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# OPEN MEETING COVER SHEET

## MEMORANDUM

<b>MEETING DATE:</b>	April 27, 2023
<b>DATE DELIVERED:</b>	April 20, 2023
<b>AGENDA ITEM NO.:</b>	31
<b>CAPTION:</b>	Project No. 54584 – Reliability Standard for the ERCOT Market.
<b>DESCRIPTION:</b>	Memo

# *Public Utility Commission of Texas*

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## **Memorandum**

**TO:** Chairman Peter M. Lake  
Commissioner Will McAdams  
Commissioner Lori Cobos  
Commissioner Jimmy Glotfelty  
Commissioner Kathleen Jackson

**FROM:** Werner Roth, Market Analysis Division  
Brendan Ok, Market Analysis Division

**DATE:** April 20, 2023

**RE:** Project No. 54584 – **Reliability Standard for the ERCOT Market**

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During the January 19, 2023 open meeting, the Commission directed Commission staff (Staff) to open a project to evaluate and establish the appropriate reliability standard for the ERCOT power region.<sup>1</sup> Establishing a robust reliability standard for the rapidly-evolving ERCOT grid is the essential next step in implementing the reliability service required by Senate Bill 3. Ahead of the March 9, 2023 open meeting, Staff filed a memo<sup>2</sup> that provided a brief history of projects relevant to the topic of the reliability standard in ERCOT, including Project No. 40000 and Project No. 42302. The Staff memo also requested comments in response to several questions. The questions touched on several key elements of the reliability standard, including:

- Which metrics should be used in establishing a reliability standard in ERCOT;
- How deliverability should be considered and included in a reliability standard;
- Additional considerations in establishing a reliability standard, including locational requirements, seasonal requirements, accounting for extreme events, and capturing the value of distributed energy resources and load resources; and
- How frequently the requirement (the reserve margin, the number of performance credits, etc) to meet the established reliability standard should be updated.

The Commission has received 24 separate initial comments and 12 reply comments totaling over 400 pages. Documents were received from consumer advocates, independent energy consultants, energy-related trade associations, generators, transmission providers, retail electric providers, municipally-owned utilities, cooperatives, energy storage providers, environmental groups, public policy groups, ERCOT, and OPUC. This memo provides a summary of the comments received and Staff's recommendations.

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<sup>1</sup> *Review of Wholesale Electric Market Design*, Project no. 52373, Item 391, Order and Modified Memorandum (January 20, 2023).

<sup>2</sup> *Reliability Standard for the ERCOT Market*, Project 54584, Item 2, Memo and Questions for Stakeholder Feedback (March 7, 2023).

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- Q1: 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?**
  - b. Which reliability metric, or combination of reliability metrics, should the Commission adopt for the reliability standard in ERCOT?**
  - c. What are the advantages of your chosen reliability metrics, and what are the disadvantages of alternative approaches?**

### **Choice of Metrics**

While there was some support to keep the reliability standard simple, there was a general acknowledgement that using a single reliability metric would be insufficient, and that there was value in pursuing a multi-metric approach. Several comments specifically pointed out that LOLE is inadequate as a standalone metric because it provides limited information on a loss of load event's size and duration. Some comments encouraged the Commission to utilize the widely used reliability standard in the industry, which is the 1-in-10, or 0.1, LOLE. Most comments, however, urged the Commission to move beyond this standard. Other comments, while supporting a broader analysis, cautioned the Commission on moving away from the industry standard without thorough analysis and justification.

The metric that most commenters expressed support for including in the reliability standard was EUE. Even among commenters that supported adopting the 0.1 LOLE reliability standard, there was support for adopting a reliability standard measured in EUE, provided that it maintained the same level of reliability as the 0.1 LOLE standard would. Other commenters recommended that the Commission create a reliability standard using EUE, in conjunction with the Value of Lost Load (VOLL) and the Cost of New Entry (CONE), to determine the economically optimal reserve margin.

ERCOT stated in its comments that the reliability metrics should not be confined to a narrow set of traditional standards. It has recommended that the standard be defined by a three-part framework that touches on multiple metrics, including establishing limits on the duration, frequency, and magnitude of loss of load events. The commenters were generally supportive of this duration/frequency/magnitude framework approach.

### **Purpose of the Reliability Standard**

Multiple commenters asked the Commission to clarify the purpose of the reliability standard and the objectives it is meant to accomplish. They stated that the process to create the standard need not be complex and time-consuming if the reliability standard would only serve as a target, a measure of market performance or to provide market knowledge. If, however, the

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reliability standard will trigger or mandate actionable events, a robust approach to establish the right reliability standard will be needed.

The commenters disagreed on whether the reliability standard needs to be a target or a mandate or if the Senate Bill 3 required it to be a target or mandate. Some commenters recommended that the Commission implement a mandatory reliability standard to incentivize investment in dispatchable generation resources. Other commenters regarded a mandated reliability standard inappropriate for ERCOT, as it would be contrary to the energy-only market design and would shift costs from investors to consumers.

### **Cost Considerations**

Many commenters emphasized that a more stringent reliability standard will provide a higher level of reliability for the ERCOT power region, but this must be balanced with the higher cost of meeting that requirement. It was recommended that the Commission consider the cost of any reliability standard it selects and provide transparency on the analysis done by it and ERCOT to select a standard.

### **Staff Recommendation**

Staff agrees with commenters and ***supports the consideration of several reliability metrics and a reliability standard that will measure multiple metrics***. Staff believes that the ERCOT duration/frequency/magnitude framework will achieve this objective. Staff reserves judgment on the specific reliability standard pending further policy review, but Staff agrees that thorough analysis is required before moving away from the traditional industry standard of 0.1 LOLE. Deviation from the industry standard, particularly to a lower threshold for the reliability standard, needs to have a reasoned justification.

For the Commission's previously adopted Performance Credit Mechanism to be effective, Staff believes that the ***reliability standard must be a mandated requirement*** once the final market design goes live.

Staff also agrees that cost considerations are important and need to be taken into account. Accordingly, it recommends the Commission direct ERCOT to include the anticipated cost of meeting the various reliability standards and provide sensitivity analysis.

**Q2: What is the most effective way that the Commission can include deliverability in the reliability standard?**

### **Deliverability**

Several commenters supported inclusion of deliverability in the reliability standard. They recommended that constraints on transmission and fuel availability and its impact on reliability should be considered. Commenters suggested methods to measure deliverability and provided

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examples on what issues might be considered for measuring deliverability, and also provided criteria to use for a resource to be considered deliverable.

Those that opposed the inclusion of deliverability concepts in the reliability standard stated that deliverability issues should be addressed by building additional transmission facilities and not by adding additional requirements to the reliability standard, as this would unnecessarily create winners and losers. Adding deliverability concepts, such as firm transmission service requirements, could harm the market and cause generation interconnection queue bottlenecks that other parts of the country have been experiencing.

ERCOT, noted that deliverability is an integral part of the discussion for achieving a reliable system, but stated that deliverability is best addressed through the planning process rather than incorporated into the reliability standard. The SERV<sup>3</sup> model does not address transmission or take deliverability into account as part of the reliability standard analysis.

### **Staff Recommendation**

Staff acknowledges the importance of deliverability in ensuring reliability across the ERCOT power region but agrees with ERCOT that deliverability should be addressed outside of establishing the reliability standard. Staff recommends that the Commission *direct ERCOT to conduct a full deliverability study* once the final market design is implemented.

**Q3: Additional considerations in establishing the reliability standard in the ERCOT power region.**

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

### **Locational Requirement**

Some commenters supported including a locational requirement to ensure that the responsibility of maintaining grid reliability was distributed across the ERCOT power region. It was pointed that other regions, such as MISO have implemented locational requirements successfully. Most commenters, including ERCOT, believe that a locational requirement should not be included, as locational considerations are best considered in the transmission planning process. The reliability standard should be for the entire ERCOT power region, and

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<sup>3</sup> The Strategic Energy & Risk Valuation Model (SERVM) developed by Astrapé Consulting utilizes a probabilistic Monte Carlo simulation method to output a distribution of expected reliability events and their associated costs. A model run would take random samples of inputs (forecasted load data, historical weather conditions, etc.), and the results over a specified number of runs would be aggregated.

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if the standard is comprehensive and the transmission planning process is working, a locational component would needlessly add complexity to the reliability standard.

### **Seasonal Component**

Some commenters recommended incorporating a seasonal component in the reliability standard to ensure that the evolving risk outside of the summer season is reflected in the standard and to capture the differences between the summer and winter seasons. Much like the locational requirement, those that advised against including a seasonal component see it as an unnecessary layer of complexity that should already be addressed through a comprehensive reliability standard that captures risk throughout the year, regardless of the season that the risk occurs in. A commenter pointed out that the requirements to meet the reliability, and the reliability service to achieve it, can be seasonal, but unless the VOLL among seasons is different, there is no reason for the reliability standard itself to have a seasonal component. ERCOT stated that its framework can facilitate discussion on the inclusion of a seasonal component.

### **Extreme Events**

In general, commenters supported additional consideration of extreme events, as necessary to create a durable reliability standard. Some commenters listed out specific operational risks that needed to be modeled, including multi-day renewable energy lulls and high levels of unplanned thermal generation outages or fuel shortages in response to extreme weather. It was also proposed to incorporate Conditional Value at Risk (CVaR) to focus on tail-end events and levels of risk, as traditional simple average-based metrics do not give sufficient weight to low-probability, high-impact events.

Commenters that preferred a more risk-neutral approach, shared concerns about placing undue weight on extreme events that would result in double-counting risks and may lead to an overly conservative reliability standard. If the Commission intended to incorporate some level of risk aversion in the reliability standard, they recommended modeling sensitivities around VOLL rather than extreme events weightings.

In their comments, ERCOT stated that it is working on adding inputs to SERVVM to model outlier extreme weather events like Winter Storm Uri. ERCOT acknowledged that understanding the characterization and risk of these kind of events is a key step in the study process. In its reply comments, ERCOT noted the proposal to utilize CVaR could be helpful to better understand the magnitude of low probability events, and that it is considering CVaR for potential inclusion in the reliability study.

### **Distributed Energy Resources and Load Resources**

There was general support for inclusion of the reliability attributes and value of distributed energy resources and load resources in ERCOT's reliability standard analysis. The commenters

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acknowledged the continued growth of these resources within the ERCOT power region and wanted to ensure future expected growth is accounted for in the study. The importance of modeling distributed energy resources and load resources correctly was also emphasized. ERCOT noted that, currently, any of these resources that are registered with ERCOT are directly incorporated into SERV, and unregistered distributed generation is indirectly reflected in the load forecast. In its reply comments, ERCOT also acknowledged that SERV does not have the capability to model these unregistered distributed energy resources at a more granular level.

### **Other Considerations**

Commenters emphasized the need to consider the impact of related legislation currently pending at the Texas Legislature. Specifically, they referred to bills that would mandate the construction of out-of-market gas generators that would only be available during emergency shortfall conditions. These commenters recommended that ERCOT construct additional reliability scenarios that would account for these out-of-market generators.

### **Staff Recommendation**

Staff agrees with comments that *embedding a locational requirement or seasonal component within the reliability standard is not needed at this time*, as these should be captured within a robust region-wide, annual reliability standard. The complexity of these additions would also likely delay the initial implementation of a reliability standard. If a specific need is identified, the locational and seasonal requirements can be thoroughly studied in a future project.

Staff also agrees with comments that view capturing extreme events as one of the critical components to consider when developing a reliability standard for the ERCOT power region. Staff recommends that the Commission support reviewing reliability metrics in a risk-averse manner, including giving ERCOT direction to review the CVAR proposal suggested in several comments.

Staff agrees that distributed energy resources and load resources should be considered within the reliability standard analysis. ERCOT and stakeholders should continue to work to identify any improvements that are needed to consider these resources more accurately within the model.

Lastly, Staff agrees that the Commission and ERCOT should consider potential legislation when reviewing the reliability standard framework. Staff recommends that pending legislation that could impact the market design and reliability standard should be modeled as a sensitivity, with legislation that is ultimately approved being fully included in the base model.

- Q4: How frequently should the Commission update the calculation of the requirement necessary to meet the reliability standard?**
- a. What criteria should help determine the frequency of the update?**



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### **Updating the Calculation of the Requirement**

Some commenters recommended that the metrics are updated on a consistent basis to provide regulatory certainty. They suggested recalculating the requirement every 2-3 years so that it keeps pace with changes in ERCOT's load and generation mix without overly disrupting market expectations. Other commenters wanted the requirement to meet the reliability standard to be recalculated at least on an annual basis. At a minimum, the commenters proposed that the requirement be updated frequently enough to align with the final market design that the Commission will implement.

### **Updating the Reliability Standard**

Several commenters addressed the frequency of updating or reviewing the reliability standard itself. Most of the commenters that addressed this pointed to the value of the reliability standard remaining stable and predictable to inform long-term investment decisions. While some commenters supported having the Commission review the reliability standard and make modifications if significant changes occur within the ERCOT power region, others opposed changing the reliability standard once it is chosen.

### **Staff Recommendation**

Staff recommends establishing an initial schedule where the requirement necessary to meet the *defined reliability standard is calculated annually*. This will provide up-to-date information to the Commission and ERCOT to assess whether the region is meeting the set reliability standard and to take any interim steps necessary until the long-term market design is fully implemented. Once the final market design is implemented, the timeline for refreshing the requirement should align with the cycle of the implemented market design.