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PROJECT NO. 54584

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

VISTRA CORP.'S COMMENTS

I. Introduction

Vistra Corp. (Vistra), on behalf of its Commission-jurisdictional subsidiaries, files these Comments in response to Commission Staff's questions issued on March 7, 2023.[1] These Comments are timely filed on March 29, 2023.

In general, Vistra supports the framework that the Commission and ERCOT have laid out for evaluating reliability metrics. Vistra suggests that the Commission and ERCOT also consider reliability standard frameworks that can account for the historically demonstrated risk aversion to firm load shed events. Vistra further recommends that the Commission consider minimum thresholds for frequency, magnitude, and duration in the belief that will help the Commission communicate its reliability standards in plain language that the public can more easily understand and engage with.

II. Answers to the Commission's Specific Questions

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).

a. Which reliability metrics, including those not previously studied, should the Commission consider in establishing a reliability standard for the ERCOT power region?

Vistra supports the Commission's further consideration of all three of the above-referenced reliability metrics and believes the "duration, frequency, and magnitude" reliability metric framework proposed by ERCOT is an effective framework to follow.[2]

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[1] Project No. 54584, Staff Memo and Questions for Stakeholder Feedback (Mar. 7, 2023).

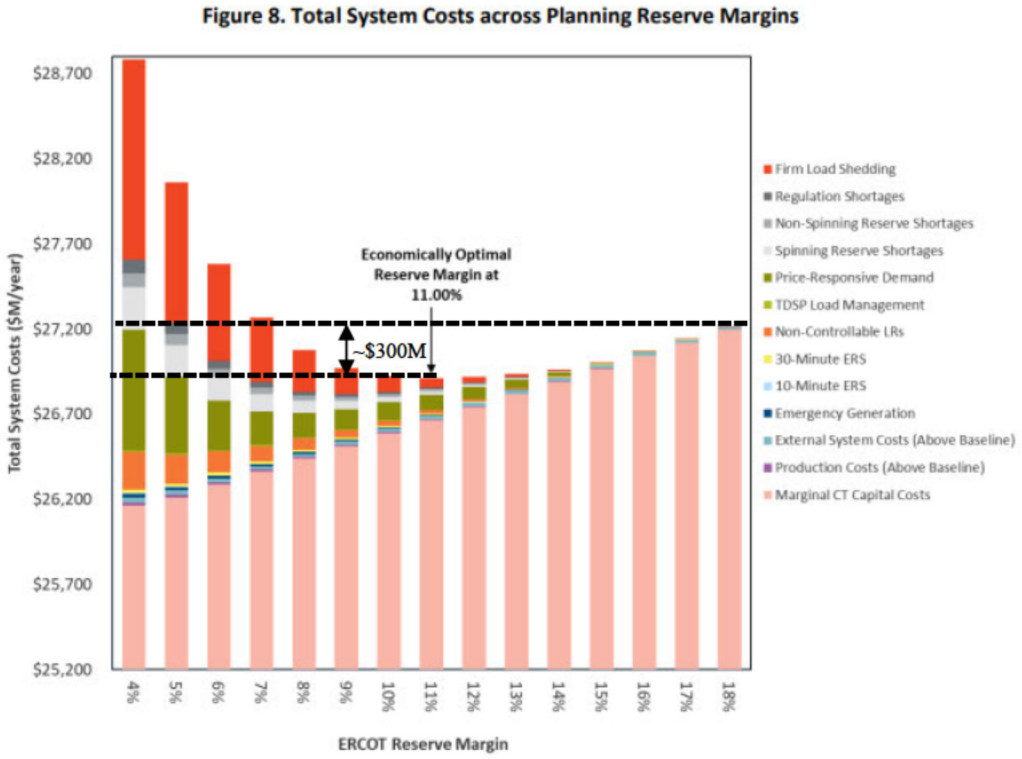
[2] Project No. 54584, ERCOT's Follow-Up Information Regarding the Proposed Reliability Standard Framework and Potential Request for Proposal (RFP) for a Value of Lost Load (VOLL) Consultant at 1 (Mar. 20, 2023); *Wholesale Market Design Implementation*, Project No. 53298, ERCOT's Letter in Response to Commissioner McAdams's Memo at 3 (Mar. 6, 2023).

Vistra also recommends that the Commission and ERCOT include in their evaluation a measure to take into account the "risk-averse" nature of reliability events, such as the "Conditional Value at Risk" (or CVaR) framework or something similar to it. London Economics International (LEI) has prepared materials responsive to these questions, which are being filed separately in this project and provide additional detail about the CVaR framework (along with other reliability standard concepts from jurisdictions around the world). These comments won't duplicate that detail, but rather provide the rationale for why Vistra believes the Commission should consider the framework.

The CVaR framework is borrowed from the investment world and is beginning to spark interest in its application to electricity planning. CVaR is a measure of the risk of "tail events." In an electric reliability standard context, that means recognizing what Texans understand firsthand: extreme "high impact, low frequency" events are so disruptive that policymakers should be risk-averse when it comes to measuring and standardizing around that risk.

Most reliability metrics – and therefore reliability standards – are anchored to *expected* outcomes, that is, the average or mean of modeled scenarios. That approach is mathematically and academically satisfactory because it aligns directly with observed probability. However, that approach is inherently *risk neutral* and fails to account for the foundational importance of electricity to modern life, which yields a natural aversion to loss of load "involuntary demand response" events. The CVaR framework helps to take into account societal preferences to avoid the costs and inconveniences of load shed by setting a *risk averse* target for the chosen reliability metric(s), allowing policymakers to make informed decisions about the trade-offs of setting a reliability standard that accounts for more extreme risks. This may be more appropriate for an electric reliability standard since extreme risks to the electric system typically correspond with extreme weather conditions.

For example, consider the following chart from the 2020 ERCOT Economically Optimal and Market Equilibrium Reserve Margins report:[3]



While the "economically optimal" point on that chart implied an 11% reserve margin, that also corresponded to a loss of load expectation (LOLE) of 0.84 events per year, with events averaging 3.09 hours per year and unserved energy of 5 GWh.[4] Meanwhile, even a cursory review of the chart should demonstrate that the incremental cost of virtually eliminating the firm load shed risks is very small relative to the total system costs: perhaps ~$300M to go beyond the common 0.1 LOLE industry benchmark. This represented about a ~1% increase in total costs from the "economically optimal" data point at the time, but could reduce the LOLE by a factor of 10 – and in so doing add distance to the risk of slipping into the much higher load shed/higher cost scenarios on the left side of the axis.

The CVaR framework lets policymakers incorporate risk aversion into other reliability standards by estimating what the average reliability metrics would be in the worst X% of scenarios. For instance, policymakers can modify the expected unserved energy (EUE) metric to reflect what

[3] Astrape Consulting, *Estimation of the Market Equilibrium and Economically Optimal Reserve Margins for the ERCOT Region for 2024*, at 35 (Jan. 15, 2021), *available at*: https://www.ercot.com/files/docs/2021/01/15/2020_ERCOT_Reserve_Margin_Study_Report_FINAL_1-15-2021.pdf.
[4] *Id.* at 40.

EUE would average in the worst 5% or 1% of scenarios ("CVaR5%" or "CVaR1%," respectively; contrast that with the 50th percentile "risk neutral" basis) – the times when it's more likely to matter to Texans.

b. Which reliability metric, or combination of reliability metrics, should the Commission adopt for the reliability standard in ERCOT?

Vistra suggests that, regardless of which reliability standard the Commission adopts for ERCOT, the reliability standard should be considered from a risk-averse standpoint. To be clear, any reliability standard, even a risk neutral one, is better than the status quo of no reliability standard. But while the Commission is actively taking feedback and seeking ideas to bring the best reliability standard for Texans, Vistra specifically recommends that the Commission consider the CVaR framework (or some similar framework) in its evaluation.

In addition to incorporating a risk aversion framework into its adopted reliability metrics, Vistra also recommends that the Commission adopt minimum requirements across all three dimensions of ERCOT's reliability metric study. As noted above, ERCOT's proposed framework for measuring the duration, frequency, and magnitude reliability metrics is a good one. Vistra agrees with the sentiment that the one-dimensional 0.1 LOLE standard is no longer a sufficient singular reliability standard, but only one of potentially several useful metrics.

c. What are the advantages of your chosen reliability metrics, and what are the disadvantages of alternative approaches?

One key advantage to a risk-averse reliability framework such as CVaR is that it aligns with the conservative policy and operating posture taken since Winter Storm Uri, which are directly linked to public feedback expressing lower risk tolerance from the public. The other advantage is that it provides policymakers with a broader menu of options by giving the flexibility to determine both the level at which to measure CVaR (e.g., the worst X% of scenarios) and how much to weight that in their standard setting (e.g., it can be incorporated into a weighted average with the risk neutral metric at a weighting of the policymaker's choosing).

A key value of minimum standards for each metric is to be able to communicate clearly to the public. For instance, while having frequent but short-duration, shallow load shed events might technically comply with a loss of load hours (LOLH) or EUE-based standard, many Texans and Texas businesses would likely find that to be an unacceptable outcome. Conversely, infrequent but

long-lasting and/or deep load shed events have already been clearly deemed unacceptable by the public. By setting individual minimum thresholds for duration, frequency, and magnitude (even if linked to or informed by a more esoteric and technically satisfactory framework), the Commission can put its reliability standards in plain language that the public can more easily understand and engage with.

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

The reliability metrics will need to be evaluated by ERCOT's multiple iterations of modeled scenarios in the SERVM software. If SERVM can take transmission constraints into account, then "deliverability" should be naturally incorporated into the reliability standard.

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

a. Should the reliability standard include a locational requirement?

No. Resource adequacy is a system-wide framework. Local needs can be addressed either through resources responding to the congestion component of locational marginal prices (LMPs) or through building transmission to import additional resources to the location (and there are other tools that the Commission and ERCOT have at their disposal to drive that outcome).

b. Should the reliability standard include a seasonal component?

No. Resource adequacy is effectively finding the "least common denominator" across an entire year for a given resource fleet and potential operating conditions (load, weather, outages, etc.). Therefore, a reliability standard that meets the most extreme winter conditions should also be able to meet the most extreme summer conditions, and vice versa (and being able to meet these conditions should also address any shoulder season conditions).

c. How can extreme events be captured in a reliability standard?

Including a risk-averse framework, such as the CVaR framework discussed above, is a way that the Commission can directly capture extreme event risk in the reliability standard.

d. How can the value of distributed energy and load resources be captured in a reliability standard?

Distributed energy resources (DERs) and load resources (LRs) should be captured in one of two ways, depending on how "formally" they participate in the ERCOT market. The ERCOT Capacity, Demand, and Reserves (CDR) Report provides a good framework by accounting for some of the impact of DERs/LRs in the load forecast itself and for other impacts in adjustments to reach a "firm load" projection.

Under this approach, DERs and LRs that provide ancillary services (AS) or participate in other programs such as Emergency Response Service (ERS) or load management programs administered by the Transmission and Distribution Utilities (TDUs) are accounted for through adjustments to the gross load forecast to arrive at a "firm load" forecast. Other DERs and LRs that are either dispatchable by ERCOT's security-constrained economic dispatch (SCED) and/or engage in "passive" response should be reflected in the load forecasts as their behavior helps to train load forecast models.

4. How frequently should the Commission update the calculation of the requirement necessary to meet the reliability standard?

The reliability standard(s) should remain stable and predictable, as that will help to inform investment decisions. The reliability metrics, on the other hand, should be updated with at least annual regularity to provide a current assessment of the reliability status of the grid.

a. What criteria should help determine the frequency of the update?

Especially to the extent that the reliability metrics are directly linked to a resource adequacy mechanism, such as the Performance Credits Mechanism (PCM), the Commission should consider aligning the frequency of each. That is, if the PCM were to be implemented seasonally, the Commission should evaluate whether a seasonal update of the reliability metrics provides meaningful value. If the effort to produce such updates at that frequency does not yield meaningful differences, though, then the Commission should avoid expending resources for negligible value.

5. **If you have any industry or academic papers on the topic and best practices that you believe the Commission should review while establishing the reliability standard for the ERCOT power region, please provide them.**

As noted above, LEI has prepared materials responsive to these questions, which are being filed separately in this project, including additional detail about the CVaR framework. Vistra recommends that the Commission and other stakeholders reference those materials.

III. Conclusion

Vistra appreciates the Commission's consideration of these comments and looks forward to working with the Commission, Staff, ERCOT, and other stakeholders in this timely proceeding.

Dated: March 29, 2023

Respectfully submitted,

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VISTRA CORP.'S COMMENTS

Executive Summary

- Vistra supports the Commission's further consideration of the loss of load expectation (LOLE), loss of load hours (LOLH), and expected unserved energy (EUE) reliability metrics and believes the "duration, frequency, and magnitude" reliability metric framework proposed by ERCOT is an effective framework to follow.
- Vistra also recommends that the Commission and ERCOT include in their evaluation a measure to take into account the "risk-averse" nature of reliability events, such as the "Conditional Value at Risk" (or CVaR) framework or something similar to it.
    - The CVaR framework lets policymakers incorporate risk aversion – particularly to extreme events – into other reliability standards by estimating what the average reliability metrics would be in the worst X% of scenarios (e.g., 5% or 1%).
- In addition to incorporating a risk aversion framework into its adopted reliability metrics (such as CVaR), Vistra also recommends that the Commission adopt minimum requirements across all three dimensions of ERCOT's reliability metric study.
    - Setting individual minimum thresholds for duration, frequency, and magnitude will help the Commission put its reliability standards in plain language that the public can more easily understand and engage with.
- The reliability standard(s):
    - Should remain stable and predictable, as that will help to inform investment decisions (the reliability metrics, on the other hand, should be updated with at least annual regularity to provide a current assessment of the reliability status of the grid, and the Commission should consider aligning with the cadence of the Performance Credits Mechanism (PCM));
    - Do not need to include locational or seasonal components; and
    - Should build on the ERCOT Capacity, Demand, and Reserves (CDR) Report framework for incorporating distributed energy resources (DERs) and load resources (LRs).
- Vistra recommends the Commission and other stakeholders review materials filed separately by London Economics International (LEI) in this project, which includes additional detail about the CVaR framework (along with other reliability standard concepts from jurisdictions around the world).