Seasonal Peak Average Wind Capacity as a Percent of Installed Capacity as defined in Protocol Section 3.2.6.2.2, Total Capacity Estimate.
2. Increase the Dispatch level of each PhotoVoltaic Generation Resource (PVGR) up to the Solar Unit Capacity as defined in Protocol Section 3.2.6.2.2, Total Capacity Estimate.
3. Increase the output from the Direct Current Ties (DC Ties) to their full Seasonal net max sustainable ratings for DC Tie Resources importing into the ERCOT Region as defined in Protocol Section 3.2.6.2.2, Total Capacity Estimate..
4. Add any or all Mothballed Generation Resources that have not yet announced their return to service during the study period.
5. Add any or all proposed Generation Resources that are outside of any study Weather Zone and have signed Standard Generation Interconnection Agreements (SGIAs) but have not yet met the other requirements of Section 6.9, Addition of Proposed Generation Resources to the Planning Models.
6. Reduce Load in the study case outside of the Weather Zones in which the identified reliability criteria violation of a transmission circuit is located such that the total Load in the case is equal to ERCOT 90/10 Forecast system wide coincident peak Load forecast plus self-serve Load. The Load scaling in any single Weather Zone shall never reduce the Load in the scaled Weather Zone below its average percentage of peak Load during the top ten hourly peak Load conditions for the past three years of the study Weather Zone.

(4) As part of its independent review of any project classified as Tier 1 pursuant to Protocol Section 3.11.4, ERCOT shall:

(a) Perform a generation sensitivity analysis. The generation sensitivity analysis will evaluate the effect that proposed Generation Resources will have on a recommended transmission project. Generation Resources that have signed Standard Generation Interconnection Agreements (SGIAs) but were not included in the study cases because they did not meet all of the requirements for inclusion in the cases pursuant to Planning Guide Section 6.9, Addition of Proposed Generation Resources to the Planning Models, will be included in the sensitivity analysis; and

(b) Evaluate impacts related to the Load scaling used in the study on any constraints resulting in project recommendations. The results of this evaluation shall be included in the final recommendations in the independent review.

**3.1.3.1 Definitions of Reliability-Driven and Economic-Driven Projects**

(1) Proposed transmission projects are categorized for evaluation purposes into two types:

(a) Reliability-driven projects; and

(b) Economic-driven projects.

(2) The differentiation between these two types of projects is based on whether a simultaneously-feasible, security-constrained generating unit commitment dispatch is expected to be available for all hours of the planning horizon that can resolve the system reliability issue that the proposed project is intended to resolve. If it is not possible to simulate a dispatch of the Generation Resources such that all reliability criteria are met without the project, and the addition of the project allows the reliability criteria to be met, then the project is classified as a reliability-driven project. If it is possible to simulate a dispatch of the Generation Resources in such a way that all reliability criteria are met without the project, but the project may allow the reliability criteria to be met at a lower total cost, then the project is classified as an economic-driven project. When performing a simulation of the generating unit commitment and dispatch, only contingencies and limits that would be considered in the operations horizon shall be simulated.

**3.1.4.1 Development of Regional Transmission Plan**

(1) The planning process begins with computer modeling studies of the generation and Transmission Facilities and substation Loads under normal conditions in the ERCOT System. Contingency conditions along with changes in Load and generation that might be expected to occur in operation of the ERCOT Transmission Grid are also modeled. To maintain adequate service and minimize interruptions during Outages, model simulations are used to identify adverse results based upon the planning criteria and to examine the effectiveness of various problem-solving alternatives.

(2) The effectiveness of each alternative will be evaluated under a variety of possible operating environments because Loads and operating conditions cannot be predicted with certainty. As a result, repeated simulations under different conditions are often required. In addition, options considered for future installation may affect other alternatives so that several different combinations must be evaluated, thereby multiplying the number of simulations required.

(3) Once feasible alternatives have been identified, the process is continued with a comparison of those alternatives. To determine the most favorable, the short-range and long-range benefits of each alternative must be considered including operating flexibility and compatibility with future plans.

**3.1.4.1.1 Regional Transmission Plan Cases**

(1) The starting base cases for the Regional Transmission Plan development are created by removing all Tier 1, 2 and 3 projects that have not received RPG acceptance or, if applicable, ERCOT endorsement from the most recent ERCOT 90/10 Forecast base cases.

(2) ERCOT shall set all non-seasonal Mothballed Generation Resources to out of service in the Regional Transmission Plan reliability base cases. ERCOT shall add proposed Generation Resources that have met the criteria for inclusion in Section 6.9, Addition of Proposed Generation Resources to the Regional Transmission Plan base cases.

(3) ERCOT shall update the Regional Transmission Plan reliability and economic base cases to reflect any updates to the amount of Switchable Generation Resource capacity available to the ERCOT Region.

(4) In the Regional Transmission Plan reliability base cases, ERCOT shall set the output from the DC Ties at the Seasonal net max sustainable ratings for DC Tie Resources as defined in Protocol Section 3.2.6.2.2, Total Capacity Estimate.

(4) In the Regional Transmission Plan reliability base cases, ERCOT shall dispatch hydro Generation Resources up to the Hydro Unit Capacity as defined in Protocol Section 3.2.6.2.2, Total Capacity Estimate.

(5) In the Regional Transmission Plan economic base cases, 8,760-hour profiles shall be used for hydro Generation Resources, WGRs, PVGRs and DC Ties. ERCOT profiles shall be used for WGRs and PVGRs. Average historical output for the past three years shall be used to create the hydro Generation Resource and DC Tie profiles.

(6) The Load utilized in the Regional Transmission Plan reliability base cases shall be organized and evaluated by Weather Zone. ERCOT shall use each Weather Zone’s 90th percentile peak Load forecast, plus self-serve Load, for the study year. ERCOT may adjust this Load forecast to reflect specific, publicly known Load additions or subtractions that ERCOT reasonably anticipates.

(7) If the total generation capacity in a Regional Transmission Plan reliability base case is less than the peak Load in the case plus losses plus an operating reserve equal to the two largest units in the case, ERCOT shall group one or more Weather Zones into no fewer than four study regions and create a separate base case for each study region for the season and year being studied.

(a) ERCOT shall not change Load or total generation capacity inside a study region. ERCOT may redispatch dispatchable Generation Resources inside a study region as necessary.

(b) ERCOT shall use the following procedures in the order listed below to balance the case:

(i) ERCOT may increase the Dispatch level of each WGR and PVGR outside the study region to a level that does not exceed the following maximums.

(A) For a WGR, the maximum Dispatch level is the Seasonal Peak Average Wind Capacity as a Percent of Installed Capacity as defined in Protocol Section 3.2.6.2.2, Total Capacity Estimate.

(B) For a PVGR, the maximum Dispatch level is the Solar Unit Capacity as defined in Protocol Section 3.2.6.2.2, Total Capacity Estimate.

(ii) ERCOT shall reduce Load outside of the study region such that the total load in the case is approximately equal to ERCOT’s 90th percentile system-wide coincident peak Load forecast plus self-serve Load.

(iii) If the Load reductions in paragraphs (7)(b)(ii) and (ii) are still not enough to balance the case, Load outside the study region may be reduced to a level sufficient to balance the case, provided that such Load reductions never reduce the Load in a scaled Weather Zone below its average percentage of peak Load during the top ten hourly peak Load conditions for the past three years of the study Weather Zone.***[The limitations to load scaling above to be reviewed further by ERCOT and in*** ***consultation with the Planning Working Group at its September meeting for potential further recommendations at the October Reliability and Operations Subcommittee meeting, for final action on this PGRR***.]

**3.1.4.2 Use of Regional Transmission Plan**

(1) If a project submitted for RPG review is included in the Regional Transmission Plan, and no changes are identified which would affect the need for the proposed project through the 21-day comment period described in Section 3.1.5, Regional Planning Group Comment Process, then the Regional Transmission Plan may serve as the ERCOT Independent Review of the proposed project, if required.

(2) Tier 1, 2, and 3 projects that are included in the Regional Transmission Plan should be submitted for RPG Project Review at an appropriate lead time. Generally, this lead time should be sufficient to allow the review to be completed before the TSP reaches the decision point at which it must initiate the engineering and procurement in order to meet the required in-service date, but not farther in advance than is necessary. In general, these lead times will be three to four months for Tier 3 projects and six to seven months for Tier 1 and 2 projects.

(3) Tier 1, 2 and 3 projects that are included in the Regional Transmission Plan but do not reach this decision point before the development of the next year’s Regional Transmission Plan begins will be removed from the case used to develop the Regional Transmission Plan and will be re-evaluated as a part of the development of this subsequent Regional Transmission Plan.

1. August 9, 2016, ERCOT Board meeting and PUCT Open Meeting; Agenda Item 6.1. Appeal of TAC Action on NPRR784, Mitigated Offer Caps for RMR Units; Oral comments by Commissioner Ken Anderson. [↑](#footnote-ref-1)
2. *See, e.g*., Comments by ERCOT on Planning Guide Revision Request (PGRR) 042, submitted June 16, 2015. [↑](#footnote-ref-2)