Midwest Independent Transmission System Operator

Midwest ISO Synchrophasor Deployment Project

Abstract

The Midwest Independent Transmission System Operator (Midwest ISO) is deploying synchrophasor technology throughout its service footprint. Midwest ISO's primary objective is to use the technology to optimize the dispatch and operation of power plants while improving the reliability of the bulk transmission system. The project deploys phasor measurement units, phasor data concentrators, and advanced transmission software applications. This technology increases the visibility of grid operators' bulk power system conditions in near real time, enables earlier detection of conditions that could result in grid instability or outages, and facilitate information sharing with neighboring regional control areas. Access to better system operating information allows Midwest ISO engineers to improve power system models and analytical techniques, improving the overall reliability and operating efficiency of the Midwest ISO system.

Smart Grid Features

This project helps Midwest ISO implement an advanced ***wide-area monitoring, visualization, and control system*** that leverages the existing communications systems. The new system provides a more expansive view of the bulk transmission system while revealing dynamic operating details. These improvements help optimize the dispatch of power generation while improving system reliability.

Advanced transmission applications for the synchrophasor system include:

- **Wide-area situational awareness** allows Midwest ISO previously unavailable visibility of the regional bulk transmission system. This enables better response to adverse changes in system conditions.
- **Oscillation monitoring** allows Midwest ISO grid operators and engineers to observe power system disturbances and oscillations and to know how these events may impact the reliability of the grid.
- **Event detection** notifies grid operators of conditions that may affect grid reliability.
- **State estimation integration** improves accuracy of power systems models for planning and operations.

At-A-Glance

Recipient: Midwest Independent Transmission System Operator

States: IA, IL, MI, MN, MO, MT, ND, OH, PA, SD, and WI

NERC Regions: Midwest Reliability Organization, ReliabilityFirst Corporation, SERC Reliability Corporation, and Western Electricity Coordinating Council

Total Budget: $34,543,476

Federal Share: $17,271,738

Transmission Owners: Ameren, Duke Energy, Great River Energy, Hoosier Energy, Indianapolis Power & Light, ITC Holdings, Manitoba Hydro, MidAmerican Energy, Minnesota Power, Northern Indiana Public Service, Otter Tail Power, Vectren Corp.

Project Type: Electric Transmission Systems

Equipment

- 150 Phasor Data Concentrators
- 25 Phasor Measurement Units

Advanced Transmission Applications

- Wide-Area Situational Awareness
- Oscillation Monitoring
- Event Detection
- State Estimation Integration

Key Targeted Benefits

- Reduced Congestion Cost
- Reduced Ancillary Service Cost
- Optimized Generator Operation

Midwest Independent Transmission System Operator *(continued)*

Timeline

Key Milestones	Target Dates
Substation automation installation starts	Q3 2010
Distribution automation installation starts	Q4 2010
Substation automation installation complete	Q4 2012
Distribution automation installation completes	Q4 2012

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