KENTUCKY MUNICIPAL ENERGY AGENCY

Emergency Response Plan

Doug Buresh

July 21, 2021

AGENDA

- NERC Assessment
  - MISO Reliability (Elevated Risk)
- KYMEA Preparation
  - Maintain Planning Reserves
  - Obtain Firm Transmission
  - Maintain Operating Reserves (90/10 Event)
- Emergency Response Plan
  - Immediate Directed Action
  - Coordination
  - Communication
  - Financial Impacts / Cash Flow

NERC 2020/2021 Winter Reliability Assessment

MISO does not anticipate resource availability issues for the upcoming 2020–2021 winter season. Based on prior winter readiness and fuel deliverability surveys, appropriate measures have been taken, making readying units for potential severe winter weather, and fuel deliverability is robust.

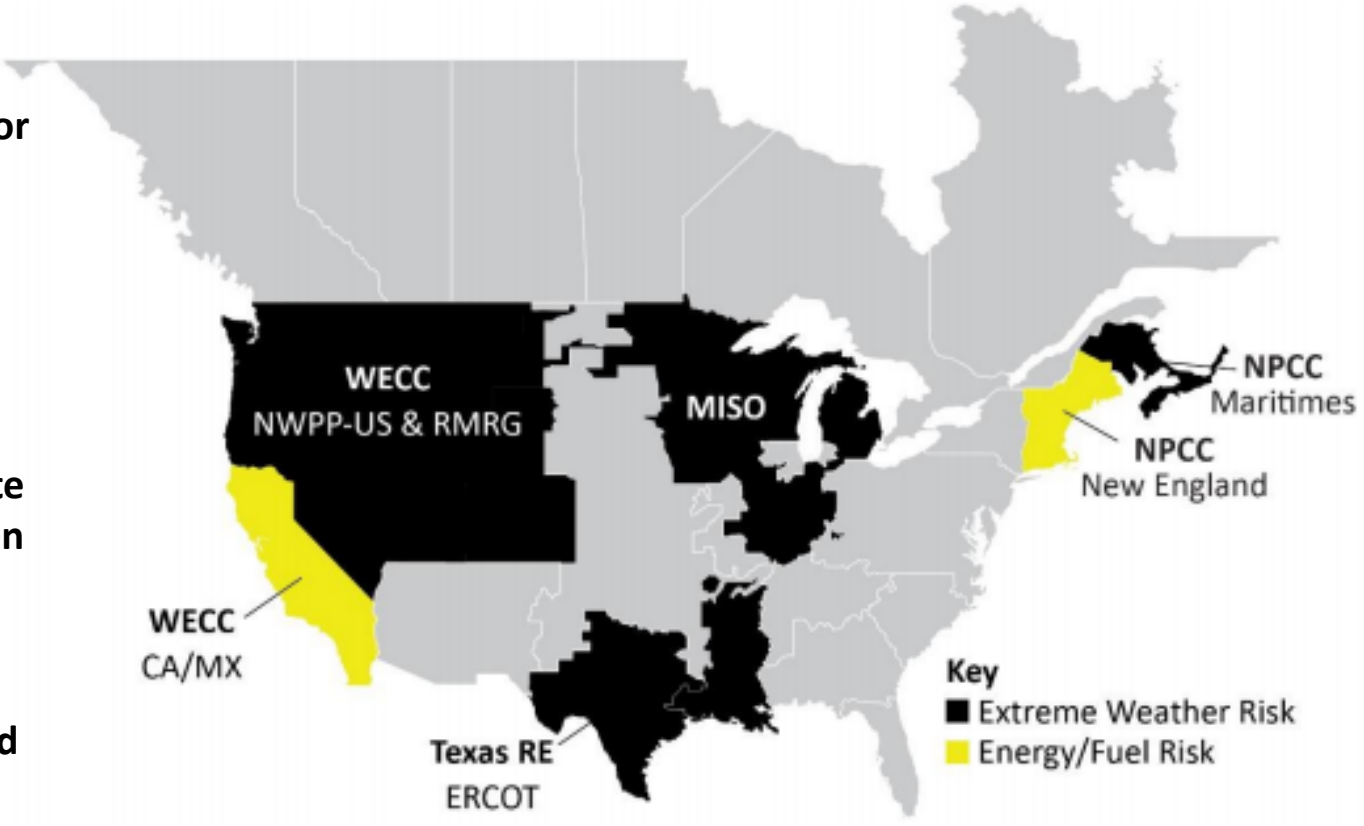


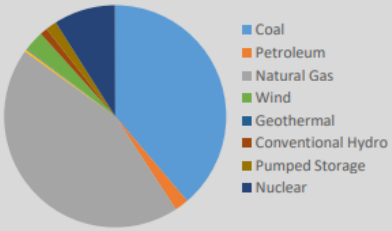
Figure 1: Areas with Reliability Risks during Extreme Weather Events and/or Fuel Supply Disruptions

MISO 2020/2021 Winter Risk Scenario

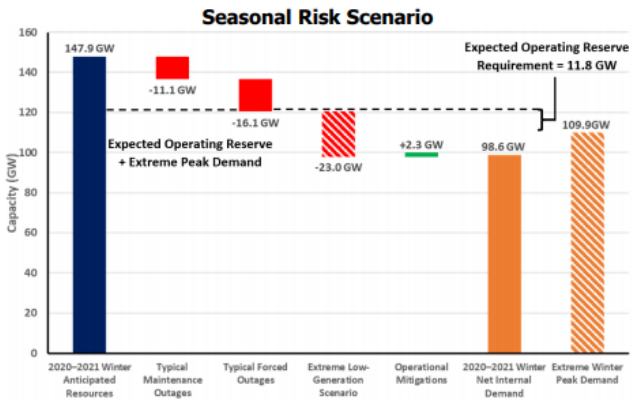
MISO

The Midcontinent Independent System Operator, Inc. (MISO) is a not-for-profit, member-based organization administering wholesale electricity markets that provide customers with valued service; reliable, cost-effective systems and operations; dependable and transparent prices; open access to markets; and planning for long-term efficiency.

MISO manages energy, reliability, and operating reserve markets that consist of 36 local Balancing Authorities and 394 market participants, serving approximately 42 million customers. Although parts of MISO fall in 3 NERC Regional Entities, MRO is responsible for coordinating data and information submitted for NERC's reliability assessments.



On-Peak Generation Fuel Mix



Risk Scenario Summary

Operating mitigations or EEAs may be needed under extreme peak demand and outage scenarios studied.

Scenario Assumptions

- **Extreme Peak Load:** 90/10 forecast
- **Outages:** Average from highest peak hour over the past five winters
- **Extreme Generation Scenario:** Additional outages corresponding to maximum generation outages observed at highest peak hour in past five years
- **Operational Mitigations:** Derived from required deployable contingency reserves.

MISO Resource Adequacy Data			
Demand, Resource, and Reserve Margins	**2019–2020 WRA**	**2020–2021 WRA**	**2019–2020 vs. 2020–2021 WRA**
Demand Projections	**Megawatts (MW)**	**Megawatts (MW)**	**Net Change (%)**
Total Internal Demand (50/50)	103,841	103,167	-0.6%
Demand Response: Available	3,822	4,536	18.7%
Net Internal Demand	100,019	98,631	-1.4%
Resource Projections	**Megawatts (MW)**	**Megawatts (MW)**	**Net Change (%)**
Existing-Certain Capacity	139,555	144,736	3.7%
Tier 1 Planned Capacity	778	574	-26.2%
Net Firm Capacity Transfers	-383	1,405	N/A
Anticipated Resources	139,951	146,715	4.8%
Existing-Other Capacity	535	6,390	1,094.3%
Prospective Resources	140,486	153,557	9.3%
Reserve Margins	**Percent (%)**	**Percent (%)**	**Annual Difference**
Anticipated Reserve Margin	39.9%	48.8%	8.9
Prospective Reserve Margin	40.5%	55.7%	15.2
Reference Margin Level	16.8%	18.0%	1.2

Highlights

- MISO does not anticipate resource availability issues for the upcoming 2020–2021 winter season. Based on prior winter readiness and fuel deliverability surveys, appropriate measures have been taken, making readying units for potential severe winter weather, and fuel deliverability is robust.
- Generator maintenance outages that were deferred from spring of this year due to the pandemic look to be on track for completion in fall. Extreme warm fall weather may impact scheduled maintenance outages, but there is no indication that these will be pushed into the peak of the winter season.

NERC 2021 Summer Reliability Assessment

MISO has sufficient resources for periods of peak demand. However, the above-normal levels of demand in the 90/10 forecast are likely to exceed capacity resources and require additional non-firm transfers from surrounding areas.

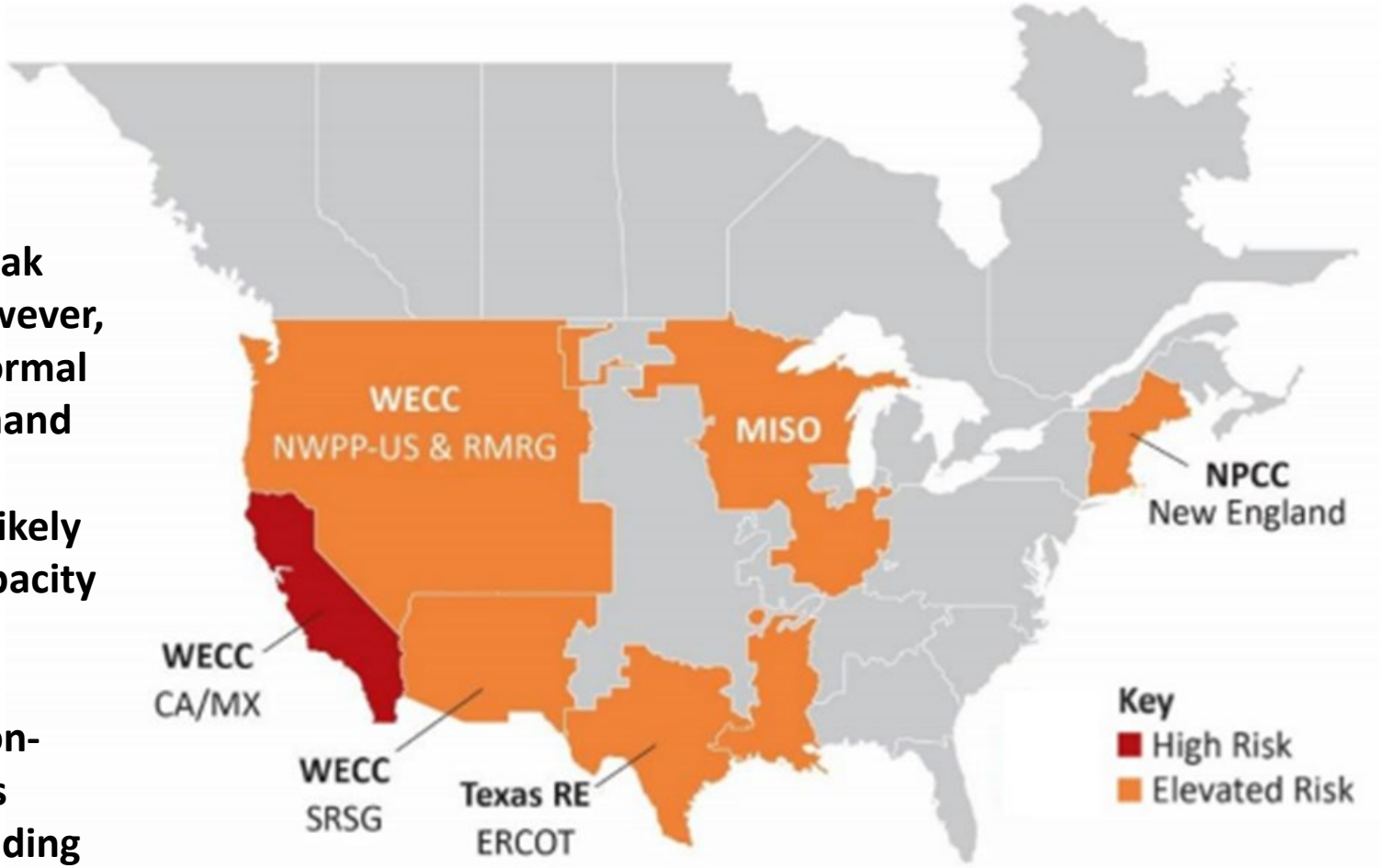


Figure 1: Energy Emergency Risk Areas

MISO 2021 Summer Risk Scenario

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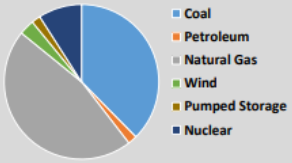
On-Peak Fuel Mix



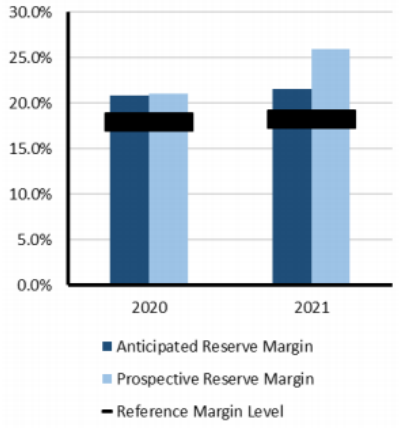
Highlights

- Summer scenarios with high resource outages and high demand may require use of load modifying resources (LMRs) and non-firm imports during peak periods. LMRs are an increasingly important segment of MISO resource portfolio. Operators designate resource constrained periods (Maximum Generation Events) to access LMRs.
- All MISO zones have met local capacity clearing requirements in the wholesale market auction and are projected to have sufficient resources for the summer.
- Covid-19 impacts on MISO load through late 2020 and the first quarter of 2021 have been much less pronounced than they were at the beginning of the pandemic. During the pandemic, MISO load has run 1–2% below normal in mild weather and 1–2% above normal in hotter weather. MISO expects load to trend close to normal through the summer; however, during a heatwave, load could trend 1–3% above normal due to increased residential demand.
- Based on probabilistic studies performed by MISO, the area has low amounts of EUE (18.6 MWh) for the summer season. Greatest risk occurs in the month of July, coinciding with the typical peak in annual demand.

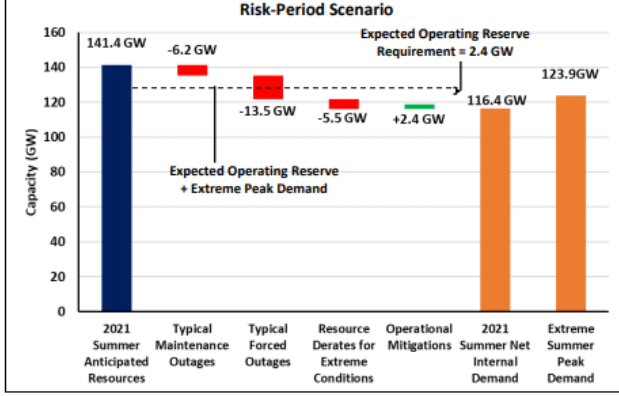
Risk Scenario Summary

Expected resources meet operating reserve requirements under normal peak-demand scenarios. Above-normal summer peak load and outage conditions could result in the need to employ operating mitigations (i.e., demand response, transfers, and short-term load interruption).

On-Peak Reserve Margins



Risk-Period Scenario

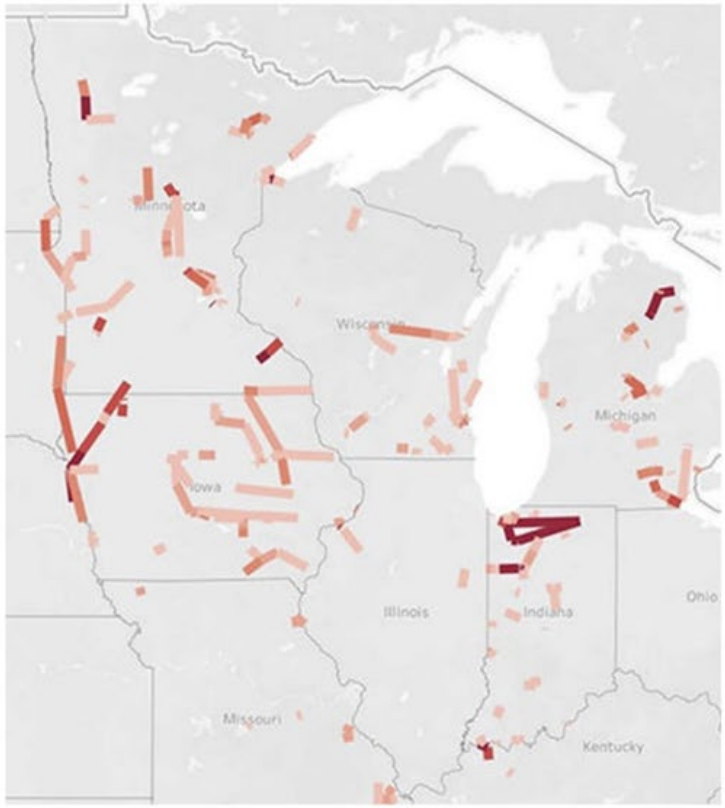


Scenario Description

- **Risk Period:** Highest risk for unserved energy at peak demand hour (late afternoon).
- **Demand Scenarios:** Net internal demand (50/50) and 90/10 demand forecast using 30 years of historical data
- **Maintenance Outages:** Rolling five-year average of maintenance and planned outages
- **Forced Outages:** Five-year average of all outages that were not planned
- **Extreme Derates:** Maximum of last five years of outages
- **Operational Mitigation:** A total of 2.4 GW capacity resources available during extreme operating conditions.

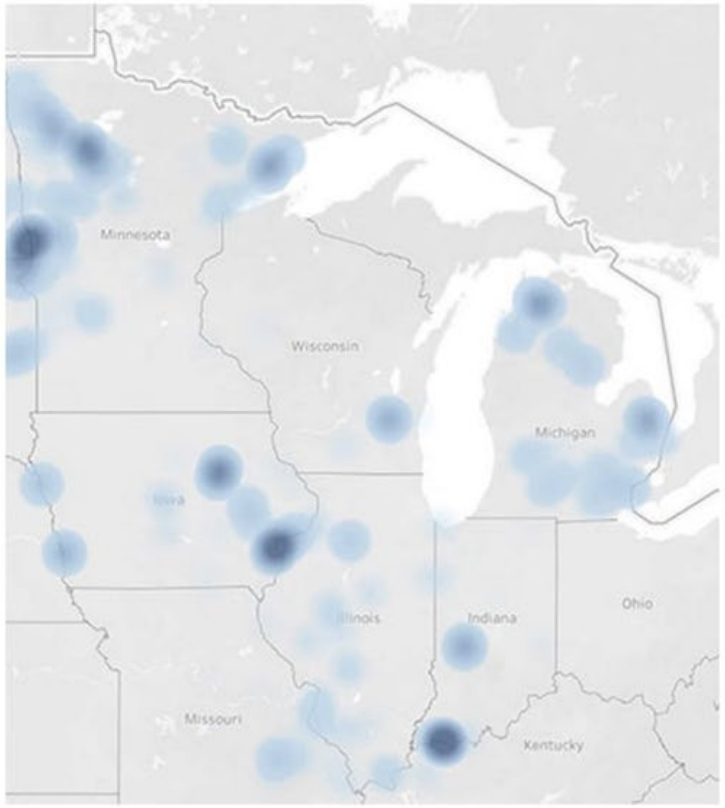
MISO 10-Year Transmission Issues

Thermal Issues



*Map reflects cumulative Thermal/Voltage issues across alll models

Low Voltage Issues



*Voltage issues by count

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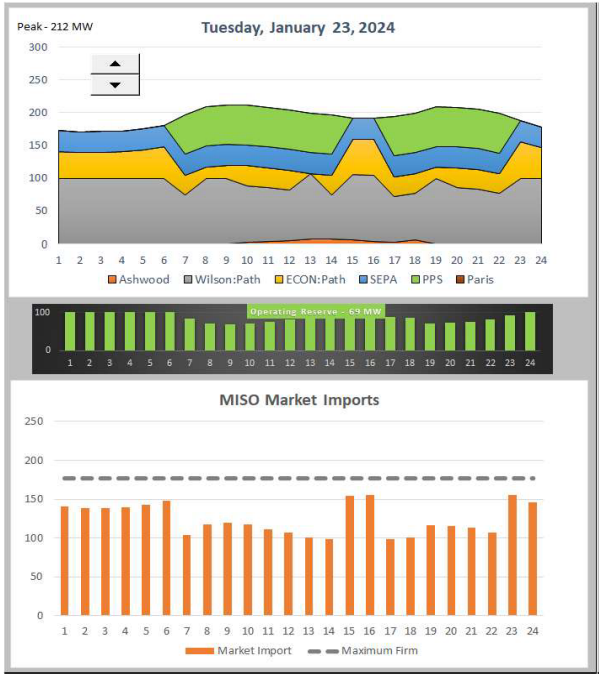
Winter Operating Reserves

Operating Reserves: 69 MW

Peak Winter Day

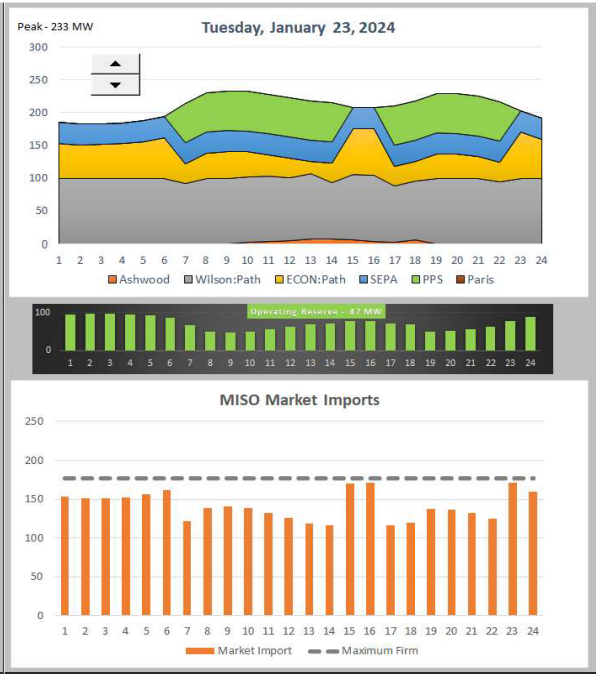
All Units Available



Operating Reserves: 47 MW

1-in-10 Peak Winter Day

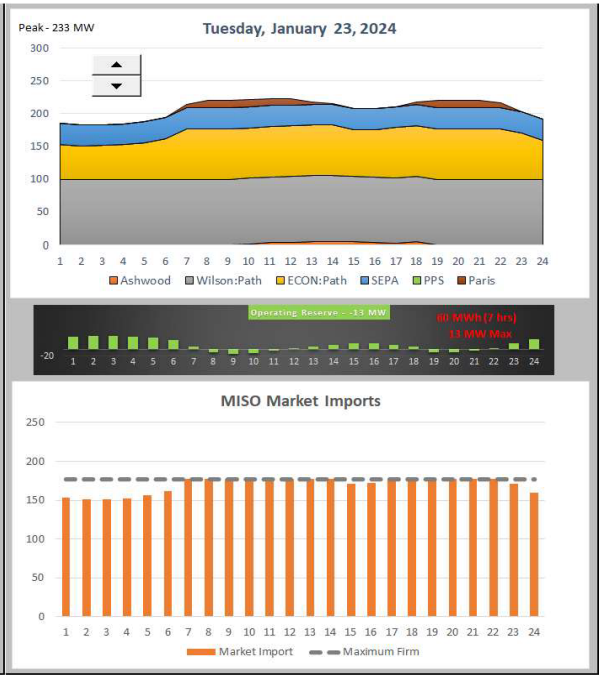
All Units Available



Operating Reserves: -13 MW

1-in-10 Peak N-1 Contingency

PPS FO, Ashwood 20% Derate

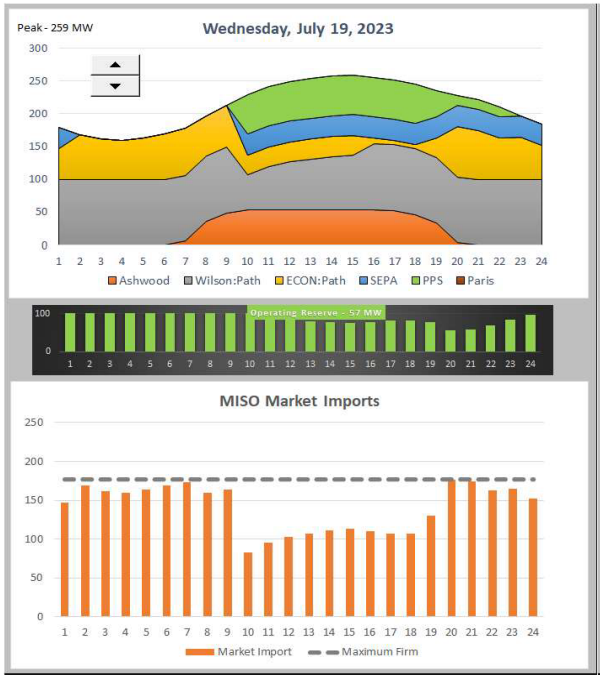


Summer Operating Reserves

Operating Reserves: 57 MW

Peak Summer Day

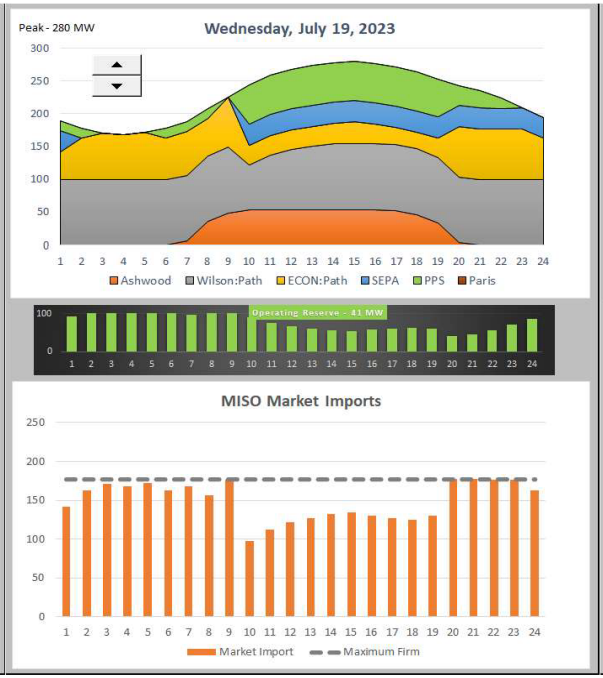
All Units Available



Operating Reserves: 41 MW

1-in-10 Peak Summer Day

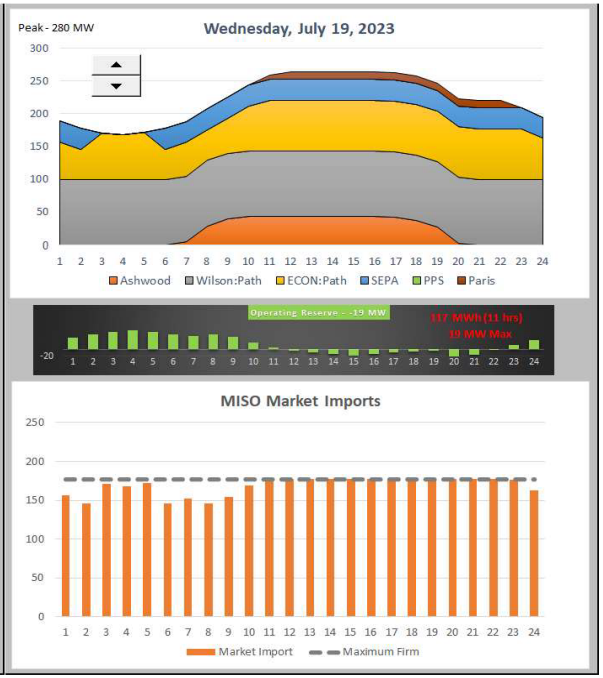
All Units Available



Operating Reserves: -19 MW

1-in-10 Peak N-1 Contingency

PPS FO, Ashwood 20% Derate



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Emergency Response Plan

Meeting with KYMEA, KYMEA Members and ACES Power Marketing to develop Emergency Response Plan

- Curtailment Coordination
- Proactive Communication
- Financial Impacts

Tentative meeting planned for August 11, 2021 (10 – 2)