2021-2022 Winter Reliability Assessment
NARUC Gas Committee
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Mark Olson, manager, Reliability Assessment
Percentages indicate the projected reserve margin under extreme conditions.
• Planned reserves based on average peak conditions can give a false indicator of risk
• NERC analyzed extreme weather risk factors
  ▪ Higher demand levels than normal peak
  ▪ Reduced supply due to generator outages, fuel limitations, and low temperature performance
• Analysis uses generator performance data from extreme weather events
• Natural gas-fired generators provides 44% of the on-peak generation mix in MISO
  - 94% Thermal
  - 3% Wind
  - 3% Hydro
  - Wind contribution: 3.8 GW (17% of nameplate wind capacity)
• Winter reserve margins exceed the MISO Reference Margin Level (18.3%)
• Resources are sufficient for normal winter peak demand
• Resources are sufficient even with normal generator outages

![Graph showing MISO Reserve Margin]

- Reserve margin decreases to 20.5%

- 2021–2022 Winter Anticipated Resources: 144.6 GW
- Typical Maintenance Outages: -11.1 GW
- Typical Forced Outages: -16.1 GW
- 2021–2022 Winter Net Internal Demand: 97.3 GW
Increased electricity demand and reduced supplies due to generation outages and derates results in a **shortfall**.

- Reserve margin decreases to **-1.2%**
- Includes **9 GW** of natural gas generator outages and derates (of **64 GW** existing)
• Resources are sufficient for normal winter peak demand
  ▪ 56.4% winter reserve margin exceeds the SPP Reference Margin Level
• Shortfall occurs with high generation outages/derates and extreme demand

Includes 13 GW of natural gas generator outages and derates (of 32 GW existing)
• Resources are sufficient for normal winter peak demand
  ▪ 41.9% winter reserve margin exceeds the ERCOT Reference Margin Level
• Peak demand increased 8% since winter 2020-2021
• Shortfall occurs with high generation outages/derates and extreme demand

Includes 22.5 GW of natural gas generator outages and derates (of 59 GW existing)
• Limited natural gas infrastructure to serve electric generation in extreme conditions
  • Southern California – limited storage and lack of redundant supply pipelines
    ▪ Ruptured pipeline is reducing flow into California
    ▪ Mitigating with increased storage at Aliso Canyon
    ▪ Prolonged cold presents risk to electric generation
  • Continuing drought in the West has caused low hydro conditions which increase reliance on natural gas generation
Natural Gas Infrastructure Risk Areas

• New England – pipeline constraints during extreme cold temperatures
  ▪ Simultaneous demand for natural gas for heating homes and operating electric generators
  ▪ Other fuels (oil or LNG) substituted but supplies are limited

• Current inventories of oil and LNG are low

• Pandemic-related supply chain issues or extreme weather could limit deliveries
• NERC issued an advisory to owners and operators in August

• Included mandatory questions to help NERC evaluate the Bulk Electric System’s winter readiness

• Key takeaway: Grid operators should prepare their operating plans to manage supply shortfalls in extreme winter weather
• Coal stockpiles have declined rapidly in the last few months
• Natural gas in storage is below average levels for upcoming winter
• Grid operators are monitoring fuel levels closely
• No BPS impacts are currently identified
To reduce the risks of energy shortfalls on the BPS this winter:

- Generators should take proactive steps to prepare for winter conditions and communicate with grid operators.
- Grid operators should prepare to implement cold weather operating plans, conduct drills, and poll generators for fuel and availability status.
- Load-serving entities should review critical loads to prevent inadvertent disruptions and ensure alert systems are in place to prepare their customers.
- Regulators should support requested environmental waivers.
Questions and Answers