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Item 14: ERCOT Assessments and Recommendations in Response to DOE, NERC, and Texas RE Grid Reports

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Board of Directors Meeting

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- **Purpose**
  Provides an overview of ERCOT initiatives related to recommendations from three recent reports concerning grid reliability

- **For Information Only**
  No action is currently requested; for discussion only

Key Takeaways

- NERC, TRE, and DOE grid reports share many of the same conclusions and recommendations
- ERCOT has initiatives related to all recommendations.

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The Three Reports Reviewed in This Presentation Include:

- **The Department of Energy** (DOE) - Resource Adequacy Report, Evaluating the Reliability and Security of the United States Electric Grid
- **North American Electric Reliability Corporation** (NERC) – 2025 State of Reliability Assessment Overview of 2024 Bulk Power System Performance
- **Texas Reliability Entity** (TRE) – 2024 Reliability Performance and Regional Risk Assessment

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Key Focus Areas of DOE – Resource Adequacy Report, Evaluating the Reliability and Security of the United States Electric Grid

1. The importance of maintaining an adequate supply of energy for the ERCOT power grid
2. The urgency to swiftly add new dispatchable generation
3. The need to ensure power plant retirements do not adversely impact grid reliability
4. The need to modernize resource adequacy criteria
5. The value of upgrading the transmission system to mitigate intra-regional power transfer risks

Key Takeaway: DOE Report was written to evaluate both the current state of resource adequacy as well as future pressures resulting from the combination of announced retirements and large load growth.

DOE Final EO Report (FINAL JULY 7)_0.pdf

ERCOT Activity related to DOE report

1. The importance of maintaining an adequate supply of energy for the ERCOT power grid.
   - ✓ Dispatchable Reliability Reserve Service (in development).
   - ✓ SB6 Demand Response for large loads (in development).
2. The urgency to swiftly add new dispatchable generation.
   - ✓ Texas Energy Fund (in development, first units 2026).
   - ✓ ERCOT Generation Interconnection Process (over 40 GW energized in the last 5 years).
3. The need to ensure power plant retirements do not adversely impact grid reliability.
   - ✓ ERCOT RMR process (existing) and 2025 OKR to update that process (in development).
   - ✓ The need to modernize resource adequacy criteria.
   - ✓ PUC 3-part Reliability Standard (2026 first report).
   - ✓ ERCOT use of ELCC for intermittent generation (existing).
4. The value of upgrading the transmission system to mitigate intra-regional power transfer risks.
   - ✓ The addition of six new synchronous condensers to the ERCOT grid scheduled for 2027.
   - ✓ ERCOT Regional Transmission Plan includes 765-kV additions starting in 2030.

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Key Focus Areas of NERC 2025 State of Reliability Assessment Overview of 2024 Bulk Power System Performance

1. **Severe weather** continues to be responsible for the most severe outages, but improved cold-weather performance and post-hurricane transmission restoration times have improved.
2. **Growth of large datacenters** are a significant near-term reliability challenge due to the rapidity with which these loads can come online and their power usage behavior.
3. **High concentrations of batteries** have resulted in improved frequency response.
4. **IBR ride-through** (both performance and modeling) issues underscore the importance of ongoing efforts to address this risk.

Key Takeaway: NERC State of Reliability assessment looks at the North American grid and identities overall trends in power system performance.

NERC 2025 Summer Reliability Assessment

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ERCOT Activity related to NERC 2025 State of Reliability Assessment

1. Severe weather continues to be responsible for the most severe outages, but improved cold-weather performance and post-hurricane transmission restoration times have improved.
   - ✓ ERCOT exceeds PUC minimums for the number of weatherization inspections annually by 65%
   - ✓ ERCOT conducts annual hurricane and winter storm simulation training with market participant operators.
   - ✓ ERCOT continues to use a pre-Hurricane posturing of the system in preparation for hurricanes.
   - ✓ 2024 completion of ERCOT Resiliency study which included analysis of historic hurricane impacts.
2. Growth of large datacenters are a significant near-term reliability challenge due to the rapidity with which these loads can come online and their power usage behavior.
   - ✓ ERCOT established the large load connection process in March of 2022 to address short interconnection timelines.
   - ✓ SB6 establishes reliability expectations for Large Loads (in development)
   - ✓ ERCOT is actively engaged with NERC, ESIG, and other research institutions to better understand emerging issues, improve modeling, and increase accuracy of analyses associated with these large loads.
3. High concentrations of batteries have resulted in improved frequency response.
   - ✓ 2024 OKR promotes Advanced Grid Support (AGS) which advances grid-forming capabilities for new batteries (NOGRR272/PGRR121) reducing frequency stability risks.
4. IBR ride-through (both performance and modeling) issues underscore the importance of ongoing efforts to address this risk.
   - ✓ ERCOT continues to advance IBR ride-through performance in the NOGRR245 implementation process
   - ✓ PGRR109 Model validation process established in 2024.

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Key Focus Areas of Texas Reliability Entity (TRE) 2024 Reliability Performance and Regional Risk Assessment

1. **Supply Chain** (major/possible) - Supply Chain risks continue to be a focal point in various areas for the industry. Lead times for grid equipment have increased significantly since 2020.
2. **Energy Availability** (major/possible) - Energy availability risks continue to reflect the rapid transformation of the Region from one dominated by large, synchronous generating resources to IBR-based resources.
3. **Gas Supply Restrictions during cold weather** (major/possible) - Natural gas represents the largest fuel source in the Region and serves as an essential fuel to meet demand and balance variable resources on the system. Given this critical role, vulnerabilities associated with natural gas delivery to generators can result in generator outages.

Texas RE 2024 Reliability Performance and Regional Risk Assessment

4. **Disorganized Integration of Large Loads** (major/likely) - ERCOT has experienced rapid load growth with data centers, bitcoin mining, and other crypto loads. Texas RE has increased the risk associated with the disorganized (that is, unmitigated) integration of these large loads.
5. **IBR Ride-through** (major/likely) - While the efforts to reduce risks from IBRs evolved and expanded in 2024, smaller scale system disturbances continued.

Key Takeaway: TRE report contained 5 risks that were considered to have a major impact and were either possible or likely to occur

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ERCOT Activity related to TRE report

1. Supply Chain for grid equipment.
   - ✓ ERCOT does incorporate known supply chain restrictions for Resource integration.
   - ✓ ERCOT includes TSP-estimated in-service dates for future grid projects in Planning studies .
2. Energy Availability risks continue to reflect the rapid grid transformation.
   - ✓ Adoption of the new Reliability Standard.
   - ✓ Incorporation of probabilistic analyses in planning, reporting, AS, and outage coordination.
3. Gas Supply Restrictions during cold weather represents a cold weather vulnerability.
   - ✓ ERCOT established the Firm Fuel Supply Service (FFSS).
   - ✓ TSPs identify gas supply loads as critical and exclude them from initial load shed rotations.
   - ✓ Participation in Gas Electric Working Group (GEWG) and Texas Energy Reliability Council (TERC).
4. Integration of Large Loads has increased the risk of a disorganized process.
   - ✓ ERCOT established the large load connection process in March of 2022.
   - ✓ SB6 establishes reliability expectations for large loads (in development).
   - ✓ ERCOT is actively engaged with NERC, ESIG, and research institutions to understand emerging issues.
5. IBR Ride-through system disturbances continue.
   - ✓ ERCOT continues to advance IBR ride-through performance in the NOGRR245 process.
   - ✓ Increased emphasis on both regional and system stability analysis.

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Summary of Issues Reported Across the Three Reports

Summary of Reported Issues	DOE	NERC	TRE
Resource Adequacy and Energy Concerns	✓		✓
Severe Weather Preparedness		✓	✓
Transmission Improvements and Modernization	✓		
IBR Ride-Through Improvements		✓	✓
Incorporation of Large Loads		✓	✓
Utilization of Batteries		✓	
Supply Chain Concerns			✓

Key Takeaway: ERCOT has initiatives that address the risks and recommendations highlighted in the three reports. Continuous monitoring and adaptation will continue to be necessary to keep pace with the changing grid.