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PROJECT NO. 54584

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

COMMENTS BY HUNT ENERGY NETWORK L.L.C.

Hunt Energy Network L.L.C. ("HEN") develops, owns and operates energy storage and other generation assets that are interconnected at distribution voltage and fully registered to participate in the ERCOT energy and ancillary services markets. HEN recommends that the Commission adopt the Expected Unserved Energy ("EUE") as the appropriate reliability standard for the reasons explained below in response to the Commission's first three questions. It is also important that the EUE measure (or whatever reliability standard is selected) account for correlated common mode failure where one event causes multiple systems to fail, such as the outage of many natural gas resources and wind resources during a severe winter storm.

Establishing a meaningful reliability standard is a critical threshold step. Once the reliability standard is established, then a target Peaker Net Margin ("PNM") as a percentage of the Net Cost of New Entry ("CONE") can be determined as a function of the EUE. This calculation provides the Commission with the key inputs necessary to determine the additional revenue streams required to incent development of new resources in an amount that meets the reliability standard. This approach to establishing the target revenue could be used in a bridging mechanism or in establishing the price for performance credits under the PCM. The Commission has appropriately moved forward on a study to calculate the Value of Lost Load ("VOLL"), which is needed to establish the reliability standard. HEN recommends that a similar study be initiated to the update the Net CONE, which has not been updated since 2012 and does not reflect current economic conditions. With these three key inputs established, the Commission will gain a better understanding of the costs of various market design measures.

(1) The Commission has previously considered various reliability metrics, such as Loss of Load Expectation (LOLE), Loss of Load Hours (LOLH), and Expected Unserved Energy (EUE).

- **Which reliability metrics, including those not previously studied, should the Commission consider in establishing a reliability standard for the ERCOT power region?**
- **Which reliability metric, or combination of reliability metrics, should the Commission adopt for the reliability standard in ERCOT?**
- **What are the advantages of your chosen reliability metrics, and what are the disadvantages of alternative approaches?**

HEN recommends that the Commission consider a different standard than the Loss of load Expectation ("LOLE"). The LOLE does not capture the significance or magnitude of a load loss event. For example, using the LOLE standard, a 24-hour loss of 20,000 MW and a one hour loss of 100 MW are each considered one day of lost load, even though one loss was severe and potentially catastrophic and the other was a relatively minor event. The Expected Unserved Energy ("EUE") standard instead measures the expected unserved MWh for the year. Using a Value of Lost Load ("VOLL") and a net Cost of New Entry ("CONE"), the economically optimal value of EUE can be determined.

In addition to using the EUE as the reliability standard, correlated common mode failures need to be taken into consideration. Traditional methods of calculating reliability measures (whether LOLE or EUE) typically exclude extreme weather events since the traditional reliability standards are designed for expected outcomes that do not account for extreme events. The EUE measure (or whatever reliability standard is selected) needs to account for **correlated common mode failure** where one event causes multiple systems to fail, such as the outage of many natural gas resources and wind resources during a severe winter storm.

With the addition of massive amounts of new solar and battery storage facilities, prolonged load shed during the summer is unlikely except possibly during an extreme drought accompanied with extreme heat. Even though an extreme winter storm may be a one-in-ten-year event or even less frequent event, it is the greatest risk and contributor to EUE if common mode failure is considered. Thus, if during a one-in-twenty-year (0.05 probability of occurrence in any one year) severe winter storm, 10,000 MW of load is shed (roughly based on latest winter SARA taking into account Phase 1 market design improvements) for 72 hours, EUE contribution from this single

event would be 0.05x10,000x72 = 36,000 MWh – likely a significant contributor to the overall annual EUE measure even though it's a relatively infrequent event. The EUE measure must be established taking into account such infrequent but high impact common mode failure events.

The EUE standard incorporates the three reliability study metrics that have been proposed by ERCOT. These reliability Study Metrics are the following:

1. **Magnitude**: Maximum load that can be rotated for any event should not exceed x% of peak (~x MW for today);
2. **Frequency**: Load Shed events for generator inadequacy should not occur more than once in x years; and
3. **Duration**: Any Load Shed event should not last for more than x hours.

The EUE measure takes into account all three of these metrics and forms a boundary for possible combinations of these three metrics. For 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 = 10,000 MWh. 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 an 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.

If, in addition to EUE, the Commission would like to limit the Magnitude and Duration of any single event, such limitation must include a minimum probability of occurrence and not be set as an absolute value. For example, if the Commission would like to set a maximum load shed amount of 20,000 MW, then that reliability criterion must be accompanied with a minimum (say greater than 5%) probability of occurrence – so, if the event has less than 5% probability of occurrence, it will not count towards violating this reliability criterion. There are always highly unlikely scenarios where say 50,000 MW of load is shed with a likelihood of 0.01%. If the 20,000 MW load shed limit were a hard reliability standard, then the grid would have to add 30,000 MW of perfectly reliable resources to meet that standard – a very high cost to avoid a one-in-hundred-

year event. However, to be clear, such events will be accounted for, along with their associated probabilities, in determining EUE. It is thus preferable to use the EUE standard instead of including a Frequency (LOLE) limitation given the shortcomings of the LOLE standard and the fact that the EUE measure already takes into account frequency.

Although these three metrics provide very useful information about the reliability of the grid and should be provided to regulators and the market by ERCOT, HEN believes that the reliability standard should be based on EUE alone and, if Commission desires Magnitude and Duration limits in addition to the EUE standard, then such limits should be accompanied with a minimum (e.g., greater than 5%) probability of occurrence.

(2) What is the most effective way that the Commission can include deliverability in the reliability standard?

Deliverability considers the ability of resources to effectively deliver energy to customers to achieve the reliability standard. Deliverability should be calculated by considering the entire ERCOT system. Thus, the resources that should be considered as "deliverable" and included in calculating the MW that count toward achieving the reliability standard, are those resources that are visible and controllable by ERCOT. These are resources that are (i) registered and fully-qualified with ERCOT and the PUC, (ii) telemetered to ERCOT such that ERCOT has real time information on the availability of the resource, and/or (iii) dispatched by ERCOT through the Security Constrained Economic Dispatch ("SCED").

Using this approach to determine those resources that are deliverable has the benefit of being relatively simple to calculate. Other alternatives, such as modeling the transmission and distribution systems, identifying constraints and modeling the operation of the grid under various scenarios quickly become extremely complicated, complex and time-consuming.

(3) Additional considerations in establishing the reliability standard in the ERCOT power region.

- **Should the reliability standard include a locational requirement?**
- **Should the reliability standard include a seasonal component?**
- **How can extreme events be captured in a reliability standard?**
- **How can the value of distributed energy and load resources be captured in a reliability standard?**

Please see HEN's answers to Questions 1 and 2 regarding how the reliability standard can capture extreme events. Importance sampling is a technique that can be utilized to ensure that high impact, low probability extreme events are appropriately captured in a reliability standard.

With respect to distributed energy and load resources, if these resources meet the deliverability requirements set forth above, then they would contribute toward meeting the reliability standard.

HEN appreciates the opportunity to offer these comments and is available to answer questions the Commission may have.

Respectfully submitted,

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EXECUTIVE SUMMARY

As described by NERC, Reliability Standards define the reliability requirements for planning and operating a bulk power system and are developed using a results-based approach that focuses on performance, risk management and entity capabilities[1]. The Commission is taking the critical step to define the reliability requirements for our market, ensuring that ERCOT continues to be a market leader well into the future.

Previous standards only accounted for the number of days of lost load (Loss of Load Expectation). Toward that end, Hunt Energy Network, L.L.C. ("HEN") recommends that ERCOT adopt the Expected Unserved Energy ("EUE") standard, which requires a wholistic view of the evolving dynamics of our system. The EUE standard incorporates the following three reliability study metrics that have been proposed by ERCOT:

- **Magnitude**: Maximum load that can be rotated for any event should not exceed x% of peak (~x MW for today);
- **Frequency**: Load Shed events for generator inadequacy should not occur more than once in x years; and
- **Duration**: Any Load Shed event should not last for more than x hours.

Through this standard, ERCOT can consider a deliverability standard by which all – large and small - eligible resources can participate and contribute to our robust Texas market.

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1 https://www.nerc.com/pa/Stand/Pages/Default.aspx#:~:text=NERC%20Reliability%20Standards%20define%20the,risk%20management%2C%20and%20entity%20capabilities.