



2018-2019 Winter Readiness

**Robert Benbow,
Executive Director, Energy Operations**

October 18, 2018

Executive Summary



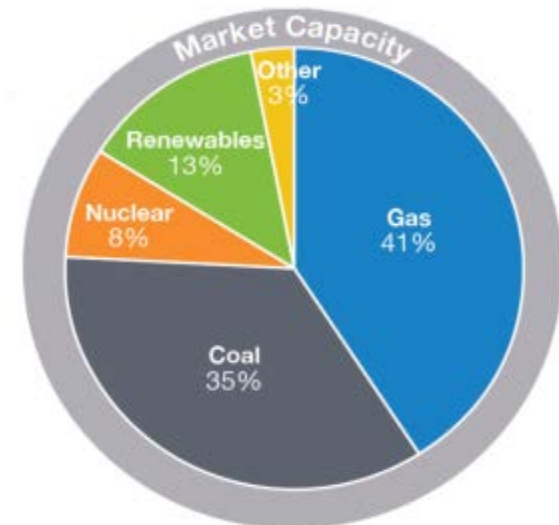
- MISO is prepared for the upcoming winter and forecasts sufficient reserve margins
- Lessons learned from last winter allow for improved management of extreme situations
- Emergency preparedness efforts bolster reliability during the winter months and year-round
- Cost-effective and innovative solutions increase preparedness and the ability to respond appropriately to challenging situations

MISO ensures reliable delivery of electricity, at the lowest cost, across the grid in 15 U.S States and Canadian province of Manitoba

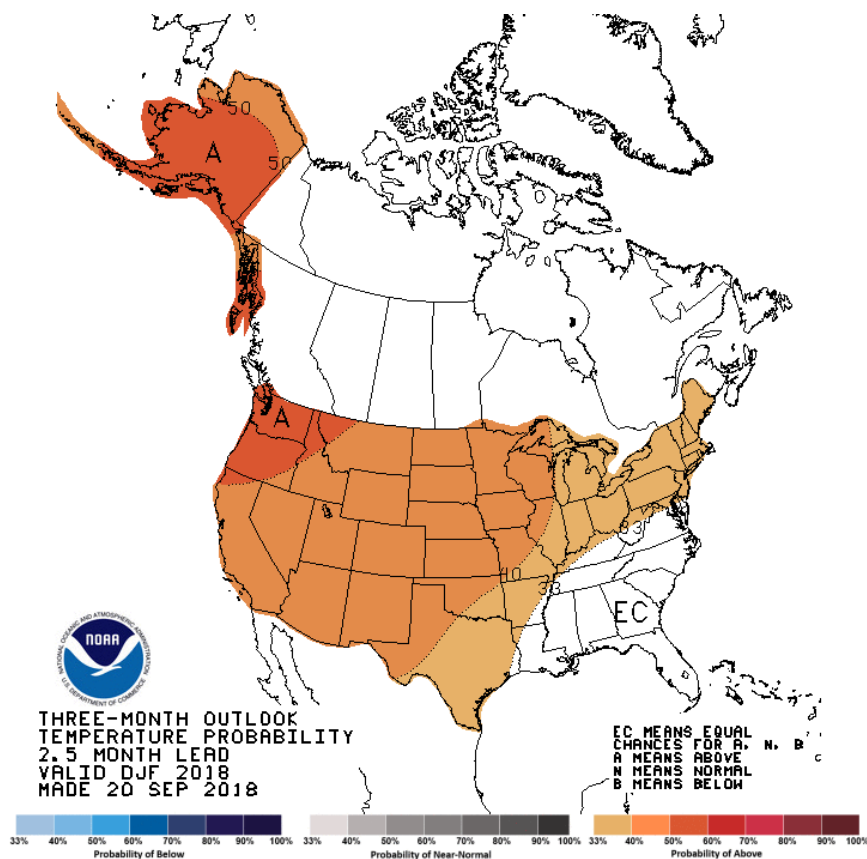
Vision: The most reliable, value-creating RTO



High Voltage Transmission	65,800 miles
Generation Capacity	174,000 MW
Summer Peak Demand	127,125 MW
Winter Peak Demand	109,307 MW
Customers Served	42 Million



Adequate resources are projected to meet demand for Winter 2018-2019



MISO Preliminary 2018-19 Winter Forecast

MISO Wide Reserve Margin Target	17%
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Projected Reserve Margin	36%
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Winter Peak Forecast	103 GW
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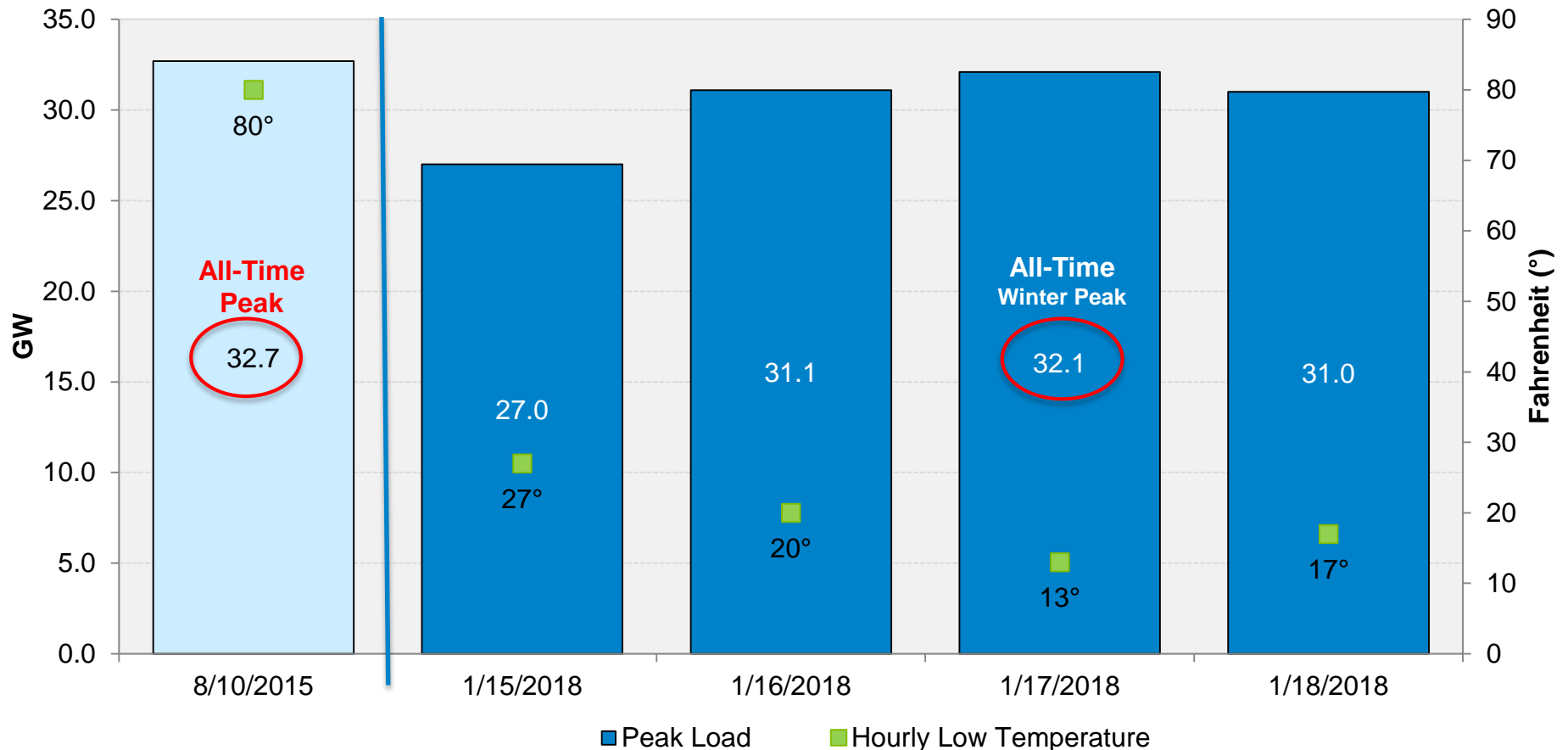
Total Projected Available Capacity	140 GW
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**All-time Winter Peak:
109 GW on January 6th, 2014**

NOAA forecasts warmer than normal temperatures for most of the MISO footprint

Record low South temperatures in January 2018 resulted in a South Region peak load 1.8% lower than the region's all-time peak, realized in Summer

South Region Peak Load and Low Temperature



Lessons learned from the January 17 South Region event will allow for more efficient management of obligations throughout the year

Capacity Advisory communication to increase situational awareness and encouraged stakeholders to update market data

Improve collaboration, communication, and coordination within MISO, with members and with neighbors

Provide greater awareness and communication surrounding the Regional Dispatch Transfer constraint

Conduct internal and external training and drills on Emergency Purchases

Proactively engage with Generator and Transmission Owners to identify outages flexible to address any tight operating conditions

MISO is well prepared to handle winter operations

Gas-Electric Coordination

- Enhanced Operational Tools
- Gas-Electric Market Alignment
- Reliability & Pipeline Calls
- Pipeline & Price Monitoring
- Operational Situational Awareness

Generation Portfolio

- Diverse generation pool to ensure reliability
- Planning and collaboration with members for generation utilization

Emergency Preparedness

- MISO EOP & Winter Readiness Workshops
- Emergency Response & Power System Restoration Drill
- Emergency Procedures

Operational Readiness

- Communication, Coordination, Planning, and Training
- **Generation Fuel Survey**
- **MISO Winterization Guidelines**
- Enhancements



Stakeholders can participate in MISO's Winter Readiness Workshop to ensure the region is ready for potential extreme weather conditions



3:00 PM - 5:00 PM Eastern
2:00 PM - 4:00 PM Central

- MISO will discuss:
 - Winter lessons learned
 - Winter 2018-19 generation and transmission assessments
 - Preparation for challenging weather conditions
 - Winterization Guidelines

Enhancements to tools and processes position MISO to manage extreme circumstances

Enhanced Reserve Procurement on Regional Directional Transfer

Aug 2018

- Provides transparent price signals to procure ten minute reserves to return the RDT constraint to within limits following a generator contingency in the South

Fancy Transformer Operating Guide

Aug 2018

- Supports unit commitments in the Baton Rouge/New Orleans area to prevent severe overloads on the Fancy Point transformer for N-1-1 events.
- Similar to other South Region load pockets like DSG, Amite South, and Western

Resource Availability and Need (RAN)

On-going

- Works to ensure sufficient resources are available for Real-Time operations

Electric-Gas Tools and Resources

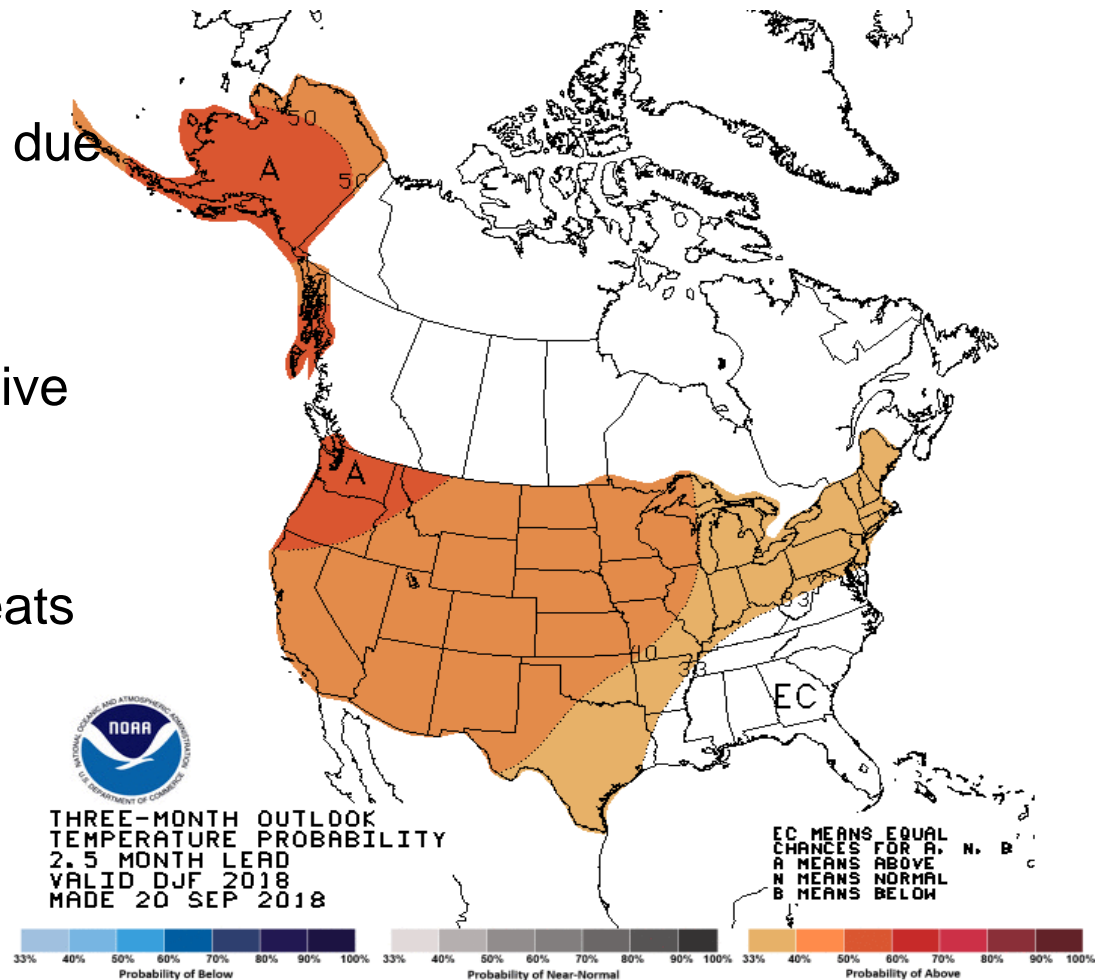
On-going

- Improves operational Electric-Gas situational awareness

Appendix

NOAA forecasts warmer than normal temperatures for most of the MISO footprint.

- 70% warmer than average temperatures are expected due to a weak El Nino
- Starting in February, an active winter is predicted for Southeast, Gulf Coast and Tennessee Valley, with threats of snow, ice, and frost
- Forecasted precipitation at near-normal levels.



Adequate resources are projected to meet demand for Winter 2018-2019

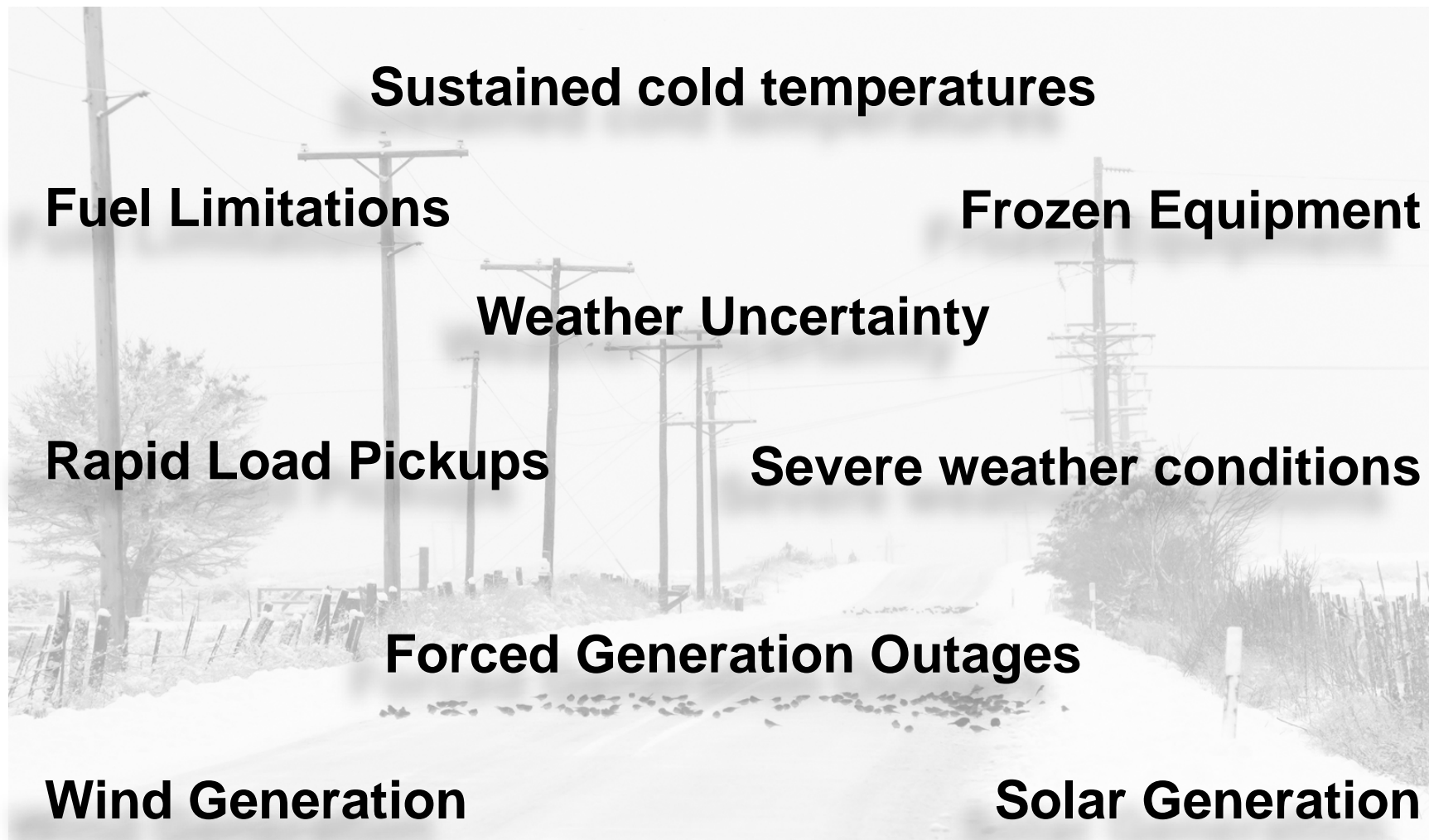
**All-time System Winter Peak:
109 GW on January 6th, 2014**

MISO Preliminary 2018-19 Winter Forecast

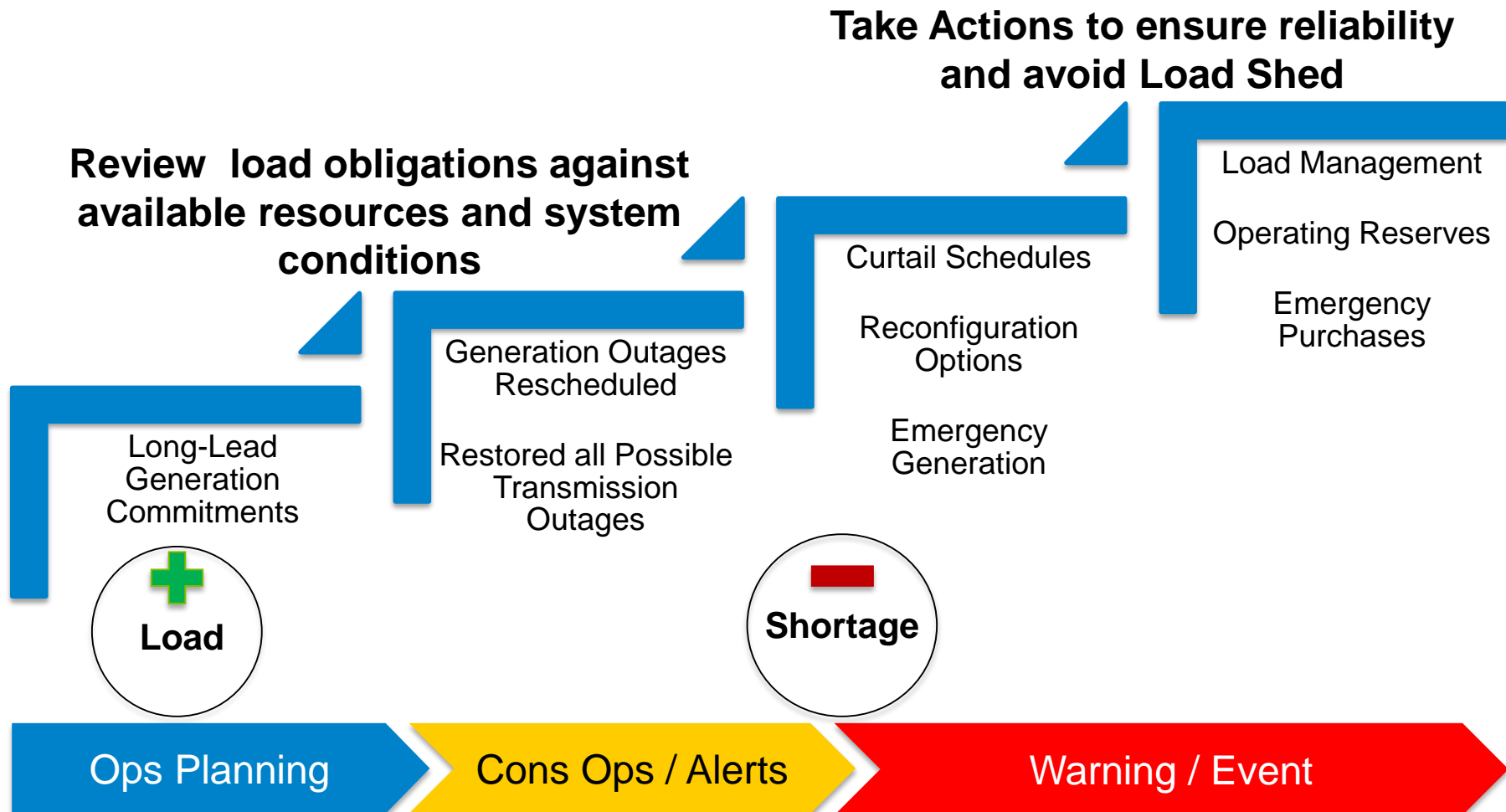
MISO Wide Reserve Margin Target	17%
Base Reserve Margin*	36%
Projected Reserve Margin*	22% to 37%
Probable Reserves after Outages*	6% to 20%
Winter Peak Forecast	103 GW
Total Projected Available Capacity	140 GW

Final assessment results will be presented at Winter Readiness Workshop on October 29

Winter brings challenges that have to be closely monitored



In Real-Time, unplanned outages and other unknowns may require additional actions



MISO continues to promote cost-effective and innovative solutions that increase preparedness and the ability to respond appropriately to challenging situations

Continued improvements on Emergency Pricing

Conduct drills and training on Emergency Purchases with external entities

Improve management of uncertainty between DA and RT load forecasts

Continue to work with Joint Parties on management of the Regional Dispatch Transfer

Coordinate with RAN* effort to address demand side management and emergency procedures