

NERC

NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

NERC Balancing Authority (BA) Certification of RED MESA, LLC owned by NextEra Energy Resources and Operated by Constellation Energy Control and Dispatch (CECD)

Site Visit Conducted
September 2, 2010
Constellation Energy Control and Dispatch Control Center
Houston, Texas

to ensure
the reliability of the
bulk power system

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Table of Contents

Introduction..... 3

Certification Team 3

Objective and Scope 3

Overall Conclusion 4

Needed for Operation..... 4

Operator Preparedness 5

Company History 5

Company Details..... 8

Documentation List..... 8

Evaluation of the BA Standards..... 9

Attachment 1 - Certification Team 10

Attachment 2 - Certification Process Steps 11

Introduction

This report presents the results of the NERC Balancing Authority (BA) Certification of Red Mesa, LLC based on recommendations from the review team in the Western Electricity Coordinating Council Interconnection. Red Mesa has contracted with Constellation Energy Control and Dispatch (CECD - NCR00015) for BA operation of their wind generation facility rated at 102.4 MW, located on a privately owned ranch, Lobo Ranch, in Seboyeta, New Mexico. This facility is interconnected with Public Service Company of New Mexico (PNM) on the 115-kV West Mesa – Ambrosia line.

BAs have a primary responsibility for maintaining the reliability of the interconnected system. They accomplish this by directly controlling generation and/or load resources to continuously balance actual interchange with scheduled interchange while regulating and stabilizing the frequency of the Interconnection. Acceptable reliability levels can be maintained only if the BAs and other entities which make up the Interconnection, function in accordance 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 not burdening neighboring systems.

Certification Team

On March 31, 2010, CECD notified WECC and NERC of Red Mesa's request to initiate the NERC BA certification process as outlined in the NERC Rules of Procedure (RoP) Section 500 and RoP Appendix 5. Following receipt of CECD's request to certify Red Mesa as a NERC certified BA, a certification team was formed. The team rosters for members of both the BA Certification Team (CT) and the CECD team are listed in Attachment 1.

Objective and Scope

The objective of this review is to assess CECD's process, procedures, and tools which will allow them to perform the function of a BA for Red Mesa. The scope of the review included: (1) Interviewing CECD's management and reviewing pertinent documentation for verification of basic requirements for BA operation; (2) reviewing procedures and other documentation developed by CECD to meet the applicable standards/ requirements; (3) interviewing CECD system operations personnel; (4), Energy Management System (EMS), communication facilities, operator displays, and discussed CECD's physical backup control center facility capabilities, and (5) performing other validation reviews as considered necessary. The review was conducted on September 1-2, 2010, at CECD's primary control center facility in Houston, Texas.

Overall Conclusion

The certification process was completed in reasonable accordance with the aforementioned Rules for determining if the applicant has the necessary tools, processes, and procedures to perform the functions of a NERC certified BA. The applicant presented to the certification team the necessary evidence during its review as it relates to the applicable standards/requirements. Because of this review, the certification team has reasonable assurance the applicant does have the tools, processes, and procedures in place to reliably perform the BA function on behalf of Red Mesa. Therefore, the BA certification team recommends to WECC that they approve certification of Red Mesa as a NERC certified BA.

The Red Mesa/CECD BA operation is currently slated to begin on or about January 1, 2011 pending approval by the WECC Operating Practices Subcommittee, the Operating Committee and the Board of Directors.

Needed for Operations - Findings

While the team recommends to WECC that Red Mesa be granted certification, the following work-in-process items must be completed prior to Red Mesa/CECD commencing operations:

1. NextEra (Red Mesa) will need to provide to the Review Team completed Interconnection agreements between them and their single adjacent BA, Public Service Company of New Mexico (PNM), prior to receiving certification. Interconnection agreements are in progress but have not been signed as of the On-site visit.
2. NextEra (Red Mesa) will need to provide to the Review Team completed Operating agreements between them and the provider of Regulating Margin and Frequency Bias prior to receiving certification. Operating agreements are in discussion but have not been completed as of the On-site visit.
3. NextEra (Red Mesa) will need to provide evidence of acceptance of membership by the SouthWest Reserve Sharing Group (SRSG) prior to going live. Should Red Mesa not be accepted into the SRSG or elect not to join, they understand that this decision would result in their being responsible for their individual most severe single contingency (MSSC) as described in the completed matrix. Application to SRSG was delivered on September 1, 2010 but was not approved as of the On-site visit of the Review Team.
4. CECD will need to provide evidence that Operator training has been completed for BA operations of Red Mesa, LLC.
5. CECD will provide evidence that the applicable Point-to-Point testing of the Red Mesa has been completed.
6. CECD will provide evidence that the software tools have been installed on their EMS system for operations of the Red Mesa system including but not limited to One-lines and ACE.

Positive Observations

- The overall impression is that CECD's EMS and control systems are very flexible. The company can operate from any location where they can get a broadband connection and has a variety of Backup Control Center (BUCC) functionalities that present a seamless operational transition from the primary to the BUCC
- System operation can be transferred to any location at a moment's notice using a secure virtual private network (VPN) connection on assigned operator laptops or a remote desktop (after applying appropriate user authentication protocols)
- The documentation provided by CECD that allowed the Certification Team to develop their conclusions was logically organized and provided in electronic format.
- There is triple redundancy of the communication system; the British Telecom Turret system is impressive. It allows flexibility of system operations without affecting their neighbors – the adjacent systems do not need to maintain a list of call numbers since the phone lines can be transferred to any location
- CECD management's commitment to Operator training

Operator Preparedness

The CT found the CECD operators to be fully equipped with excellent operating tools and they are well prepared as a result of extensive training. All operators are NERC certified with 71 percent of the system operators certified at the RA/RC level. It is recommended that CECD enhance the present EMS model to provide neighboring Transmission mapping to allow the operator to see the dynamics of their neighbors.

CECD currently provides BA services for 13 BAs, four of which are generation only BAs located in the Western Interconnection.

Company History

Constellation Energy, a Fortune 200 company, is the parent company of CECD. Constellation Energy is based in Baltimore, Maryland with businesses that include CECD, Baltimore Gas and Electric (BG&E) a regulated utility, and Constellation Commodities Group a power generation and wholesale marketing entity. CECD operates from a control center located in Houston, Texas and its back-up control center in Austin, Texas.

CECD currently provides BA services in SERC and WECC. In WECC, CECD provides BA services for:

- Harquahala Generating Facility (HGMA)
- Gila River Power, LP (GRMA)
- Dynegy Arlington Valley (DEAA)
- NaturEner Wind Energy 1, LLC (GWA)

- Griffith Energy, LLC

The CECD Control Center is located in Houston. All EMS support (administrative and IT) is located within the perimeter of the control center. The CECD control system consists of an AREVA (formerly Alstom/ESCA) standard control system that was upgraded in February 2005 and can accommodate up to 75 BAs. The control center contains 10 AREVA Work Stations with five 21-inch screens each for operator interface, plus six 50" LCD screens that can display information for each of the 11 BAs CECD operates (12 BAs following certification of Red Mesa). CECD has 10 NERC Certified Operators and 2 supervisors that are also NERC certified. There are also 5 CECD personnel in training. Normal staffing currently consists of two operators per shift (12 hour shifts) with an increase to 3 operators during day shift during the summer peak period. CECD is implementing a new Integration Desk (the I-Desk) to allow for a focus on intermittent resource facilities.

The CECD Control Center is a virtual control center with an EMS that interfaces with redundant data centers located in geographically dispersed areas that exchange data with the Operating Areas. SCADA data for the EMS is managed on a SCADA front end server (SMP) that is located at the Operating Area. These servers are serially connected to an RTU to retrieve data. The SCADA data is transmitted to the CECD EMS services over MPLS data circuits, a primary circuit with a back-up circuit in place with automatic failover capability. The CECD EMS servers are on a LAN segment that is isolated from the Constellation Corporation Network by firewalls. The only control capability from the CECD Control Center's EMS is Automatic Generation Control (AGC) of generating facilities within operating limits established by the owners and operators, and maintained in the generators Distributive Control System. The primary function of the CECD control center is to provide operations personnel with monitoring capability and ensure data is collected for operating purposes. Additional operating functions performed from each of the work stations include energy accounting, electronic tag review, tag approval, and event logging.

All of the functions described above, including plant dispatch upon loss of AGC, can be performed manually by system operators in coordination with persons located at each Operating Area where ultimate control is maintained. In addition, though the workstations described above are the primary interface for day-to-day operations, all functions performed at these stations can be performed remotely on operator assigned laptops. In the case of remote access, while outside the primary control center, each CECD operator has been provided a Remote Secure Access (RSA) key that is used in combination with a remote network account. Once granted remote access each CECD operator must complete the login process that is used onsite in the control center.

CECD has a Disaster Recovery system that ensures data is collected. The data from the EMS Production system is replicated to the Disaster Recovery site under normal conditions to maintain a current backup database. If the production site becomes unavailable, the Disaster Recovery site can be activated and will retrieve SCADA data from the Operating Areas. Operators have access to the production site or the Disaster Recovery site through the Areva WebFG software that is installed on the control center workstations and the CECD portable laptops. Therefore, if the CECD primary control center is evacuated, the CECD EMS System can be accessed from any remote location using CECD operator laptops, that are password protected in combination with an RSA key/additional password requirements, with secure broadband wireless access or high-speed internet. In addition, there are desktop workstations located at remote Disaster Recovery sites and back-up control centers in Austin and Baltimore. All access

is limited through the use of multiple passwords, digital security keys, and additional layers of security.

Triple redundancy is provided in data communications, which uses Multiple Protocol Labeling Switching (MPLS) connections provided by Verizon, formerly MCI/WorldCom. There are primary and secondary paths from each plant or BA to Baltimore and primary and secondary paths from Baltimore to Houston. The data is also mirrored from the primary data center to a secondary data center.

CECD's primary operator communication system is provided by British Telecom. Telephone numbers can be redirected or forwarded to any location making the redirection transparent to CECD's clients and operational counterparties. Operators also have the option of accessing a British Telecom Virtual Turret across a secure connection, replicating all of the stored numbers and features of their control center phones in a disaster recovery situation. This Virtual Turret can be configured to dial out of and receive phone calls into any land-based phone line or cellular phone. A designated back-up cell-phone is kept charged at all times, with all pertinent phone numbers stored. Wireless Priority Service is in place and accessible at all times for use with this phone or personal cell-phones. Additional communications capability includes Satellite Phones, Nortel phones and Cisco VOIP Phones and, fax and email communications.

Connectivity to the Houston Control Center is provided through diverse circuits which enhances the reliability of communications. The primary connection is a Verizon MPLS circuit with a Verizon backup DS3 circuit. There is also a secondary connection consisting of a 100 Mbps circuit with Time Warner. In the event of a failure with the local ISP service, internal gateway protocols will allow for the rerouting of this traffic to Baltimore, where Constellation utilizes AT&T and Verizon Business for ISP access.

CECD maintains a backup control program, which includes backup facilities in two geographically diverse locations. CECD also has its primary and backup control systems set up to interface with the operator computer profiles so that the operators can log onto the system from any location, with a secure virtual private network (VPN) connection on assigned operator laptops or a remote desktop, applying appropriate user authentication protocols. This flexibility allows for extremely thorough disaster recovery plans that cover all conceivable scenarios. The plan also includes organizational assistance for meeting the personal and family requirements of operators.

CECD operator displays are adequate to perform the BA function for Red Mesa. Red Mesa displays will include: CPS1 and CPS2, DCS status, ACE value, L_{10} , MW schedules for the BA, tie-line readings at the point of interconnection with WALC, AGC status, frequency, required contingency reserves, generator breaker status, time-error, ATEC Status, Primary and Secondary Inadvertent, and one-line diagrams. Red Mesa and their PSE will also have access to most of the information contained above via the secure CECD data page which refreshes every 10 seconds.

The CECD EMS is set to operate in the Auto-Time Error Correction mode. Primary notification of Manual Time Error Corrections will come through the WECCNet messaging system. CECD utilizes frequency offset in the EMS for Manual Time Error Corrections.

CECD currently uses Open Access Technology International (OATI) electronic tagging software. CECD will be the tag approval authority for Red Mesa. In addition, CECD currently uses webSAS and the Western Interchange Tool (WIT).

Company Details

Red Mesa Wind consists of 64, 1.6 MW GE 12 kV wind turbine generators with a total capacity of 102.4 MW. The Red Mesa collector station connects to the Red Mesa Switchyard (115 kV) operated by the interconnected Transmission Operator, PNM. The Red Mesa Switchyard is 7 miles west of PNM's Marquez Tap on the 115 kV West Mesa Line. This allows Red Mesa Wind to connect to PNM's 115 kV West Mesa – Ambrosia line. There will be revenue quality metering located at the Red Mesa Switchyard providing the common meter boundary between PNM and Red Mesa, which will be telemetered to the CECD Energy Management System. The CECD EMS will model a dynamic transfer of the telemetered Red Mesa generation output, in coordination with PNM, and the receiving Balancing Authority at Four Corners, where the Red Mesa regulation and balancing resources will be delivered and accounted for between the appropriate parties.

Red Mesa's agreement with the interconnected Transmission Operator requires the Red Mesa Wind generation resource to be dynamically scheduled outside of PNM's footprint and Red Mesa's self provision of the resources for regulation, balancing and reserves by Red Mesa. The solution to meeting the terms of this agreement is a two step process. First, the Red Mesa Wind facility is establishing the infrastructure and processes to operate as a Balancing Authority. Secondly, the Balancing Authority's generation will be dynamically transferred, via a dynamic schedule, on firm transmission to Four Corners, where the Red Mesa Wind Balancing Authority will receive resources to regulate, balance, and supply or deliver reserves. The Red Mesa Wind Balancing Authority will have a frequency bias obligation of 1 MW, using the default minimum requirement of 1% of estimated maximum generation levels. Red Mesa will also be a member of the Southwest Reserve Sharing Group and will maintain the 5 MW of Contingency Reserves (3 which must be spinning) using a remote resource that delivers to where the Balancing Authority generation is dynamically transferred, Four Corners. In addition, there will be balancing capability in both directions for manage the deviation between schedule and actual production and to manage ATEC. There will be an agreement to supply 15 megawatts up or down to meet the requirements previously described with TEP.

Documentation List

Copies of all of the supporting CECD documents were collected as evidence of CECD's preparedness and will be kept as a record of evidence to support the certification team's recommendation. These documents will be retained at the WECC office in Salt Lake City, Utah for a period of six 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 WECC offices after proper authorization is obtained through WECC and NERC.

- CECD BA questionnaire
- Site visit agenda
- Site visit presentations
- Neighboring BA questionnaire

- Master CECD BA Matrix
- Letter "Request to Initiate the Balancing Authority Certification Process For Red Mesa, LLC"
- CECD's Master BA file "Master Red Mesa Certification Evidence.pdf"
- Documentation resulting from the "Needed for Operation" items

CIP Requirements

CECD and Red Mesa provided the certification team documents as evidence of their compliance to CIP-001. These documents however are not available for public viewing and are retained at the WECC office in Salt Lake City, Utah for a period of six years.

Evaluation of the BA Standards

The certification team was able to assess the applicant's ability to reasonably meet the BA standards/requirements as documented in the **Master CECD BA Matrix**.

Attachment 1 – Team Members

The BA Certification Team

- Jim Hughes – NERC
- Bert Peters – Arizona Public Service Company
- Paul Rice – WECC
- John Greenlaw – WECC RC

The CECD Staff Personnel that Participated in the On-site Visit

- J.T. Thompson – CECD Vice President
- Denise Ayers - CECD Vice President
- Rebecca Martinez - CECD Associate
- C.J. Ingersoll - CECD Director, Compliance
- David Jones – CECD Operator
- Scott Angelmaier – CECD Operator

Attachment 2 - Certification Process Steps

Documentation Review

The certification team reviewed the appropriate documentation that provided reasonable assurance that CECD has the tools, processes, procedures, and training to operate as a NERC certified BA.

The certification team used a spreadsheet to catalog the documentation evidence provided by CECD, namely *Master CECD BA Matrix*. The spreadsheet contains all the applicable NERC standards and associated requirements for a NERC Certified BA along with CECD document references of evidence that was provided and met the applicable standards and requirements.

Applications Review

The September 1-2, 2010 site visit focused on documentation review, interview of NERC Certified operators, and evaluation of the BA applications and operator toolsets that CECD has available for their operators. The CT reviewed CECD's online applications that will be used to perform the Red Mesa/CECD BA requirements. CECD developed a series of EMS demonstrations that were led by the BA operators. These demonstrations provided the certification team with an understanding of CECD applications, as well as demonstrate the operator readiness to assume the duties of the BA Operator.

Operational Testing

CECD and Red Mesa plan to conduct a series of operational tests as a condition of certification. Operational testing is primarily focused with testing the necessary signals in order to facilitate the data exchange, EMS's functionality, operating practices, the Energy Settlement, Tracking and Reconciliation (ESTAR) tool, and the CCD Scheduling tool.