

Minutes Resources Subcommittee

April 28, 2010
Ameren General Office Building
St. Louis, Missouri

A meeting of the North American Electric Reliability Corporation (NERC) Resources Subcommittee (RS) was held on April 28, 2010 at the Ameren Corporation Office in St. Louis, Missouri. The agenda, and attendance list are attached as **Exhibits A** and **B**, respectively. There are no individual statements or minority opinions.

Resources Subcommittee Chair Terry Bilke presided and a quorum was present.

Resources Subcommittee Appreciation for Meeting Host Ameren Corporation

The Resources Subcommittee acknowledges and appreciates the hospitality that the Ameren Corporation and specifically Gerry Beckerle and Crystal Ward provided to the subcommittee as it hosted the RS meeting at their facility.

Antitrust Compliance Guidelines

Secretary Vandervort acknowledged the NERC Antitrust Compliance Guidelines.

January 27–28, 2010 RS Meeting Minutes

The RS approved the January 27–28, 2010 RS minutes.

Resources Subcommittee Welcomes New Member and Officer Change

The Resources Subcommittee welcomed Michael Oatts, Southern Company, as a SERC representative to the subcommittee. Mike has taken the position that Raymond Vice previously occupied. The RS wishes Raymond success in all of his future endeavors and activities.

Chair Bilke appointed Sydney Niemeyer to be the Chair of the Frequency Working Group as the successor to outgoing Chair Raymond Vice.

RS Acknowledges OC Goals and Objectives

The 2010 NERC Top Ten Performance Goals and Objectives are included in the RS meeting agenda. Chair Bilke acknowledged that Goal 1.d. “Assess the extent and impact of the decline in frequency responsiveness of the Eastern Interconnection and develop an action plan to address the issue.” by its subject matter is a goal of the RS. The RS will remain a key player in the NERC Frequency Response Initiative effort.

Frequency Working Group — Chair Sydney Niemeyer

Mr. Niemeyer reported that the Frequency Working Group supported the NERC Frequency Response Initiative meeting held on April 27, 2010. The Frequency Working Group will assist the initiative, the Frequency Response Standard Drafting Team, and the NERC effort to revise BAL-003 regarding the interconnection frequency performance and trends.

Inadvertent Interchange Working Group — Chair Don Badley

Bill Herbsleb gave a report to the RS on the activities of the Inadvertent Interchange Working Group. Mr. Herbsleb reported that he and Mr. Badley are working to reconcile some historical balances in the Eastern Interconnection. An issue occurs when a BA changes historical data for accuracy. When this occurs it changes all future balances from that point in time going forward. If an interconnection was balanced, it becomes unbalanced. The Inadvertent Interchange Working Group is diligently addressing this problem.

Mr. Michael Potishnak is working with CERTS Carlos Martinez to map monthly inadvertent interchange. Mr. Martinez stated that Mike's recommendations will be captured and presented to the industry during upcoming inadvertent interchange training.

The RS is scheduling two sessions of Inadvertent Interchange Training. Each session is expected to last 1 ½ days. Three RS sponsored sites are being considered, a SERC region location, a SPP region location, and a RFC region location. The first day will be an introduction to inadvertent interchange, especially useful to those that have not used the software application before or to be used as a refresher class. The second day will focus on how to troubleshoot problems, address mismatches, maneuver through the operational functions, understand and use the administrative functions, and what to do / how to proceed if problems occur. See Inadvertent Interchange Application Training, below.

Don Badley moved the RS to endorse the Inadvertent Interchange Training Sessions and to assist CERTS Carlos Martinez with the training content and arrangements as necessary. The motion passed.

Operating Reserves Working Group — Chair Larry Akens

Mr. Akens reported that a Hydro Quebec member of the Balancing Authority Control Standard Drafting Team (BACS DT) has submitted a preliminary Operating Reserves technical paper to the SDT for review, evaluation, and to use as an operating reserve standards reference document. After the BACS DT comes to consensus on a version of the technical document, Mr. Akens will present the document to the Operating Reserves Working Group for their review and endorsement.

Frequency Response Initiative

Bob Cummings, NERC Director of System Analysis and Reliability Initiatives, and the Frequency Response Standard Drafting Team, the Reliability-based Control Standard Drafting Team, industry subject matter experts, the Balancing Authority-control Standard Drafting Team, the Frequency Working Group, and the Resources Subcommittee met for a full day meeting to discuss the NERC Frequency Response Initiative on Tuesday, April 27, 2010. Numerous RS members are on the various standard drafting teams and work closely with Mr. Cummings on the Frequency Response

Initiative team. The RS Frequency Working Group will assist the Frequency Response Initiative, the Frequency Response Standard Drafting Team, and the NERC effort to revise BAL-003 regarding the interconnection frequency performance and trends.

Inadvertent Interchange Application Training

CERTS Inadvertent Interchange Application training is in the NERC 2010 budget. The training will be at two locations and will be scheduled to last 1 ½ days for each session. The meeting beverages and lunch expenses will have to be worked out. Training participants maybe on there own for lunch. Beverages may be provided by the host organization or be funded by NERC, this expense will be determined as the training is finalized. The three sites and the RS contacts that are being considered are SPP (Robert Rhodes), Southern Co. (Mike Oatts), and MISO (Terry Bilke).

ACE Diversity Interchange (ADI)

Don Badley, the ADI Task Force chair, reported that the ADITF met after the January RS meeting and will meet on Thursday, April 29, 2010. The ADITF will make assignments to members to begin drafting the ADI technical paper to fulfill its OC assignment and scope. The technical paper, when finished will be presented to the RS, the Interchange Subcommittee, and the Operating Reliability Subcommittee for approval and authorization to present the paper to the NERC Operating Committee. At the discretion of the OC, the ADITF may be retired or it may be requested by the OC to generate an ADI standard authorization request.

NERC BA Bubble Diagram

The RS authorized the posting of the revised NERC BA Bubble Diagram. The RS is asked to review the Bubble Diagram posted on the NERC RS Web site for inaccuracies and errors. The RS will work with the NERC Compliance Registry Program to keep the Bubble Diagram up-to-date with the changes to the NERC registry. Chair Bilke will review the diagram to ensure that there are no US BAs shown in Canada.

The BA Bubble Diagram can be found at: http://www.nerc.com/docs/oc/rs/ctrl_nerc.jpg

NERC Reliability Standards

Numerous RS members are on the listed standard drafting teams. These standards began as RS-sponsored standard authorization requests (SARs). Each standard drafting team is developing new or revising existing standard(s), and will post all the documents for industry comment through the NERC Standards Program. The goal for each standard drafting team is to make significant progress towards the next comment posting or standard ballot.

Frequency Response SDT — Chair Bill Herbsleb

The FRRSDT is coordinating efforts with the RS, the Frequency Working Group, NERC Staff, and the NERC Frequency Response Initiative team. Based on the March 18, 2010 FERC Order the FRRSDT is revising BAL-003. The FRRSDT is also supporting the Frequency Response Initiative.

Reliability-based Control SDT — Chair Doug Hils

Doug Hils, Reliability-based Control Standard Drafting Team (RBCSDT) chair, reported to the RS that the RBCSDT field trials are continuing with status conference calls taking place each month.

Mr. Hils stated that the WECC has begun participation in the RBCSDT field trials with approximately half of the WECC BAs participating and more WECC BAs anticipated joining in the near future.

RBC monthly field trial summaries, documents and tools can be found on the RBCSDT Web site at:

http://www.nerc.com/filez/standards/Reliability_Based_Control_FieldTrial_Tools_2007-18-RF.html

Balancing Authority Control SDT (BAL-002, 004, 005, 006 Revisions) — Chair Larry Akens
Larry Akens, Balancing Authority Control Standard Drafting Team (BACSDT) chair, reported that the drafting team meets each month in a meeting or via a conference call. The drafting team is making significant progress towards revising the standards for posting and ballot. The BACSDT will meet again on April 29, 2010 to continue its drafting process.

Intelligent Alarms

Doug Hils reported that he visited the Reliability Coordinator Working Group to present the RS authorized revised Intelligent Alarms, frequency trigger limits (FTLs) alarms, RC action recommendations. Mr. Hils reported that the RCWG supported the changes. The changes have already been incorporated into the NERC Intelligent Alarms, FTL 5 minute alarms.

Performance Standard Reference Guidelines

Secretary Vandervort will post the Performance Standard Reference Document comments and responses on the NERC RS Web site. Chair Bilke will present the Performance Standards Reference Guidelines to the Operating Committee at the OC meeting to replace the current version in the NERC Operating Manual.

Reliability Metrics Working Group

Jerry Rust, OC Member and RMWG liaison conveyed to the RS that any frequency response analysis it had planned to undertake, the RMWG would assist in the documenting and trending the proposed metric(s).

The RMWG utilizes S.M.A.R.T. (specific, measurable, attainable, relevant, and tangible) criteria that proposed metrics must meet. The RMWG will consider, evaluate, and work with the RS if it deems the trend meets the criteria.

NERC Active Resources Subcommittee Applications

Consortium for Electric Reliability Technology Solutions (CERTS) project manager Carlos Martinez presented a status of the NERC RS applications, see **Exhibit C**. The presentation focused on:

- Research Results for Automatic Identification of Frequency Events and Calculated Frequency Response – Research Objectives
- Frequency Response Data Collection and Analysis System (FRDCA)
- Current and Outstanding Application Issues

- Inadvertent Interchange Change of Scope will be presented to the Inadvertent Interchange Working Group to begin field testing
- The Frequency Monitoring and Alarm Change of Scope will be presented to the RS and the Frequency Working Group to execute Field Testing
- A 2-page User Guide for Intelligent Alarms and Resources Adequacy applications will be prepared to help the Reliability-based Control Standard Drafting Team (BAAL) field test. Field Test Volunteers: Don Badley, Tony Nguyen, Larry Akens, Mike Oatts, Mike Potishnak, Bill Herbsleb, Terry Bilke, James Murphy, John Tolo, Bob Cummings (including NERC Situational Awareness and Reliability Initiatives; and Situational Awareness staff), John Swez, Doug Hils, Gerry Bilke, and Tom Vandervort
- Transition of NERC applications projects, Change of Scopes, support and training of Gil Tam from EPG started in February, 2010. Gil will be taking over and presenting the applications support, CoS status and training during the RS meeting in July, 2010.

DOE North American SynchroPhasor Initiative (NASPI) — Information Only

From the January, 2010 RS meeting, Mr. Bilke reported that the NASPI Real Time Data Measuring System (RTDMS) visualization tool is very good and recommended the RS members take a look at it. Additional information can be found on the following Web sites:

- <http://www.naspi.org/>
- <http://www.powerit.vt.edu/Fnet.htm>
- www.rtdmsusersgroup.org<<http://www.rtdmsusersgroup.org>>

FERC Study on Frequency Response of Renewable Resources

Mahmood Mirheydar reported that FERC is performing a study to determine if frequency response is an appropriate metric to assess the reliability impacts of integrating renewable resources is complete but has not been released to the public. The report may be released to the public before the next RS meeting, if so, Mr. Mirheydar will be able to report on the results, conclusions, and recommendations.

Time Error Monitoring

The subcommittee reported the following time error monitoring statistics:

Interconnection Time Error Totals Jan – Mar, 2010			
	Fast Time Error Corrections	Slow Time Error Corrections	Total Time Error Corrections
Eastern Interconnection	25	0	25
Western Interconnection	12	9	21
ERCOT #	-	-	-
Hydro Québec *	-----	-----	-----

* Hydro Quebec has a frequency based time error monitoring process that does not fit this table.
 # ERCOT TEC data not available at this time.

Performance Monitoring

- CPS1 Review

- CPS2 Review
- DCS Review

The NERC compliance program determines control performance standards CPS1, CPS2, and disturbance control standard (DCS) violations, penalties, and monitors corrective actions. The Resources Subcommittee members are required to sign a NERC Confidentiality Agreement prior to reviewing and discussing the CPS1, CPS2, and DCS reports.

Due to the confidential nature of the data, details of the discussion and review the results of the call cannot be disclosed.

Resources Subcommittee Action Item List

Tom Vandervort reviewed and updated the action item list, which is affixed as **Exhibit D**.

Wednesday, July 28, 2010 Thursday, July 29, 2010	8 a.m. – 5 p.m. 8 a.m. – noon	Pensacola, FL Host: Southern Co Office * Coordinator: Mike Oatts
Wednesday, October 27, 2010 Thursday, October 28, 2010	8 a.m. – 5 p.m. 8 a.m. – noon	Philadelphia, PA Host: PJM Office or TBD * Coordinator: Bill Herbsleb
Wednesday, January 26, 2011 Thursday, January 27, 2011	8 a.m. – 5 p.m. 8 a.m. – noon	Austin, TX Host: ERCOT Office * Coordinator: Sydney Niemeyer
Wednesday, April 20, 2011 Thursday, April 21, 2011	8 a.m. – 5 p.m. 8 a.m. – noon	San Diego, CA Host: TBD, WECC RS members * Coordinator: WECC RS Members
Wednesday, July 27, 2011 Thursday, July 28, 2011	8 a.m. – 5 p.m. 8 a.m. – noon	Denver, CO Host: TBD, WECC RS members* Coordinator: WECC RS Members

Dates and Locations of Future Meetings

Additional meetings or conference calls may be scheduled as necessary for RS business-related purposes.

* Future RS meetings will be hosted at RS member, Region, utility, or volunteer facilities.

Respectfully submitted,

Tom Vandervort

Thomas J. Vandervort
 Resources Subcommittee Secretary

Antitrust Compliance Guidelines

I. General

It is NERC's policy and practice to obey the antitrust laws and to avoid all conduct that unreasonably restrains competition. This policy requires the avoidance of any conduct that violates, or that might appear to violate, the antitrust laws. Among other things, the antitrust laws forbid any agreement between or among competitors regarding prices, availability of service, product design, terms of sale, division of markets, allocation of customers or any other activity that unreasonably restrains competition.

It is the responsibility of every NERC participant and employee who may in any way affect NERC's compliance with the antitrust laws to carry out this commitment.

Antitrust laws are complex and subject to court interpretation that can vary over time and from one court to another. The purpose of these guidelines is to alert NERC participants and employees to potential antitrust problems and to set forth policies to be followed with respect to activities that may involve antitrust considerations. In some instances, the NERC policy contained in these guidelines is stricter than the applicable antitrust laws. Any NERC participant or employee who is uncertain about the legal ramifications of a particular course of conduct or who has doubts or concerns about whether NERC's antitrust compliance policy is implicated in any situation should consult NERC's General Counsel immediately.

II. Prohibited Activities

Participants in NERC activities (including those of its committees and subgroups) should refrain from the following when acting in their capacity as participants in NERC activities (e.g., at NERC meetings, conference calls and in informal discussions):

- Discussions involving pricing information, especially margin (profit) and internal cost information and participants' expectations as to their future prices or internal costs.
- Discussions of a participant's marketing strategies.
- Discussions regarding how customers and geographical areas are to be divided among competitors.

- Discussions concerning the exclusion of competitors from markets.
- Discussions concerning boycotting or group refusals to deal with competitors, vendors or suppliers.
- Any other matters that do not clearly fall within these guidelines should be reviewed with NERC's General Counsel before being discussed.

III. Activities That Are Permitted

From time to time decisions or actions of NERC (including those of its committees and subgroups) may have a negative impact on particular entities and thus in that sense adversely impact competition. Decisions and actions by NERC (including its committees and subgroups) should only be undertaken for the purpose of promoting and maintaining the reliability and adequacy of the bulk power system. If you do not have a legitimate purpose consistent with this objective for discussing a matter, please refrain from discussing the matter during NERC meetings and in other NERC-related communications.

You should also ensure that NERC procedures, including those set forth in NERC's Certificate of Incorporation, Bylaws, and Rules of Procedure are followed in conducting NERC business.

In addition, all discussions in NERC meetings and other NERC-related communications should be within the scope of the mandate for or assignment to the particular NERC committee or subgroup, as well as within the scope of the published agenda for the meeting.

No decisions should be made nor any actions taken in NERC activities for the purpose of giving an industry participant or group of participants a competitive advantage over other participants. In particular, decisions with respect to setting, revising, or assessing compliance with NERC reliability standards should not be influenced by anti-competitive motivations.

Subject to the foregoing restrictions, participants in NERC activities may discuss:

- Reliability matters relating to the bulk power system, including operation and planning matters such as establishing or revising reliability standards, special operating procedures, operating transfer capabilities, and plans for new facilities.
- Matters relating to the impact of reliability standards for the bulk power system on electricity markets, and the impact of electricity market operations on the reliability of the bulk power system.
- Proposed filings or other communications with state or federal regulatory authorities or other governmental entities.
- Matters relating to the internal governance, management and operation of NERC, such as nominations for vacant committee positions, budgeting and assessments, and employment matters; and procedural matters such as planning and scheduling meetings.

Agenda

Resources Subcommittee

April 27, 2010 | 1 p.m.–5 p.m.
April 28, 2010 | 8 a.m.–5 p.m.
Ameren General Office Building
1901 Chouteau Avenue
St. Louis, Missouri 63103

1. **Administrative**
 - a. Membership and Guests — Terry Bilke
 - i) **Attachment:** RS Organization and Assignments
 - ii) **Attachment:** RS Roster
 - iii) **Attachment:** RS Survey Contacts
 - b. Arrangements — Tom Vandervort
 - c. Approval of Meeting Minutes — Terry Bilke
 - i) **Attachment:** January 27-28, 2010 RS Meeting Minutes
 - d. Approval of the Meeting Agenda
 - e. Procedures
 - i) **Attachment:** Parliamentary Procedures — Terry Bilke
 - ii) **Attachment:** Antitrust Compliance Guidelines — Tom Vandervort
 - f. Resources Subcommittee Action Items List (review prior to the meeting) — Terry Bilke
 - i) **Attachment:** RS Action Items List
 - g. NERC–RS Confidentiality Agreement — Terry Bilke
 - i) **Attachment:** Confidentiality Agreement
 - h. Resources Subcommittee Scope, Available on NERC RS website — Tom Vandervort
 - i) RS Scope Link: http://www.nerc.com/docs/oc/rs/RS_Scope.pdf
2. **RS and Officer Changes — Terry Bilke**
 - i) Michael Oatts replaces Raymond Vice as a SERC RS Member
 - ii) Sydney Niemeyer replaces Raymond Vice as Frequency WG Chair
3. **NERC 2010 Goals and Objectives, Information Only — Tom Vandervort**
 - i) **Attachment:** Top 10 NERC 2010 Goals and Objectives
4. **Working Group Reports**

Working Group Meetings, Conference Calls, or Action since the last RS Meeting

 - a. Frequency Work Group — Sydney Niemeyer

- b. Inadvertent Interchange Work Group — Don Badley
- c. Operating Reserves Work Group — Larry Akens

5. **NERC Related Activity**

- a. NERC Operating Committee Meeting – RS Action Items / Assignments — Terry Bilke, Jerry Rust
 - i) **Attachment** – Terry Bilke’s Presentation to the Operating Committee
 - ii) **Attachment** – Operating Committee Draft Minutes
- b. Frequency Response Initiative, Overview and Actions — Bob Cummings
 - i) Identify Specific Frequency-related Reliability Factors
 - ii) Identify Root Causes of Changes in Frequency Response
 - iii) Consider Impacts of Integration of New Generation Technologies (e.g. solar generation) on Frequency Response
 - iv) Determine if Results-based Frequency Response Standards are Warranted
 - v) March 18, 2010 FERC Orders (including Order on BAL-003)
 - (1) **Attachment** – March 18, 2010 FERC Order on BAL-003
 - vi) BAL-003 Advisory
 - (1) **Attachment** – Reliability Risk – Interconnection Frequency Response (Revision 1)
 - (2) **Attachment** – Advisory Background
 - vii) Establishing an Authoritative Frequency Response Nomenclature
- c. Intelligent Alarms - Frequency Trigger Limits (FTLs) Diagnosis and Actions — Terry Bilke, Doug Hils, Carlos Martinez
- d. Reliability Metrics Working Group (RMWG) — Jessica Bian, Jerry Rust
- e. Reliability Fundamentals Working Group (RFWG) — Jerry Rust
- f. ACE Diversity Interchange Task Force (ADITF) — Don Badley
- g. Update NERC BA Bubble Diagram / Map — Terry Bilke, Tom Vandervort
 - i) Link to BA Bubble Diagram — <http://www.nerc.com/filez/rs.html>

6. **NERC Reliability Standards and Reliability Related Documents**

- a. Frequency Response SDT — Bill Herbsleb
- b. Reliability-based Control SDT — Doug Hils, Sydney Niemeyer
- c. Balancing Authority Control SDT — Larry Akens
- d. NERC OC Operating Manual
 - (1) Link to NERC OC Operating Manual - http://www.nerc.com/files/opman_12-13Mar08.pdf
 - i) Performance Standards Guidelines — John Swez
 - (1) **Attachment:** Performance Standards Guidelines Comments
 - ii) Area Interchange Error Survey Training Document – Don Badley and Inadvertent Interchange Working Group
 - iii) Frequency Response Characteristic Survey Training Document – Sydney Niemeyer and Frequency Working Group
 - iv) Inadvertent Interchange Accounting Training Document – Don Badley and Inadvertent Interchange Working Group

- v) Time Monitoring Reference Document – Don Badley and Inadvertent Interchange Working Group
 - e. Reliability Concepts Document – Balancing and Frequency Control – Terry Bilke
 - vi) **Attachment:** – Balancing and Frequency Control (Part 1) Comments
 - f. BAL-001 CPS1 Reporting Requirement – Terry Bilke, Tom Vandervort
7. **RS Software Applications**
- a. Resources Adequacy (ACE-Frequency) Application System — Carlos Martinez, Terry Bilke
 - i) Functionality and Utilization of the RS Approved Change of Scope System for Data Collection for Frequency Response Purposes
 - ii) Research Results and Recommendations on Automatic Identification of Abnormal Generation and Load Events and Frequency Response Calculations for Three Interconnections
 - b. Intelligent Alarms — Carlos Martinez, Terry Bilke
 - c. AIE Monitoring Application — Carlos Martinez, Don Badley, Bill Herbsleb
 - d. CPS1 & BAAL Monitoring Application— Carlos Martinez, Doug Hils
 - e. Frequency Monitoring and Analysis Application — Carlos Martinez, Sydney Niemeyer, Terry Bilke
 - f. Inadvertent Interchange Application — Carlos Martinez, Don Badley, Bill Herbsleb
 - g. NERC-CERTS-RS Software Application Training – Terry Bilke, Carlos Martinez
 - h. DOE North American SynchroPhasor Initiative (NASPI) — Terry Bilke, Bob Cummings
8. **Frequency and Control Performance**
- a. Western Interconnection Frequency Trends and Events — James Murphy
 - b. Eastern Interconnection Frequency Trends and Events — Terry Bilke
 - c. ERCOT Interconnection Frequency Trends and Events — Sydney Niemeyer
 - d. Hydro Quebec Interconnection Frequency Trends and Events — Mike Potishnak
 - e. CPS1, CPS2, BAAL Data Trends — Terry Bilke
 - f. DCS Data Trends — Terry Bilke
 - g. Inadvertent Interchange Accounting — Don Badley, Bill Herbsleb
 - i) Balances
 - ii) Mismatches
 - iii) Remaining Transition Issues
 - iv) FRCC reporting balances with SERC, not Internal-FRCC BA-to-BA
 - v) Western Interconnection Inadvertent Interchange Balances (July 1 – December 31, 2009)
 - h. FERC Study on Frequency Response of Renewable Resources – Mahmood Mirheydar
 - i) **Attachment** – FERC Study
 - i. Super Bowl Activity versus the Interconnection Frequency – Terry Bilke
9. **Time Error**
- a. Eastern Interconnection — Bill Herbsleb

- b. Western Interconnection — John Tolo
- c. ERCOT Interconnection — Sydney Niemeyer
- d. Hydro Québec Interconnection — Mike Potishnak

10. **Future Meetings**

- a. July 28-29, 2010 — Pensacola, Alt: Gulfport, Southern Co. Contact: Mike Oatts
- b. October 27-28, 2010 — Valley Forge, PA, PJM Interconnection Contact: Bill Herbsleb
- c. January 26-27, 2011— Austin, TX, ERCOT Office Contact: Sydney Niemeyer
- d. April 20-21, 2011 — San Diego, CA Location TBD, Contact WECC RS Members

* Future RS meetings need to be held at region, utility, or volunteer facilities

Attendance List Resources Subcommittee Meeting

April 28, 2010
Ameren General Office Building
St. Louis, Missouri 63103

Meeting Attendance

<u>Name</u>	<u>Attendance</u>
Terry Bilke, Chair	Y
Don Badley, Vice Chair	via phone
Sydney Niemeyer	Y
Mike Potishank	Y
Bill Herbsleb	Y
John Swez	Y
Larry Akens	Y
Gerry Beckerle	Y
Mike Oatts	Y
Robert Rhodes	Y
James Murphy	Y
John Tolo	Y
Tom Vandervort	Y
Carlos Martinez	Y
Mahmood Mirheydar	Y
Phil Tatro	Y
Bob Cummings	Y
Doug Hils	Y
Howard Illian	Y
Jerry Rust	Y
LeRoy Patterson	Y
Darrel Richardson	Y
Tony Nguyen	Y
Eddy Lim	via phone
Andy Rodriquez	Y

<i>Consortium for Electric Reliability Technology Solutions</i>	Automatic Identification of Frequency Events and Freq. Response
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**Research Results on Automatic
Identification and Archive of Interconnections
Frequency Events and Frequency Response**

For: RS and FRSDT
By: C. Martinez, H. Illian, L. Patterson

April 27, 2010

NERC
NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

CERTS
CONSORTIUM FOR ELECTRIC RELIABILITY TECHNOLOGY SOLUTIONS

PRESENTATION OUTLINE

- *Research Results for Automatic Identification of Frequency Events and Calculated Frequency Response*
- *Frequency Response Data Collection and Archiving System - (FRDCA)*
- *NERC Applications Status and Outstanding Items for RS*

***AUTOMATIC IDENTIFICATION OF FREQUENCY EVENTS AND
FREQUENCY RESPONSE – RESEARCH OBJECTIVES***

- Investigate and validate automatic methods and processes to identify interconnections frequency events by extending and validating the approach recommended by Florida Region Representatives using 1-second phasor frequency data and 10-second ACE data
- Validate the number of events and the Frequency Response estimates calculated for the events identified using:
 - FRSDT definitions for frequency values for points (A) and (B)
 - Largest BA-ACE for event loss MW
 - RS yearly list of events used for BA Frequency Bias calculations
- Archive for five years interconnections frequency events and its Frequency Response automatically identified and calculated, together with BAs entered Frequency Response survey data, for Stakeholders analysis, comparison and definition of interconnection periodic (yearly) event lists for calculating periodic BAs Frequency Bias

***Research Results on Automatic Identification
of Frequency Events and
Calculated Frequency Response***

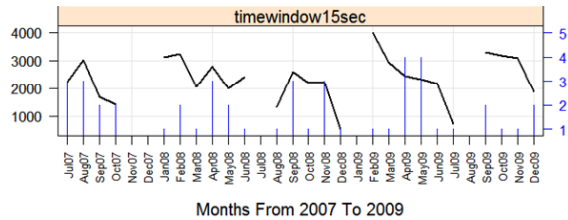
AUTOMATIC IDENTIFICATION OF FREQUENCY EVENTS AND RESEARCH RESULTS AND RECOMMENDATIONS

Project Team concluded the method recommended by the Florida Region does produce a representative and adequate set of frequency events if the size of the frequency change and/or time window is adjusted for each interconnection from the recommended 0.040 Hz and 15-second window for Eastern to the following parameters:

Interconnection	Frequency Deviation	Initial Frequency for frequency declines	Initial Frequency for frequency increases	Time Windows (Sec)
Eastern Interconnection	36 mHz	<= 60 Hz	>=60 Hz	25
Western Interconnection	50 mHz	<= 60 Hz	>=60 Hz	25
ERCOT	70 mHz	<= 60 Hz	>=60 Hz	25

NUMBER OF FREQUENCY EVENTS IDENTIFIED USING FLORIDA RECOMMENDED PARAMETERS FOR EAST 0.040 Hz, 15-SECOND WINDOW AND BELOW 60.00 Hz

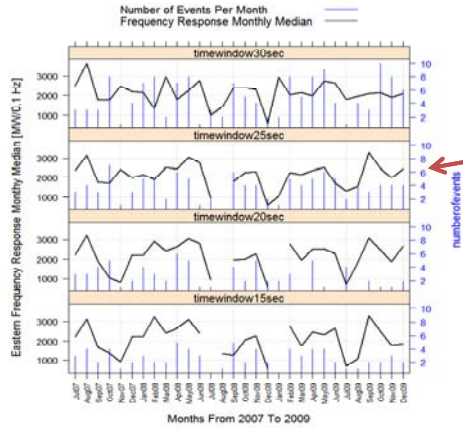
Month Year	15-Seconds Window Frequency Response Median	Number of Identified Events
Jul07	2236	3
Aug07	3239	3
Sep07	1703	2
Oct07	1416	2
Nov07	NA	NA
Dec07	NA	NA
Jan08	3121	1
Feb08	3240	2
Mar08	2061	1
Apr08	2786	3
May08	2000	2
Jun08	2425	1
Jul08	NA	NA
Aug08	1338	1
Sep08	2608	3
Oct08	2193	1
Nov08	2251	3
Dec08	528	1
Jan09	NA	NA
Feb09	3993	1
Mar09	2930	1
Apr09	2460	4
May09	2334	4
Jun09	2175	1
Jul09	705	1
Aug09	NA	NA
Sep09	3305	2
Oct09	3185	1
Nov09	3091	1
Dec09	1883	2



Research results indicate Florida recommended parameters to identify and define Eastern Interconnection frequency events do not produce a representative, adequate set of frequency events.

The proposed method is capable of producing a representative and adequate set of frequency events for each interconnection if the size of the frequency change and/or time window is adjusted as recommended.

EASTERN NUMBER OF EVENTS USING RECOMMENDED PARAMETERS – 0.036 Hz, 25-SECOND WINDOW BELOW 60.00 Hz

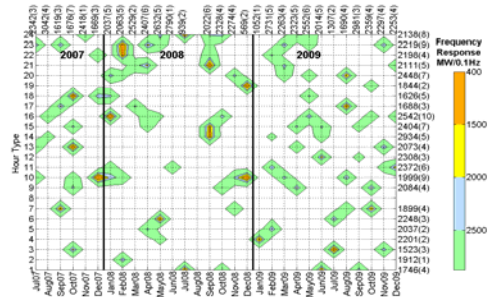
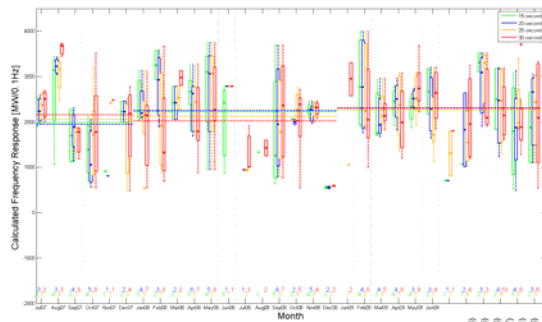


Recommended Parameters For Eastern Interconnection

Analysis of above results indicate that for Eastern a delta frequency of 0.036 Hz and below 60.00 Hz the 25-second event set is representative and produces an adequate list of frequency events.

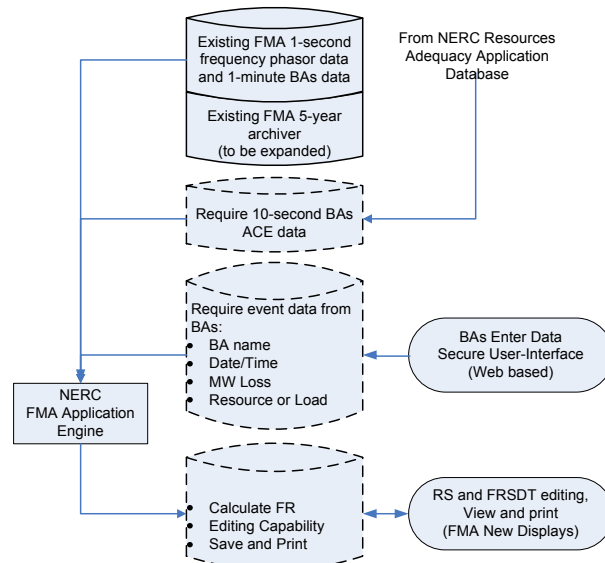
The 25-second event set contains about 4 events per month with a total of about 47 events per year, with only 1 month without events. About 50-percent of the events automatically identified match the RS produced list of events for 2009.

CALCULATED FREQUENCY RESPONSE MEDIAN, VARIABILITY AND TIME DISTRIBUTION DURING MONTH-HOUR



Frequency Response Data Collection and Archive System - FRDCA

FREQUENCY RESPONSE DATA COLLECTION AND ARCHIVE (FRDCA) - NERC FMA APPLICATION EXTENSION



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FRDCA-SYSTEM FOR STAKEHOLDERS EDITING OF BA ENTER EVENTS AND REAL-TIME COLLECTED EVENTS

Interconnection

Time Window For BA or Real Time Event Data

Events During Time Window

BA Entered Data for Selected Event and RS/FRSDT Editing

Frequency Response Calculated

Frequency Response Calculations for BA and Real Time Event Data

Real Time Matching Event For RS/FRSDT Editing

RS/FRSDT Save and Print

BA enter Data

Phasor 1-second and ACE 10-Second ACE Data

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FRDCA-SYSTEM FOR HISTORICAL EVENT DATA RECALL, COMPARISON AND PRINTOUT FOR ANALYSIS

Sort Events from Selected Period

Event(s) Selection for Display and Print

Selected Real Time Event Time-Freq. Plot 1-Second Resolution

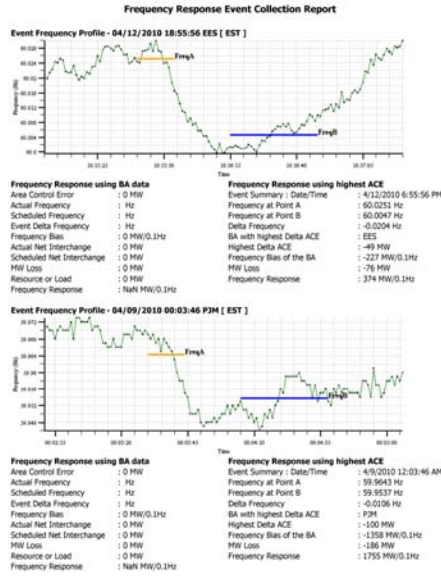
Selected Real Time Event and Frequency Response Calculation

Print Selected Events

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**FREQUENCY RESPONSE DATA COLLECTION AND ARCHIVE (FRDCA)
PRINTOUT OF SELECTED EVENTS – 2 EVENTS PER PAGE**



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***NERC Applications Status
and Outstanding Items***

NERC Applications Status Summary

Application	NERC Applications Status
Resources Adequacy (ACE Frequency)	Release 6.1 – Available in application web-site
Inadvertent	Release 3.0 – Current Production version. CoS for new and enhanced reports completed. FAT in progress On Site Training outline submitted to RS
Area Interchange Error (AIE)	Release 1.0 – Current production version
Intelligent Alarms	Release 1.0 – Current production version
Frequency Monitoring and Analysis (FMA)	Release 1.0 – Current production version CoS for data collection and archive of Frequency Response data completed. FAT completed. Ready for RS/FRSDT Field Test
Automated Reliability Reports (ARR)	Release 1.0 – Current production version Current users up to 21

Current and Outstanding Issues

- The 2009 Inadvertent CoS will be deliver for Field Test during first week of May
- **Access will be to RS Inadvertent Working Group Members**
- The FMA CoS ready for RS/FRSDT Field Test
- **RS and FRSDT to define Members to execute Field Test**
- **A 2-page Integrated User Guide** for I-Alarms and Resources Adequacy applications will be prepared to help Reliability Base Control Standard (BAAL) Field Tests participants
- **Does RS concurs with the Guide preparation?**
- Transition of NERC applications projects, CoS, support and training to Gil Tam from EPG started in February. Gil will be taking over and presenting the applications support, CoS status and training during the RS meeting in July – **Questions ?**



Resources Subcommittee
April 28, 2010 Meeting
Open Action Item List

Action Figure	Subject	Action Item/Assignment	Due Date	Completion Date
Resources Subcommittee	NERC Frequency Response Initiative	042710, Resources Subcommittee to support Bob Cummings and the Frequency Response Initiative. RS will work with RS Frequency WG, the RBCSDT, the BACSDT, the FRRSDT, NERC Staff, FERC Staff, and industry contributors to address relative issues and concerns.	072810	
Terry Bilke	Bubble Diagram	042810, Terry Bilke to review the NERC BA Bubble Diagram to ensure that the US BAs are not located in Canada.	072810	
Bill Herbsleb, Mike Potishnak	BA Check List for Decertificaton	<p>102809, Bill Herbsleb, Mike Potishnak, and Tom Vandervort to develop some sort of check list on what needs to be done when a BA:</p> <ul style="list-style-type: none"> • Certifies • Decertifies • Merges • Consolidates, Etc. <p>012710, Bill and Mike to work on the BA Check List. Terry asked to develop the check list by the end of February, 2010.</p> <p>Mike wants to have the BA mapping as part of the resolution (what is looked at before and after a BA divides, merges, retires, etc. – the initial BA and resulting BA).</p> <p>042810, Bill Herbsleb to send NERC action items to Tom Vandervort to process.</p>	072810	
Resources Subcommittee	NERC OC Operating Manual Docs	<p>073108, RS members on each open BAL-related standard drafting team are to request that the SDT write or plan to write a modules for each SDT specific requirement and how to achieve technical results for the PSRD.</p> <p>102908, Resources Subcommittee recommended to the OC that the RS documents</p>	072809	

Action Figure	Subject	Action Item/Assignment	Due Date	Completion Date
		<p>that are found in the OC Operating Manual be kept in the manual.</p> <p>102908, RS Working Groups and RBCSDT, BACSDT, and FRSDT are to revise the documents for accuracy. RS will then submit the revised documents to the RFWG to update the manual. SDTs can develop the documents as standards reference documents to support their respective standards.</p> <p>012909, John Swez to review the Performance Standard Reference Document for accuracy. Ongoing action item.</p> <p>RS Operating Manual documents are:</p> <p>Performance Standard Reference Document (PSRD) – John Swez</p> <p>Area Interchange Error Survey Training Document – Don Badley and Inadvertent Interchange WG</p> <p>Frequency Response Training Document – Sydney Niemeyer and Frequency WG</p> <p>Inadvertent Interchange Accounting Training Document – Don Badley and Inadvertent Interchange WG</p> <p>Time Monitoring Reference Document – Don Badley and Inadvertent Interchange WG</p> <p>072909, RS needs to review and concur with revisions and then forward to the OC for authorization to post for industry comments 45 days.</p> <p>102809, Terry to present the revised PSRD to the OC to begin the Ops Manual revision process. With OC authorization, the PSRD will be posted for 45 days.</p> <p>121609, NERC posted the Performance Standard Reference Document for 45 day comment period which ends on Feb 12, 2010.</p>		
Tom Vandervort	Performance Standard Referenced Guidelines	042810, Tom Vandervort to post the PSRG, comments, and responses on the NERC RS website.	072810	
Tom Vandervort	CPS Reporting to NERC	042810, Tom Vandervort to reply to entity that inquired about BAL-001 reporting requirement – to report CPS data to NERC. Refer to Terry's e-mail and have the individual contact Terry if he wants to discuss the reporting requirements.	072810	
Tom Vandervort	Coordinate NERC RS Applications with CIP Group	042810, Tom Vandervort to coordinate the NERC RS applications with the CIP Program. Contact Bill Herbsleb to get background on RS concerns.	072810	
Tom Vandervort	DCS Report	042810, Tom Vandervort to contact Chris Scheetz on why the right two columns are not always filled in on the quarterly reports with the data that is submitted. (e.g.	072810	

Action Figure	Subject	Action Item/Assignment	Due Date	Completion Date
		Robert Rhodes identified SPP DCS reports that had the data submitted, but the data was not on the quarterly report.		
Tom Vandervort	DCS Report	042810, Tom Vandervort to contact Chris Scheetz to incorporate the asterick by the WECC BAs on the CPS2 Data for the Last 12 months that are participating in the RBCSDT Field Trials. The asterick should be the same as the Eastern Interconnection.	072810	
Don Badley , Bill Herbsleb and Inadvertent Interchange Work Group	Inadvertent Interchange Balances	073108, HIGH PRIORITY Coordinated effort is necessary to attain and incorporate the proper 2006 and 2007 carry-forward inadvertent interchange data. Don Badley to work with Bill Herbsleb, Carlos to aggressively bring all BAs up to date and balance their inadvertent interchange values through January 1, 2007 (the line in the sand – balances going forward). RS members and RS Survey Contacts may be called upon to resolve the mismatches and imbalances. 102909, Don Badley and Bill Herbsleb are addressing the mismatched balances, in progress. Don and Bill may call upon RS members for assistance to resolve mismatches and balance the Eastern Interconnection inadvertent interchange accounts. 012710, Don and Bill will prepare and send out a summary of the EI mismatches.	072810	
	NERC-CERTS Project Review			
Carlos Martinez	Inadvertent Interch missing or mismatch data entries	072909, Based on RS suggestion, Carlos to send e-mail notification to BAs' staff that performs Inadvertent Interchange application data entries when triggers show missing or mismatched data. Carlos to work closely with Don Badley and Bill Herbsleb. Ongoing effort.	072810	
Robert Rhodes, Mike Oatts, Terry Bilke	Inadvertent Interchange Training	042810, Robert, Mike, Terry to check for availability of their meeting facilities to host Inadvertent Interchange application training. Training will be 1 ½ day sessions at two of these three locations.	060110	
Don Badley Bill Herbsleb	Inadvertent Interchange Training	042810, Don, Bill, and the Inadvertent Interchange Working Group are to work with CERTS Carlos martinez and Gil Tam to finalize training plans.	060110	