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NERC Reliability Guideline for DER Forecasting Practices

Shayan Rizvi, Northeast Power Coordinating Council
Senior RAPA Engineer, NERC SPIDERWG Chair
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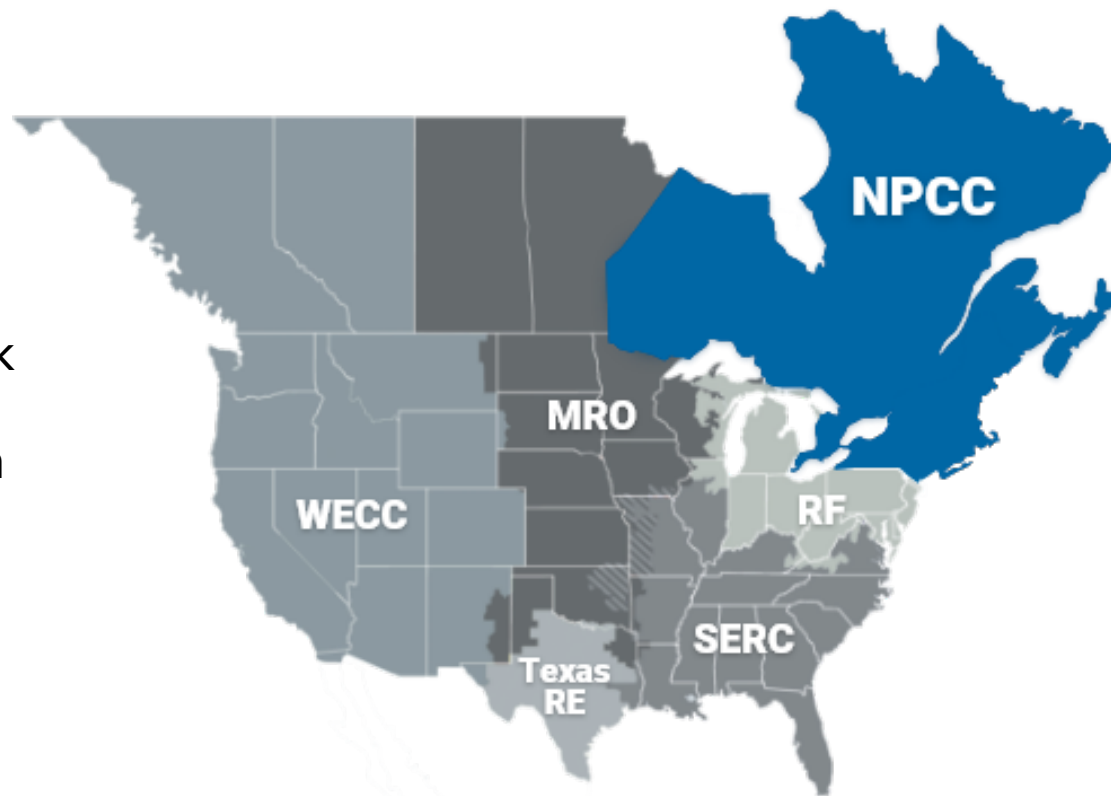
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NPCC is responsible for promoting and enhancing the reliability of the international, interconnected bulk power system in Northeastern North America

The NPCC geographic region includes the State of New York and the six New England states as well as the Canadian provinces of Ontario, Québec and the Maritime provinces of New Brunswick and Nova Scotia

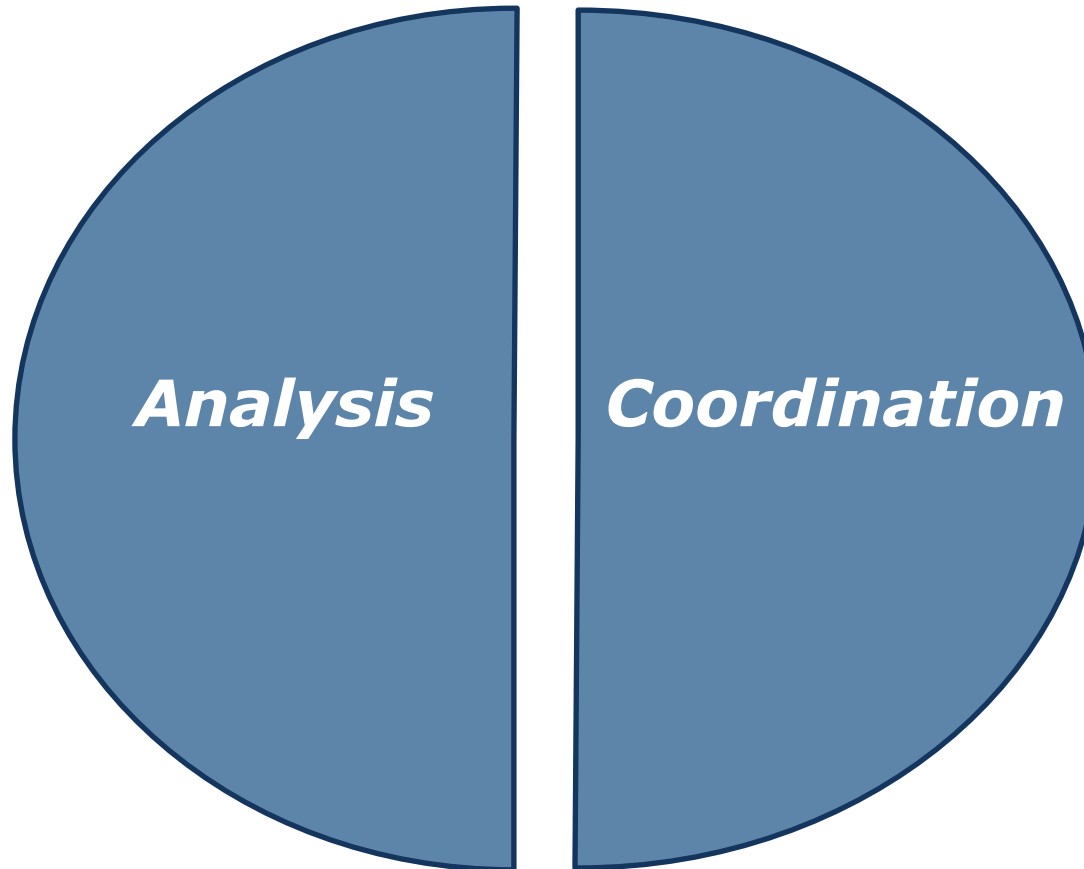
Overall, NPCC covers an area of nearly 1.2 million square miles, populated by more than 55 million people



*The purpose of the System Planning Impacts from Distributed Energy Resources Working Group (SPIDERWG) is to address aspects of a growing penetration of distributed energy resources (DER) related to system planning, **operating**, modeling, and **reliability impacts** to the Bulk Power System (BPS).*

*SPIDERWG Scope Document –
March 2023*

NERC SPIDERWG



- Reliability Guideline focuses on:
 - What it takes to develop a process for an integrated resource plan
 - Long-term DER forecasting practices
 - DER forecasting approaches
 - Forecasting practices in relation to MOD-031
 - Long-term DER forecasting impacts on BPS level studies

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Reliability Guideline

DER Forecasting Practices and Relationship to
DER Modeling for BPS Planning Studies

March 2025

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3353 Peachtree Road NE
Suite 600, North Tower
Atlanta, GA 30326
404-446-2560 | www.nerc.com

Top-Down

Starts with high-level forecasts (e.g., state or utility level) and allocates DERs to smaller areas using geographic patterns or proportional metrics.

Bottom-Up

Builds forecasts from detailed local data (e.g., substations, circuits), aggregating them to represent broader system behavior.

Alternative Methods

Used when historical data is lacking; includes time series extrapolation, policy-based targets, economic simulations, diffusion models, and customer adoption modeling.



DER Capacity and Type (MW)

Purpose: *Supports steady-state modeling and base-case assumptions.*

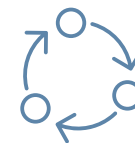
Key Insight: *Helps define starting conditions for Bulk Power System (BPS) studies using historical and forecasted DER data.*



DER Location (Load Bus)

Purpose: *Identifies geographic distribution and connectivity of DERs.*

Key Insight: *Enhances model accuracy by aligning DER placement with regional and local forecasts, considering feeder configurations.*



T-D Operational Profile

Purpose: *Assesses DER output patterns to identify risk-prone hours.*

Key Insight: *Informs dispatch assumptions and future base case characteristics beyond simple capacity metrics.*

Did you find a reputable source?

- Was the data filled out completely?
- Are there any suspicious values?
- Is this an aggregate level forecast?

Are you tracking DER location in the forecast?

- DER capacity
- DER dispatch and assumptions depending on base case
- Is there a link to base case inputs?

Are you taking into account expected operational profiles?

- Did you assume one profile?
- What are the profiles based on?

Do you understand the method, inputs, and outputs of the forecast?

- Did you need weather data?
- Did the forecast use more than one method?
- Did the forecast use sensitivities?

Does the forecast "make sense" from a high level and T-D perspective?

- Is the forecast coordinated with neighbors?
- Does the output of the DER match with assumptions?
- Did the forecast sensitivities include policy/market/economic changes?
- How sensitive was the forecast?

Figure 3.5: Example Checklist Questions for MOD-031

Coordination

- TP's and PC's should coordinate with RPs to discuss their DER forecasting in their region
- Load forecasting and planning departments should be both be aware of how to meet TP/PC requirements
- RP's should coordinate with adjacent RP's to avoid double counting of DERs

Develop checklists

- Method to validate forecasted data that will be used in planning studies

Knowledge gathering and communication

- Attend and contribute to forums where forecasting is discussed



Questions and Answers

Shayan Rizvi
srizvi@npcc.org

SPIDERWG webpage
[https://www.nerc.com/comm/RSTC/Pages/
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*We welcome additional participants and
contributors to SPIDERWG!*