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RELIABILITY STANDARD FOR THE	**§**	**PUBLIC UTILITY COMMISSION**
	§	
ERCOT MARKET	**§**	**OF TEXAS**

I. INTRODUCTION

Shell Energy North America (US), L.P. ("Shell Energy") appreciates the opportunity to provide reply comments in response to questions provided by the Staff ("Staff") of the Public Utility Commission of Texas ("Commission") regarding a Reliability Standard for ERCOT Market. Shell Energy has a widespread stake in the electricity market, spanning retail interests, thermal generation ownership, energy scheduling, renewable and emerging technology development, risk management services and end use energy consumption. Given the wide array of interests, Shell Energy advocates for and supports transparent, competitive, technology-neutral market-based solutions to achieve desired reliability objectives at the lowest cost. Shell Energy greatly appreciates the Commission and Staff's hard work on these critically important matters and is grateful for the opportunity to provide input. Shell Energy looks forward to further discussion and opportunities to provide its perspective on these significant issues as we move forward.

II. REPLY COMMENTS

Retaining 1-in-10 year Loss of Load Event (LOLE) Standard is inefficient:

Shell Energy reiterates that a reliability standard that is based on a mandatory procurement of capacity (MW) is contrary to an energy-only market design. Energy and Ancillary Service markets can be modified to meet a target Reliability standard to ensure resource adequacy. For the target reliability standard, Shell Energy disagrees with other commentors that request the Commission retain the 1-in-10 year LOLE Standard. The traditional LOLE Standard does not capture the magnitude or duration of a loss of load event and therefore will distort the reliability needs of the system. If a reserve margin-based resource adequacy reliability standard needs to be

developed then **a target reliability standard based on the Normalized Expected Unserved Energy (NEUE) is most reasonable as it creates a boundary condition for the system based on frequency, duration, magnitude, probability, system size and cost of the event.**

Disagree that EUE assumes a lower level of reliability than 1-in-10 Year LOLE:

We disagree with other commentors arguments that metrics like EUE assume a lower level of reliability than 1-in-10 Year LOLE. It is very clearly shown in HEN's example *"the grid experiencing 1 loss of load event every 10 years (Frequency) losing 10,000 MW (Magnitude) for 10 hours (Duration) would have an EUE= 0.1 x 10,000 x 10 = 10,000MWh. Similarly, the grid experiencing 10 loss of load events every 10 years (Frequency) losing 100 MW (Magnitude) for 10 hours (Duration) would have an EUE = 1 x 1,000 x 10 = 10,000 MWh. Although the grid would meet a LOLE reliability standard of 0.1 day/year for the first example, it would fail the LOLE standard for the second example, even though the second scenario may be much less impactful to grid operations and easily managed by ERCOT (ERCOT maintains 1,000 MW of reserves even when shedding firm load). This example shows the shortcomings of the LOLE standard while demonstrating how the EUE standard creates a boundary that these three metrics must meet in combination.*[1]" ERCOT has roughly over 7GWs of different forms of demand response that is more than sufficient to cover a small shortage event but not enough to cover a large shortage event. LOLE would have shown the system to be unreliable even with the possibility of two small shortages in 10 years but would have shown the system to be reliable even with the possibility of a significantly large event once every 10 years. These results are misleading. On the other hand, **NEUE accurately characterizes reliability based on the impact to the load being served and hence is a better metric to use when determining the cost-benefit of actions to be taken to improve reliability.**

A 1 day in 10 year (or 2.4 hour per 8760 hours in a year) measure produces an error rate of approximately 0.02% of all hours. **In statistical quality control that rate of error would equal a 3.5 standard deviation from normal operations.** If we apply that same risk to the energy served by ERCOT to its customers, we will get the same level of statistical and operational risk expressed in unserved energy rather than unserved hours of the year. I.e., From a statistical

[1] HEN Comments at 3.

perspective, A 0.02% NEUE gives you the same level of reliability as a 1 day in 10 year reliability standard. At the same time, NEUE reliability standard would have the immediate advantage of allowing ERCOT to value unserved energy directly and better account for the cost-benefit of actions to be taken to improve reliability. A target 0.002% NEUE reliability standard as used in Australia is more stringent by a factor of 10 in absolute magnitude than a 1 day in 10 year reliability standard. A target 0.002% NEUE reliability standard is already deep in the tail end of the risk profiles, where large expenditures will have diminishing risk benefit returns showing that a system designed based on a NEUE reliability standard can provide a much more reliable outcome than if it were designed based on LOLE.

Disagree that metrics like target NEUE standards are inconsistent with the legislative mandate:

We disagree with other commentors arguments that metrics like target NEUE standards are inconsistent with the legislative mandate[2]. The requirement in Senate Bill 3 from the 87th Texas Legislative Session ("SB3")[3] is to "establish requirements to meet the reliability ***needs*** of the power region" and determine "services necessary to ensure ***appropriate*** reliability." SB3 mandates procuring services needed to address reliability needs and to maintain appropriate reliability. This is done setting a target reliability standard that is achieved through services that balance the economic trade-off of marginal improvements in reliability relative to the cost of those services. From that perspective, it is incorrect for Electric Reliability Council of Texas (ERCOT) to look at single number and not a probability weighted number in their reliability analysis study. **We disagree with ERCOT's comments "…any load shed event should not last for more than x hours ..... limit on the magnitude of any single loss of load event ….".** If we take ERCOT's approach then a system (generation mix) with a duration threshold that is violated in 99% of the simulation runs will be shown to have the same level of reliability as another system (with much firmer generation mix) for which the simulation runs have only 1 run that violated the duration threshold. This also implies that a single extremely low probability scenario added to a 50,000-run simulation could cause unintended/undesirable study results showing failure of any chosen level of reliability metric for even extremely reliable systems. For example: a 0.000001 probability 4-

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[2] STEC Comments at 5.

[3] Tex. S.B. 3, 87th Leg., R.S. (2021) § 18, as codified as PURA § 39.159(b)

hour load shed event due to 75% generation outage added in the simulation in which all other runs have no load shed great than or equal to 4-hours could give the impression that the system could be expected to have 4-hour load shed event frequently unless 75% more generation is added. Adding that much additional generation would be too costly and at the same time would minimally improve reliability. Hence, the design of any reserve margin reliability standard for ERCOT must be designed to balance tradeoffs between cost and the reliability benefit. The Commission should **consider the marginal improvement in reliability by ensuring that the reliability target that is adopted is probability-based**, giving more weight to events of higher probability and less weight to events less likely to happen. The target reliability metric should be statistical in nature. It should also be recognized that the **reliability standard should not be applied to the actual system reliability, but rather to probabilistic simulations of reliability which will in turn set market parameters**.

III. CONCLUSION

Shell Energy appreciates the opportunity to provide reply comments on this important issue. SB3 does not require establishment of a mandated capacity procurement reliability standard. To preserve Texas' vibrant Energy-only wholesale and retail market, if a reserve margin-based reliability standard is developed, then it should be a ***target reliability standard*** and not a mandated reliability standard. The design of any of these target reserve margin reliability standards for ERCOT must find a way to balance tradeoffs between cost and reliability benefits. If a reserve margin-based resource adequacy reliability standard needs to be developed then a target reliability standard based on the Normalized Expected Unserved Energy (NEUE) is most reasonable as it considers frequency, duration, magnitude, probability, and cost of the event.

Respectfully submitted,

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SHELL ENERGY'S EXECUTIVE SUMMARY

- ***A target NEUE standard is consistent with the legislative mandate***: SB3 requires the commission to "establish requirements to meet the reliability ***needs*** of the power region" and determine "services necessary to ensure ***appropriate*** reliability". It does not require the commission to establish a mandated capacity procurement reliability standard. A mandatory procurement of capacity (MW) is contrary to an energy-only market design. Energy and Ancillary Service markets could be modified to meet a target Reliability standard to ensure resource adequacy.
- ***Retaining 1-in-10 year Loss of Load Event (LOLE) Standard and setting a limit on # of hours and maximum MWs of any load shed event results in inefficient outcome:*** The traditional LOLE Standard does not capture the magnitude or duration of a loss of load event and hence could distort the reliability needs of the system. While a target reliability standard based on the Normalized Expected Unserved Energy (NEUE) creates a boundary condition for system based on frequency, duration, magnitude, probability, system size and cost of the event. The design of any target reserve margin reliability standard for ERCOT must find a way to balance tradeoffs between cost and reliability benefits. The target reliability metric should be statistical in nature. The marginal improvement in reliability should be considered by ensuring that the adopted reliability standard is probability-based. The reliability standard should not be applied to the actual system reliability, but rather to probabilistic simulations of reliability which will in turn set market parameters. Value based risk analysis is property conducted using probability weighted numbers, not using just a single number. All the reliability metrics from the 45 different regions/countries that are listed in ERCOT's filing are based on probability weighted values.
- ***NEUE provides a higher level of reliability than 1-in-10 Year LOLE:*** From a statistical perspective, A 0.02% NEUE gives you the same level of reliability as a 1 day in 10 year (2.4 hour per 8760 hours in a year) reliability standard. At the same time, NEUE reliability standard would have the immediate advantage of allowing ERCOT to value unserved energy directly and hence better account for cost-benefit of actions to be taken to improve reliability. A target 0.002% NEUE reliability standard as used in Australia is more stringent by a factor of 10 in absolute magnitude than a 1 day in 10 year reliability standard. A target 0.002% NEUE reliability standard is already deep in the tail end of the risk profiles, where large expenditures will have diminishing risk benefit returns showing that a system designed based on a NEUE reliability standard can provide a much more reliable outcome than if it were designed based on LOLE.