

## MISO Outage Coordination Update

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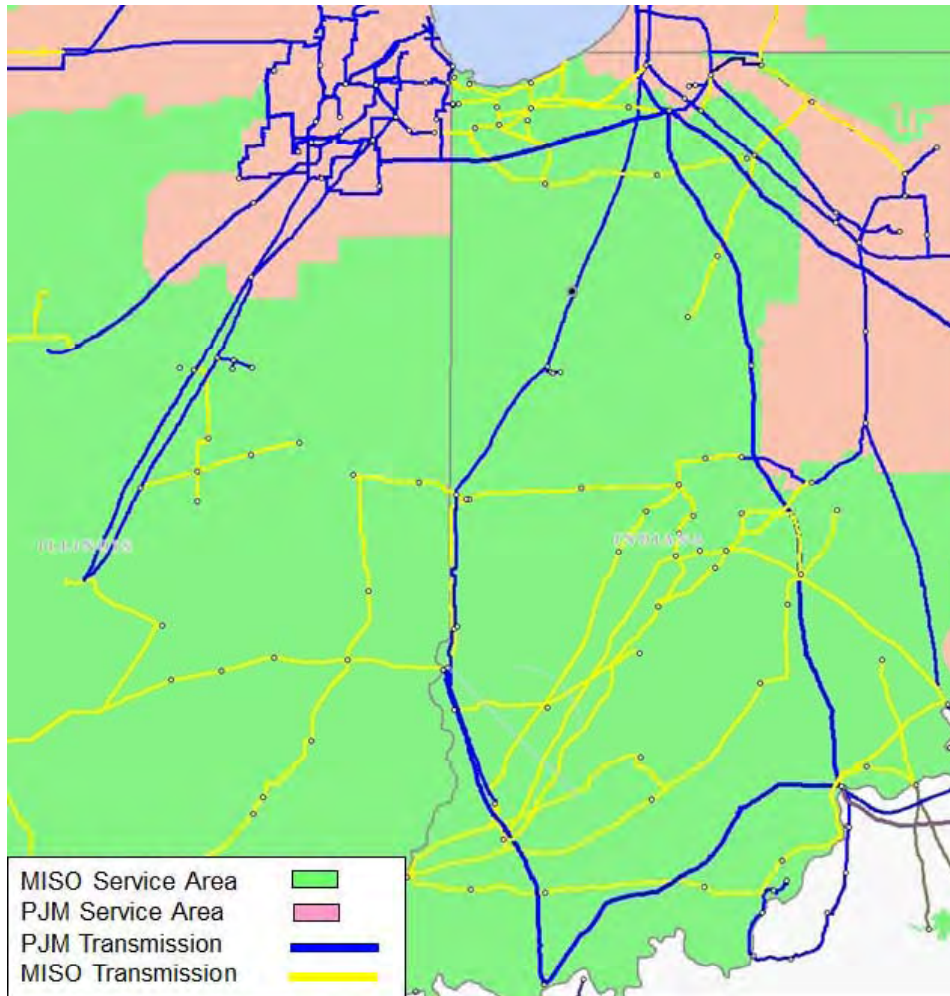
# Overview

- **Market to Market Review**
  - Guiding Principles
- **MISO FTR Funding Success**
  - Internal coordination practices
- **Next Steps**
  - Ensure problem statement is well defined
  - Additional data necessary to determine next steps

# Market to Market Is a Tool for Operations

- **M2M has existed since 2005 and brought many benefits to the seam**
  - Lower production costs when managing congestion
  - Price convergence at the Seam
  - Minimizes out of market actions to preserve reliability
- **Increase in M2M flowgates does not increase congestion across the seam**
  - 90% of total binding hours on MISO flowgates are for standing constraints

# Complex Seam with Heavy Transfers

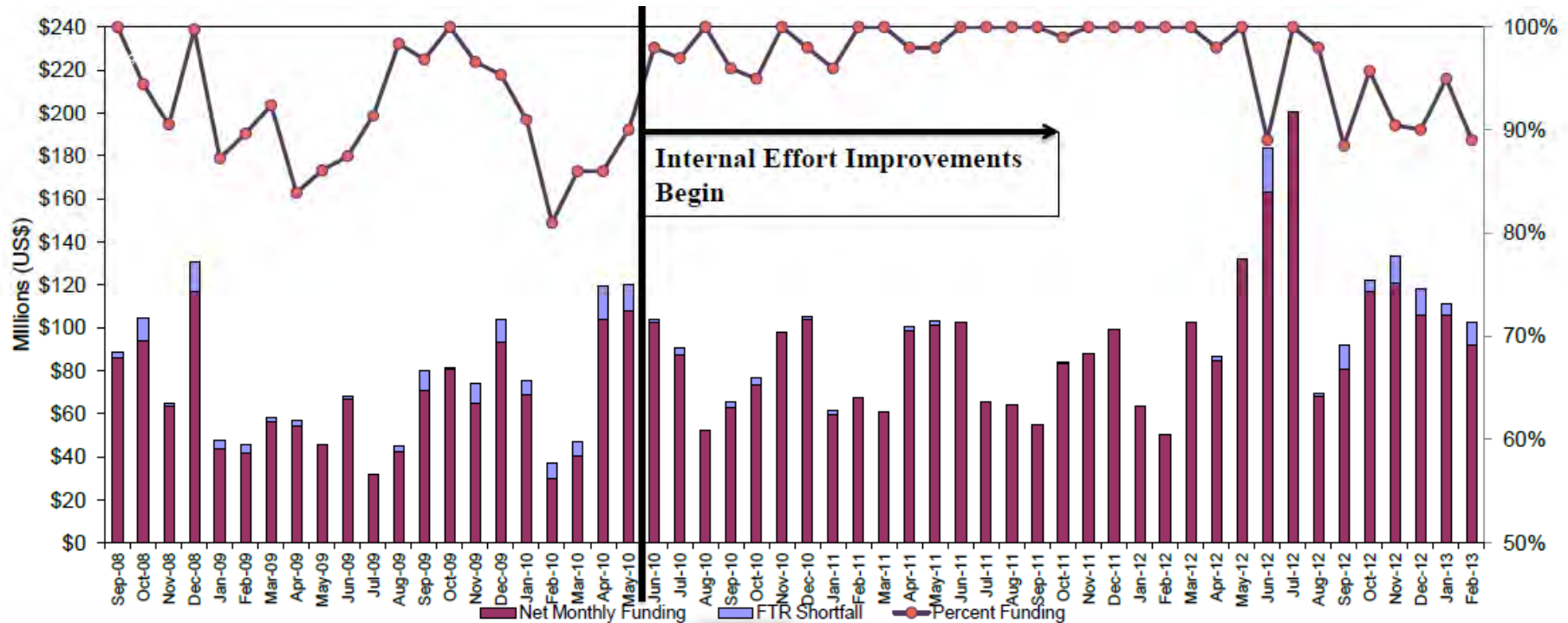


- **Loss of Wilton Center-Dumont 765 kV impacts underlying 345kV and 138kV system**
- **Meadow Lake & Fowler Ridge**
- **Clinton and Kincaid**
- **M2M facilitates efficient and reliable operation under a variety of operating scenarios**

# Tipping point for No. of M2M Flowgates

- **Parties agreed in 2011 to no longer use approximate or “Proxy” Flowgates to control flow on heavily loaded constraints**
  - Maximizes flow across all facilities; requires more flowgates b/c there are no substitutes in real time
  - Can make it challenging to model expected congestion on forward processes
- **Half of increased M2M Flowgates only exist for switching equipment in and out of service**
  - MISO is willing to explore alternative approaches to temporary conditions at the start of planned outages

# MISO's FTR Funding Improvement



- **MISO solved FTR underfunding issues through internal coordination without changing outage coordination rules**



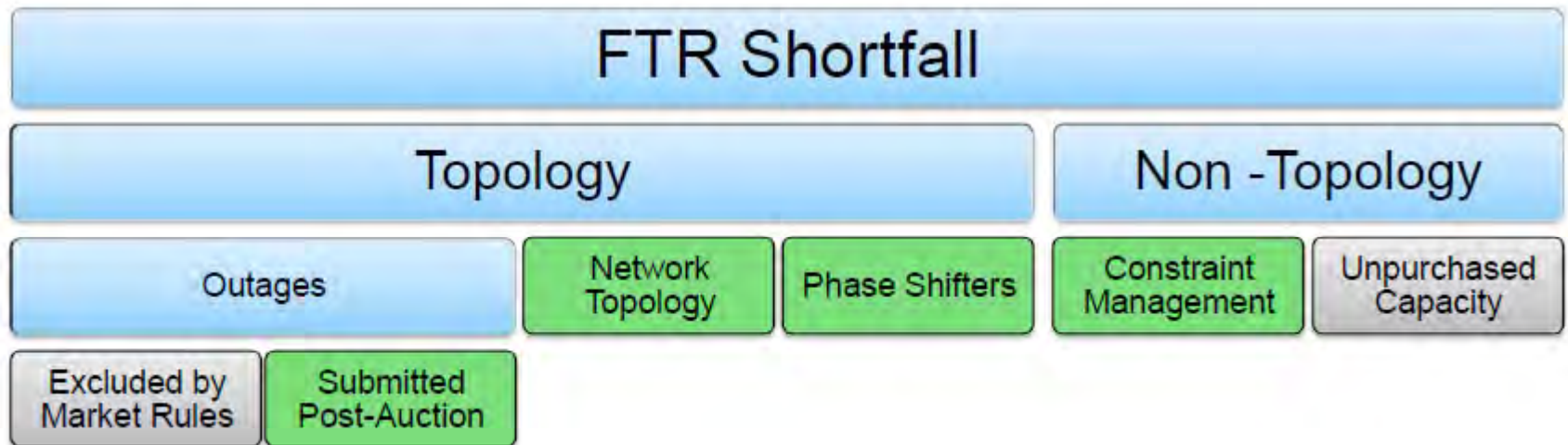
# Coordination Prior to Annual/Monthly Auctions

- **Forward Operations groups focus models on expected outcomes**
  - System is dynamic, changes month to month
- **Review expected outages for upcoming month and suggest constraints to be modeled in monthly auction**

# Multiple Areas Driving FTR Underfunding

Actionable vs. Market Bias

Determined which categories could be directly improved without market changes



- MISO provides monthly reports at its FTRWG that identify specific drivers of underfunding for each month



# Additional Detailed Analysis Is Required

- **PJM reports\* show 2012/2013 PJM underfunding driven primarily by outages in PJM classic -> \$240M**
  - Underfunding on MISO facilities -> \$47M (20%)
  - 8 out of the 9 MISO facilities are standing constraints
- **Specific drivers of underfunding need to be identified**
  - Outage Driven -> If so, submitted in time for FTR auction?
  - Other standing system constraint
  - Requested specific outage details from PJM that will assist us in our analysis



\* Monthly MIC Markets Reports

## Next Steps

- **MISO receive and review data from PJM and quantify key drivers for PJM FTR underfunding issues**
- **MISO work with PJM SMEs to explore process improvements**
- **MISO continue discussions with TOs about outage submittal times**

# Timeline

- **Propose SMEs meet bi-weekly**
- **Detailed review of outage processes – August 2013**
- **Identify possible solutions – September 2013**
- **Feedback from JCM – November 2013**
- **Develop detailed design – Nov – Jan 2014**
- **MISO and PJM Stakeholder Processes – Feb – Mar 2014**
- **Implementation – Apr- June 2014**

# Appendix

# Binding Hours on MISO Flowgates

Year	Outage Specific Flowgate Binding Hours	Total MISO Flowgate Binding Hours	Percentage Outage Specific Binding Hours
2011	2,490	18,405	14%
2012	2,451	22,456	11%
2013*	783	8,114	10%
<b>Total</b>	<b>5,724</b>	<b>48,975</b>	<b>12%</b>



\* Data as of April 2013

# MISO Flowgates Identified in PJM MIC Operations Reports

Flowgate	Underfunding	Constraint Type
Monticello - East Winamac 138kV	\$15.6M	Standing
Laporte – Michigan City 138 kV	\$9.5M	Standing
Beaver Channel – Albany 161 kV	\$8.8 M	Standing
Oakgrove – Galesburg 161 kV	\$3.5M	Standing
Stillwell Xfmr	\$3.3M	Forced Outage
Rising 345/138 kV Xfmr	\$2.7M	Standing
Rantoul – Rantoul Jct 138 kV	\$1.9M	Standing
Brokaw 345/138 kV Xfmr	\$1.2M	Standing
6101 - Hennepin 138kV (Comed/MISO)	\$1.2M	Standing