



NORTH AMERICAN ELECTRIC RELIABILITY COUNCIL

Princeton Forrestal Village, 116-390 Village Boulevard, Princeton, New Jersey 08540-5731

Resources Subcommittee Meeting

May 4–6, 2005
Portland, Oregon

Minutes

A regular meeting of the North American Electric Reliability Council Resources Subcommittee (RS) was held on May 4–6, 2005 in Portland, Oregon. The meeting announcement, agenda, and attendance list are attached as **Exhibits A, B, and C**, respectively. Individual statements and minority opinions are affixed as **Exhibits D and E**. (There were none.)

Resources Subcommittee member Raymond Vice presided in the absence of Chairman Carl Monroe. The secretary announced that a quorum was present.

Minutes of the Previous Meeting

The subcommittee approved the January 26–28, 2005 Resources Subcommittee meeting minutes.

Warren McReynolds Recognized

Chair Raymond Vice recognized the work that Warren McReynolds, from Bonneville Power Administration, has performed for the Resources Subcommittee. The RS presented Mr. McReynolds with a plaque commemorating his long-term contribution of supplying Western Interconnection frequency data and frequency analysis. On behalf of the subcommittee, Mr. Vice thanked Mr. McReynolds for his continuous support through the years and expressed best wishes on his future retirement.

Resources Subcommittee Scope and Membership

The secretary informed the subcommittee that the proposed RS scope and membership criteria developed during the last meeting were forwarded to the Operating Committee. The OC is in the process of revising the subcommittee membership criteria and will consider the RS recommendations.

The secretary will contact FRCC to request a nomination to fill the regional vacancy from the resignation of Don McInnis.

Resources Subcommittee Action Item List

The subcommittee reviewed and updated the action item list, which is affixed as **Exhibit F**.

Task Force Reports

Frequency Task Force – Chairman Raymond Vice

Balance Resources and Demand Draft Standard Field Test

The Frequency Task Force hosted a WebEx meeting to discuss the Balance Resources and Demand Draft Standard, Proposed Phase II Field Test. The WebEx participants included the Resources Subcommittee

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and members of the Operating Reliability Subcommittee, the Reliability Coordinator Working Group (RCWG), the Balance Resources and Demand Standard Drafting Team, and industry participants.

Raymond Vice and Doug Hils summarized the results of the Phase I field test and the expectations of the Phase II field test. The following Phase II field test items were discussed:

- Changes to the Phase II field test addressing the RCWG concerns
- RCWG endorsement of the Phase II field test
- The authority, criteria, and methodology for a RC to suspend the entire Phase II field test or an individual BA's participation in the field test
- Phase II field test requirements
- CPS2 compliance waiver
- Possible DCS compliance waiver
- BA data summarization and reporting criteria
- A possible ACE cap
- Presentation of the Phase II field test plan to the Operating Committee for approval

Mr. Vice asked the RCWG to discuss and endorse the Phase II field test within the next two weeks. The Balance Resources and Demand Standard Drafting Team will present the Phase II field test plan to the Operating Committee for approval and authorization to start the test and would like to include the RCWG endorsement in its request.

NERC Reliability Standards, SARs, Reference Documents and Training Documents

Review Issues for Special Consideration

The subcommittee reviewed nine standards-related issues to determine the course of action to take (i.e., urgent action SAR, normal SAR process, inclusion in a reference document, or consideration as a regional difference).

1. WECC DCS grace period of 60 minutes

The WECC DCS recovery period is structured more conservatively than the requirements of the NERC standards. WECC suggests that the DCS recovery period should be 60 minutes from the beginning of an event (or 45 minutes from the end of the 15-minute recovery period) and the addition of specific recovery criteria within the NERC DCS standard. In addition, WECC has alternate language from NERC reliability standards in that WECC insists that a minimum amount of reserve has to be carried at all times, some of which has to be spinning. Don Badley led the discussion and proposed that the subcommittee develop a SAR to revise the NERC DCS criteria.

RS Response: The Operating Reserve Task Force will review WECC's suggestion and consider incorporating the language into a SAR. Mike Potishnak and Don Badley will get WECC's proposal details for review, analysis, and consideration by the ORTF.

2. ACE Special Cases — Reliability concern since it affects ACE calculation

During the Reliability Standards transition process, the Special ACE Cases were assigned to NAESB to be dealt with as business practices. These special cases are pseudo ties and dynamic schedules that affect the ACE equation and have reliability implications. To return these Special ACE Cases requirements to the NERC reliability standards, the subcommittee needs to submit a SAR accompanied by a letter detailing the reliability implications to the Standards Authorization Committee (SAC) and the Joint Interface Committee (JIC).

RS Response: The AGC Task force will review and consider incorporating the ACE Special Cases or the Dynamic Transfer White Paper into BAL-001 or BAL-005. The task force will develop a SAR to accomplish this revision following its review. The RS believes this function needs to be returned to the NERC reliability standards.

3. Time Error Correction — Reliability concern since it affects ACE calculation

During the Reliability Standards Transition Process, the Time Error Correction procedures were assigned to NAESB to be dealt with as business practices. The methodology to implement a time error correction (TEC) is to offset frequency from the normally scheduled 60.00 Hz.

Manipulating the interconnection frequency has serious reliability implications. Every NERC calculation that uses “Scheduled Frequency” is affected by this standard. To return the Time Error Correction requirements to the NERC reliability standards, the subcommittee needs to submit a SAR accompanied by a letter detailing the reliability implications to the Standards Authorization Committee (SAC) and the Joint Interface Committee (JIC).

RS Response: The Frequency Task force will review and consider incorporating the TEC into BAL-004, using the WECC Automatic Time Error Control (WATEC) procedure for TEC or possibly eliminating it. The task force will develop a SAR to accomplish this revision following its review. The RS believes this function needs to be returned to the NERC Reliability Standards.

4. Eastern Interconnection adoption of WECC WATEC — Automatic Inadvertent Interchange Payback and TEC — Reliability Concern since it contains an ACE control adjustment

The NAESB Inadvertent Interchange Payback Task Force has been deliberating the Inadvertent Interchange Payback issue for over two years but has not been able to arrive at a consensus. The WECC has petitioned to use their WATEC procedure and intends to incorporate this procedure into the NAESB business process. For the Eastern Interconnection, the IIPTF is considering: 1) a frequency bandwidth option that pays back in-kind within the frequency bandwidth and a mandatory financial settlement outside the frequency bandwidth; and 2) the WATEC methodology for the Eastern Interconnection. The WATEC procedure adjusts the “Control ACE” to payback Inadvertent Interchange thus having reliability implications. The subcommittee needs to evaluate the “Control ACE” manipulation for both the Western and the Eastern Interconnections through the WATEC process. Since WECC is definitely going to continue using the WATEC standard it needs to be returned to the NERC reliability standards. The subcommittee also needs to consider using the WATEC process in the Eastern Interconnection and the benefits of one standard setting the requirements for both Inadvertent Interchange Payback and Automatic Time Error Correction. To return the WECC WATEC Inadvertent Interchange Payback standard and to recommend using the WECC WATEC Inadvertent Interchange Payback in the Eastern Interconnection, the WATEC Inadvertent Interchange Payback standard needs to be incorporated into the NERC reliability standards. The subcommittee needs to submit a SAR accompanied by a letter detailing the reliability implications to the Standards Authorization Committee (SAC) and the Joint Interface Committee (JIC).

RS Response: The Inadvertent Interchange Task Force will review and consider incorporating the WATEC into the NERC reliability standards for inadvertent payback. The task force will develop a SAR following its review. The RS believes this function needs to be returned to the NERC reliability standards.

5. Generator’s obligation to support frequency deviation and governor response operation criteria

An incident occurred in which the Eastern Interconnection experienced a frequency excursion and a generator did not respond to the excursion. The generator informed the Balancing Authority that the new reliability standards do not contain a requirement with respect to a generator’s governor response. Terry Bilke believes the BA’s interconnection agreement with the generator addresses the requirement for providing governor response. Raymond Vice commented that in the policies, it was up to the control area to ensure that sufficient turbine governor response was available to maintain the stability of the Interconnection and ensure stable operations under islanding conditions. The reliability standards adopt this same philosophy for the Balancing

Authorities. It doesn't tell the Balancing Authorities HOW they are to go about this, only that it is their responsibility. The subcommittee needs to evaluate:

- The need for governor response operation criteria;
- Whether the Frequency Response Standard (FRS) SAR that is currently posted for industry comment addresses the immediate real-time requirements that would include governor frequency response;
- Whether the subcommittee should include "generator frequency support" requirements in the RS standards review.

RS Response: The RS agrees that there is no requirement for the generators to support Interconnection frequency in existing standards. The RS believes the generators should support Interconnection frequency possibly through an ancillary services market.

Generator requirements should be included in NERC standards unless there is a robust ancillary service market or other mechanism for providing turbine governor response. As proposed the FRS SAR will not require generators to support Interconnection frequency. However, MOD-027-1 that is currently under development does have such a requirement. If this standard is passed as written, no further action is required. If MOD-027-1 is not authorized, then the Frequency Task Force will review and consider an appropriate generator governor SAR.

6. When to call AIE and ACE Surveys — Criteria, Triggers, Trends, etc.

During the last meeting, the subcommittee discussed the criteria to initiate AIE and ACE Surveys. During the standards review and evaluation of the current standards, it is an opportune time to determine and propose the "when to call surveys" criteria. During April 2005, the subcommittee was asked to evaluate a number of consecutive day frequency excursions and had an email discussion on this subject. The subcommittee needs to come to a consensus on when to call surveys and submit a SAR to the Standards Process Manager.

RS Response: Terry Bilke will evaluate Eastern Interconnection historical data and significant events and recommend survey initiation criteria (criteria that would require approximately 3 surveys a year). WECC and ERCOT have existing criteria for calling surveys.

As an interim guide for the Eastern Interconnection, the RS recommends AIE Surveys be called when the following circumstances occur:

- Any sudden change of frequency greater than 35 mHz, which cannot be explained by a known disturbance, or
- any sustained frequency change of greater than 20 mHz low, or 35 mHz high, or daily RMS of 20 mHz, or higher.

7. Inadvertent Interchange Unilateral Payback — Reliability concern since it affects ACE calculation

During the Reliability Standards Transition Process, the Inadvertent Interchange Payback requirements were assigned to NAESB to be dealt with as business practices. The unilateral payback control offset within the NAESB, Inadvertent Interchange Payback Standard, business practice is based on the ACE equation and is limited to the Balancing Authority's L_{10} limit. As long as unilateral payback is based on the ACE equation (and includes a limiting factor of $ACE - L_{10}$), it reflects reliability implications. To return the Inadvertent Interchange Unilateral Payback requirements to the NERC reliability standards, the subcommittee needs to submit a SAR accompanied by a letter detailing the reliability implications to the Standards Authorization Committee (SAC) and the Joint Interface Committee (JIC).

RS Response: The Inadvertent Interchange Task force will review and consider the need for incorporating Inadvertent Payback into the NERC reliability standards.

8. Inadvertent Interchange Unilateral Payback clarification language . . . “the ACE for CPS should NOT include any offsets (e.g., unilateral inadvertent payback, Western Interconnection automatic time error control, etc.)

When the unilateral inadvertent interchange payback SAR is written for Item 7 above, clarifying language needs to be added to ensure that “controlling ACE” may be adjusted for unilateral inadvertent payback, and other applications such as the Western Interconnection Automatic Time Error Control (WATEC), etc. However, the official ACE Equation does not include any adjustments such as those that can be included in the controlling ACE calculation. Insertion of this clarification language within the standards requirements may give guidance to the Balancing Authorities to ensure accurate ACE data. The subcommittee needs to evaluate the clarification language and incorporate it within the SAR.

RS Response: The Inadvertent Interchange Task force will review and consider the need for incorporating clarifying language into the NERC Reliability Standards for the Eastern Interconnection.

9. Combustion Turbine Governor Response — Are there specific requirements unique to combustion turbines

Raymond Vice asked General Electric for information on conditions under which a combustion turbine governor might respond with positive frequency response rather than the expected negative response: 1) is this positive governor response typical of combustion turbines in general; or 2) does it only occur under specific operational conditions? Mr. Vice was seeking guidance to determine whether this or some similar scenario can actually limit or reverse the expected governor response from combustion turbines and if so, under what operational conditions. If most combustion turbines run in this mode when on line then NERC may need to take it into consideration when estimating the frequency responsive reserves required on the interconnections and when modeling various frequency excursions, particularly at high load conditions when other frequency responsive resources may not be available. Mr. Vice will lead a discussion to determine if the standard requirements need to be enhanced to reflect combustion turbine operation. If so, the subcommittee will develop a SAR to revise or add the correct reliability standards requirements.

RS Response: This condition only occurs when gas turbines are operating at maximum output limited by blade temperature as indicated by exhaust gas temperature and only limits response to low frequency deviations. It is not clear what percentage of gas turbines operate in this mode at any given time. In addition, the mass flow of air through the compressor of a gas turbine varies geometrically with frequency (speed of the compressor). This may reduce the ability of the turbine to respond to frequency deviation. The Frequency Task Force will continue to investigate these issues and determine if a NERC reliability standard requirement is necessary.

Frequency Response Standard SAR

The secretary reported that the public response to the posted Frequency Response Standard (FRS) SAR supports the proposed standard concept. By unanimous consent, the Resources Subcommittee endorsed the development of the Frequency Response Standard. In addition, the subcommittee will determine if it will submit a draft FRS standard with its recommendation. The secretary will convey the subcommittee’s recommendation to the Standards Process Manager.

At some point in the future, a drafting team will be formed to develop the standard. It is important for the Resources Subcommittee members to self nominate themselves to participate on the standard drafting team.

Standard BAL-005-0, Automatic Generation Control, Requirement 13

The subcommittee discussed the language in BAL-005-0, Automatic Generation Control, Requirement 13.

R13. Each Balancing Authority shall perform hourly error checks using Tie Line megawatt-hour meters with common time synchronization to determine the accuracy of its control equipment. The Balancing Authority shall adjust the component (e.g., tie-line meter) of ACE that is in error (if known) or use the interchange meter error (I_{ME}) term of the ACE equation to compensate for any equipment error until repairs can be made.

The discussion focused on whether the language “Each Balancing Authority shall perform hourly error checks . . .” is a literal interpretation to perform hourly checks at the end of each 60-minute period. The requirement language was transferred from the operating policies to the reliability standards word-for-word. The subcommittee concluded that the language did not mandate that the “hourly error checks” be performed at the end of each hour. The intent of the language was that Balancing Authorities are responsible in general to keep their ACE calculation reasonably accurate (i.e., “perform hourly error checks (periodically),” with no particular periodicity specified. It is recognized that there are differences in application of this requirement among regions.

Projects

ACE Project 2000-03

Project Manager Carlos Martinez reported that the Consortium for Electricity Reliability Technology Solutions (CERTS) reported that Release 3 is projected to be available in late May 2005. Release 3 will revise 2005 performance data and incorporate additional geographical jurisdiction adjustments.

AIE Project 2000-04

CERTS sent the AIE program and initial actual WECC sample data to the RS evaluation team to review and analyze the software and recommend enhancements. CERTS is looking forward to receiving the FTF review and recommendations in July 2005.

Inadvertent Checkout Website (SPP Inadvertent Tool Migration) Project 2001-37

CERTS is currently in the process of migrating the SPP database to NERC and duplicating the user interface. New Inadvertent Interchange analysis and tool recommendations were submitted from a number of different sources and are being incorporated into the software. CERTS estimates the completion of the SPP Inadvertent Tool migration to be at the end of the second quarter of 2005.

Frequency Data Collection and Analysis System Project 2003-11 and the Eastern Interconnection Phasor Project

The RS discussed the recent developments with the Eastern Interconnection Phasor Project (EIPP). Bob Cummings and Mr. Martinez brought the subcommittee up-to-date on the intentions and expectations of the EIPP. Frequency data collection and retention will be performed by the EIPP. The EIPP will not analyze the frequency data. With the development of the EIPP frequency data collection and analysis, the subcommittee does not believe that the FDCAS project needs to be further pursued.

Mr. Badley moved to cancel the FDCAS Project. The motion was approved.

Mr. Bilke moved that the Resources Subcommittee develop tools and methodologies for analysis of Eastern Interconnection frequency data supplied from the EIPIP based on phasor measurement technology. These methods and tools will be designed to be compatible with the other interconnections. The motion was approved.

ACE-Frequency Data Quality Improvements

Mr. Martinez presented the CERTS Data Quality report and the NERC-CERTS-RS strategies to improve the ACE-Frequency data submittal and processing. This includes an alarm function that notifies NERC, CERTS, RCs, and the initiating “signal sender” that transmission has been lost or skewed. The

collaborative NERC-CERTS effort to implement the report's recommendation is under way and may require RS actions.

Frequency Performance

The RS monitors the Interconnection frequency and average frequency error trend on an ongoing basis.

Eastern Interconnection Frequency Performance

Bill Herbsleb and Terry Bilke reviewed the Eastern Interconnection frequency performance. The subcommittee discussed recent frequency excursions noting that the Eastern Interconnection had recovered from each excursion in a timely manner. The RCs and BAs have recovered from each frequency excursion in accordance with the standards and excellent operating practices to return frequency to normal bounds. After discussion, the RS recommended that the RCs use the CERTS ACE-Frequency Tool to monitor and identify BAs that are contributing to frequency errors whenever the frequency errors are greater than 50 mHz. The subcommittee also believes that when the Data Quality Report recommendations are implemented the ACE-Frequency software will become even more valuable to RCs and BAs. The RS will continue to closely monitor the Eastern Interconnection frequency errors.

ERCOT Interconnection Frequency Performance

Sydney Niemeyer reviewed ERCOT frequency performance. There were no significant events during the recent quarter

Western Interconnection Frequency Performance

Yuri Makarov reviewed the Western Interconnection frequency performance. There were no significant events during the recent quarter.

Control Performance Standard

The subcommittee reviewed the monthly CPS1 and CPS2 data for trends and violations. There are no current CPS1 or CPS2 violations.

Disturbance Control Standard

The subcommittee reviewed the 2005 1st quarter DCS data. There were no events during the quarter.

Time Error

Eastern Interconnection

The Eastern Interconnection called 65 time error corrections during the 1st quarter 2005: 0 Slow TECs; 65 Fast TECs.

ERCOT Interconnection

The ERCOT Interconnection called 15 time error corrections during the 1st quarter 2005: 1 Slow TECs; 14 Fast TECs.

WECC Interconnection

The Western Interconnection called 23 time error corrections during the 1st quarter 2005: 13 Slow TECs; 10 Fast TECs.

FERC NOPR — Imbalance Provisions for Wind Energy

Raymond Vice explained the current FERC energy imbalance tariff and the proposed NOPR for imbalance provisions for wind energy. Reviewing the NOPR, the subcommittee determined that there were no reliability concerns within the Generation Imbalance NOPR.

Handling Wind Generation Impacts on Grid Balancing Functions: CAISO and European Experiences

Yuri Makarov gave a presentation on Handling Wind Generation Impacts on Grid Balancing Functions: CAISO and European Experiences. (**Presentation 1**)

Dates and Locations of Future Meetings

- | | |
|------------------------|---------------------------|
| 1. July 27–29, 2005 | Salt Lake City, Utah |
| 2. October 26–28, 2005 | Asheville, North Carolina |
| 3. January 25–27, 2006 | U.S. or Canada |
| 4. April 26–28, 2006 | U.S. or Canada |
| 5. July 26–28, 2006 | U.S. or Canada |
| 6. July 26–28, 2006 | U.S. or Canada |
| 7. October 25–27, 2006 | U.S. or Canada |

Respectfully submitted,

Tom Vandervort

Thomas J. Vandervort
Resources Subcommittee Secretary

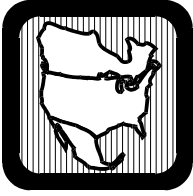


Exhibit A

NORTH AMERICAN ELECTRIC RELIABILITY COUNCIL

Princeton Forrestal Village, 116-390 Village Boulevard, Princeton, New Jersey 08540-5731

Resources Subcommittee

Wednesday, May 4, 2005 — 8 a.m. to 5 p.m.

Thursday, May 5, 2005 — 8 a.m. to 5 p.m.

Friday, May 6, 2005 — 8 a.m. to noon

Meeting Logistics and Registration Form

Hotel	Marriott Portland Downtown Waterfront 1401 SW Naito Parkway Portland, OR 97201
Phone and fax	Ph: 503-226-7600 ❖ Fx: 503-221-1789
Room rate	\$109 single/double occupancy, \$93 per diem
Room block	Nights of May 3–5, 2005
Reservation cut-off date	Tuesday, April 12, 2005 (NOTE: After this date, the hotel will release this block of rooms and only accept reservations on a space-available basis.)
Check-in and check-out times	Check-in: 3 p.m. Check-out: noon
Transportation	The hotel is located about 15 minutes away from the Portland International Airport. <ul style="list-style-type: none">• Blue Star Shuttle service is available at baggage claim. Approx. \$13. For pick up after 5 p.m., please call 503-249-1837.• Taxi: Approximately \$25
Hotel reservation instructions	When making your hotel reservation, please be sure to mention the "NERC/North American Electric Reliability Council" meeting to get the preferred rate and to ensure your reservation is credited to the NERC room block. <i>The hotel may charge NERC a penalty if the total rooms blocked for this event are not picked up.</i> Also, if you use a travel agency for your travel plans, please make sure the agency mentions NERC.
Attire	Business casual.

Please type or print.

Name:	
Title:	
Company:	
Telephone:	
Email:	
Attending: <input type="checkbox"/>	Not Attending: <input type="checkbox"/>

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Exhibit B

NORTH AMERICAN ELECTRIC RELIABILITY COUNCIL

Princeton Forrestal Village, 116-390 Village Boulevard, Princeton, New Jersey 08540-5731

Resources Subcommittee Meeting

Wednesday, May 4, 2005 — 8 a.m.–5 p.m.

Thursday, May 5, 2005 — 8 a.m.–5 p.m.

Friday, May 6, 2005 — 8 a.m.–noon

Marriott Portland Downtown Waterfront
1401 SW Nation Parkway
Portland, OR 97201
Phone: 503-226-7600

Agenda

Frequency Task Force Conference Call Balance Resources & Demand Standard Field Test Discussion

Wednesday, May 4, 2005

Conference Call Time: 8 a.m.–11 a.m., PDST (11 a.m.–2 p.m., EDST)

Phone Number: (732) 694-2061

Access Code: 1108050405

1. **Administrative**
 - a. Membership and Guests – Chair
 - b. Introductions – Chair
 - c. Organization, Roster, and Survey Contacts List – Secretary
 - d. Arrangements – Secretary
 - e. Approval of January 26–28, 2005, Meeting Minutes – Chair
 - f. Approval of Agenda – Chair
 - g. Procedures
 - i) Parliamentary Procedures – Chair
 - ii) Antitrust Compliance Guidelines – Chair
 - h. Resources Subcommittee Scope – Chair
 - i. Resources Subcommittee Action Items List – Chair

2. **Task Force Reports**
 - a. Automatic Generation Control Task Force – Raymond Vice
 - b. Control Criteria Task Force – Alan Oneal
 - c. Frequency Task Force – Raymond Vice
 - d. Inadvertent Task Force – Don Badley

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e. Reserves Task Force – Mike Potishnak

3. Compliance

a. Compliance and Certification Managers Committee Liaisons – Joe Willson, Raymond Vice

4. NERC Reliability Standards

- a. Standard BAL-001-0, Real Power Balancing Control Performance – Carl Monroe
- b. Standard BAL-002-0, Disturbance Control Performance – Carl Monroe
- c. Standard BAL-003-0, Frequency Response and Bias – Carl Monroe
- d. Standard BAL-004-0, Time Error Correction – Carl Monroe
- e. Standard BAL-005-0, Automatic Generation Control – Carl Monroe
- f. Standard BAL-006-0, Inadvertent Interchange – Carl Monroe
- g. Reference Document – Performance Standards Reference Document – Carl Monroe
- h. Training Document – Area Interchange Error Survey Training Document – Carl Monroe
- i. Training Document – Frequency Response Characteristic Survey – Carl Monroe
- j. Training Document – Inadvertent Interchange Accounting Training Document – Carl Monroe
- k. Balance Resources and Demand Draft Standard Update – Raymond Vice
- l. Frequency Response Standard SAR – Tom Vandervort
- m. Proposal for Operating Reserve Standard – Mike Potishnak

5. NERC Active Resources Subcommittee Projects – Status

- a. Area Control Error (ACE) Project (Project 2000-03) – Carlos Martinez
- b. Area Interchange Error (AIE) Project (Project 2000-4) – Carlos Martinez
- c. CPS1 & CPS2 Displays (Project 2001-38) – Carlos Martinez
- d. Frequency Data Collection and Analysis (Project 2003-11) – Terry Bilke, Carl Monroe
- e. DOE Eastern Interconnection Phasor Project (EIPP) – Terry Bilke, Carlos Martinez
- f. Inadvertent Project – Carlos Martinez
- g. Data Quality – Carlos Martinez

6. Frequency Performance

- a. Western Interconnection Frequency Trends
- b. Eastern Interconnection Frequency Trends
- c. ERCOT Frequency Trends
- d. CPS1 and CPS2 Data Trends
- e. DCS Data Trends
- f. Inadvertent Interchange Balances – Joe Emde, Carl Monroe
- g. WECC Inadvertent Interchange Status – Don Badley
- h. High Frequency Issue – Terry Bilke, Raymond Vice, Carl Monroe

7. Time Error

- a. Eastern Interconnection – Joe Willson
- b. Western Interconnection – Don Badley
- c. ERCOT Interconnection – Sydney Niemeyer

8. Issues Requiring Resources Subcommittee Consideration

- a. Dynamic Transfer Catalogue – Carl Monroe
- b. WECC Frequency Response Reserve Update – Don Badley
- c. FERC NOPR - Imbalance Provisions for Wind Energy – Tom Vandervort

9. Future Meetings

- a. July 27–29, 2005 – Salt Lake City, UT
- b. October 26–28, 2005 – Asheville, NC
- c. January 25–27, 2006 – US or Canada
- d. April 26–28, 2006 – US or Canada
- e. July 26–28, 2006 – US or Canada
- f. October 25–27, 2006 – US or Canada

**Resources Subcommittee Meeting
May 4–6, 2005
Portland, Oregon**

Exhibit C

RS Meeting Attendance Sheet	
Resources Subcommittee Member/Guest	Organization
Robert Rhodes (for Carl Monroe)	SPP
Raymond Vice, Acting Chair	Southern Company
Larry Akens	TVA/SERC
Don Badley	NWPP
Gerry Beckerle	Ameren
Terry Bilke	MISO
Yuri Makarov	CAISO
Sydney Niemeyer	Texas Genco, LP
Mike Potishnak	ISO-NE
Doug Hils (for John Swez)	Cinergy
Bill Herbsleb (for Joe Willson)	PJM
Tom Vandervort	NERC
Brian Nolan (via phone)	NERC
Bob Cummings (via phone)	NERC
Nasser Jaleeli (via phone)	PCE
Howard Illian (via phone)	Energy Mark
Robert Blohm	Economist/Consultant
Maureen Long	NERC Consultant
Albert M. DiCaprio	PJM
Bart McManus	BPA
Warren McReynolds	BPA

Exhibit D

**Individual Statements
Resources Subcommittee Meeting
May 4–6, 2005**

None

Exhibit E

**Minority Opinions
Resources Subcommittee Meeting
May 4–6, 2005**

There were none.

Resources Subcommittee

May 5, 2005 Meeting

Open Action Item List

Exhibit F

Action Figure	Subject	Action Item/Assignment	Due Date	Completion Date
Carl Monroe	Complete RS Roster	<p>RS openings need to be filled. Don Benjamin sent a letter to OC Chair Cowbourne regarding openings.</p> <p>Note: 12/11/2002, Don Benjamin sent subcommittee "candidate" letter to Transmission Customers – Further action is on hold until the future of the subcommittees is decided</p> <p>2/28/2003, The RS is currently balanced: 7 – TP, 7 – TC, and 1 – Chair. The RS is short from a full roster by: 2 – TP, and 2 – TC. – ECAR nominated Gerry Mellinger to replace Bob Kissner (3/4/03)</p> <p>7/14/03, OC will address future RS membership by 1/1/04</p> <p>1/28/04, Need Canadian RS Member, and RS vacancies (Randy Jones appointed Vice Chairman)</p> <p>7/29/04, TV to visit with Don Benjamin regarding filling vacancies – need Canadian representatives.</p> <p>12/16/04, OC Subcommittee Officers met in Scottsdale to discuss subcommittee structure.</p> <p>1/28/05, RS has the authority to nominate candidates to fill vacancies. RS has developed Scope recommendation and will request the OC adapt its recommendation prior to filling the RS roster.</p> <p>050505, Awaiting direction from OC for Subcommittee membership criteria. Need to solicit a FRCC member nomination.</p> <p>051705, TV sent e-mail to FRCC Chairman Linda Campbell requesting a nomination for the RS.</p>	7/28/05	
Carl Monroe	SPP Inadvertent Tool Use by FRCC	<p>Carl to send a letter to FRCC (Linda Campbell) requesting FRCC to use the SPP Inadvertent tool. Ask for a way to automatically send data to NERC.</p> <p>7/31/03, Carl to call Linda Campbell to discuss SPP Inadvertent Tool or converting</p>	7/28/05	

Action Figure	Subject	Action Item/Assignment	Due Date	Completion Date
		<p>FRCC Inadvertent data to a compatible data format for the SPP tool.</p> <p>10/28/04, Carl to visit with Linda to follow-up discussions</p> <p>1/28/05, Carl to try to visit with Linda Campbell at next OC meeting.</p> <p>072805,</p>		
Carl Monroe	DCS Survey	<p>Carl to write letters to CAs that have disturbances larger than their largest contingencies (All of 2003).</p> <p>The intent is to verify that each “largest single contingency “ is accurate and correct.</p> <p>7/31/03, Carl believes the results will give the subcommittee valuable data.</p> <p>1/30/04, Joe Emde to supply DCS data to Carl</p> <p>4/28/04, Carl to analyze and generate CA - DCS inquiry letters</p> <p>10/28/04, Question came up during the meeting – How often do the regions update their “Single Largest Contingency” Policy 1. B. 2.1 – Annual Review</p> <p>2.1. “Contingency review. All Reserve Sharing Groups and Control Areas shall at least annually review their probable contingencies to determine their prospective Most Sever Single Contingencies.”</p> <p>Does each region have a definition of their “single largest contingency” and do the regions review and update the “single largest contingency” on an annual basis?</p> <p>RS Members surveyed to identify the regions single largest contingency on an annual basis.</p> <p>1/28/05, TV to draft letter for Carl to send to regions requesting information from their annual review of their most severe single contingencies.</p> <p>4/1/05, Letter from Carl sent to Regional Managers reminding them that all Balancing Authorities and Reserve Sharing Groups shall review, no less frequently than annually, their probable contingencies to determine their prospective most severe single contingencies. – Close this item?</p> <p>050505, Carl received a response from ECAR stating their largest single contingency.</p>	7/28/05	

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		051705, Received a response from ECAR, MRO (MAPP), and SERC		
Carl Monroe	SPP AIE Tool	4/28/04, Carl to research the SPP AIE tool. Evaluate the tool to determine if it is practical to use in the Eastern Interconnection. 10/28/04, Ongoing activity 1/28/05, , all 8/14/03 inadvertent interchange accounts have been updated. 072805,	7/28/05	
Terry Bilke	When to Call "Surveys"	050505, Terry will evaluate EI historical data and significant events and recommend "survey" initiation criteria. WECC and ERCOT have existing criteria for calling "surveys." As an interim guide for the EI, the RS recommends that any sudden change of frequency greater than 35 mHz which cannot be explained by a known disturbance or any sustained frequency change of greater than 20 mHz-low or 35 mHz-high or daily RMS of 20 mHz or higher (criteria that would require approximately 3 surveys a year).	070105	
Terry Bilke and Carlos Martinez	CPS1 and CPS2 Display (Project 2001-38)	050505, Terry and Carlos are to discuss and review the project specification with the intent towards the BAAL Standard (Balance Resources and Demand Standard). The intent is to consider "CPS1 and BAAL" instead of "CPS1 and CPS2" project specification and direction.	070105	
Tom Vandervort	IS Dynamic Transfer Catalogue	4/28/04, TJV to visit with IS regarding cataloguing Dynamic Transfers and determine how RS can help the catalogue process. 10/01/04, TJV visited with IS and found the Dynamic Transfer Catalogue project is still active but delayed due to IS resources. 1/10/05, TJV visited with IS and found the standards V0 project has consumed IS time and manpower. The IS intends to pursue the Dynamic Transfer Catalogue sometime in calendar 2005. 1/25/05, TV to follow up on this item with the IS 050505, IS has this on their next meeting agenda, May, 2005. The IS is planning to draft a Dynamic Transfer Catalogue letter and Data Submittal Form. RS will support/work with the IS at the IS request.	7/28/05	

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Don Badley	AIE Software – Functionality System Review	<p>10/29/04, Don Badley to process RS Members Confidentiality Forms (work with Carlos as necessary) to allow them to review the CERTS AIE – in order to Test Functionality of the System</p> <ul style="list-style-type: none"> • Reconciled Hourly AIE Data • Reconciled Monthly Inadvertent Data <p>Don to attain addresses, phone numbers, e-mail addresses from the agenda item 1:</p> <p>Frequency Task Force Members to evaluate the AIE System:</p> <p>Don Badley</p> <p>Raymond Vice</p> <p>Terry Bilke</p> <p>Mike Potishnak</p> <p>Yuri Makarov</p> <p>Tom Vandervort</p> <p>Brian Nolan</p> <p>12/10/04, Don Badley contacted WECC to identify why the WECC confidentiality agreements have not been sent to the FTF members. WECC replied to Don that the Non-Disclosure Agreements have not been sent yet, but would be sent in the near future.</p> <p>1/28/05, WECC committed to Don to send their confidentiality agreements to the listed RS FTF members this week. We will cover this item during the meeting agenda item 5b.</p> <p>050505, CERTS sent AIE software and WECC data to RS FTF for initial analysis and evaluation. Frequency Task Force will analyze the data / summarize the results / make recommendations. Timetable-by July 30, 2005</p>	7/28/05	
Don Badley and IITF	V0 Standards, Ref Docs, Training Docs	<p>012805 Task Forces to review V0 Standards:</p> <ul style="list-style-type: none"> • Review V0 Standards to ensure they are “safe and effective” • Recommend moving sections within V0 to a Ref Doc 	072805	

Action Figure	Subject	Action Item/Assignment	Due Date	Completion Date
		<ul style="list-style-type: none"> • Recommend improvements to the V0 via a SAR • Recommend deletions of sections of V0 • Recommend forwarding sections of V0 to NAESB • Start with V0 Standards, Ref Docs, Training Docs <p>Standard BAL-006-0, Inadvertent Interchange, Version 0</p> <p>Training Document – Area Interchange Error Survey Training Document</p> <p>Training Document – Inadvertent Interchange Accounting Training Document</p> <p>050505, On-going activity.</p> <p>072805,</p>		
Don Badley and IITF	AIE Surveys	<p>012805 Inadvertent Interchange Task Force to incorporate a revision within V0 Standard to specify when to call AIE Surveys – discuss during April, 05 RS meeting and how to call an AIE Survey</p> <p>050505, When to call surveys are to be included in the standards review and recommendations.</p>	072805	
Don Badley and IITF	EI Adoption of WATEC	<p>050505, 1) The Inadvertent Interchange Task Force will review and consider incorporating the WATEC into the NERC Reliability Standards for inadvertent payback. The Task Force will develop a SAR to accomplish this revision following its review. The RS believes this function needs to be returned to the NERC Reliability Standards.</p> <p>2) The Inadvertent Interchange Task force will review and consider the need for incorporating clarifying language into the NERC Reliability Standards for Inadvertent Interchange Payback. Language to be considered is: “The official “ACE Equation” does not include any adjustments unilateral inadvertent interchange payback, Western Interconnection Automatic Time Error Control (WATEC), etc.”</p>	070105	
Raymond Vice and Freq TF	V0 Standards, Ref Docs, Training Docs	<p>012805 Task Forces to review V0 Standards:</p> <ul style="list-style-type: none"> • Review V0 Standards to ensure they are “safe and effectie” • Recommend moving sections within V0 to a Ref Doc • Recommend improvements to the V0 via a SAR • Recommend deletions of sections of V0 • Recommend forwarding sections of V0 to NAESB • Start with V0 Standards, Ref Docs, Training Docs 	072805	

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		Standard BAL-003-0, Frequency Response and Bias, Version 0 Pay close attention to the variable bias calculation Standard BAL-004-0, Time Error Correction, Version 0 Training Document – Frequency Response Characteristic Survey Training Document 050505, On-going activity 072805,		
Raymond Vice and AGC TF	ACE Special Cases Pseudo Ties and Dynamic Transfers	050505, The AGC Task Force will review and consider incorporating the ACE Special Cases or the Dynamic Transfer White Paper into BAL-001 or BALI-005. The Task Force will develop a SAR to accomplish this revision following its review. The RS believes this function needs to be returned to the NERC Reliability Standards.	070105	
Raymond Vice and Freq TF	Time Error Correction	050505, The Frequency Task Force will review and consider incorporating the TEC into BALI-004, using the WATEC procedure for TEC or possibly eliminating it. The Task Force will develop a SAR to accomplish this revision following its review. The RS believes this function needs to be returned to the NERC Reliability Standards.	070105	
Raymond Vice and Freq TF	Generator's Obligation to Support Interconnection Frequency	050505, The RS agrees that there is no requirement for the generators to support interconnection frequency in existing standards. The RS believes the generators should support interconnection frequency possibly through an ancillary services market. Generator requirements should be included in NERC standards unless there is a robust ancillary service market or other mechanism for providing turbine governor response. As proposed the FRS SAR will not require generators to support interconnection frequency. However, MOD-027-01 that is currently under development, does have such a requirement. If this standard is passed as written, no further action is required. If MOD-027-1 is not authorized, then the Frequency Task Force will review and consider an appropriate generator governor SAR.	070105	
Raymond Vice and Freq TF	Combustion Turbine Governor Response	050505, The Combustion Turbine Governor Response issue only occurs when gas turbines are operating at maximum output limited by blade temperature as indicated by exhaust gas temperature and only limits response to low frequency deviations. It is not clear what percentage of gas turbines operate in this mode at any given time. In addition, the mass flow of air through the compressor of a gas turbine varies geometrically with frequency (speed of the compressor). This may reduce the ability of the turbine to respond to frequency deviation. The Frequency Task Force will continue to investigate these issues and determine if a NERC Reliability Standard requirement(s) is necessary.	070105	
Mike Potishnak and	"Reserves" Standard	012805 Mike presented the initial Operating Reserves Standard draft to the RS. The RS consensus thought the proposal was a good start, had a lot of merit, but was too prescriptive in its language and proposed methodology. Mike and the ORTF will take	072805	

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ORTF		<p>the subcommittee comments into consideration in the next draft of the proposal.</p> <p>050505, Larry Akens and Mike Potishnak will work together on this Action Item.</p>		
Mike Potishnak and ORTF	V0 Standards, Ref Docs, Training Docs	<p>012805 Task Forces to review V0 Standards:</p> <ul style="list-style-type: none"> • Review V0 Standards to ensure they are “safe and effective” • Recommend moving sections within V0 to a Ref Doc • Recommend improvements to the V0 via a SAR • Recommend deletions of sections of V0 • Recommend forwarding sections of V0 to NAESB • Start with V0 Standards, Ref Docs, Training Docs <p>Standard BAL-002-0, Disturbance Control Performance, Version 0</p> <p>050505, On-going activity</p> <p>072805,</p>	072805	
Mike Potishnak and ORTF	WECC DCS Consideration	<p>050505, The Operating Reserve Task Force will review the WECC DCS grace period of 60 minutes and consider incorporating the language into a SAR during the RS standards review process. Mike Potishnak to attain the details from Don Badley.</p>	070105	
Alan Oneal and Control Criteria TF	V0 Standards, Ref Docs, Training Docs	<p>012805 Task Forces to review V0 Standards:</p> <ul style="list-style-type: none"> • Review V0 Standards to ensure they are “safe and effectie” • Recommend moving sections within V0 to a Ref Doc • Recommend improvements to the V0 via a SAR • Recommend deletions of sections of V0 • Recommend forwarding sections of V0 to NAESB • Start with V0 Standards, Ref Docs, Training Docs <p>Standard BAL-001-0, Real Power Balancing Control Performance, Version 0</p> <p>Reference Document – Performance Standards Reference Document</p> <p>032805, Alan sent his first draft of BAL-001 and PSRD for the RS to review.</p> <p>050505, On-going activity</p> <p>072805,</p>	072805	

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Raymond Vice and AGC TF	V0 Standards, Ref Docs, Training Docs	<p>012805 Task Forces to review V0 Standards:</p> <ul style="list-style-type: none"> • Review V0 Standards to ensure they are “safe and effective” • Recommend moving sections within V0 to a Ref Doc • Recommend improvements to the V0 via a SAR • Recommend deletions of sections of V0 • Recommend forwarding sections of V0 to NAESB • Start with V0 Standards, Ref Docs, Training Docs <p>Standard BAL-005-0, Automatic Generation Control, Version 0</p> <p>050505, On-going activity</p>	072805	
Raymond Vice and AGC TF	ACE Surveys	<p>012805 AGC Task Force to incorporate a revision within V0 Standard to specify when to call ACE Surveys – discuss during April, 05 RS meeting</p> <p>050505, When to call ACE surveys are to be included in the standards review.</p> <p>072805,</p>	072805	
Sydney Niemeyer and Joe Emde	January CPS1 Data	<p>050505, Sydney to send correct data to Joe Emde for January 2005, CPS1 data. The data shown is actually CPS2 data.</p> <p>051505, Complete</p>	060105	051505
Bill Herbsleb or Joe Willson and Joe Emde	Inadvertent Interchange Balances	<p>050505, Bill to contact Joe Emde to address old Inadvertent Interchange values between PJM and neighbors to determine how to enter Balanced Numbers. PJM and neighbors have balanced their Inadvertent Interchange values but cannot make entries to adjust the SPP Inadvertent Interchange Tool to reflect the old inadvertent interchange balance.</p> <p>Joe to contact SPP as necessary to address the problem and inform Bill Herbsleb and the RS on how to reconcile past discrepancies that are balanced.</p>	060105	
Carlos Martinez	Data Quality	<p>Write an initial definition of “data quality” for the RS to review. (In conjunction with Terry Bilke’s “why” data accuracy and quality are necessary.)</p> <p>7/14/03 – Terry received and commented on Carlos’s data quality draft.</p> <p>8/1/03 – Carlos to send data quality summary to the subcommittee.</p> <p>10/28/03 – Carlos to send “completed” summary to the subcommittee</p>	7/28/05	

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		<p>1/30/04, One of the common themes from the BIT is data quality concerns, time stamps, and reporting requirements. Possibly report back at the next RS meeting.</p> <p>4/1/04, Terry submitted Data Quality SAR to Standards Process</p> <p>4/28/04, Discuss during the meeting, Carlos to distribute Data Quality White Paper</p> <p>6/30/04, CERTS – Carlos Martinez, Arun Harnoor, and Romulo Barreno are collaborating on the Data Quality issues, concerns, problems, remedies, solutions and possible future project(s). First step will be to complete the white paper.</p> <p>7/28/04, Carlos to present, review, and discuss Data Quality White Paper with RS</p> <p>10/28/04, Carlos to update current status of Data Quality White Paper with RS</p> <p>1/28/05, Carlos to update</p> <p>040105, CERTS completed Data Quality Final Report. Carlos to send to TV.</p> <p>050505, Carlos presented the Data Quality Final Report and the recommendations to improve the transmittal, monitoring, and alarming of data transmittal of ACE-Freq data. NERC-CERTS have the majority of tasks and may request assistance from the RS.</p>		
Carlos Martinez and Joe Emde	ACE and AIE – Data “Unavailability” for CERTS	<p>During the last April RS meeting, Carlos Martinez asked the RS to give CERTS feedback on the frequency desired for data output. The discussion led to an action item for the Frequency Task Force to give CERTS the frequency parameters on “unavailability.” To determine what and when frequency is considered to be “unavailable.”</p> <p>8/1/03 – Both NERC and CERTS to identify why CERTS is not receiving all CA data. Carlos to work with Joe Emde and Paul Baratelli and correct discrepancies.</p> <p>10/28 – CAs not reporting; CAs reporting but not reliable; CAs reporting and reliable; ready to send to subcommittee.</p> <p>1/30/04, Due to time restraints, Carlos has not had time to identify who is not supplying data to CERTS. Carlos to work with Paul Baritelli to resolve the issue.</p> <p>This is important, If Carlos can get the detailed information where the break-downs are, Carl can pass the information and statistics on to the OC at its next meeting.</p>	7/28/05	

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		<p>It may be a vicious circle. NERC needs to feed back to the CAs to identify which are not submitting data. (i.e. if the CAs are submitting data and NERC is not receiving the data, a notification needs to be made from NERC to the CAs in order to identify why it is not being received). If there is a break down or miscommunications – they need to be resolved and fixed!</p> <p>Carlos, Tom, Paul, to visit and determine how to establish a receipt process for the data. Possibly include DEWG (data exchange working group) – Enlist Carl's help if necessary!</p> <p>3/1/04, Joe E started validating data transmittal nodes and contacting control areas</p> <p>4/28/04, Discuss during the meeting, Carlos to distribute Data Quality White Paper to the subcommittee.</p> <p>10/28/04, Joe and Carlos to discuss with the RS the current status of the AIE and ACE data and the amount of data that is "available" and "unavailable," and what additional steps can be taken to remedy the situation.</p> <p>050505, Joe Emde Status Report: The CERTS tool was missing almost 700 MWs of ACE at the time of the last RS meeting. As of today, it's missing a little over 100 MWs. I'm not exactly sure of the numbers but Carlos can probably give you them.</p> <p>There are currently about 8 CAs that are consistently offline.</p> <p>BREC, CWLD, DEVI, LAFA, IP, SC & UPPC work intermittently but are down more often than not. I'm not sure how to fix them.</p> <p>SEPA does not submit its data via ICCP so it's not possible to insert them into the tool.</p> <p>Note: BREC – Big River Elect Corp (ECAR), DEVI (?), LAFA – Lafayette Utility System (SPP), IP – Illinois Power (MAIN), SC (?), UPPC – Upper Peninsula Power Co. (Main)</p> <p>050505, NERC and CERTS are continuing to investigate data quality problems with the ACE – Frequency displays.</p>		
Carlos Martinez	AIE Project (Project 2000-4)	050505, Carlos to send AIE Project specifications, approvals, background information to Brian Nolan, NERC Projects Manager. This information and documentation is necessary for the project paper trail.	060105	
Carlos	CPS1 & CPS2 Displays (Project	050505, Carlos to send CPS1 and CPS2 Project specifications, approvals, background information to Brian Nolan, NERC Projects Manager. This information	060105	

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Martinez	2001-38)	and documentation is necessary for the project paper trail.		
Carlos Martinez	EIPP Freq Analysis Project	050505, Terry Bilke made a motion for the Resources Subcommittee to develop tools and methodologies for analysis of Eastern Interconnection frequency data supplied from EIPP and based on Phasor measurement technology. These methods and tools will be designed to be compatible with the other Interconnections. The motion passed.	080105	