

NERC

NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

NERC Balancing Authority (BA) and Reliability Coordinator (RC) Certification Review of the expanded Midwest ISO footprint of Big Rivers Electric Corporation (BREC)

Site Visit Conducted
August 10-11, 2010
Midwest ISO
Carmel, Indiana

to ensure
the reliability of the
bulk power system

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Introduction

This report presents the results of the North American Electric Reliability Corporation's (NERC) Balancing Authority (BA) and Reliability Coordinator (RC) Certification review of Midwest Independent Transmission System Operator (Midwest ISO) NCR00826, and their preparation for the addition of Big Rivers Electric Corporation (BREC) NCR01180 to the Midwest ISO's Balancing Authority and Reliability Coordination footprint.

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 by the BAs and other entities that make up the interconnection following good operating practices and reliability criteria, including planning and operating standards as defined by 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.

RCs have a primary responsibility for the real-time operating reliability of its RC area in coordination with its neighboring RC's wide area view; operate with good operating practices and compliance with the NERC Standards without regard to economic consideration and burdening neighboring systems. This is accomplished as the RC monitors and when necessary controls loading the System Operating Limits (SOLs) and Inter-regional Reliability Operating Limit (IROL) of the Bulk Electric System facilities within their area of responsibility at or below their respective limits.

Big Rivers Electric Corporation will be integrating into the Midwest ISO in two stages:

1. Reliability Coordinator transition from Tennessee Valley Authority (TVA) to the Midwest ISO will take place on or before September 1, 2010.
2. Balancing Authority transition to the Midwest ISO Balancing Area will take place on or before December 1, 2010.

The step transition into the Midwest ISO is necessary due to the Kentucky Public Service Commission placing the BREC hearing in the middle of September. This action was taken by the Kentucky Public Service Commission due to higher priority cases that have mandatory action dates. The initial Midwest ISO plan for BREC integration was modified due to this action.

Certification Team

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/RC Certification Team (CT) and the Midwest ISO team are listed in Attachment 1.

Objective and Scope

The objective of this review was to assess the Midwest ISO readiness to integrate BREC into the Midwest ISO BA and RC footprint. The scope of the review included: (1) Communication capabilities, procedures and protocol between Midwest ISO and BREC; (2) Various Midwest ISO Energy Management System (EMS) screen shots regarding the BREC footprint; (3) Interviewing Midwest ISO and BREC System Operations personnel; (4) Confirming applicable tie line and generator test data; (5) Reviewing scheduled training programs for Midwest ISO and BREC operating personnel; (6) Reviewing applicable agreements for the Midwest ISO BA; (7) Physical Scheduling System (PSS) modifications; (8) changes in congestion management and flowgates, and (9) reviewing Midwest ISO operating guides. The review was conducted on August 10-11, 2010 at the Midwest ISO facility in Carmel, IN.

Overall Conclusion

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 incorporate BREC into Midwest ISO's BA & RC footprint. Midwest ISO presented to the certification team the necessary evidence for its review, as it relates to the scope of this certification. The certification team has a reasonable assurance that Midwest ISO does have the tools, processes, and procedures in place to reliably perform the necessary BA & RC services. The team found that the Midwest ISO provided evidence that they reliably can incorporate BREC into the necessary tools, processes, and procedures that will be in place to perform the BA & RC functions in behalf of or for BREC.

Therefore, the certification team recommends certification of the expanded BA and RC footprint and that the Midwest ISO modify the current Joint Registration Organization (JRO) registration of the Midwest ISO and the associated LBAs¹ to include BREC prior to expanded BA operation.

- Midwest ISO expanded RC operation is currently slated to begin on or before September 1, 2010.
- Midwest ISO expanded BA operation is currently slated to begin on or before December 1, 2010.

Needed for Operation

While the team recommends to NERC that Midwest ISO RC expansion of BREC certification be granted, the following work-in-process items must be completed prior to adding BREC and going operational. These must be completed on or before September 1, 2010:

- Fully deploy the outage scheduling tool (CROW) with BREC
- Operator training associated with the RC role must be completed for BREC and Midwest ISO operating personnel

¹ LBA is a Midwest ISO term "Local Balancing Authority". These are entities that have entered into a JRO agreement with the Midwest ISO. This is a Coordinated Functional Registration in the NERC RoP section 500.

- BREC validation of the Midwest ISO Network model must be complete.

While the team recommends to NERC that Midwest ISO BA JRO expand certification to include BREC, the following work-in-process items must be completed prior to adding BREC and going operational. These must be completed on or before December 1, 2010:

- Operator training associated with the BA role must be completed for BREC and Midwest ISO operating personnel
- Testing and deployment of the Physical Scheduling System (PSS)
 - Training completed for BREC operators
- Open/Closed loop generator testing completed for all BREC Units
- BREC validation of the Midwest ISO commercial model

Positive Observations

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

- Operator involvement in the change management process
 - Parallel operation including Midwest ISO Operators during conversations between BREC & TVA
- Operating Guide updates and status
- EMS modeling including two hundred plus additional data points, mostly 69kV, to improve model accuracy

Midwest ISO Emergency Preparedness

- The CT found that the Midwest ISO has implemented steps to update their adjacent BA agreements to provide their operators with as many emergency resource 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
 - PJM Interconnection, LLC

Company Background

Midwest ISO Background Information

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. Midwest ISO has approximately 56,300 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 United States and 1 Canadian province, which in all covers approximately 920,000 square miles.

Generation capacity of the Midwest ISO exceeds 144,132 MW within their market area and 159,000 MW within the entire Midwest ISO reliability area. 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 104,788 MW. With the addition of BREC, the Midwest ISO forecasted peak increases to 106,340 MW, an incremental increase of approximately 1.5%. The number of tie-lines will increase to 558 once BREC is within Midwest ISO's BA footprint. Generation being added with the BREC addition is 1,834 MW. The Frequency bias will increase by 17 MW/Hz, and the new Midwest ISO bias will be 1064.9 MW/Hz. With the addition of BREC, the DCS reporting by the Midwest ISO will not be affected. BREC has no units that are large enough to be DCS reportable. All tie line verification has been completed as of the date of this certification.

Midwest ISO has been providing Contingency Reserve services for BREC since Jan 1, 2010 under the FERC approved attachment RR to the Midwest ISO tariff, provided BREC makes a request to Midwest ISO.

BREC Background Information

BREC is an electric generation and transmission cooperative headquartered in Henderson, Kentucky and has three members. The members are Jackson Purchase Energy Corporation, headquartered in Paducah, Kenergy Corporation headquartered in Henderson, and Meade County Rural Electric Cooperative Corporation, headquartered in Brandenburg. BREC member cooperatives deliver retail electric power and energy to more than 111,000 residential, commercial, and industrial customers in portions of 22 Western Kentucky counties.

BREC is registered with NERC in the SERC region as a Balancing Authority, Distribution Provider, Generator Operator, Generator Owner, Planning Authority, Purchase Selling Entity, Resource Planner, Transmission Owner, Transmission Operator, Transmission Planner, Interchange Authority, Load Serving Entity, and a Transmission Service Provider. In its role as a Transmission Operator, BREC provides certain Transmission Operator services to the Owensboro Municipal Utility.

BREC has a 2010 forecasted peak load of 1,646 MW that is served through the utilization of approximately 1834 MWs of BREC generation owned or controlled through contractual rights. Installed capacity is approximately 1,444 MWs of generation with the largest being the 454 MW Robert D. Green Generating Station. BREC also owns rights to the Henderson Station 2 and contracted capacity with the Southeastern Power Administration for 390 MW. The largest single generation resource is the 417 MW Wilson unit. Currently, BREC has 17 tie-lines with TVA, LGEE, and once integrated into the Midwest ISO the total Midwest ISO tie-lines will increase by 9 tie-lines. BREC's has 1,262 miles of transmission.

Operating Facility Details

Midwest ISO built and continuously refines its extensive network computer model of the interconnected reliability region and surrounding systems. Their Network Model has 37,580 network buses, 303,800 SCADA data points, 5,644 generating units, and 30,482 loads. Included in their toolset for operation are a State Estimator that utilizes over 249,000 real-time measurements and Real Time Contingency Analysis that solves over 8,300 “what-if” contingencies approximately every five minutes.

Midwest ISO will calculate the area control error (ACE) for the expanded BA Area, including BREC after December 1, 2010. This will increase the number of tie-lines for the Midwest ISO to monitor from 549 to 558. Some of these interconnections are with companies of the Independent Electricity System Operator of Ontario, the Mid-Continent Area Power Pool, PJM, Southwest Power Pool and the Tennessee Valley Authority. The Midwest ISO has seams agreements or memorandums of understanding with each of these organizations to facilitate operations.

Midwest ISO has two primary control centers that 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 Alstom (formerly AREVA) standard control system. The operation center contains numerous Alstom workstations 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 Alstom workstations to display control information. The video wall in the primary control room is 150 feet wide by 10 feet tall. The board is used to display a large dynamic transmission overview showing all 230 kV transmission facilities and above, plus critical underlying 100 kV facilities and above in Midwest ISO and surrounding areas. It includes the line MW and MVAR flows, lines out-of-service indications, high voltage and low voltage alerts. 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 that is located in Indianapolis, IN (i.e.: 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 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.

Evidence Presented

Communication capabilities, procedures and protocol between Midwest ISO and BREC

Midwest ISO presented various documents that provided the certification team an overview of the inclusion of BREC in the operator-to-operator communication that is required to operate as a RC and BA. BREC, as an existing BA, will enter into a CFR with Midwest ISO and will communicate with the Midwest ISO as the BA (per the CFR) and RC for BREC. The Midwest ISO communication channels and contacts that exist today will not change. The CT verified the following:

- That BREC will use the Midwest ISO Communication System (MCS)
- Midwest ISO's operator and operations staff were aware and recognized the unique arrangement between BREC as a TOP and Owensboro Municipal Utilities (OMU) (note OMU will remain with TVA as their RC).
- Midwest ISO Procedure, OP-010 Generator Operator Communication with Midwest ISO including Excessive Energy Exemption (EEE) will address the Generator Operator communications required when BREC enters into the Midwest BA expanded footprint.
- All Blast calls for the RC and BA functions are being updated to address the addition of BREC. (Note this was confirmed during the Control Room tour conducted by the CT)

Various Midwest ISO Energy Management System (EMS) screen shots regarding the BREC footprint

Midwest ISO presented a number of EMS screen displays that are currently residing in the Midwest ISO test or staging EMS environment. These screens will move to the live or production EMS once BREC becomes part of the Midwest ISO RC/BA footprint. These screens included ACE calculation, tie line summary page along with several others. The team reviewed several existing screens used by Midwest ISO BA (Market Monitoring Tool, Regional Generation Dispatch Monitoring Tool, Tie Line Screens etc.). The BREC frequency bias setting of -17 MW/.1Hz will be combined with Midwest ISO's frequency bias setting of -1047.9 MW/.1Hz, and Midwest ISO will use a frequency bias setting of -1064.9/.1hz to ensure that the Eastern Interconnection frequency bias obligations remain unchanged for the remainder of 2010.

Open/closed loop generator testing is an item captured under the section "Needed for Operation" and must be completed prior to BA operation beginning. There were no new EMS screens created, but all screens were updated to include BREC as appropriate. BREC, as an LBA, will maintain the capability to control an adequate amount of generation necessary for operating under Constant Frequency & Constant Net Interchange modes in order to facilitate interconnection of islands during a restoration event.

The CT reviewed Midwest ISO's displays including the Non-Market Monitor where the BREC ACE will be monitored until the BA integration on December 1, 2010. As of that date, the BREC ACE will be integrated into the Midwest ISO ACE value. Other EMS displays included

BREC Load, BREC Contingencies (list of the BREC N-1 on-line analysis results), BREC Monitored Elements display (which shows that BREC is being monitored by all Midwest ISO Network Applications), RTCA Display (Real Time Contingency Analysis Tool), and Midwest ISO Overview display (Big Picture wide area view of the BREC System).

The team visited the Midwest ISO Control Center and verified that the following displays were in the Midwest ISO development systems: the Non-Market Monitor ACE Display, BREC ACE, and tie line display and the Generation Area Status Screen.

BREC facilities have been added to the Resource Physical Capacity Details Display, and SCADA EMS Display. Verification was also made that the RTCA and all OP Guides were on-line and viewable by all the Midwest ISO and BREC Operators via the Midwest ISO Extranet. The team also confirmed in real-time that the Wide Area View Midwest ISO map board was updating with real-time information for the BREC area.

Interviewing Midwest ISO system operations personnel

The CT interviewed two of the operators that will be responsible for the expanded Midwest ISO Area, one RC operator and one BA operator. Each operator provided a summary of what they knew of BREC or what was expected of them as the RC and BA for BREC.

The CT questioned the operators on what training was or will be provided to them prior to assuming this added responsibility. Training for BREC operators and the targeted Midwest ISO operators are required tasks for the RC and BA implementation dates.

The BA operator had a general understanding of the new BA Area, had some knowledge of the BREC units, and size and was interested in how they affected the footprint. The operator also had a good understanding of the tie line changes (net of nine additional ties). Once the Midwest ISO assumes RC responsibility for the BREC BA Transmission Loading Relief (TLR) procedures currently in place will continue to be used until BREC integrates into the Midwest ISO BA Area as a LBA. Once BREC is a LBA, generation re-dispatch and the Midwest ISO Security Constrained Economic Dispatch (SCED) will be used to mitigate transmission issues. BREC will be participating in the BA JRO review as part of the Balancing Authority Task Team and Balancing Authority Committee. BREC will also be participating as part of the closed session of the Midwest ISO Operation Working Group (OWG), and the Power System Restoration Working Group and Reliability Sub-Committee (RSC).

When asked about the integration being a positive or negative, the RC operator responded that having BREC internal will allow Midwest ISO to have more control of all the generation, have all of BREC facilities internalized and thus enhance Midwest ISO's ability to watch and monitor BREC facilities by allowing re-dispatch etc., to mitigate congestion. The CT sampled various questions in the document titled, Midwest ISO-RC-BA Operator Questions 8-10-11-2010.docx where Operator responses are captured. In general, the Midwest ISO Operators were aware of and had knowledge of the BREC footprint and the expected changes.

Interviewing BREC system operations personnel

The CT interviewed by phone several members of BREC's Management, and one BREC System Operator. The CT sampled various question in the document titled, Management Responses – BREC Operator Questions –AUG 10-11-2010.docx where BREC Operations Management responses are captured. The CT questioned the BREC Operator using the document titled, “BREC Operator Questions –AUG 10-11-2010.docx where BREC Operator responses are captured. In general, the BREC Operator was aware and comfortable with the training and

assistance received from the Midwest ISO Staff, and believes BREC is prepared for the change. The only concern raised by the Operator was the need for more hands on training with the CROW tool. This item is captured in the “Needed for Operations” section of the report.

Confirming applicable tie line and generator test data

Midwest ISO presented various documents and EMS screens that provided the CT a verification that the proper ties are being monitored. Note that the BREC addition will add thirteen (13) ties [five (5) ties with LGEE and eight (8) ties with TVA] but the existing BREC ties will be internalized, so there will be a net gain of nine (9) new tie lines. Open and closed loop testing is pending and must be completed prior to BA certification and is captured above in the “Needed for Operation” section.

Reviewing scheduled training programs for Midwest ISO and BREC operating personnel

Midwest ISO conducted three RC training sessions at BREC, July 19-21, July 26-28 and Aug 2-4 to educate the BREC Operators. These sessions included Midwest ISO Overview, Outage Coordination, Communication, Tools, Displays, Normal Operations, Abnormal Operations, and Emergency Operations. The BREC BA Training will be conducted on Oct 26, Nov 2 and Nov 9, 2010.

The CT reviewed the training curriculum for the Midwest ISO and BREC operators and was satisfied that all items for the transition of the BA function from BREC to the Midwest ISO were in place. Midwest ISO RC Operators have had the following training material already presented: a BREC Overview, Communications changes, Displays and Tool Changes, Flowgate Changes, Op Guides Changes, and Congestion Management Changes.

The training of the Midwest ISO BA operators, as a result of the integration, will include: screens that are affected which include EMS, Real-Time, ACE, Tie lines, and AGC. Training will also include a review of the changes required in communication to BREC, on-line displays, Op Guides, Outages, flowgates, and market-o-market flowgate changes. The CT team reviewed the Midwest ISO transition plan and believes that all items required for the transition have been included. The CT team believes that the entire operator training at both locations must be complete. The CT team reviewed the training material outlines to ensure all necessary operator items are being addressed.

The CT still needs evidence that all the training is done for operators at the Midwest ISO and BREC prior to the Midwest ISO taking BA operation of BREC. The CT will be seeking an affirmation that the available operators are trained per the schedule and recognizes that not all the operators may be available for the training as scheduled. Midwest ISO and BREC will be asked to provide an attestation requiring that any operator missing this training as originally scheduled has received the training prior to taking the desk post-integration. Midwest ISO’s Operator training will be completed in Cycle 3, and is captured under the “Needed for Operation” section above.

Reviewing applicable agreements for the Midwest ISO BA/LBA Joint Registration Organization (JRO)

The Midwest ISO BA/LBA JRO is being revised and will include BREC as a LBA within the Midwest ISO BA Area. When complete it will be shared as defined in the NERC Rules of Procedure. Additionally, the Midwest ISO Regional Reliability Plan was reviewed and accepted

by the NERC Operating Reliability Subcommittee (ORS). BREC will be part of the central region operation which is located in the Midwest Office in Carmel. The BREC Adjacent BA Agreement will be undone as they become part of the Midwest ISO BA. Emergency Energy Agreements with adjacent BAs are in place and are sufficient to handle all anticipated system emergencies. The Midwest ISO System Restoration plan was reviewed and updated to include BREC as a full member and not just a participant. BREC currently participates in the drills and will continue but now as a full member.

Additional Agreements that will require updating as the BREC addition takes place include the Regional Reliability Plan, which was approved by SERC and the NERC ORS, the Balancing Authority Agreement which was signed as of 12-21-09, along with a number of Core Agreements including but not limited to the Transmission Owners Agreement, signed 12-22-09, and the Midwest ISO Emergency Preparedness Agreement. Note that all existing agreements with Manitoba Hydro, Independent Electric Cooperative, Inc, Ohio Valley Electric Cooperative, Kansas City Power and Light, Omaha Public Power District, and PJM all remain in place. The Midwest ISO Restoration Plan was revised with minimal changes.

PSS modifications

Midwest ISO provided an overview of the changes required for the PSS. Changes required for the BA footprint change include updating the Container Table (tables allows access to the market information), adding BREC to the Regional CA Table (this table reflects BREC becoming a BA entity in Midwest ISO), adding BREC as a LBA, including BREC in the Commercial model, and adding their sink and sources tables. The BREC Interchange Tier Table was added to allow BREC to upload net actual interchange information. The sink-source table has not been completed yet, and this cannot be done until seven (7) days before going live, due to Market implications. Training at BREC on the PSS items still needs to be done and will take place in October 2010.

Changes in congestion management/flowgates

Midwest ISO and the CT reviewed the applicable Op Guide changes that are required for the BREC integration, the flowgate changes that are required for the Interchange Distribution Calculator (IDC), and the TLR process based upon the BREC integration. Flowgate changes will be made in the IDC for the RC change. BREC has 22 flowgates that will have Midwest ISO as the RC. Once the BA change takes place, a number of flowgates will involve coordination through the Midwest ISO Market processes. Midwest ISO has addressed all flowgate issues.

Reviewing Midwest ISO operating guides

All OP Guide changes for 9-1-2010 are done. There are three OP Guides that involve TVA and one new Op Guide that was developed between TVA and Midwest ISO. The three existing OP Guides that were updated because of the changes and move into the Midwest ISO footprint are:

- The Coleman Op Guide
- The Marion-Renshaw-Livingston Area OP Guide
- The Vectren North and South Flows Op Guide.
- The new Op Guide that was developed with TVA is the New Hardinsburg 161/138 kV Transformer Op Guide. Although new to the Midwest ISO, this OP Guide is already in place between BREC and TVA.

Midwest ISO did not have to update its Emergency Preparedness RTO-EOP-002-r10, RTO-EOP-A-r3, and RTO-EOP-004-r8 procedures since they are written by functional entity and member status.

Documentation List

Electronic copies of all of the supporting BREC and Midwest ISO documents were reviewed at Midwest ISO, and an electronic copy of the documents was hand delivered on a password protected CD to the CT before leaving the site. A Transmittal Letter and password will be e-mailed to the CT separately. 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 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 - Certification Participants

The Certification Team

- Bob Goss SERC
- Don Urban ReliabilityFirst Corporation
- Jim Hughes (Lead) North American Electric Reliability Corporation
- Jim Uhrin ReliabilityFirst Corporation
- Kevin Berent SERC

The Entity Staff that Participated in the On-site Visit

- Tim Aliff Sr. Mgr. Central Regional Operations
- Jason Brown Lead Outage Planning
- Ben Deutsch Sr. Mgr. Operations, Procedures & Compliance
- Tabitha Hernandez Lead Interchange Scheduling
- Ron Mihlbachler Sr. Reliability Analyst
- John Rymer Senior Trainer
- Anuhya Satturu EMS Engineer 1
- Kala Seidu Director, Market Modeling & Forecast
- Steve Swan Sr. Mgr. Balancing Authority & CRSG
- Robert A, Thomasson Sr. Supervisor of Energy Control. BREC
- Kyle Trotter Senior Market Engineer
- Adam VanBibber Sr. Balancing Authority Operator
- Kim Van Brimer Sr. Operations Specialist
- Michael Walsh Sr. Director UDS, EMS, Compliance & Training
- David Zwergel Sr. Director Regional Operations

Attachment 2 - Certification Review

Documentation Review

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

Applications Review

The site visit focused on documentation review, interview of NERC certified operators, and evaluation of the various 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 & RC requirements for the BREC footprint. Midwest ISO developed and led a series of EMS demonstrations using their testing environment. These demonstrations provided the CT an understanding of Midwest ISO's proposed applications for the BREC footprint, as well as demonstrated the readiness of Midwest ISO to assume the duties of the BA and RC Operator for the BREC footprint.

Operational Testing

Midwest ISO and BREC have conducted a series of operational tests. Operational testing was primarily focused on the BREC Area operations as well as tools necessary to support reliability. Specific testing included end-to-end closed/open generator and Tie-line testing. However, as stated in the "Needed for Operation" section of this report, Midwest ISO still needs to complete the Open/Closed loop generator testing for all BREC Units.