

# NERC

NORTH AMERICAN ELECTRIC  
RELIABILITY CORPORATION

## NERC Balancing Authority (BA) Certification Review of the Midwest ISO as part of the Dairyland Power Cooperative Integration

Site Visit Conducted  
April 20, 2010  
Midwest ISO  
Carmel, Indiana

to ensure  
the reliability of the  
bulk power system

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# Introduction

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This report presents the results of the North American Electric Reliability Corporation's (NERC) Balancing Authority (BA) Certification review of Midwest Independent Transmission System Operator (Midwest ISO) NCR00826, preparation for the addition of Dairyland Power Cooperative (DPC) NCR00979 to the Midwest ISO Balancing Authority Area.

BAs have a primary responsibility for maintaining the reliability of the Bulk Power System. They accomplish this by directly controlling their generation and/or load resources to continuously balance their actual interchange with their scheduled interchange while regulating and stabilizing the alternating-current frequency of the Interconnection. Acceptable reliability levels can be maintained only if the BAs and other entities which make up the interconnection function in accord with good operating practices and reliability criteria, including planning and operating standards as defined by the North American Electric Reliability Corporation (NERC) Reliability Standards. Good operating practices include, but are not limited to, full compliance with the NERC Standards without regard to economic consideration, and burdening neighboring systems.

## Certification Team

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NERC's decision to complete a certification review began the process that is outlined in the NERC Rules of Procedure (RoP) Section 500 and RoP Appendix 5, and a certification team was formed. The team rosters for members of both the BA Certification Team (CT) and Midwest ISO team are listed in Attachment 1.

## Objective and Scope

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The objective of this review was to assess the Midwest ISO readiness to integrate DPC into an expanded Midwest ISO BA Area. The scope of the review included: (1) Communication capabilities, procedures and protocol between Midwest ISO and DPC; (2) Various Midwest ISO Energy Management System (EMS) screen shots regarding the DPC footprint; (3) Interviewing Midwest ISO system operations personnel; (4) Confirming applicable tie line and generator test data, (5) Reviewing scheduled training programs for Midwest ISO and DPC operating personnel,, (6) Reviewing applicable agreements for the Midwest ISO BA/LBA Joint Registration Organization (JRO), (7) Physical Scheduling System modifications, (8) changes in congestion management/flowgates, and (9) reviewing Midwest ISO operating guides. The review was conducted on April 20, 2010 at the Midwest ISO facility in Carmel, IN.

# Overall Conclusion

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The certification process was completed in reasonable accordance with the aforementioned Rules of Procedure to determine if the applicants have the necessary tools, processes, and procedures to perform the function as NERC certified BAs. The applicants presented to the certification team the necessary evidence for its review, as it relates to the scope of this review. Because of this review, the certification team has reasonable assurance that Midwest ISO does have the tools, processes, and procedures in place to reliably perform the necessary BA services. Therefore, the BA certification team recommends certification of the expanded BA footprint and that the Midwest ISO should modify the current Joint Registration Organization (JRO) registration of the Midwest ISO and the associated LBAs<sup>1</sup> to include DPC prior to expanded BA operation.

The Midwest ISO expanded BA operation is currently slated to begin on or about June 1, 2010.

## Needed for Operation

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While the team recommends to NERC that Midwest ISO BA JRO expand certification to include DPC, the following work-in-process items must be completed prior to Midwest ISO going operational:

- Training completed for DPC operating personnel
  - Per posted schedule at the time of CT review
- Training completed for Midwest ISO BA and RC operating personnel
  - Per posted schedule at the time of CT review
- Testing and deployment of the Physical Scheduling System (PSS)
- Deploy the Midwest ISO operating guides

## Positive Observations

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In the implementation of the process, the Certification Team had noted a number of positives that stood out to the team, and they are:

- Operator involvement in the change management process
  - Operators presented the material during the Certification
- Operating Guide Updates and status
- Proactive in agreements and JRO
- Involvement with DPC in the transition planning
  - Ongoing decision making
  - JRO

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<sup>1</sup> LBA is a Midwest ISO term “Local Balancing Authority”. These are entities that have entered into a JRO agreement with the Midwest ISO

- BA Task Force & BA Committees

## Midwest ISO Emergency Preparedness

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The CT found that the Midwest ISO has implemented steps to expand the adjacent BA agreements to provide their operators with as many options as possible. The current adjacent BA Agreements include, but are not limited to, the following companies:

- Manitoba Hydro
- Independent Electric Cooperative, Inc
- Ohio Valley Electric Cooperative
- Kansas City Power and Light
- Omaha Public Power District
- Big Rivers Electric Corporation

## Company Background

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Midwest ISO is a non-profit, member-based organization committed to being the leader in electricity markets by providing their customers with valued service, reliable cost effective systems and operations, dependable and transparent prices, open access to markets, and planning for long-term efficiency.

Midwest ISO has a peak load (set July 31, 2006) of 116,030 MW within their market area and an overall peak load of 136,520 MW across the entire Midwest ISO Reliability area. The Midwest ISO has approximately 55,930 miles of transmission facilities at voltage levels of 500kV, 345kV, 230kV, 161kV, 138kV, 120kV, 115kV and 69kV. Geographically, the Midwest ISO regional area covers an area of 13 states and one Canadian province, which in all covers about 920,000 square miles.

Since January 6, 2009 the Midwest ISO has been operating as a BA and calculating ACE for a footprint with a 2010 forecasted peak of 103,860 MW. With the addition of DPC, the Midwest ISO forecasted peak increases to 104,788 MW. This is an incremental increase of approximately 0.8%. The Midwest ISO is responsible for monitoring over 750 BA Area tie lines. The number of tie lines will decrease to 549 once DPC is within the Midwest ISO BA Area.

Generation capacity of the Midwest ISO exceeds 139,800 MW within their market area and 159,000 MW within the entire Midwest ISO reliability area. With the addition of DPC the generation capacity in the market area will increase to approximately 141,110 MW. In addition, the DPW BA Area wind resources that will be transferring into Midwest ISO BA Area are approximately 37 MW. After the integration, the Midwest ISO will have approximately 6837 MW of renewable wind generation in the Midwest ISO BA footprint.

Midwest ISO has been the administrator for the Midwest ISO – Manitoba Hydro Contingency Reserve Sharing Group (MIDWEST ISOMIDWEST ISO-MHEB CRSG) since Jan 1, 2010. Midwest ISO has been providing Contingency Reserve services for DPC since Jan 1, 2010 under

the FEREC approved attachment RR to the Midwest ISO tariff provided DPC makes a request to the Midwest ISO.

## Operating Facility Details

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The Midwest ISO built and continuously refines its extensive network computer model of the Midwest ISO interconnected reliability region and surrounding systems. Their Network Model has 36,730 network buses, 286,000 SCADA data points, 5,464 generating units, and 29,627 loads. Included in their toolset for operation are a State Estimator that utilizes over 233,600 real-time measurements and Real Time Contingency Analysis that solves over 8,300 “what-if” contingencies on average in less than five minutes.

The Midwest ISO has two primary control centers which are located in Carmel, Indiana and St. Paul, Minnesota. All required support staff (administrative and IT) are located within the same buildings at each location. The Midwest ISO control system consists of an AREVA (formerly Alstom/ESCA) standard control system. The operation center contains numerous AREVA work stations with multiple head monitor screens (three workstations with seven monitors per operator) at each operator’s workstation. Midwest ISO also has a video wall that can be accessed from any of the AREVA work stations to display control information. The video wall in the primary control room is 150 feet wide by 10 feet tall. Also displayed on the video wall are a delta flow and delta generation displays, a flowgate monitoring tool, a frequency and frequency trends display, the ACE, ACE trends display, the ACE vs. BAAL, load, load trends, load forecast, net scheduled interchange, actual interchange, reserves, weather, and news.

Midwest ISO is staffed with NERC certified operators. Normal staffing consists of 16 operators per shift (12 hour shifts) and one shift manager. Staffing is adjusted as required during weather events and peak seasons.

Dual redundancy is provided in data communications, which uses frame relay connections provided by two separate nationwide communication providers. There are primary and secondary data communication paths from each LBA to the Midwest ISO for BA data. The data is also mirrored to their back-up site which is located in Indianapolis, IN remote from their primary site.

Midwest ISO’s primary operator communication system is the AT&T and or Time Warner Telecom system. Telephone circuits can be “hard line” redirected or forwarded. Operators also have the option of accessing an ICP IQMX Turret Phones, replicating all of the stored numbers and features of their office phones in a disaster recovery environment. Cell phones are kept charged at all times, with all pertinent phone numbers loaded. Additional communications capability includes ICP IQMX Turret Phones at each operator position in the primary and backup operation center sites, and also in the St. Paul control room. In addition, Nortel phones, cell phones, voice over IP phones, and analog phones are available as backups. There is also a satellite phone at each site along with fax machines and e-mail communications.

# Documentation List

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Electronic copies of all of the supporting Midwest ISO and DPC documents were collected as evidence of Midwest ISO's preparedness to integrate DPC into the Midwest ISO BA Area. Electronic documents will be kept as a record of evidence to support the certification team's recommendation. These documents will be retained at the NERC office in Princeton, NJ for a period of no less than 5 years.

None of the documents listed below are included with the distribution of this final report. Per the NERC Rules of Procedure and due to the confidential nature of this material, these documents are available for review at the NERC offices after proper authorization is obtained through NERC.

- NERC, Midwest ISO, and DPC's various BA evidence, correspondence, and presentation files
- Documentation/evidence resulting from the "Needed for Operation" items

## **CIP Requirements**

CIP standards are not in scope for this certification review.

# Attachment 1

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## The BA Certification Team

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- Don Urban Reliability*First* Corporation
- Jim Hughes (Lead) North American Electric Reliability Corporation
- Jim Uhrin Reliability*First* Corporation

## The Midwest ISO Personnel that Participated in the On-site Visit

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- Barry McMahon Sr. Reliability Analyst
- Kyle Trotter Sr. Market Engineer
- Hernan Rodriguez Sr. Balancing Authority Operator
- Michael McMullen Director West Regional Operations
- Michael Walsh Sr. Director UDS, EMS, Compliance & Training
- Ben Deutsch Sr. Mgr. Operations, Procedures & Compliance
- Kim Van Brimer Sr. Operations Specialist
- David Zwergel Sr. Director Regional Operations
- Nicholas Browning Scheduling Lead
- Steve Swan Sr. Mgr. Balancing Authority Operations
- Gareth Lim Lead, Modeling Engineering
- Keith Mitchell Technical Mgr. RT Ops
- David Espling Mgr. Tech Training

# Attachment 2

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## Documentation Review

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The certification team also reviewed the appropriate documentation that provided reasonable assurance that the Midwest ISO has the tools, processes, procedures, and training to operate an expanded BA Area that includes DPC.

## Applications Review

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The site visit focused on documentation review, interview of NERC certified BA operators, and evaluation of the BA applications, and operator toolset that Midwest ISO has available for their operators. The certification team reviewed Midwest ISO's online applications that will be used to perform the BA requirements for the DPC footprint. Midwest ISO developed a series of EMS demonstrations using their testing environment that were led by Midwest staff. These demonstrations provided the certification team with an understanding of Midwest ISO's proposed applications for the balancing area of DPC, as well as demonstrate the readiness of the Midwest ISO to assume the duties of the BA Operator for the DPC footprint.

## Operational Testing

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Midwest ISO and DPC have conducted a series of operational tests. Operational testing was primarily focused on the BA Area operations as well as tools necessary to support reliability. Specific testing included generator dispatch, regulation and a tie line checkout of two (2) generators of eleven (11) and the remaining tieline.