



MISO Congestion Management

ESIG Fall Technical Workshop

10/25/2022

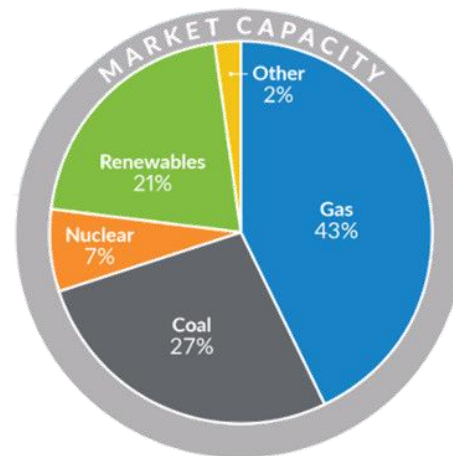
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Region Reliability Coordination

MISO drives value creation through efficient and reliable markets, operations, planning, and innovation

The most reliable, value-creating RTO



★ Represent MISO's regional office and control center locations; MISO's primary data center is located in Carmel, IN



MISO by-the-numbers*

High Voltage Transmission	65,800 miles
Customers Served	42 Million
Peak System Demand	127,125 MW
Generation Capacity	189,421 MW

Operator Awareness Tools used for MISO Congestion Management

- Equipment status alarms
- SCADA
- EMS : Energy Management System
- SE : State Estimator
- RTCA : Real-Time Contingency Analysis
 - Basecase (real-time overloads)
 - N-1
- Various other reliability and data analysis tools

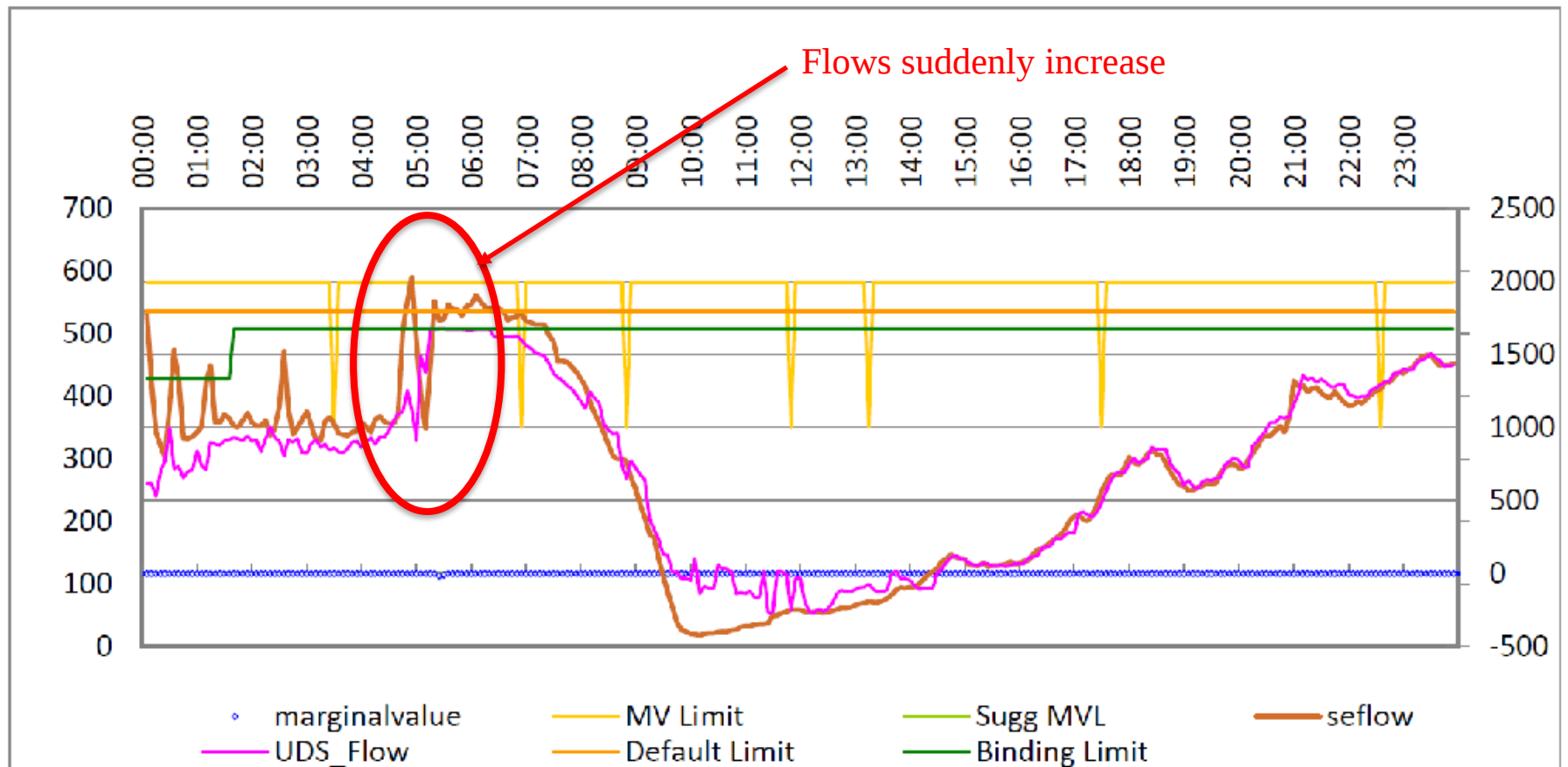
Disturbances may occur that require the use of one or multiple Control Actions available for MISO Congestion Management

- Curtailment of Test Energy if applicable
- Set applicable generation to Not Qualified (NQ) for Ancillary Services
- Activate constraint in Unit Dispatch System (market binding, SCED)
- Market to Market (if applicable)
- Transmission Loading Relief (TLR)
- Commitment of Generation Resources
- Manual redispatch of applicable generation
- Reconfiguration Options
- Emergency Declarations or Safe Op Mode
 - Access Emergency Dispatch Ranges
 - Access to Emergency Only Generation
 - Load Shed

How does MISO Operate Renewables?

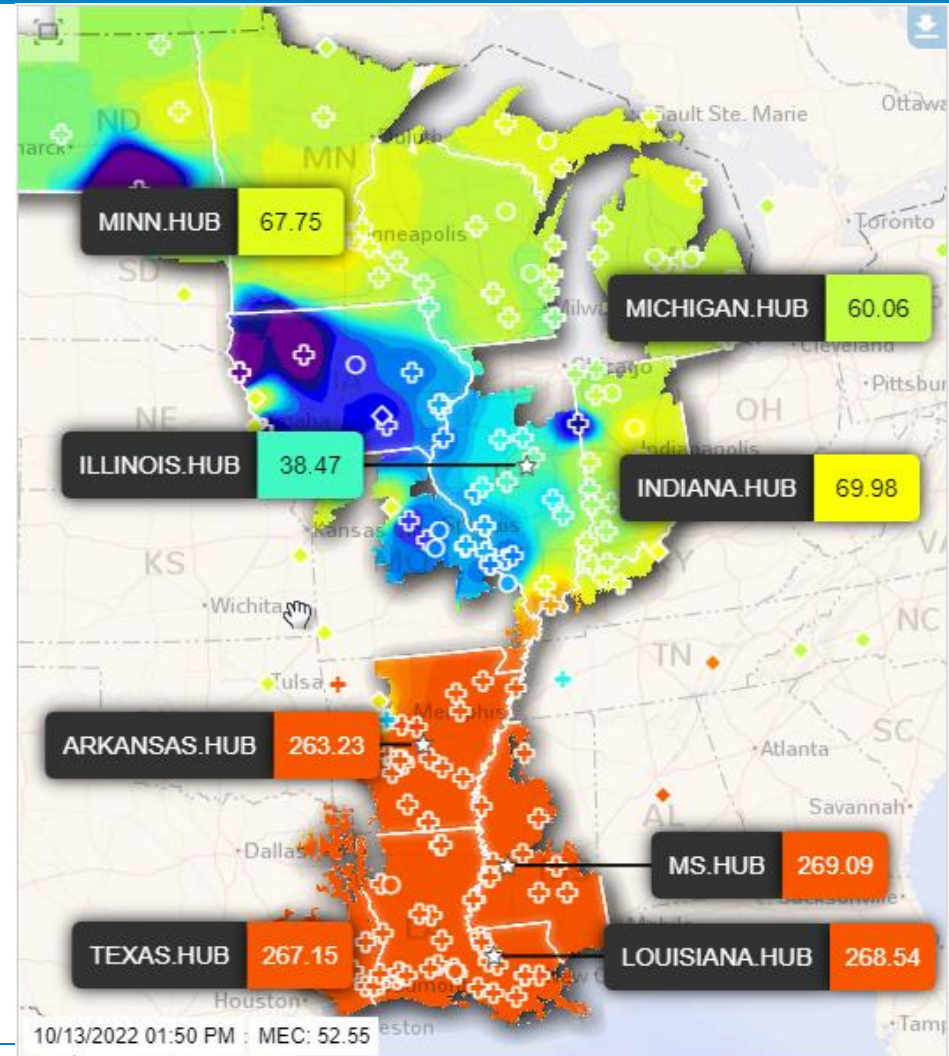
- Renewables (wind and solar) are treated the same as any other generator within the MISO footprint.
 - Forecasts are used as their Economic Maximum; the market utilizes that as it dispatches the units.
- Unique Challenges for renewables:
 - Wind and solar farms can be built at a much faster pace than Transmission.
 - Best sites for wind and solar are usually great distanced from load.
 - Very fast ramping resources (Volatility).
 - Can result in quickly pushing congestion over limits.
 - Can also result in low voltages on the system.
- These unique challenges result in more MRDs and capping of renewable resources than other types of resources within the MISO footprint.

Example of volatile constraint due to fast ramping wind



Challenges and Potential Mitigation(s)

- Reconfiguration Requests due to Congestion Costs
- Transmission build-out needed to fully realize benefit of low cost resources (specifically wind generation)

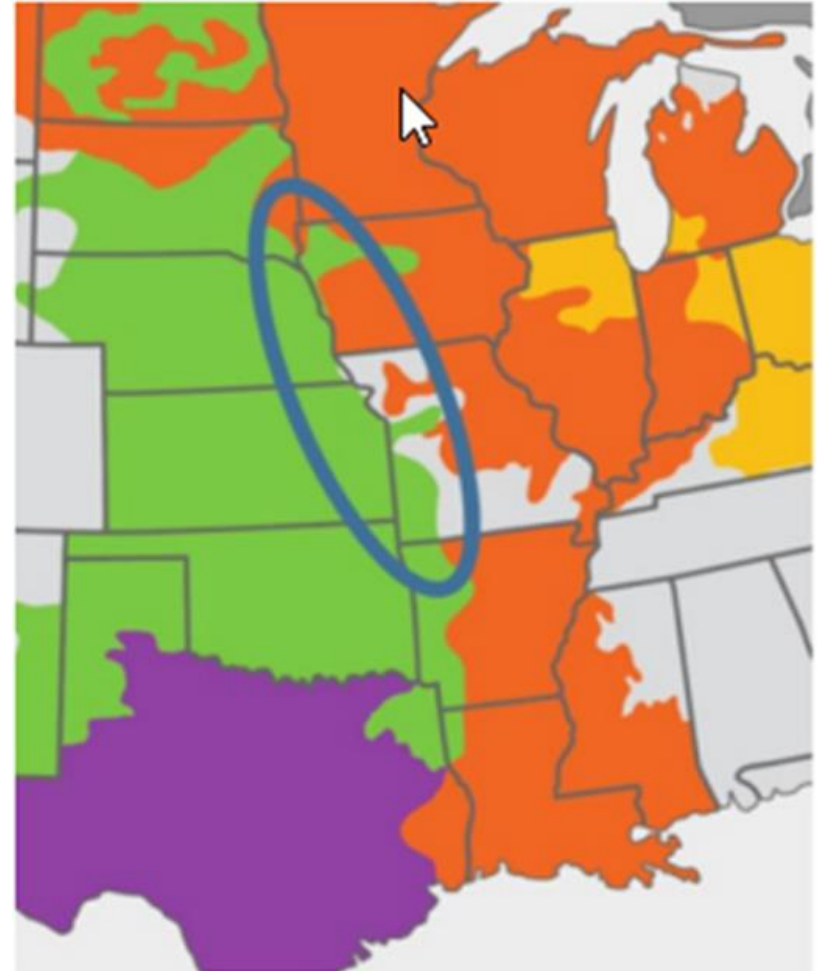


Reconfiguration for Congestion Cost Task Team

- Closed, Reliability only stakeholder task team formed to develop a process for evaluating and taking action on requests for reconfiguration due to congestion costs
- First meeting held on January 20, 2022.
- Designing process to account for the reliability and economic impacts of reconfiguring the transmission system to alleviate congestion costs
- Process is now being finalized in the open Reliability Subcommittee (RSC)

SPP – MISO Joint Targeted Interconnection Queue Study (JTIQ)

- Developed as a means to identify projects required for the interconnection of low cost resources which provide economic benefit to both the MISO and SPP regions



SPP – MISO Joint Targeted Interconnection Queue Study (JTIQ)

- The JTIQ Study involved coordinated technical analyses performed by SPP and MISO to determine the transmission project requirements that would cost effectively resolve the transmission constraints inhibiting the interconnection of new generation near the SPP-MISO seam.
- Joint study started in December 2020 and concluded in December 2021.
- Both MISO and SPP stakeholder communities have been involved throughout the process.
- Cost Allocation discussions will be on-going throughout 2022.

Selected JTIQ project portfolio

- 7 project portfolio with an estimated cost of \$1.75 Billion
- Fully resolves targeted transmission constraints identified in the study
- Delivers economic benefits to each RTO through adjusted production cost savings
 - \$724 Million to MISO
 - \$247 Million to SPP





Questions?

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