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Submitted to the Illinois Power Agency,
Illinois Commerce Commission, &
Illinois Environmental Protection Agency
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Re: ReliabilityFirst Corporation Response to Resource Adequacy Study Stakeholder Questions

In response to the Illinois Power Agency, Illinois Commerce Commission, & Illinois Environmental Protection Agency's Resource Adequacy Post-Workshop Stakeholder Questions posted on June 18, 2025, ReliabilityFirst Corporation (RF), on behalf of itself, and SERC Reliability Corporation (SERC)[1] respectfully provides comments on technical reliability considerations related to resource adequacy.

RF is one of the six North American Electric Reliability Corporation[2] (NERC) Regional Entities responsible for preserving and enhancing the reliability, resilience, and security of the bulk power system (BPS, or "system").[2] Collectively, NERC and the Regional Entities comprise the ERO Enterprise. With specific authorities under the Federal Power Act and through a delegation agreement with NERC, RF's mission serves the public good and supports health and safety by assuring BPS reliability for over 73 million customers in our 13 states (including Maryland) and the District of Columbia.[3] We are responsible for auditing and enforcing the NERC Reliability Standards for more than 300 registered entities in our footprint, which include Regional Transmission Organizations (specifically PJM and MISO), utility companies, and generators. We also provide outreach and education to registered entities in our footprint, and technical expertise to state public utility commissions, legislators, and other stakeholders.

RF's role with the states is to serve as an independent, objective technical resource concerning reliability risks. While energy policy should appropriately prioritize BPS reliability, our statements are not intended, and should not be interpreted, as advocating for a specific policy outcome.

TOPIC 1: Resource Adequacy Study goals and scenario analysis considerations.

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[1] Map of the six Regional Entities in North America:
https://www.nerc.com/AboutNERC/keyplayers/Pages/default.aspx

[2] The North American Electric Reliability Corporation (NERC) is a not-for-profit international regulatory authority designated by the Federal Energy Regulatory Commission (FERC) to assure the effective and efficient reduction of risks to the reliability and security of the grid. Through delegation agreements and with oversight from FERC, NERC works with six Regional Entities (including RF) on compliance monitoring and enforcement activities. Collectively, NERC and the Regional Entities comprise the ERO Enterprise. The ERO Enterprise jurisdiction includes users, owners, and operators of the BPS, which serves nearly 400 million people in the continental United States, Canada, and Mexico.

[3] RF does not have jurisdiction over the local distribution of electricity, which is a state responsibility.

Section 9.15(o) of the Illinois Environmental Protection Agency Act (415 ILCS 5/) defines a series of goals and objectives for the Agencies to pursue, driving to a report that identifies prospective reliability shortfalls, defines and evaluates those shortfalls, and subsequently produces a plan to alleviate the shortfalls. Specifically, the Agencies shall develop and publicly issue a

> *"…report to the General Assembly that examines the State's current progress toward its renewable energy resource development goals, the current status of CO2e and copollutant emissions, reductions the current status and progress toward developing and implementing green hydrogen technologies, and the current and projected status of electric resource adequacy and reliability throughout the State…"*

Further, if a shortfall is identified during such examinations, the Agencies shall consider various options to alleviate the shortfall, including "*the use of renewable energy, energy storage, demand response, transmission development*", potential proposals to "reduce or delay CO2e and copollutant emissions reductions" to the limited extent necessary, or other strategies to resolve the shortfall or reliability violation.

While the statute is direct in its focus, there are likely additional goals and considerations the Agencies could evaluate beyond the objectives defined in the statute while also being supportive of the study's intent and aligned with Illinois values. These additional goals or expanded considerations may be woven into RA Study scenario development as policy considerations, important market drivers, evaluation metrics, or other similar variables. It is with this understanding that the Agencies are particularly interested in stakeholder feedback, answered through the questions provided below, surrounding goals that should be taken into consideration, key scenarios/drivers/policies that may be important when completing model development and ensuing analysis, or additional factors that are important to define at the start of the study process.

Question 1: The Agencies recognize this study process is purposefully targeted in its nature, with Section 9.15(o) providing clear goals and expectations of the resource adequacy study and resulting report. What additional goals, objectives, or evaluation metrics should be considered, either as part of this study process or future resource adequacy study efforts?

It could be helpful to also consider the resource adequacy of Illinois' neighbors – many times we see entities relying on their neighbors and ties to import resources during tight scenarios, but overreliance on neighbors in extreme conditions can pose a risk. The ERO Interregional Transfer Capability Study (ITCS) states that planners should consider all options and balance reliance on external resources vs. internal resources.[4] Additionally, because the electric system is highly interconnected, actions taken by any one state can have resounding and immediate impacts on neighboring states.

Another area that is important to consider related to resource adequacy is Essential Reliability Services (ERS), discussed further in response to Question 6. These services include blackstart capability, voltage support, and frequency response. They vary by resource type, as shown below, and RF has observed that a diverse portfolio of generator resources is key to ensuring adequate ERS for reliability. Resource diversity

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[4] See ITCS Final Report, p. 19. The report also stresses the importance of resource availability in neighboring systems, stating that "interregional transmission could mitigate certain extreme conditions by distributing resources more effectively…if there is sufficient available generation in neighboring systems at the times of need."

helps mitigate the limitations or vulnerabilities of individual technologies, thereby enhancing the overall resilience of the power system.

	Frequency Response	Voltage Control	Dispatchable for Ramping	On-site Fuel Availability	Fast Start-up <30 minutes	Availability on and off peak	Blackstart Capability
Biomass	Partially Exhibits Attribute	Exhibits Attribute	Partially Exhibits Attribute	Partially Exhibits Attribute	Partially Exhibits Attribute	Exhibits Attribute	Does Not Exhibit Attribute
Hydro	Exhibits Attribute	Exhibits Attribute	Exhibits Attribute	Partially Exhibits Attribute	Exhibits Attribute	Partially Exhibits Attribute	Exhibits Attribute
Natural Gas - CT	Exhibits Attribute	Exhibits Attribute	Exhibits Attribute	Does Not Exhibit Attribute	Exhibits Attribute	Exhibits Attribute	Exhibits Attribute
Oil - Steam	Exhibits Attribute	Exhibits Attribute	Exhibits Attribute	Exhibits Attribute	Does Not Exhibit Attribute	Exhibits Attribute	Exhibits Attribute
Coal - Steam	Exhibits Attribute	Exhibits Attribute	Exhibits Attribute	Exhibits Attribute	Does Not Exhibit Attribute	Exhibits Attribute	Does Not Exhibit Attribute
Oil/Diesel - CT	Exhibits Attribute	Exhibits Attribute	Exhibits Attribute	Exhibits Attribute	Exhibits Attribute	Exhibits Attribute	Exhibits Attribute
Nuclear	Partially Exhibits Attribute	Exhibits Attribute	Does Not Exhibit Attribute	Exhibits Attribute	Does Not Exhibit Attribute	Exhibits Attribute	Does Not Exhibit Attribute
Solar	Partially Exhibits Attribute	Partially Exhibits Attribute	Partially Exhibits Attribute	Does Not Exhibit Attribute	Exhibits Attribute	Partially Exhibits Attribute	Does Not Exhibit Attribute
Battery	Partially Exhibits Attribute	Partially Exhibits Attribute	Exhibits Attribute	Does Not Exhibit Attribute	Exhibits Attribute	Partially Exhibits Attribute	Partially Exhibits Attribute
Solar + Battery	Partially Exhibits Attribute	Partially Exhibits Attribute	Exhibits Attribute	Does Not Exhibit Attribute	Exhibits Attribute	Partially Exhibits Attribute	Partially Exhibits Attribute
Wind On-Shore	Partially Exhibits Attribute	Partially Exhibits Attribute	Partially Exhibits Attribute	Does Not Exhibit Attribute	Exhibits Attribute	Partially Exhibits Attribute	Does Not Exhibit Attribute
Wind Off-Shore	Partially Exhibits Attribute	Partially Exhibits Attribute	Partially Exhibits Attribute	Does Not Exhibit Attribute	Exhibits Attribute	Partially Exhibits Attribute	Does Not Exhibit Attribute

Does Not Exhibit Attribute

Partially Exhibits Attribute

Exhibits Attribute

If conducting periodic studies, it is helpful to track total resource projections and how they have changed from year to year. This can help states understand trends, use data to aid in any needed policy updates, and plan for later study years when the study is reperformed.

Aligning goals, objectives, and evaluation metrics to ensure that the study is prioritizing reliability can help ensure its effectiveness. Illinois could consider defining how much dispatchable power, synchronous reserves, inertia, short-circuit current, and Blackstart Resources the state would like to maintain as load is added to the system and the generation mix changes.

Additionally, studying resource adequacy across all months and seasons (not just winter and summer peak) can help to identify risks of unserved load. Scheduled and unplanned generation or transmission outages, plus the use of weather dependent resources, may create unexpected shortfalls and challenges at unexpected times. Transmission planning, long-term energy storage, grid-enhancing technologies, and load-flexibility are tools to help mitigate these challenges, and the studies could provide additional value by identifying where these tools can be implemented.

Question 2: Which variables are the highest priority to explore? Further, are there important policies or drivers missing in addition to those outlined in the preceding stakeholder workshop that could help shape scenario development?

The NERC Long Term Reliability Assessment (LTRA)[5] cites surging demand growth and thermal generator retirements driving resource adequacy challenges over the next ten years, although all the drivers listed below in Question 3 impact reliability. Important policies that may impact scenario development are identified in Question 4 below.

[5] NERC LTRA, p.6

<u>Question 3:</u> Which of the following drivers are most critical to explore in the resource adequacy modeling scenarios and why?

a. Extreme weather

b. Demand growth

c. Thermal retirements

d. Transmission build and future needs

e. Generation resource diversity

f. Out-of-state reliance on generation resources

g. Some other driver not described above

All the drivers listed above are important to consider in the modeling process, and several are thoroughly interconnected, making it challenging to isolate or rank their individual significance to resource adequacy. There are additional risks listed in the RF Regional Risk Assessment[6] that could be useful to consider as well. For example, while not typically considered a driver for a resource adequacy study, cyber and physical security risks can impact the grid beyond traditional N-1 contingency scenarios, with the potential to simultaneously impact multiple generators and lines. These risks are elevated as we move to a more digitized and distributed grid.

Additionally, new types of resources present new risks to study. For example, battery storage is a flexible, dispatchable resource with fast frequency response, but battery charging patterns can impact overall load and transmission flows. While a resource adequacy study cannot account for all risk scenarios, resilience metrics on how the resource mix can perform collectively across a wide range of scenarios (such as extreme weather) can provide additional clarity.

<u>Question 4:</u> Are there known or expected developments in federal or state policy that should be integrated into scenario development? Please explain in detail and provide references where possible.

Changes in energy policy can impact long-term resource adequacy. The policies mentioned below have the potential to impact resource adequacy but should not be considered exhaustive.[7]

At the federal level, several changes arising from the Department of Energy (DOE) and the Environmental Protection Agency (EPA) over the last several months could impact near and long-term resource adequacy outlooks. Under the executive order titled *Strengthening the Reliability and Security of the United States Electric Grid*,[8] the Secretary of Energy has been instructed to utilize section 202(c) of the Federal Power Act (FPA) to keep designated power generation sources online due to reliability

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[6] ReliabilityFirst Regional Risk Assessment.
Note: SERC and MRO also publish similar regional risk assessments.
[7] This information provided below is not comprehensive and should not be construed as RF advocating for or against any of these policies.
[8] Strengthening the Reliability and Security of the United States Electric Grid – The White House

concerns[9]. Section 202(c) of the FPA grants the DOE emergency authority to require a temporary order for the connection of generation, transmission, interchange, or delivery of electricity. As of 2025, the Department of Energy has exercised this authority four times, including instances where power plants were ordered to remain operational for at least 90 days, just days before their planned retirement. This means that power plants slated for retirement may not always be brought offline when expected. Additionally, the recent proposed rollback of regulations from the EPA aimed at fossil fuel power plant emissions may enable these facilities to remain operational for longer periods of time.[10]

With the Big, Beautiful Bill officially signed into law, potential renewable energy projects in the queue may be impacted. The legislation largely repeals renewable energy tax credits from the 2022 Inflation Reduction Act (IRA). It constricts the timeline in which solar and wind projects can utilize 45Y and 48E tax credits, and this may be further revised under the recent executive order titled *Ending Market Distorting Subsidies for Unreliable, Foreign Controlled Energy Sources*.[11] These changes could influence how many proposed renewable energy projects are successfully developed and brought online.

Policies related to data centers continue to evolve in response to their growing energy demand. As an example, FERC has been engaged in ongoing discussion about how to regulate data center co-locations with power plants. Following a technical conference held by FERC last year, FERC opened a new review to assess whether PJM's tariff should include provisions that clarify the co-location interconnection process for large loads, such as data centers, while ensuring continued grid reliability and cost allocation fairness.[12] The proceeding could have broader implications for national policy related to co-location and the integration of large electrical loads.

Senators in Illinois have introduced SB1527,[13] a bill aimed at removing existing barriers to nuclear power expansion in the state. The legislation would repeal the current prohibition on constructing new nuclear reactors with a nameplate capacity greater than 300 MW. If this proposal becomes law, there is potential for more nuclear power to be developed within the state.

In late June, the House Committee on Energy and Commerce held a markup on 13 bills centered on grid security and bolstering domestic energy. All 13 bills have been forwarded to the House and await further action. If enacted, they could influence resource adequacy.[14] The bills are listed below; see the hyperlinks for more information.

1. **H.R. 3616**, *Reliable Power Act*
2. **H.R. 1047**, *Guaranteeing Reliability through the Interconnection of Dispatchable Power (GRID Power) Act*

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[9] The executive order also mandated the development of a uniform methodology for analyzing current and anticipated reserve margins. The methodology and analysis was posted in the DOE's Resource Adequacy Report: *Evaluating the Reliability and Security of the United States Electric Grid*.

[10] EPA Proposes Repeal of Biden-Harris EPA Regulations for Power Plants, Which, If Finalized, Would Save Americans More than a Billion Dollars a Year | US EPA

[11] Ending Market Distorting Subsidies for Unreliable, Foreign-Controlled Energy Sources – The White House

[12] FERC Orders Action on Co-Location Issues Related to Data Centers Running AI | Federal Energy Regulatory Commission

[13] Illinois General Assembly - Bill Status of SB1527

[14] Full Committee on Energy and Commerce Advances 13 Bills to Unleash American Energy

3. **H.R. 3632**, *Power Plant Reliability Act of 2025*
4. **H.R. 3638**, *Electric Supply Chain Act*
5. **H.R. 3157**, *State Energy Accountability Act*
6. **H.R. 3628**, *State Planning for Reliability and Affordability Act*
7. **H.R. 3657**, *Hydropower Relicensing Transparency Act*
8. **H.R. 3015**, *National Coal Council Reestablishment Act*
9. **H.R. 3617**, *Securing America's Critical Minerals Supply Act*
10. **H.R. 3109**, *Researching Efficient Federal Improvements for Necessary Energy Refining (REFINER) Act*
11. **H.R. 3062**, *Promoting Cross-border Energy Infrastructure Act*
12. **H.R. 1949**, *Unlocking our Domestic LNG Potential Act of 2025*
13. **H.R. 3668**, *Improving Interagency Coordination for Pipeline Reviews Act*

Question 6: What blind spots or gaps in the RA Study process do you worry might be overlooked or otherwise not addressed?

a. Are the identified blind spots or gaps unique to customer segments, modeling scenarios, market conditions or other targeted parameter?

Previous resource adequacy studies from other organizations have identified key challenges in the modeling process, offering valuable lessons for future analyses. Like many studies, initial data collection can be a critical issue. For example, on April 1, NERC released an aggregated report from last year's Level 2 NERC Alert on IBR model quality deficiencies, and one of the key findings from the report was that many Generator Owners did not have the requested model data readily available.[15] Model data is critical for resource adequacy and energy assurance planning and helps identify stability issues and relay coordination challenges to address events. Preemptively communicating and creating methodologies for data collection can help guide the modeling process.

A thorough resource adequacy study process will also account for the differences in power generation sources. When evaluating thermal retirements, it is important to be aware that replacement energy is primarily expected to come from new natural gas and variable generation resources, predominantly wind and solar, that do not yet have the same Essential Reliability Services (ERS) (also discussed in Question 1).[16] This knowledge and the consideration of differences in ERS across different resource types will help inform a comprehensive resource adequacy scenario analyses.

Blackstart capabilities (i.e., the ability to restore power to the grid following a widespread disturbance) are also important to reliability and helpful to include in resource adequacy modeling scenarios.[17] The distinguishing characteristic of Blackstart Resources is that they can be started without being connected to the grid. While not all conventional resources have blackstart capability, Blackstart Resources are typically conventional generation units. The reliability concern arises that as more conventional resources

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[15] NERC Alert Level 2 - Inverter-Based Resource Model Quality Deficiencies.pdf
[16] ERS Abstract Report Final.pdf
[17] NASEO_The Black Box of Blackstart_FINAL.pdf

are retired, fewer Blackstart Resources are available, which could extend system restoration time during a blackout.

Additional considerations that would be helpful for a more comprehensive analysis include the role of interdependencies (such as natural gas-electric interdependencies) and fuel security.

b. How could the identified blind spots or gaps be addressed? (e.g. through additional scenarios, targeted data inputs, utilizing specific modeling, etc.)

A wide range of planning and operational scenarios along with the use of clear, consistent data input specifications can help address blind spots. Coordination, communication, and collaboration between the state, local utilities, and the RTOs (both PJM and MISO) can also help identify and mitigate gaps in studies and assessments.

Question 7: Have any peer jurisdictions developed scenario(s) through the completion of their own resource adequacy assessments or studies that should also be considered by the Agencies through this Resource Adequacy Study?

Using real observed conditions as a scenario in a resource adequacy study can be beneficial. RF developed a scenario study using actual peak demand, modeling a cold snap that occurred this past winter[18]. This study, based on real observed system conditions and forecast using the NERC LTRA and GADS generation availability, helped to highlight potential shortfalls should similar conditions recur.

There are additional resources, studies, and assessments that can be utilized to compare and contrast results. These include the NERC long-term reliability assessment and seasonal (summer/winter) assessments, as well as RTO reports. The RTOs issue State of the Market reports that provide a historical look back, plus their Transmission Expansion Plan reports (RTEP in PJM, MTEP in MISO) provide a look into future transmission planning and load forecasts. Additional RTO reliability reports such as the FERC Order 1920 studies can also provide a view of resource adequacy over a wide range of scenarios across the region.

TOPIC 2: Analytical approach to analysis and data assumptions.

The quality and accuracy of the data used, coupled with the assumptions incorporated to support the data's infusion into scenario design underpin the modeling and analysis of this RA Study process. To begin, these data and assumptions are used in base case development, drawing from historic trends and broadly accepted projections, incorporating established policies, expected developments, and largely conservative assumptions to represent a "business-as-usual" outlook against which alternative scenarios are compared. Due to the importance placed on data inputs, assumptions, drivers, and ultimately scenarios used to test alternative opportunities and impacts, it is paramount that these inputs are also fully developed and defined. This includes fleshing out current and future market conditions and constraints, generation project development forecasts and timing, transmission and distribution system enhancements, customer-driven distributed energy resources, and demand response adoption), policy and legislative initiatives that directly impact resource adequacy inputs and results, and other similar considerations that are critical to frame scenarios and completing sensitivities. The questions below are aimed at

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[18] NERC Reliability Insights: New Approaches Needed to Ensure System Adequacy

understanding Stakeholder feedback on what key inputs (date, assumptions, and other considerations) should be considered by the Agencies through the RA Study process.

Question 8: Are there recommendations for specific data sources that could be utilized in this study?

a. Are there preferences for certain input assumptions that should be made?

b. What prior or concurrent studies could be referenced that might add value or ensure alignment with similar or adjacent work (e.g., queue assumptions, RTO projections)?

PJM and MISO, as well as NERC, share data and material that could be utilized for data sources and assumptions. As an example, the NERC LTRA includes assumptions throughout the document indicating where and how uncertainties were addressed.[19] The response to question 10 below contains additional information on this topic.

Question 9: Are there specific transmission constraints, expansions, or projects that should be considered and reflected in a model scenario? Further, Are these transmission considerations intended to target and/or solve specific challenges? Please explain, provide supporting documentation justifying inclusion, and provide pertinent reference materials including reports or studies.

PJM, MISO, and NERC each share transmission reports that could be helpful to Illinois. PJM and MISO issue transmission expansion plans each year, which identify transmission system additions and improvements needed for reliable grid operations now and in the future (PJM issues the RTEP report and MISO issues the MTEP report). Future transmission projects detailed in the PJM RTEP and the MISO MTEP can be considered during modeling and study activities.

NERC recently issued its ITCS (Interregional Transfer Capability Study).[20] The study, which was directed by the Fiscal Responsibility Act of 2023, analyzes the amount of power that can be moved or transferred reliably from one area to another area of the interconnected transmission systems. The study was conducted in consultation with the six Regional Entities, including RF, and each transmitting utility in neighboring transmission planning regions. Transfer capability is a critical measure of the ability to address energy deficiencies by relying on distant resources and is a key component of a reliable and resilient bulk power system.

Question 10: Are there specific assumptions that should be considered concerning generation resources, including buildout (queue, pace, technology availability) or retirements, both in-state and regionally in the RTO markets?

a. Which proposed assumptions should be considered as part of the base case and which are best considered as part of a prospective scenario? Provide any available references to RA studies, IRPs, or comparable assessments and reports to support your recommendations.

b. Which assumptions are contingent upon specific policy and/or legislative conditions being met or otherwise enacted? Please plain in detail.

[19] NERC LTRA. Additionally, the following spreadsheet provides data used to create various graphics throughout the report.

[20] ITCS Final Report

Both PJM and MISO have manuals that outline assumptions used in their resource adequacy analyses.[21] Examples of assumptions include load forecasts (e.g., load growth, seasonal and daily load shapes), demand response, and resource availability (e.g., planned and unplanned outages, the reliability of fuel supplies, weather conditions for wind and solar, battery charging and discharging behavior). Additionally, transmission assumptions address the capacity of the transmission grid to move power within and between regions.

The NERC LTRA states that it uses a dataset that includes projected on-peak demand and system energy needs, demand response, resource capacity, and transmission projects.[22]

Question 11: As a component of the RA Study, the Agencies will be seeking to obtain utility and RTO load forecast projections and the underlying assumptions behind the load forecasts. In addition to these utility forecast assumptions, what additional assumptions should also be considered, either embedded in a base case or considered in scenarios? Further, what data sources should be drawn upon, supporting any load forecast modifications? (i.e. large load / electrification growth)

> a. Provide details on why these additional assumptions should be considered during the modeling process?
>
> b. Are any proposed load forecast assumptions directly impacted and/or predicated upon specific to policy, legislative, or other conditions being met and/or otherwise enacted? Please explain in detail.

Please see our response to Question 10 above as well at the NERC Long Term Reliability Assessment, which includes items to consider when performing a resource adequacy study. Additionally, policy can impact load forecasts. For example, Executive Orders[23] and congressional funding may impact the rate of data center load growth due to financial incentives, goals, and/or streamlining permitting and siting. In addition, federal and state electric vehicle policies may increase (or decrease) electrification in the transportation sector impacting load forecasting by region and by state.

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[21] See PJM Manual 20, PJM Manual 20-A and MISO Business Practice Manual (BPM) 011

[22] See NERC LTRA at p. 4.

[23] For example, see the January 2025 Executive Order on Advancing United States Leadership in Artificial Intelligence Infrastructure