NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

2023-2024 Winter Reliability Assessment

Mark Olson, Manager, Reliability Assessment
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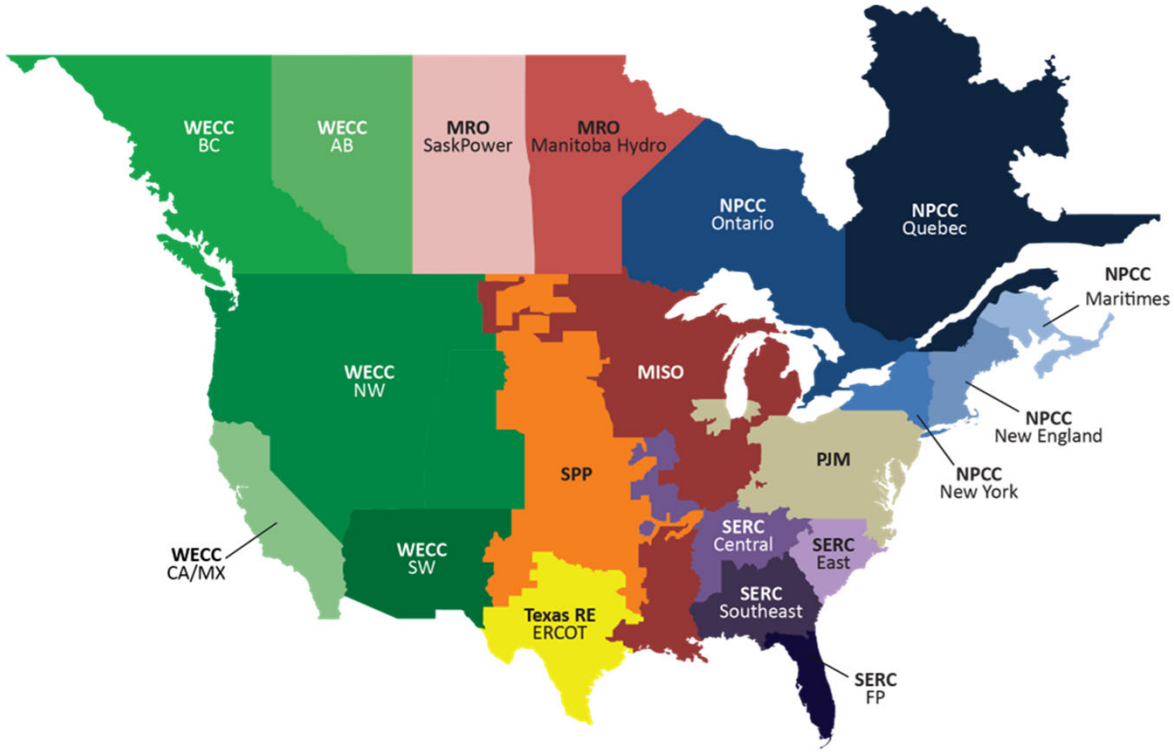
RELIABILITY | RESILIENCE | SECURITY




WRA Background

- Assesses risk of electricity supply shortfalls
- Describes industry preparations to manage winter risks
- Coordinated with Regions and reviewed by technical committee
- Released November 8, 2023



- MISO *(Midcontinent Independent System Operator)*
- PJM

MRO – Midwest Reliability Organization
- MRO-Manitoba Hydro
- MRO-SaskPower
- SPP

NPCC – Northeast Power Coordinating Council
- NPCC-Maritimes
- NPCC-New England
- NPCC-New York
- NPCC-Ontario
- NPCC-Québec

SERC – SERC Reliability Corporation
- SERC-East
- SERC-Central
- SERC-Southeast
- SERC-Florida Peninsula

Texas RE – Texas Reliability Entity
- Texas RE-ERCOT *(Electric Reliability Council of Texas)*

WECC
- WECC-CA/MX *(California/Mexico)*
- WECC-AB *(Alberta)*
- WECC-BC *(British Colombia)*
- WECC-NW *(Northwest)*
- WECC-SW *(Southwest)*

Winter Risk Assessment Inputs

On-peak Reserve Margins

- Industry peak demand forecast
- Expected resource output at time of peak demand

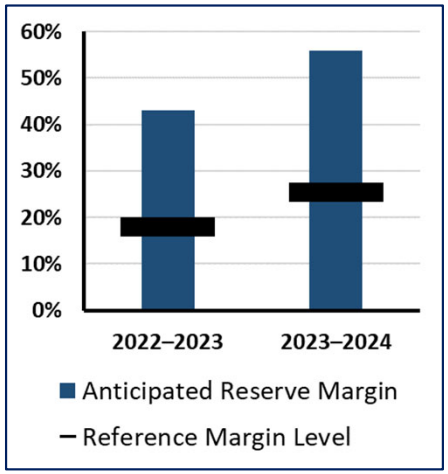
Operational Risk Analysis

- Normal and extreme demand
- Generator availability assessed for extreme winter scenarios

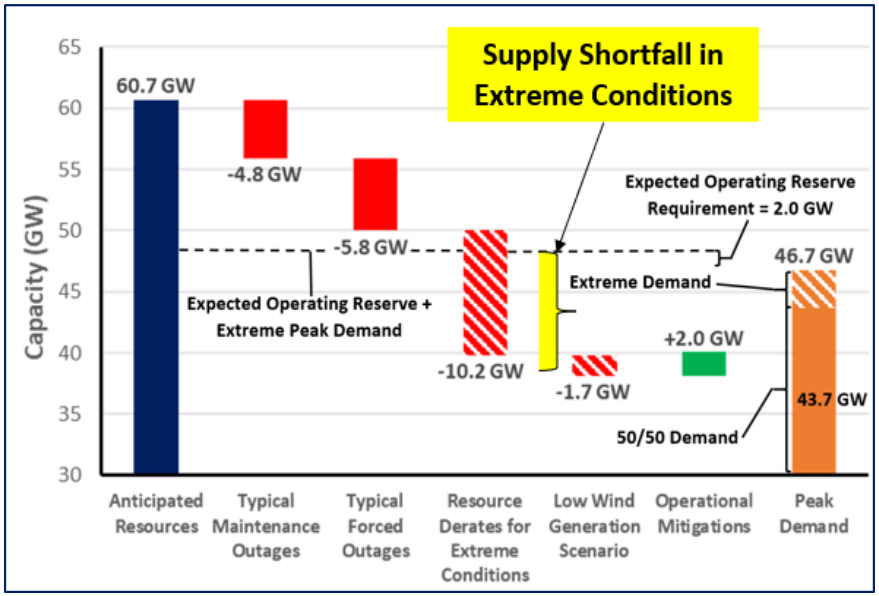
Probabilistic Energy Metrics

- Analysis performed for NERC's biennial Probabilistic Assessment or winter study

Probabilistic Assessment for Winter



On-peak Reserve Margins



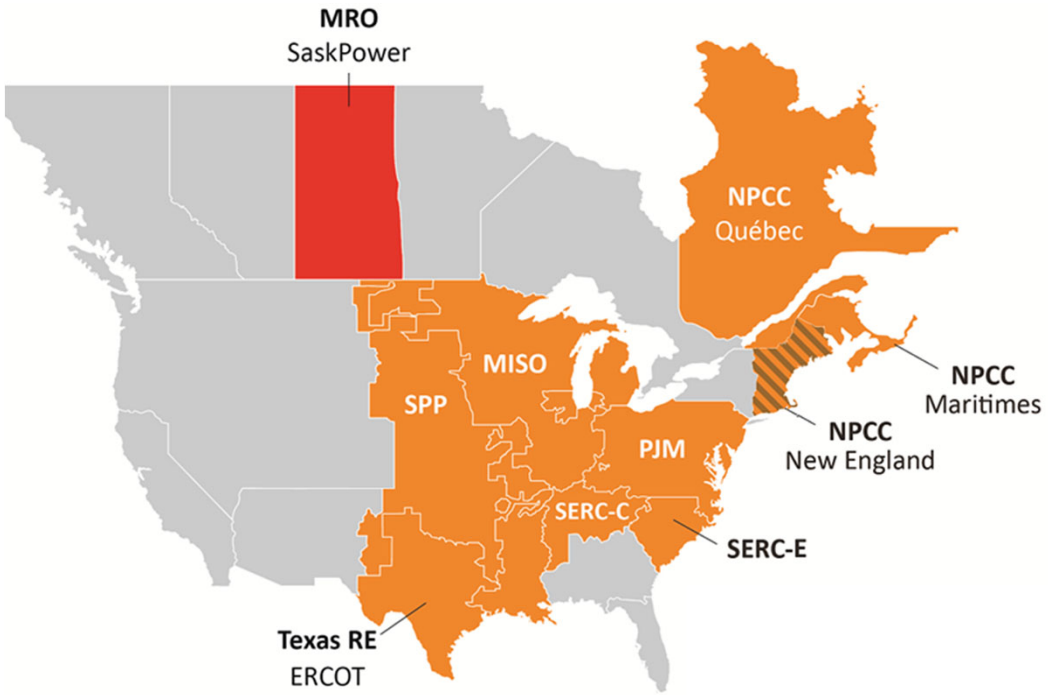
Operational Risk Analysis

2023-2024 Winter Reliability Assessment Highlights

Wide area cold events pose risk to reliability

Adequate resources in U.S. areas for normal winter conditions

Positive trend in industry cold weather preparations but generator and fuel performance remain a concern



2023-2024 Winter Reliability Risk Map

Seasonal Risk Assessment Summary	
High	Potential for insufficient operating reserves in normal peak conditions
Elevated	Potential for insufficient operating reserves in extreme conditions
Low	Sufficient operating reserves expected

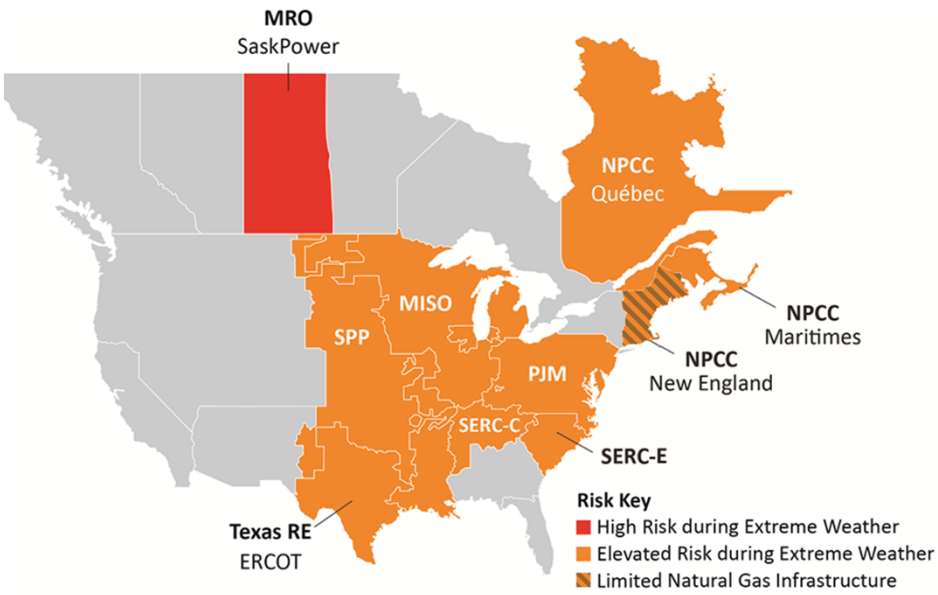
Extreme conditions include 90/10 demand scenarios, historical high generator outage rates, and low variable energy resource scenarios

Winter Reliability Assessment Trend

Factors contributing to expanded risk area:

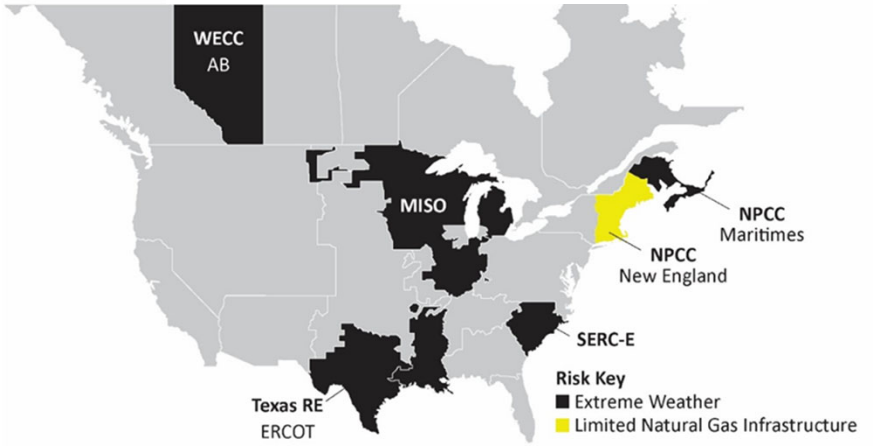
- Higher peak-demand projections
- Less generation capacity
- Load forecasting challenges
- Generator and fuel supply vulnerabilities to extreme weather

Current Winter (2023-2024)



Winter Reliability Risk Maps

Prior Winter (2022-2023)



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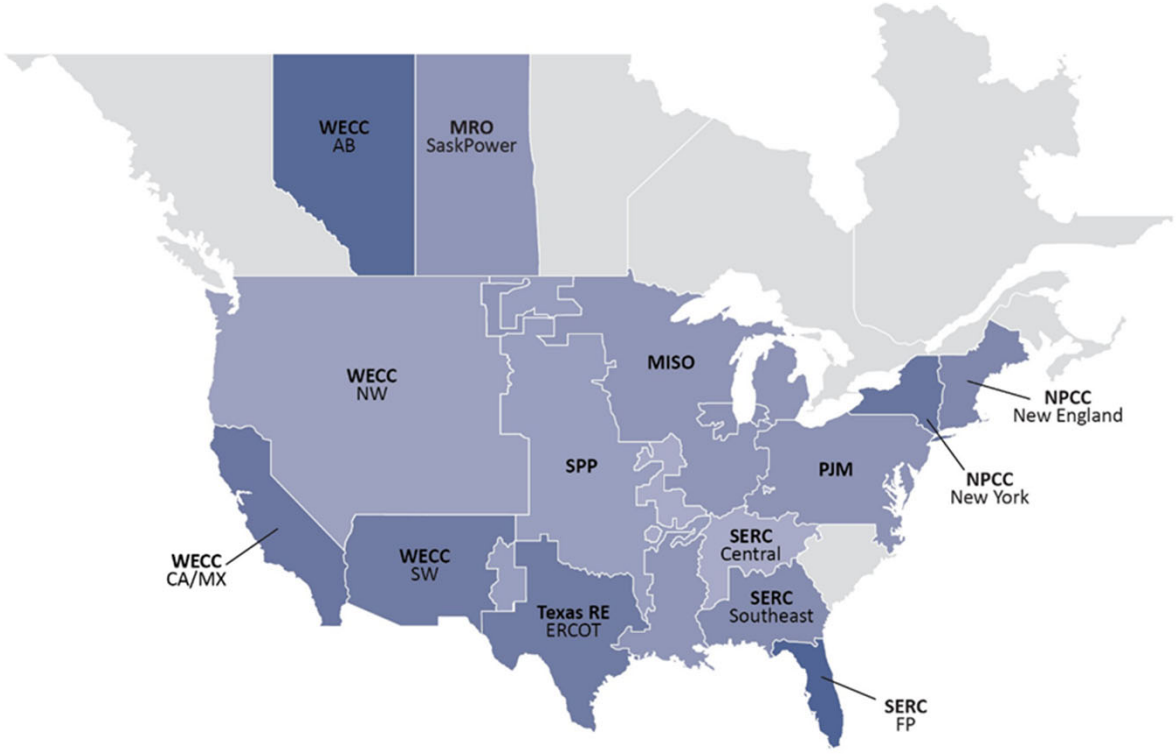
Interconnected Natural Gas and Electric Systems

- Natural gas fuel is essential for winter reliability
- Weather-related generator and fuel system failures can widen the reliability impact of extreme winter events



All other assessment areas have less than 35% natural gas fired generation contribution to winter resource mix.

	Natural-Gas-Fired Generation	
	Peak Winter Capacity	Contribution to Total Winter Resource Mix
MISO	67.5 GW	46%
MRO-SaskPower	2.1 GW	46%
NPCC-New England	17.3 GW	54%
NPCC-New York	24.5 GW	66%
PJM	84.9 GW	47%
SERC-Central	22.7 GW	44%
SERC-Florida Peninsula	50.6 GW	79%
SERC-Southeast	31.5 GW	51%
SPP	27.4 GW	41%
Texas RE-ERCOT	54.2 GW	62%
WECC-AB	11.4 GW	75%
WECC-CA/MX	39.9 GW	65%
WECC-NW	31.0 GW	39%
WECC-SW	18.2 GW	62%

Natural-Gas-Fired Generation Capacity Contributions to 2023–2024 Winter Generation Mix

Takeaways…the next winter and beyond

- Winter electric reliability risks are mounting:
  - Accelerating demand growth and changing load profiles
  - Generator retirements
  - Natural-gas interdependence
- Focus for resource planning is changing in parts of the U.S. from a peak season in summer to winter (or both seasons)
- Improving the performance of electric generators and natural-gas fuel supplies in extreme cold temperatures is a priority

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Questions and Answers