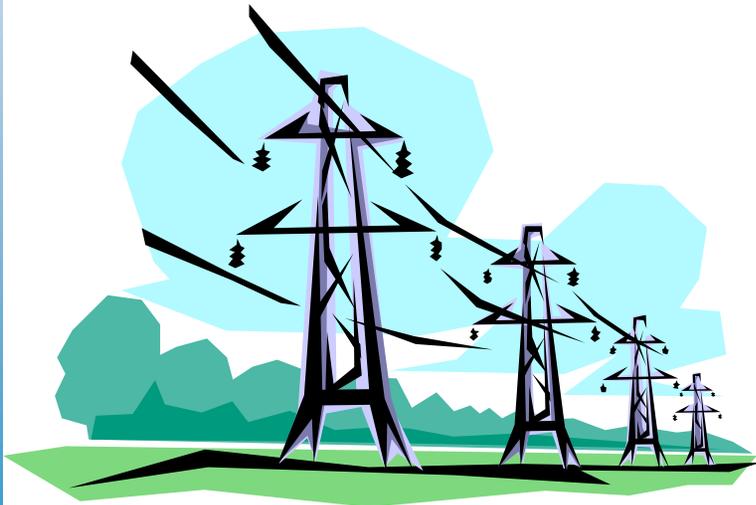


IURC 2005 SUMMER READINESS FORUM

Midwest ISO's Readiness for Summer Operations



Roger Harszy
VP, Real Time Operations
Midwest ISO

May 6, 2005

MISO

Topics

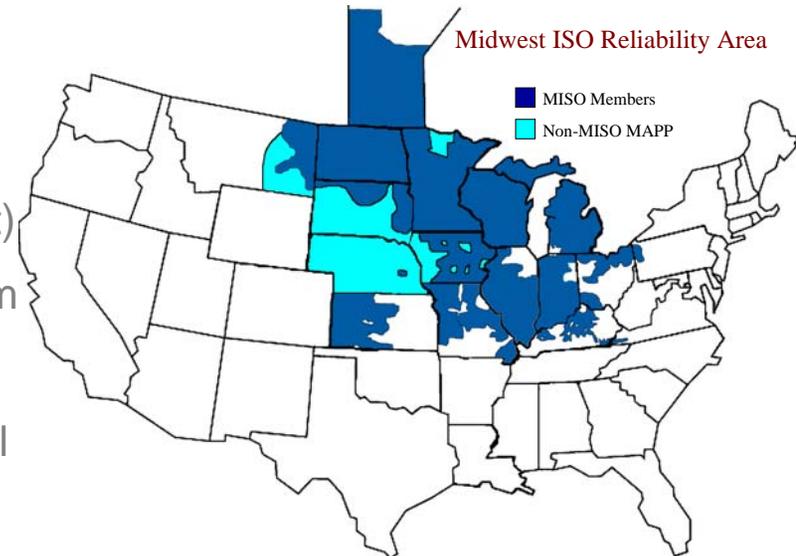
- Background
- Reliability Operations
- Market Operations
- TLR Reduction Since Market Start
- Capacity Projections
- Procedures

Background

The Midwest ISO is the independent, non-profit regional transmission organization that monitors the high-voltage transmission grid across much of the Midwest.

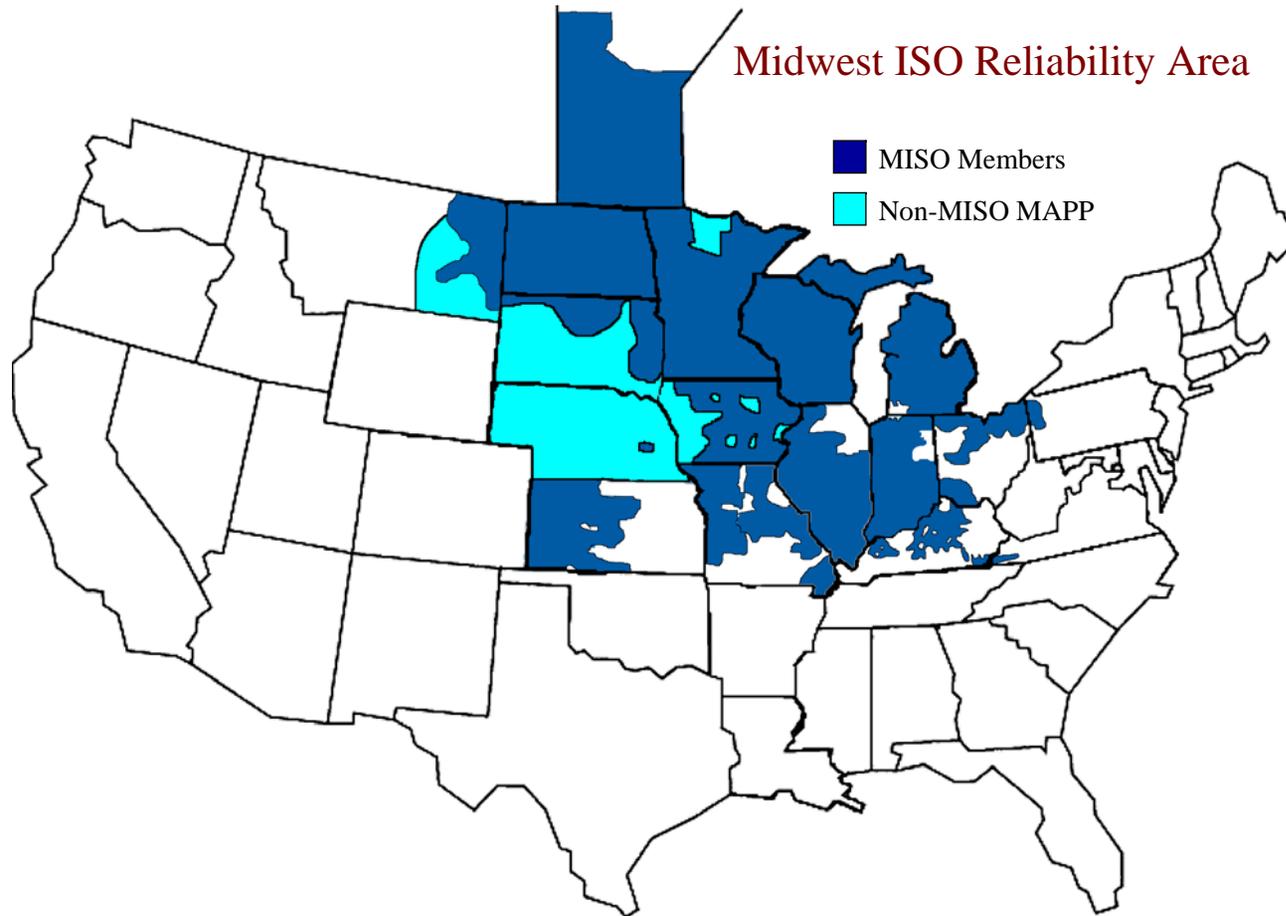
Operational Since December 15, 2001

- 23 Transmission Owners
- 35 Balancing Areas (25 in Market)
- 132 GW of peak load (116 GW in Market)
- 161 GW generating capacity (141 GW in Market)
- 117,000 miles of transmission lines (96,000 in market)
- 16.5 million customers (15.1 million in market)
- Carmel, Indiana and St. Paul, Minnesota Control



MISO

Midwest ISO Service Territory



Midwest ISO Regional Boundary Split

West Region

Total

15 Control Areas
33,068 MW Peak Demand
39,641 MW Generation
2,463 Monitored Elements

Market Sub-Region

5 Control Areas
15,968 MW Peak Demand
20,091 MW Generation
1,263 Monitored Elements
317 CPNodes

Non-Market Sub-Region

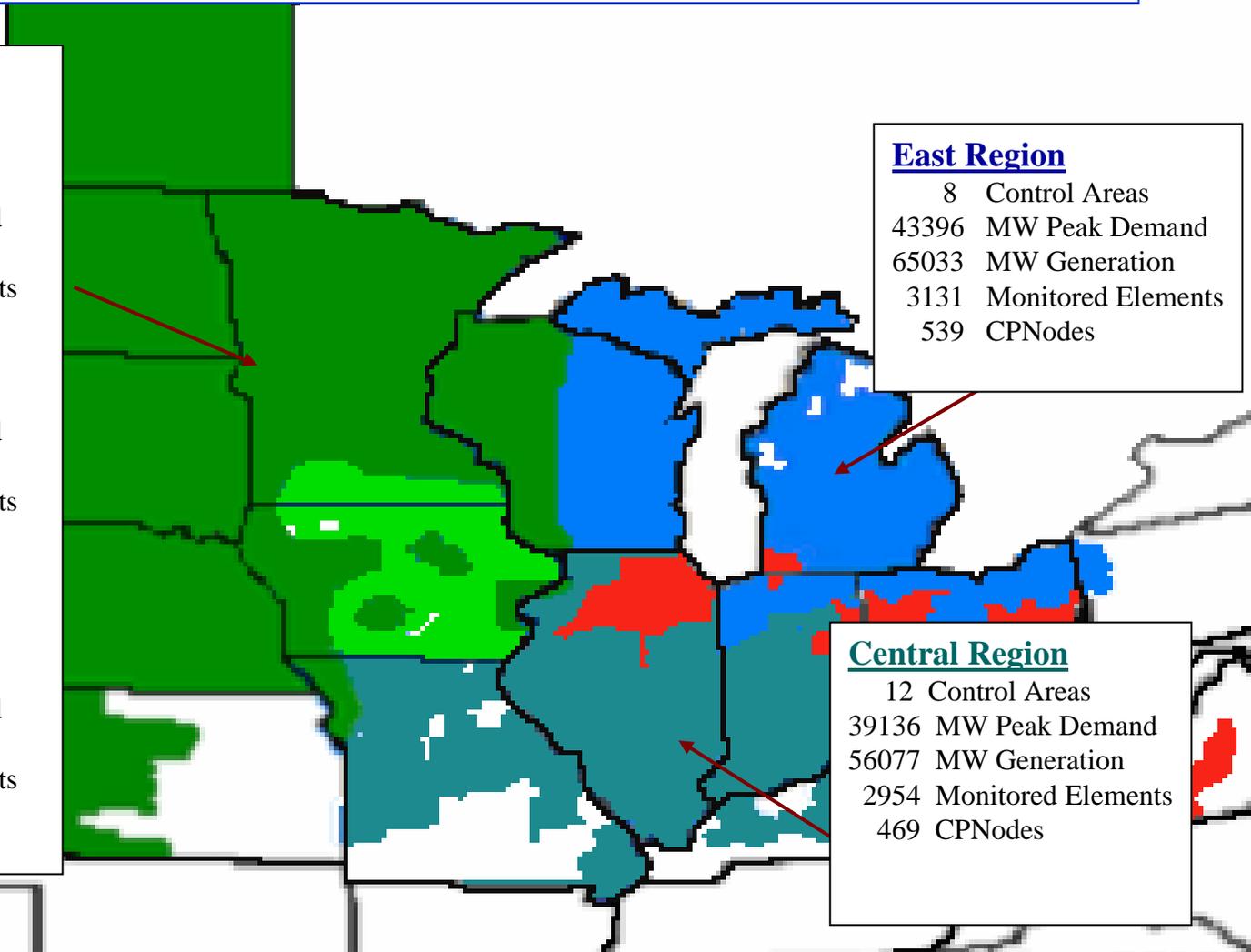
10 Control Areas
17,100 MW Peak Demand
19,550 MW Generation
1,200 Monitored Elements

East Region

8 Control Areas
43,396 MW Peak Demand
65,033 MW Generation
3,131 Monitored Elements
539 CPNodes

Central Region

12 Control Areas
39,136 MW Peak Demand
56,077 MW Generation
2,954 Monitored Elements
469 CPNodes



Reliability Operations

- **State Estimator**
 - 31,000 Network Buses
 - 134,000 Measurements
 - Takes 12 seconds to solve and is triggered automatically every 90 seconds or on demand
 - Provides outstanding visibility of MISO and surrounding areas.
 - 24 x 7 engineering support to maintain very high availability

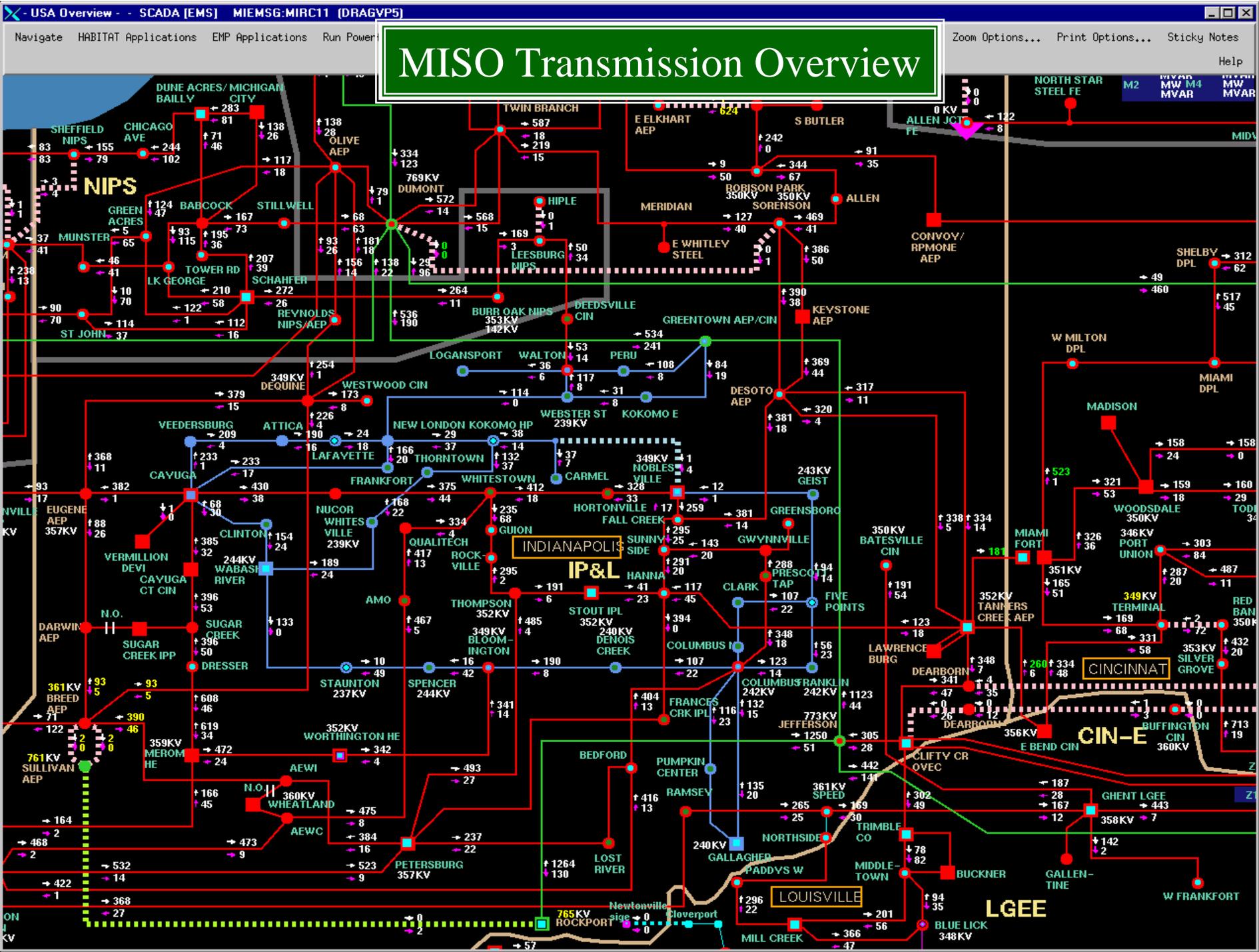
Reliability Operations

- **Contingency Analysis**
 - 8350 Contingencies or “what ifs” performed
 - Takes 2 minutes to analyze contingencies and is run automatically at least every 5 minutes or on demand as needed
 - Most comprehensive analysis of any power system

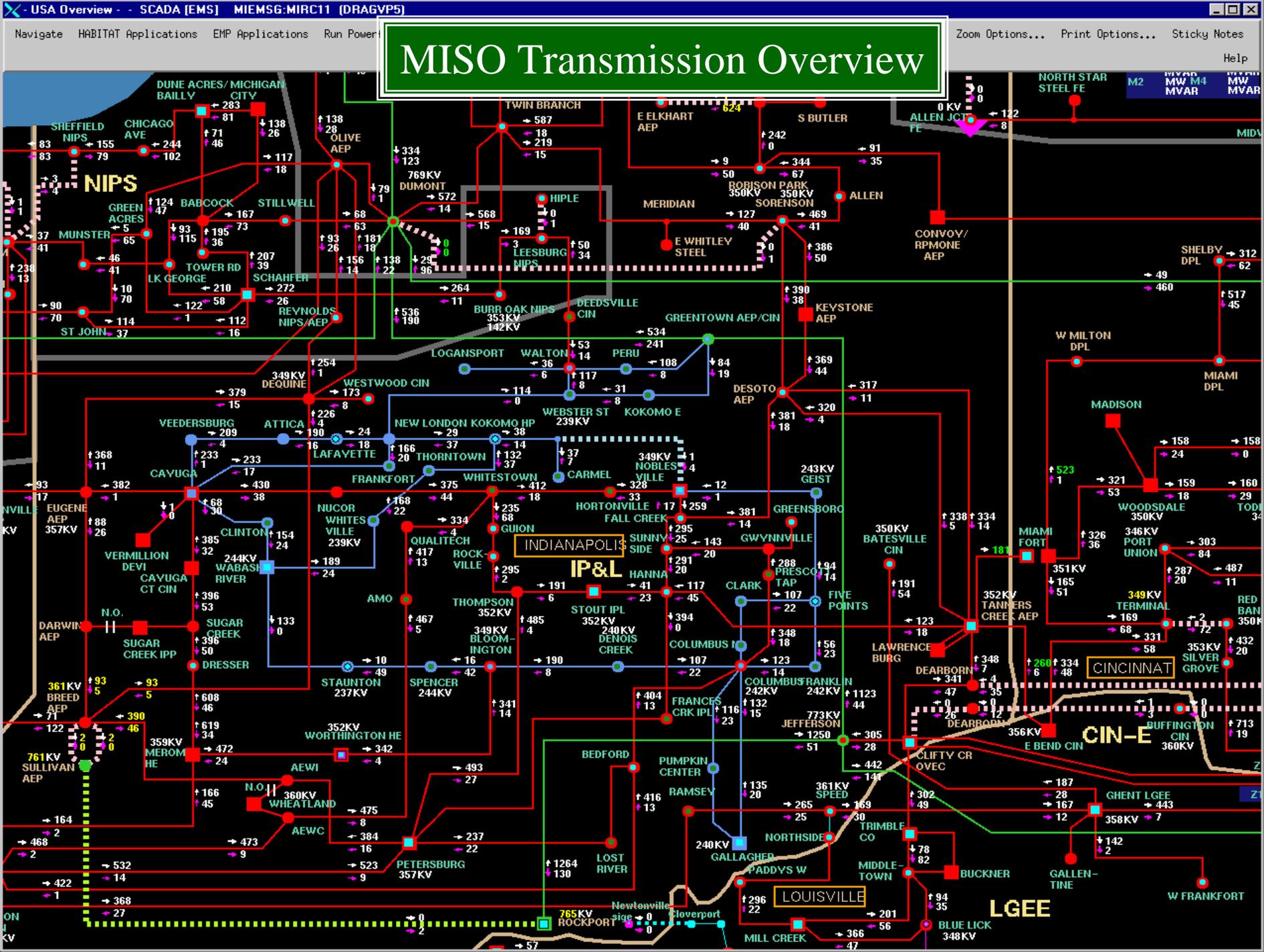
Carmel, Indiana



St. Paul, Minnesota **MISO**



MISO Transmission Overview



Market Operations

- Starting April 1, 2005, MISO is operating a Real-Time and Day-Ahead energy market
 - Locational Marginal Prices (LMPs) with Financial Transmission Rights (FTRs) optimizes dispatch to manage congestion
- Similar to systems used by PJM, ISO- New England, and the New York ISO

Market Operations

Real Time Operations

- Control area NSI calculated every 5 minutes. Ramped NSI is sent every 4-seconds.
- Dispatch instructions (set points) are sent every 5-minutes
- Dispatch instructions are consistent with offer parameters submitted by Market Participant
- SCED objective is to minimize cost to serve load and manage constraints

Capacity Projections

- ECAR Regional Reliability Organization
 - ECAR Generation Resource Panel reports:
 - Capacity Margin in the ECAR Region is expected to be 19.4% during the peak demand this summer compared to 20.1 % last summer
 - Capacity Margins appear to be satisfactory

Procedures

- Maximum Generation
- Minimum Generation
- Transmission Contingencies
- Conservative Operations
- Safe Operating Mode

