2019 Illinois Summer Preparedness Policy Session

June 26th, 2019

Bob Kuzman
Director, State Regulatory Affairs
MISO drives value creation through efficient and reliable markets, operations, planning, and innovation

The most reliable, value-creating RTO

<table>
<thead>
<tr>
<th>MISO by-the-numbers</th>
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</thead>
<tbody>
<tr>
<td>High Voltage Transmission</td>
</tr>
<tr>
<td>Generation Capacity</td>
</tr>
<tr>
<td>Peak Summer System Demand</td>
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<tr>
<td>Customers Served</td>
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</tbody>
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https://www.misoenergy.org/about/media-center corporate-fact-sheet/
# MISO Preliminary 2019 Summer Forecast

<table>
<thead>
<tr>
<th>Summer Peak Forecast</th>
<th>125 GW</th>
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<tbody>
<tr>
<td>Total Projected Available Capacity*</td>
<td>149 GW</td>
</tr>
</tbody>
</table>

**All-time Summer Peak:**
127 GW on July 20th, 2011

NOAA forecasts warmer than normal temperatures for the MISO South region and parts of the Eastern footprint

*Includes Installed Capacity of Planning Resource Auction cleared resources, with wind and solar at capacity credit, plus Planning Resource Auction offered generation that did not clear but is expected to be available for the summer season.
MISO projects adequate reserves to meet 2019 expected summer peak demand forecast

- However, summer scenarios with high resource outages and high demand could have some challenges

<table>
<thead>
<tr>
<th></th>
<th>Demand Forecast (GW)</th>
<th>Reserve Margin Requirement (GW)</th>
<th>Supply (GW)</th>
<th>Reserves (GW)</th>
<th>Minimum Reserve Requirement</th>
<th>Beyond Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017/18 PY</td>
<td>125.0</td>
<td>144.8</td>
<td>148.5</td>
<td>23.5 (18.8%)</td>
<td>15.8%</td>
<td>3.0%</td>
</tr>
<tr>
<td>2018/19 PY</td>
<td>124.7</td>
<td>146.0</td>
<td>148.6</td>
<td>23.8 (19.1%)</td>
<td>17.1%</td>
<td>2.0%</td>
</tr>
<tr>
<td>2019/20 PY</td>
<td>124.7</td>
<td>145.9</td>
<td>148.8</td>
<td>24.1 (19.3%)</td>
<td>16.8%</td>
<td>2.5%</td>
</tr>
</tbody>
</table>
Range of projections include the uncertainty of a number of parameters and incorporate lessons learned from past years.

### Generation

- **Probable Generation Capacity**
  - Removes an average volume of resource outages (planned, maintenance, and forced)

- **Low Generation Capacity (High Outage)**
  - Removes a higher than normal volume\(^1\) of resource outages (planned, maintenance, and forced), typically because of non-normal weather conditions

### Load

- **Probable Load Forecast**
  - 50/50 forecast\(^2\), provided by Market Participants

- **High Load Forecast**
  - 90/10 forecast\(^3\)

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\(^1\) Based on 5-year historical outage information provided by Resource Owners

\(^2\) 50% chance of the actual load being lower and 50% chance of the actual load being higher

\(^3\) 90% of the actual load being lower and 10% chance of the actual load being higher
Adequate reserves are projected to meet expected summer peak demand forecast

Summer scenarios with high generation outages and high demand could drive operational challenges

**Summer 2019 Resource Adequacy Projections (GW)**

- **Probable Generation Capacity Scenario**
  - June: 115
  - July: 119
  - August: 118

- **Low Generation Capacity (High Outage) Scenario**
  - June: 109
  - July: 110
  - August: 111
MISO partners with members, drills on emergency procedures, and builds on past lessons learned to ensure operational readiness for summer.

Emergency Operating Procedures guide operator actions when an event has the potential to, or actually does, negatively impact system reliability.

- **Conservative System Operations**
- **Geo-Magnetic Disturbance Warning**
- **Severe Weather Alert**
- **Cold Weather Alert**
- **Hot Weather Alert**

### Maximum Generation Emergency Procedures

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
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<tbody>
<tr>
<td>1</td>
<td>Commit Emergency Resources, Declare NERC EEA 1, Activate Emergency Limits</td>
</tr>
<tr>
<td>2</td>
<td>Declare NERC EEA 2, Implement LMRs, LMMs Stage 1, Commit EDR Resources, Emergency Energy Purchases, Public Appeals, and set Emergency Pricing Tier 2 Offer Floor</td>
</tr>
<tr>
<td>3</td>
<td>Utilize Operating Reserves, and LMMs Stage 2</td>
</tr>
<tr>
<td>4</td>
<td>Reserve Call and Emergency Reserve Purchases</td>
</tr>
<tr>
<td>5</td>
<td>Declare NERC EEA 3, Firm Load Shed, and set LMPs and MCPs to VOLL</td>
</tr>
<tr>
<td></td>
<td>Max Gen and, possibly, Capacity Advisory Termination</td>
</tr>
</tbody>
</table>

Data Source: SO-P-NOP-00-449 Rev 2 Conservative System Operations and SO-P-EOP-00-002 Rev 7 MISO Market Capacity Emergency procedures
Stakeholder awareness of emergency procedures and communication processes improves transparency and sets expectations, ensuring the integrity of the electric grid.

MISO initiates several types of communications ahead of, or during abnormal operating conditions:

1. **Capacity Emergencies** requiring firm load curtailments
2. **Transmission System Emergencies or Forced Transmission Outages** requiring firm load curtailments
3. **Severe risk of terrorist attack, man-made or natural disasters** with potential to cause loss of firm load
Contact Info

Bob Kuzman
bkuzman@misoenergy.org

Rob Benbow
rbenbow@misoenergy.org
Questions?
Appendix
MISO is well prepared to handle operational challenges this summer

- MISO projects adequate reserve to meet 2019 summer peak forecasted demand of 125 GW
- No identified issues with the transmission system
- MISO engages with its state officials and stakeholders to maximize preparation during emergency conditions
- MISO partners with members and neighbors to ensure operational readiness for summer
The need for emergency procedures will be impacted by the availability of resources:

- **Wind Generation**
  - Counted as Summer Capacity: 2.6 GW
  - Potentially Available: 15.9 GW

- **Load Modifying Resources**
  - Counted as Summer Capacity: 12.3 GW
  - Potentially Available: 8.6 GW

- **Capacity Imports**
  - Counted as Summer Capacity: 3.3 GW
  - Potentially Available: 8.6 GW

- **Stranded Capacity**
  - Counted as Summer Capacity: -4.1 GW

GW stands for Gigawatts, a unit of power.
MISO prepares for extreme conditions in advance. In Real-Time, unplanned outages and other unknowns may require additional actions.
MISO is prepared for emergency situations