To: NPCC Reference Manual Recipients

Subject: NPCC Reference Manual - Revision Number 13

Revision 13 to the NPCC Reference Manual, which is long overdue, includes the revised NPCC Membership Agreement, working group scopes, and new and/or revised Criteria (A), Guideline (B) and Procedure (C) Documents. Attachment 1 presents a list of all revisions.

Revisions to the NPCC Reference Manual are primarily distributed through the new NPCC Web Site (http://www.npcc.org/) and via e-mail upon requests to NPCC Staff. As was the case with Revision 12, Reference Manual material will be distributed in Adobe format only, but copies of NPCC Documents in Word format can be obtained by request to NPCC staff.

For those of you that refer to the on-line versions of the Reference Manual located on the NPCC Web Site, the revised items—as described in Attachment 1—have been updated. The files are in two locations:

1) The A, B and C Documents are found in the “NPCC Criteria Guides Procedures” folder, to which the direct link is: http://www.npcc.org/CriteriaGuidesProcedures.htm. Alternatively, go to the Web Site at www.npcc.org, click on “Reliability” and then on “NPCC Criteria Guides Procedures.”


For those of you that will continue to maintain an up-to-date hard copy of the Reference Manual, the revised items can be downloaded and printed from the bookmarked revision13.pdf Adobe 4.0 file also located at: http://www.npcc.org/ReferenceManual.asp.

Hard copies can also be provided by mail in response to specific requests to NPCC Staff. Hard copies will continue to be distributed to control center managers and the members of the Task Force on Coordination of Operation that provide copies for control centers. Also, e-mail or hard copies will be sent to those of you who already have requested such copies.

Very truly yours,

Jørn C. Haahr

Jørn C. Haahr
Senior Engineer

Attachment
NPCC Reference Manual Recipients:

**NPCC Committees, Task Forces, Working Groups etc.**

*Normal distribution, unless e-mail with attachments or hard copy has been requested*

- NPCC Officers
- NPCC Full Member Representatives and Alternates
- NPCC Public Interest Members
- Members, Reliability Coordinating Committee
- Members, Public Information Committee
- Members, Compliance and Assessment Subcommittee
- Members, Task Force on Coordination of Operation
- Members, Task Force on Coordination of Planning
- Members, Task Force on Energy Management Technology
- Members, Task Force on System Protection
- Members, Task Force on System Studies
- Members, Environmental Matters Working Group
- Members, Load, Capacity & Fuels Working Group
- Members, Joint Glossary Working Group
- Members, CO-1 Working Group
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- Members, CO-10 Working Group
- Members, CP-7 Working Group
- Members, CP-8 Working Group
- Members, CP-9 Working Group
- Members, SS-37 Working Group
- Members, SS-38 Working Group
- NPCC Staff

**One or more Reference Manuals each - hard copies**

Managers:
- CONVEX, Dennis G. Potemski - 3
- Maine Control, John G. Hinkley - 1
- New Hampshire Control, J. A. Breton - 1
- REMVEC II, Paul J Liddell - 3
- James N. Begin, CMPC - 4
- Robert A. Hiney, NYPA - 2
- Roger C. Zaklukiewicz, NU - 2

TFCO Representatives from:
- Hydro-Québec (M. Armstrong) - 6
- ISO New England (P. Shortley) - 6
- New Brunswick (W. Snowdon) - 6
- Nova Scotia Power (D. Berringer) - 6
- NYPP (M. Calimano) - 8
- IMO (D. Schmidt) - 11

**Special Requests**

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<th>Name</th>
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<tr>
<td>Julius Bleiweis</td>
<td>Peter Magoun, PSNH</td>
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<tr>
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<td>Robert Charpentier</td>
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<td>David M. Conroy, CMPC</td>
<td>Carole St-Louis, Hydro-Québec</td>
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<td>Jim Cyrulewski, MEPCC</td>
<td>Christian Strasbourg, Hydro-Québec</td>
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<td>S. Dey, Keyspan</td>
<td>Vid Varneckas, Con Ed</td>
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<tr>
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<td>TFSP New York Contacts:</td>
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<td>Judy Kerschner, IMO</td>
<td>Robert Calus - RG&amp;E</td>
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<td>Vinod C. Kotecha, Con Edison</td>
<td>L. J. Gelbien - Keyspan</td>
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<td>Mark J. Kuras, PJM</td>
<td>Boris Shulim - O&amp;R/Con Edison</td>
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<td>Gary Lindsay, OHSC</td>
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Attachment 1

Revision 13 to the NPCC Reference Manual

The revisions, and instructions for updating a hard copy of the Reference Manual, are listed in the order of the tabs in the manual.

- **In front**
  - **Table of Contents**
    
    The new Table of Contents replaces the existing table, and reflects the following revisions:

  - **Revision Record, Revision 13**
    
    The new Revision Record replaces the existing record. It shows the Documents that were replaced in the previous revisions and those that are being added and replaced now.

- **NPCC Membership Agreement**
  
  The NPCC Membership Agreement, dated November 9, 2000, replaces the Memorandum of Agreement, dated November 9, 1999

- **NPCC Task Force Scopes (includes Subcommittee and Working Group scopes)**

  - **Working Group Scopes**
    
    The revised cover page for the NPCC Working Group Scopes replaces the existing cover page.


    Please insert the scope for the System Operational Tools Working Group (CO-10) approved by the RCC at the November 9, 2000 meeting

    Please remove the scope for the former CP-7 Working Group and insert the scope for the new Working Group on Review of NERC Planning Standards (CP-9) approved by the RCC at the June 29, 2000

- **NPCC Directory**
  
  The NPCC Directory is updated periodically and the latest version can be downloaded separately from the “About NPCC” page on the NPCC Web Site. The direct link to “About NPCC” is: http://www.npcc.org/about_npcc.htm
NPCC Documents

• Criteria
  NPCC Reliability Compliance and Enforcement Program (Document A-8).
  Please insert under tab A-8 this new Criteria Document, that was approved at the
  November 9, 2000 Membership Meeting.

• Guidelines
  Guidelines for Identifying Key Facilities and Their Critical Components for System
  Restoration (Document B-20).
  Please insert under tab B-20 this new document, that was approved at the June 29,
  2000 Reliability Coordinating Committee Meeting.

  NPCC Guidelines for the Implementation of the Reliability Compliance and
  Enforcement Program (RCEP) (Document B-22).
  Please insert under tab B-22 this new document that was approved at the November
  9, 2000 Reliability Coordinating Committee Meeting

• Procedures
  Listing of NPCC Documents by Type (Document C-0).
  The revised Document, dated November 2000, replaces the existing Document,
  dated December 1999 (the Document is located right after the green “Procedures”
  tab in the manual).

  Procedures for Communications During Emergencies (Document C-3)
  The revised Document, dated March 8, 2000, replaces the existing Document, dated

  Monitoring Procedures for Control Performance Guide During Normal Conditions
  (Document C-8)
  The revised Document, dated March 3, 1999, replaces the existing Document, dated
  March 10, 1995

  Procedures for Solar Magnetic Disturbances on Electrical Power Systems
  (Document C-15)
  The revised Document, dated November 7, 2000, replaces the existing Document, dated
  March 25, 1998

  Procedures During Shortages of Operating Reserve (Document C-19)
  The revised Document, dated January 18, 2000, replaces the existing Document, dated
  July 18, 1995

  Procedures During Abnormal Operating Conditions (Document C-20)
  The revised Document, dated March 3, 1999, replaces the existing Document, dated
  May 12, 1994

  Review Process for NPCC Reliability Compliance Program (Document C-32)
  Following Document C-30, please insert this new document, which is dated June 23,
  2000 (the Reference Manual does not have sufficient tabs!).

Finally, Revision 13 (filename rivision13.pdf) also includes a copy of this cover letter.
Northeast Power Coordinating Council
Reference Manual

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(Revision 13 entries are bolded)

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Handbook for ECAR-MAAC-NPCC-VACAR
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NERC Certificate of Incorporation

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NPCC Directory


NERC Glossary of Terms

NERC Glossary of terms................................................................. August 1996
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WHEREAS, reliable electric service is critical to the economic and social welfare of the millions of residents and businesses in Northeastern North America (as defined herein); and

WHEREAS, the reliable and efficient operation of bulk power systems in Northeastern North America is fundamental to achieving and maintaining reliability of power supply, requiring extensive coordination of system design and operations; and

WHEREAS, an open, inclusive process for assuring the establishment of, and compliance with regional design and operating criteria by all entities and industry sectors participating in the electricity market in Northeastern North America, in coordination with its members, including the ISO/Control Areas and sub-regional Councils within the region, is essential to assuring reliable service; and

WHEREAS, Northeast Power Coordinating Council is the appropriate authority to establish regional criteria, consistent with NERC/NAERO broad-based standards, and to assess and enforce mandatory compliance with such regional criteria in Northeastern North America.

NOW, THEREFORE, the members of Northeast Power Coordinating Council hereby agree as follows:
I. **Purpose of Northeast Power Coordinating Council**

The Full Members hereby agree to amend the Membership Agreement, which established the Northeast Power Coordinating Council (the "Council"), as provided herein effective November 9, 2000.

The purpose of the Council is to promote the reliable and efficient operation of the interconnected bulk power systems in Northeastern North America through the establishment of criteria, coordination of system planning, design and operations, and assessment and enforcement of compliance with such criteria. In the development of reliability criteria, NPCC, to the extent possible, facilitates attainment of fair, effective and efficient competitive electric markets.

II. **Membership of the Council**

A. The members of the Council as of October 1, 2000 are listed on Schedule A hereto.

B. Upon suitable application describing the nature and activities of the applicant, additional entities shall be accepted by the Executive Committee as members in the appropriate categories, defined as follows:
(1) Full Membership shall be available to entities which participate in the interconnected electricity market in Northeastern North America.

(2) Public-Interest Membership shall be available to regulatory agencies with jurisdiction over participants in the electricity market in Northeastern North America and to public-interest organizations expressing interest in the reliability of electric service in Northeastern North America.

C. Independent System Operators ("ISO’s"), and Control Areas operating in Northeastern North America are expected to be Full Members of the Council. The New York State Reliability Council and any other sub-regional reliability councils which may be formed are also expected to be Full Members.

D. For purposes of this Agreement, two voting classes, each consisting of several sectors are hereby established. The two voting classes shall be composed solely of either Transmission Providers or Transmission Customers, defined as follows:

(1) A Transmission Provider means any entity operating in Northeastern North America which
owns, operates, or controls facilities used for the transmission of electric energy in international, interstate, or inter-provincial commerce; provided, however, that those facilities must be beyond the generator step-up transformers or radial generator leads and be employed in the interconnected bulk power system; or any sub-regional reliability council.

(2) A Transmission Customer means any entity not primarily a Transmission Provider operating in Northeastern North America which enters into a transmission service agreement with, or receives transmission service from, a Transmission Provider or an ISO within Northeastern North America.

E. (1) Upon acceptance of a new applicant for membership, the applicant shall indicate its voting class preference subject to Executive Committee approval.

(2) Executive Committee assignments of members to voting class shall be binding on the member and on the Council. Such assignments shall be subject to reevaluation and change upon request or at the discretion of the Executive Committee.
F. For purposes of this Agreement, the term "Northeastern North America" shall be deemed to comprise the geographical area within the perimeter border enclosing the State of New York, the six New England States of the United States, and the Canadian Provinces of Ontario, Quebec, Newfoundland, and the Maritime Provinces of New Brunswick, Nova Scotia and Prince Edward Island including any radial load or generation connecting to these systems.

III. Organization of the Council

A. Each Full Member shall designate a representative and an alternate representative with full authority to act for it in carrying out the work of the Council.

B. The Council shall have an Executive Committee to consist of the Council Chair, ex officio, who shall also be Chair of the Executive Committee, Vice Chair[s], the Executive Director, and the Secretary, all ex officio; and additional members to be selected by the two voting classes of Full Members, as follows:

(1) Transmission Providers:
Transmission Providers shall designate ten Executive Committee members as follows:

ISO-New England 1
New England Transmission Provider 1
New York ISO 1
New York State Reliability Council 1
Independent Electricity Market Operator 1
Ontario Transmission Provider 1
Hydro-Quebec TransEnergie 2
Maritime Provinces Transmission Providers 2

(2) Transmission Customers:

The Transmission Customers shall designate ten Executive Committee members, reflecting, insofar as practicable, the diversity of membership among the sectors in the voting class so as to distribute voting power equitably within the voting class.

The Council’s officers, when serving ex officio shall not have any vote on the Executive Committee.
The term of office of the voting members of the Executive Committee shall be three years. Initial terms of Committee members shall be staggered by the Committee so that members serve initial terms of one, two, or three years. There shall be no limit on the number of terms which may be served by any individual.

C. The officers of the Council shall consist of a Chair, one or more Vice Chairs, a Secretary and a Treasurer, with assistants as appropriate, and such additional officers as may be approved by both voting classes. Officers shall hold office for one year or until the next Annual Meeting of Members of the Council and until their successors are duly elected and qualified. In the temporary absence of the Chair, a Vice Chair designated by two-thirds vote of the individual Full Members represented on the Executive Committee shall perform the duties of the chair.

The Council shall also employ an Executive Director and Staff, as required to carry out the Council’s mission and to perform the functions of the Council.

D. In the event a vacancy occurs in the membership of the Executive Committee, or in the office of Vice
Chair, Secretary, or Treasurer in the interim between Annual Meetings of Members of the Council, the Chair may designate a person (from the same voting class when applicable) to fill such vacancy with the approval of two-thirds of the Full Members represented on the Executive Committee.

In the event a vacancy occurs in the Office of Chair in the interim between Annual Meetings of Members of the Council, the Executive Committee may fill such vacancy by approval of both voting classes. The term of office of the persons designated to fill any such vacancy shall expire on the date of the next subsequent Annual Meeting of Members of the Council. The authority and responsibilities of the Chair and of the Executive Director shall be defined by the Executive Committee.

E. Duties of the Executive Committee

The Executive Committee shall develop Council policies, direct the activities of the Council, accept additional entities as members, review and approve or modify the assignment of Full Members to their appropriate voting class, and make assignments to the committees of the Council. The Executive Committee shall oversee the Council's assessment and
enforcement of mandatory compliance with reliability criteria through administration of the NPCC Reliability Compliance and Enforcement Program. The duties of the Executive Committee shall also include consideration and resolution of all budgetary matters, including the levying of any special assessments, and determination of the annual membership fee for Full Members. However, the Executive Committee may not amend this Agreement or establish, modify or eliminate any of the Council’s reliability criteria, guides, programs or procedures; nor may the Executive Committee add, modify, or eliminate voting classes established pursuant to this Agreement.

To carry out the purposes of the Council, the Executive Committee, acting through the Executive Director and Council staff, shall enlist such personnel from members as may be necessary; and, within the limits of the annual budget, may employ such personnel, incur such administrative expenses, and retain such independent professional consulting services for the Council and the committees of the Council as it may deem desirable.
The Council shall also have a Standing Committees known as the Reliability Coordinating Committee (the Council’s principal technical committee), the Public Information Committee, and such other committees, subcommittees, task forces, and other such NPCC groups as the Executive Committee or the Standing Committee may deem appropriate. Standing Committee members shall be nominated by the Full Members and approved by the Executive Committee in accordance with guidelines established by the Executive Committee.

IV. Voting Rights

A. Class Voting by the General Membership.

(1) Each Full Member also shall have one vote when voting within its voting class on issues to be decided by the general membership by class voting in accordance with this Agreement.

(2) Issues related to the following matters, and any other issues expressly so designated by this Agreement, shall be resolved by the general membership by class voting:

- Establishment, modification, or elimination of any regional reliability criteria consistent with the North American Electric
Reliability Council/North American Electric Reliability Organization (NERC/NAERO)
broad-based standards

- Establishment, modification, or elimination of the NPCC Reliability Compliance and Enforcement Program
- Election of Officers
- Selection of the members of the Council’s Executive Committee other than those serving *ex officio*
- Addition, modification, or deletion of voting classes
- Amendment of this Agreement

The resolution of such issues shall require the approval of both voting classes by two-thirds vote of the Full Members voting within each class when a quorum of the voting class has been obtained. Full Members may vote within a voting class by personal representative, by teleconference, by prior written consent, or by proxy. A majority of all Full Members in a voting class shall constitute a quorum sufficient to permit class voting by that voting class. A voting class failing to establish a quorum of the voting class through participation in person,
by teleconference, by prior written consent or by proxy may not vote; and, in that event, the issue shall be resolved by vote of the voting class which has established a quorum.

B. Class Voting by the Executive Committee and Standing Committee.

The resolution of all issues before the Executive Committee and the Standing Committee shall require the approval of both voting classes by two-thirds vote of the Full Members represented on each Committee voting within each voting class when a quorum of the voting class has been obtained.

Full Members may vote within a voting class by personal representative, by teleconference, by prior written consent, or by proxy. A majority of all Full Members in a voting class shall constitute a quorum sufficient to permit class voting by that voting class. A voting class failing to establish a quorum of the voting class through participation in person, by teleconference, by prior written consent or by proxy may not vote; and, in that event, the issue shall be resolved by the voting class which has established a quorum.
C. Subcommittee, task force, and other such NPCC groups procedures, including voting procedures, shall be established by the Standing Committee.

D. Any Full Member dissatisfied with the outcome of a vote at a meeting of a Standing Committee, task force, or other such NPCC group may bring the matter up for reconsideration by the Standing Committee or for consideration by the Executive Committee in accordance with procedures established by the Executive Committee which may include Alternate Dispute Resolution.

E. Public-Interest Members shall not have any voting rights.

V. Membership Rights and Obligations

A. Full Members shall have the following additional rights and obligations:

(1) Rights:

(a) Attendance at all meetings of the general membership of the Council; and, subject to procedures established by the Reliability Coordinating Committee and to the terms of applicable confidentiality agreements, attendance at meetings of the Council’s
committees, task forces and other such NPCC groups.

(b) Access to all committee, subcommittee, task force, and other such NPCC group’s minutes; and to reports and technical data developed by the Council’s staff, subject to procedures established by the Reliability Coordinating Committee and to the terms of applicable confidentiality agreements.

(2) Obligations:

(a) Each Full Member shall plan and design its bulk power system in compliance with Criteria, Guides, and Procedures established by the Council and applicable NERC/NAERO Standards.

(b) Each Full Member shall conduct its operations in compliance with Criteria, Guides, and Procedures established by the Council and applicable NERC/NAERO Standards.

(c) Each Full Member shall assure that, whenever it enters into arrangements with non-members which could have an impact on the reliability of the interconnected bulk
power systems in Northeastern North America, the arrangements accord with criteria established by the Council, the North American Electric Reliability Council, its successor, or the regional reliability councils established in areas in which the facilities used for such arrangements are located.

(d) Each Full Member shall notify the Council of its existing facilities and operating procedures and of its plans for major additions or modifications affecting the operation of the interconnected systems; and shall report to the Council any decision as to significant alterations or changes proposed for their respective electric systems, whether in generation, transmission, inter-system communication or control and protective equipment, or in operating procedures; such report to be submitted promptly and, except in cases of emergency, before final commitments are undertaken or changes in operating procedures become effective.
(e) Each Full Member shall promptly notify the Council and all other members in writing or electronically if its bulk power system is not being designed or operated, or its operations are not being conducted in compliance with Criteria, Guides, and Procedures established by the Council, stating its reasons, and providing its plan and schedule to achieve compliance.

(f) Each Full Member agrees to submit such data and reports as required by the Reliability Compliance and Enforcement Program and to abide by the compliance assessments and sanctions prescribed by the Council's enforcement procedures, subject to Alternate Dispute Resolution.

(g) Each Full Member shall undertake and perform the administrative and financial obligations described in Article X of this Agreement.

B. Public-Interest Members shall have the following rights:

(1) Attendance at all meetings of the general membership of the Council; and, subject to
procedures established by the Reliability Coordinating Committee and to the terms of applicable confidentiality agreements attendance at meetings of the Council’s committees, task forces and other such NPCC groups.

(2) Access to all committee, subcommittee task force, and other such NPCC group’s minutes and reports, subject to procedures established by the Reliability Coordinating Committee and to the terms of applicable confidentiality agreements.

VI. **Coordination of Design and Operations**

Subject to approval by both of the voting classes of the general membership of the Council, the Reliability Coordinating Committee shall from time to time, through an open and inclusive process, establish or modify criteria for such elements of design as affect the operation of the interconnected bulk power systems of the members, and, through an open and inclusive process, establish or modify criteria for such elements of operating procedure as affect the operation of the interconnected systems. Such criteria, as a minimum, shall be consistent with applicable policies and criteria.
established by the North American Electric Reliability Council or its successor.

The Executive Director shall promptly inform the Reliability Coordinating Committee of any reports received from a member advising the Council of additions, modifications, alterations, and changes proposed for its bulk power system which have been submitted pursuant to Article V A(2)(d) of this Agreement. The Executive Director shall also promptly inform all members of the Council and the Reliability Coordinating Committee of reports of non-compliance with Council criteria submitted pursuant to Article V A(2)(e) of this Agreement.

On receipt of reports of proposals for additions, modifications, alterations, and changes or notification of noncompliance with Council Criteria, Guides, and Procedures received pursuant to Article V (2) (d) and (e) hereof, the Council, through its Reliability Coordinating Committee, shall proceed expeditiously to study and evaluate the proposed alterations or changes or non-compliance. Each member shall cooperate fully in the study and shall provide information requested by the Council concerning such proposals or reports of non-compliance.
Upon completion of such study and evaluation, the Executive Director shall report to each member the findings, conclusions, and recommendations of the Reliability Coordinating Committee with respect to such matters. If the Reliability Coordinating Committee determines that the proposals for alterations or changes, the reported non-compliance with Council criteria or instances of non-compliance identified following Council reviews could have a significant or persistent adverse impact upon the reliability of the interconnected bulk power systems, the Executive Committee may, and upon request of any member shall, call a special meeting of the members of the Council to consider further the effect of any such proposed additions, modifications, alterations, changes, or non-compliance on the interconnected systems and to consider the feasibility of any reasonable alternatives thereto.

In addition to its efforts to resolve issues arising out of such reports, the Executive Committee shall establish Alternate Dispute Resolution procedures pursuant to which Full Members may seek to voluntarily resolve disputes which could have a significant or persistent adverse impact on the reliability of the
interconnected bulk power systems in Northeastern North America.

VII. **Assessment and Enforcement of Mandatory Compliance**

Subject to approval by both of the voting classes of the general membership, the Council shall establish a Reliability Compliance and Enforcement Program, including matrices for measuring compliance, levying sanctions, and procedures for Alternate Dispute Resolution. Such program shall be administered by the NPCC Executive Committee. The Reliability Coordinating Committee, with the full cooperation of each member, shall expeditiously evaluate, as appropriate, alterations or measures designed to correct any assessed non-compliance and shall report such studies to the NPCC Executive Committee.

VIII. **Meetings**

Meetings of the Council may be held on such dates as the Chair from time to time determines and shall be held in such places as the Chair may from time to time designate. Special meetings may be called from time to time by the Chair, by the Executive Committee, or by three or more Full Members of the Council. Notice of all meetings, stating the time and place, shall be given by
the Council staff in writing to each member by issuing the notice at least one week prior to the date of the meeting. The Secretary, Assistant Secretary, or, in their absence, a secretary pro tempore, shall keep the records of Council meetings.

When appropriate, the general membership and the committees may use proxies or teleconference facilities. Such participation shall satisfy quorum requirements. The general membership, the Executive Committee, the Standing Committees, subcommittees, task forces and other such groups of the Council may take action without a meeting by unanimous written consent of all Full Members entitled to vote at a meeting.

IX. Budget

The Executive Committee, acting on behalf of the Council, shall adopt an administrative expense budget for each calendar year. Each Full Member shall be notified of the annual administrative expense budget and of its Membership Fee or assessment of its proportional share of expenses due on or before December 1st of the preceding year.
X. Funding

The Council’s annual administrative expenses, including any special assessments approved by the Executive Committee, shall be apportioned to and funded by the Full Members of the Council in fixed and variable components, as follows:

(A) Each Full Member, other than Full Members which are ISO/Control Areas, shall be assessed and pay an annual Membership Fee of $5,000 as established by the Executive Committee.

(B) A transition to ISO/CA Net Energy for Load based funding is outlined as follows:

(1) For the budget year 2001 - transitional year two, each ISO/Control Area shall be assessed and pay its proportional share of the remaining expenses of the Council in proportion to a .6667/.3333 weighted average of the ISO/CA percentages based upon the ratio of the Control Area’s 1999 Net Energy for Load to the aggregate Net Energy for Load within all Control Areas in Northeastern North America and the 1999 assessment percentages (NB 2.33%, NS 1.43%,
Ontario 19.22%, Quebec 17.88%, NE 24.17%, NY 34.97%).

(2) For Budget assessments starting in the year 2002 and thereafter, each ISO/Control Area shall be assessed and pay its proportional share of the remaining expenses of the Council in proportion to the ratio of the second previous year’s Net Energy for Load within the Control Area to the aggregate Net Energy for Load within all Control Areas in Northeastern North America.

(C) Public-Interest Members shall not be assessed any charge.

(D) Except in the event of dissolution of the Council, no member shall, without its consent, be responsible for administrative expenses of the Council in any one calendar year in excess of its Membership Fee or assessed portion of the amount budgeted for administrative expenses for that year, whichever is applicable; provided, however, that special assessments may be separately budgeted and their cost allocated by the Executive Committee to the Full Members which are ISO/Control Areas.
(E) The costs of dissolution of the Council shall be borne only by Full Members which are ISO/Control Areas in the same manner as that described in Article X (B)(2) of this Agreement.

XI. **Termination of Membership and Dissolution of the Council**

A. Termination

A Full Member may terminate its rights and obligations under this Agreement (other than its obligation to pay its (i) Membership Fee or (ii) its proportionate share of the administrative expenses of the Council, including special assessments or the costs of dissolution of the Council, if applicable, for the full calendar year within which such termination is effective) at any time upon one year’s written notice to the Executive Director; whereupon, it shall cease to be a member of the Council as of the date such termination is effective. The Executive Director shall promptly inform all members of receipt of any such notices. Public-Interest Members may terminate their membership in the Council at any time upon fifteen days written or electronic notice without liability to the Council.
B. Dissolution

The Council may be dissolved by vote of a majority of the Full Members which are ISO/Control Areas.

XII. General

A. This Agreement may be amended with the approval of both voting classes by vote of two-thirds of the Full Members in each voting class.

B. Notices to the Council pursuant to this Agreement may be written or electronic and shall be addressed to the Executive Director at the Council’s office in New York City, New York. Notices shall be effective upon receipt.

C. This Agreement shall be governed by, and construed in accordance with, the laws of the State of New York.

D. No member shall be liable for the failure of any other member to perform its obligations hereunder.

E. This Agreement shall not create any rights in non-members of the Council.

F. No NPCC officer, member of the Executive Committee or member of other such NPCC group, or employee of the Council shall be personally liable to NPCC or
any Member thereof, for damages for breach of any duty owed to NPCC or any Member, thereof, except for liabilities arising from breach of any duty based upon an act or omission (1) in breach of the duty of loyalty owed to NPCC or any individual Member, (2) not in good faith or involving a knowing violation of law, or (3) resulting in receipt of an improper personal benefit by such NPCC officer, member of the Executive committee or member of other such NPCC group, or employee of the Council. Neither the amendment nor repeal of this paragraph, nor the adoption of any provision of this Membership Agreement inconsistent with this paragraph, shall eliminate or reduce the protection offered by this paragraph to a NPCC officer, member of the Executive Committee or member of other such NPCC group, or employee of the Council in respect to any matter which occurred, or any cause of action, suit or claim which, but for this paragraph, would have accrued or arisen, prior to such amendment, repeal, or adoption.

G. Those entities listed as members on Schedule A and subsequent applicants granted membership in the Council
H. shall be deemed to have accepted and to be bound by all the terms and conditions of this Agreement, as adopted on November 9, 2000 and as subsequently amended, without the need to sign this Agreement.

I. The modifications of this Agreement, adopted on November 9, 2000 shall become effective on November 9, 2000.

Executed as of January 19, 1966

As amended to November 9, 2000
### FULL MEMBERS*

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<td>Nova Scotia Power Incorporated</td>
</tr>
<tr>
<td>Constellation Power Source, Inc.</td>
<td>TC</td>
<td>Ontario Power Generation, Inc.</td>
</tr>
<tr>
<td>Edison Mission Marketing and Trading, Inc.</td>
<td>TC</td>
<td>Orange and Rockland Utilities, Inc.</td>
</tr>
<tr>
<td>ENRON Capital and Trade Resources</td>
<td>TC</td>
<td>PECO Energy Company</td>
</tr>
<tr>
<td>Hydro One Inc.</td>
<td>TP</td>
<td>Reliant Energy Services, Inc.</td>
</tr>
<tr>
<td>Hydro-Quebec Energy Services Group</td>
<td>TC</td>
<td>Rochester Gas and Electric Corporation</td>
</tr>
<tr>
<td>Independent Electricity Market Operator</td>
<td>TP</td>
<td>Sithe Energies, Inc.</td>
</tr>
<tr>
<td>Long Island Power Authority</td>
<td>TP</td>
<td>TransÉnergie Hydro-Quebec</td>
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<tr>
<td>National Grid USA</td>
<td>TP</td>
<td>The United Illuminating Company</td>
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<td>Vermont Electric Power Company, Inc.</td>
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<td>New York Power Authority</td>
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<td>New York Independent System Operator</td>
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<tr>
<td>New York State Electric &amp; Gas Corporation</td>
<td>TP</td>
<td></td>
</tr>
</tbody>
</table>

### PUBLIC INTEREST MEMBERS

- New York State Department of Public Service
- Office of Senator Henri S. Rauschenbach
- Québec Energy Board

*Full Members vote within Transmission Provider (TP) or Transmission Customer (TC) voting classes.
Working Group Scopes

CO-1  Working Group on Control Performance
CO-2  Working Group on Dispatcher Training
CO-7  Operational Review Team
CO-8  System Operations Managers Working Group
CO-10 System Operational Tools Working Group
CP-8  Working Group on Review of Resource and Transmission Adequacy
CP-9  Working Group on Review of NERC Planning Standards
EMT-1 Working Group on Energy Management Technology Workshop
EMWG  Environmental Matters Working Group
JGWG  Joint Glossary Working Group
LESPWG Lake Erie Security Process Working Group
LCFWG  Load, Capacity & Fuels Working Group
SS-37 Working Group on Base Case Development
SS-38 Working Group on Inter-Area Dynamic Analysis

Note:
CP-7 The former Working Group on Review of NERC Planning Standards has been replaced by CP-9 (same name, but expanded scope)

November 2000
Objective

Provide an evaluation of the operations, practices and procedures within the NPCC Areas to achieve conformance with the criteria, guides and procedures of the Northeast Power Coordinating Council (NPCC) and the North American Electric Reliability Council (NERC). Reviews will be conducted on a voluntary basis.

Activities

1. Develop and maintain an operational questionnaire to be used as the vehicle for operational reviews. The questionnaire should cover all aspects of NPCC criteria, guidelines and procedures, including, but not limited to:
   - manual load shedding
   - dispatcher training
   - operating reserve
   - control performance
   - common operational terminology
   - inter-area voltage control
   - changing inter-area interface capability, such as the impact of transmission system outage scheduling on critical elements
   - the derivation, application, and interpretation of operating limits
   - recovery to a secure state following contingencies
   - the basic principles of operating procedures in emergencies as they affect inter-Area security
   - inter-area and interregional data exchanges for operational purposes
   - monitoring and application of Energy Management Systems
2. Using the questionnaire described above as a guide, conduct on-site interviews with the operating personnel of the area requesting its review.

3. Following the interview process, prepare a report, based on the results of the above questionnaire, for the management of the Area reviewed. The report will emphasize both needed improvement as well as outstanding performance.

4. Upon request, provide an evaluation of the operations, practices and procedures of control areas within the NPCC neighboring Regions to achieve conformance with the criteria of the Region and the North American Electric Reliability Council (NERC).

NPCC Reliability Coordinating Committee
March 21, 2000
The System Operational Tools Working Group (CO-10) is responsible for taking a lead role in the development of NPCC and NERC operational tools (e.g., electronic tagging, the NERC Interchange Distribution Calculator and electronic scheduling), including hardware, software and integrated systems. The System Operational Tools Working Group will define the need for operational tools, evaluate the cost benefits of operational tools, coordinate their implementation within NPCC and coordinate common training in the use of operational tools.

Scope of Activities

1. Provide a forum for NPCC members to discuss the future needs for operational tools.

2. Review and comment on the technical and budgetary implications, and manpower impact, of emerging operational tools coming from all sources such as NERC and IEEE.

3. Develop plans that enable NPCC meet the transition dates and functional requirements of operational tools as directed by NERC.

4. Coordinate the development of compatible operational tools among the NPCC Areas.

5. Coordinate training programs to integrate new operational tools.

NPCC Reliability Coordinating Committee
November 9, 2000
Task Force on Coordination of Planning

Proposed Scope of Work

NPCC Review of NERC Planning Standards

(CP-9)

Objective

The Working Group will be responsible for providing consolidated NPCC Regional review and comment to the NERC Planning Standards.

Tasks

1. Provide NPCC review and comment to those NERC Planning Standards, which were in Phase I of the NERC Pilot Compliance Program, that have completed field tests and have been placed in final NERC due process.
2. Prepare NPCC review and comment for those NERC Planning Standards, which have been selected for Phase II of the NERC Compliance Program. Submit consolidated NPCC Regional comments to the final NERC due process upon completion of Phase II field tests of the NERC Compliance Program.
3. Prepare NPCC review and comment of those NERC Planning Standards, which have been selected for Phase III of the NERC Compliance Program. Submit consolidated NPCC Regional comments to the NERC due process at the appropriate time.
4. Prepare NPCC review and comment of those NERC Planning Standards, which have been selected for Phase IV of the NERC Compliance Program. Submit consolidated NPCC Regional comments to the initial NERC Due process. Follow-up with additional Regional comments, for submittal to the Final NERC due process upon completion of the field tests of the Phase IV measurements.
5. Review the reformatting of NPCC Planning documents and submit to other Task Forces and RCC for review and approval.

Schedule

The schedule for comments to the Planning Standards associated with the various Phases of the NERC Compliance Program will be dictated by the NERC schedule. NPCC to develop its own internal review schedule to meet the NERC schedule.

The reformatting of the NPCC Planning Documentation is to be presented to RCC for approval at the November 2000 RCC meeting.
Working Group

Members selected to represent NPCC Areas and the Task Forces on Coordination of Planning, System Protection and System Studies. The Task Force on Coordination of Planning will be the lead Task Force.

Budget

A budget of $7,500 has been allocated for the working group in the 2000 NPCC budget.
NPCC
Reliability Compliance and Enforcement Program

Adopted by the Members of the Northeast Power Coordinating Council November 9, 2000, based on recommendation by the Reliability Coordinating Committee, in accordance with paragraph IV, subheading (A), of NPCC Membership Agreement dated November 9, 2000 as amended to date.
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Note:
Terms in bold typeface are defined in the NPCC Glossary of Terms (Document A-7)
1.0 Introduction

The purpose of the Northeast Power Coordinating Council is to promote the reliable and efficient operation of the interconnected bulk power systems in Northeastern North America through the establishment of criteria, coordination of system planning, design and operations, and assessment and enforcement of compliance with such criteria. In the development of reliability criteria, NPCC, to the extent possible, facilitates attainment of fair, effective and efficient competitive electric markets.

The NPCC Reliability Compliance and Enforcement Program (the Program) described in this document is to be used to assess and enforce compliance with NPCC reliability criteria in such a way that the reliability objective stated above will be achieved. Actions taken by NPCC under the Program, including the imposition of sanctions, where applicable, shall in no way be construed as an acceptable alternative to the Member’s continued obligation to comply with NPCC Criteria, Guides and Procedures. As such the Member, as stated in the NPCC Membership Agreement, remains responsible for providing its plan and schedule to achieve compliance. It is further noted that the Program requirements are applicable only to the elements of the bulk power system as defined by NPCC. This definition can be found in the NPCC Glossary of Terms (Document A-7). The Program is applicable to all Full Members of the Council who have by virtue of their membership in NPCC agreed, under Section V, Sub-section A (2) (f) of the NPCC Membership Agreement, to submit such data and reports as required and described in the Program.

The Program is designed to be consistent with the concept that compliance assessment and enforcement is most effectively accomplished by the entities that are closest to the complying party. The Program establishes the following assessment structure: NPCC will assess and enforce compliance to those standards and criteria for which the Areas have the reporting responsibilities, and the Areas will assess and enforce compliance to those standards and criteria for which the market participants have reporting responsibilities. The specific standards and criteria covered by this Program are described in Appendix A, which will be amended annually as required.

1.1 Non-member Facilities

A Member, through whose facilities a non-member connects with or proposes to connect with the NPCC bulk power system shall use its best efforts to assure that the arrangements for such connection are consistent with NPCC criteria in accordance with the provisions and requirements of the NPCC Membership Agreement.
2.0 Reliability Criteria

2.1 Development of Criteria

The criteria utilized in assessing compliance have been developed by NPCC consistent with the North American Electric Reliability Council broad-based standards. NPCC has implemented its Open Process as a means of assuring that the development and modification of these criteria are non-discriminatory. The process provides the opportunity for industry input into the establishment of such criteria.

2.2 Obligations of Members

Appendix A of this document sets forth the compliance requirements to which each Member has agreed for the current enforcement year.

3.0 Compliance Assessment and Enforcement Process

The compliance assessment and enforcement process, shown in Figure 1, is described below in terms of the functional entities that will be responsible for the process. In addition, the Guidelines for the Implementation of the Reliability Compliance and Enforcement Program (RCEP) (Document B-22) describes in detail the processes utilized by the Program and other pertinent details related to the Program.

3.1 Compliance Monitoring and Assessment Subcommittee (CMAS)

CMAS, as a standing subcommittee of the Reliability Coordinating Committee (RCC), has the responsibility to perform independent compliance monitoring and assessment functions and to recommend the appropriate compliance violation sanctions to the RCC.

CMAS establishes the Program requirements and schedule and submits them to the RCC for approval. Once approved CMAS is responsible for managing the Program, making periodic reports to the RCC, and seeking RCC approvals when necessary.

NPCC Task Forces are utilized to develop compliance templates and to perform many of the technical assessments required in the Program. The results of these assessments are forwarded to CMAS for compliance review.
NPCC Compliance Assessment and Enforcement Process

Figure 1
CMAS employs, whenever practical, the use of self-certification forms as a means of streamlining the reporting process. The Review Process for NPCC Reliability Compliance Assessment and Enforcement Program (Document C-32) will be utilized to verify compliance reporting. The review process, which requires selected Areas to present detailed information related to selected requirements, assures accurate and efficient execution of the Program. CMAS establishes an annual schedule for the review process that is approved by the RCC.

CMAS conducts its compliance assessment and submits its report to the RCC for review and approval. CMAS will also provide a sanction recommendation for compliance violations where appropriate.

3.2 Reliability Coordinating Committee (RCC)

RCC, a standing committee of NPCC, reviews the compliance report submittals received from CMAS. Prior to a final compliance determination, the RCC may remand the report to CMAS for clarification. Once RCC has made a final compliance determination, any dispute regarding the technical compliance assessment will be submitted to the Enforcement Panel (EP).

RCC also reviews sanction recommendations received from CMAS. Prior to endorsing them, the RCC may remand the sanction recommendations back to CMAS for further clarification before forwarding them to the EP.

3.3 Enforcement Panel

The NPCC EP, which consists of five members, functions independently from the NPCC Executive Committee (EC). The panel has two Transmission Providers and two Transmission Customers. These four EP members choose, as Chairman, the fifth member of the EP. The Chairman will not be an employee of, nor affiliated with, a Transmission Provider or a Transmission Customer. Members of the EP will be elected by the NPCC membership from a slate of candidates proposed by the EC. The EP has full discretion to implement sanctions.

The EP will receive either an undisputed RCC determination of a compliance violation including a sanction recommendation or a disputed technical assessment from the RCC, for a given requirement.

For the undisputed RCC determination the EP reviews the recommendation, determines the appropriate sanction and notifies the violator.
The violator shall notify the EP as to whether it will accept or contest the sanction. If the violator accepts the sanction the EP issues its final report. If, however, the violator contests the sanction, it shall be given the opportunity to present its case to the EP before a final report is issued to the violator.

In the instance where the EP receives a disputed technical assessment, the contesting party will be notified and given the opportunity to present its case to the EP before a final report is issued.

If, after the EP final report is issued the violator disputes the technical assessment and or the sanction, it may seek to invoke the NPCC Policy for Alternative Dispute Resolution to resolve the issue. Upon resolution of the dispute the ADR report will be forwarded to the NPCC Executive Committee.

3.4 Executive Committee

The NPCC EC will provide oversight to the assessment and enforcement process through administration of the Program. The EC will monitor the RCC compliance-related activities, EP final reports including sanction determinations and the results of any cases resolved through the NPCC ADR process in order to determine the success of the Program and whether changes are desirable.

3.5 Appeal to FERC or Applicable Canadian Regulatory Authority

Either the NPCC or the Area (“Disputing Area”) may apply to the FERC or applicable Canadian Regulatory Authority to hear an appeal of any arbitrator’s decision resulting from implementation of the NPCC ADR process. Such an appeal shall be filed at FERC or applicable Canadian Regulatory Authority within fifteen (15) days of the arbitrator’s decision. The NPCC and the Disputing Area agree that in any appeal to the FERC or applicable Canadian Regulatory Authority either NPCC or the Disputing Area may raise any issues raised in the arbitration or the EP proceeding, including the factual basis for the technical assessment or sanction or whether the procedures were properly followed. Neither NPCC nor the Disputing Area, however, may raise issues regarding the validity of the reliability standard and criteria in RCEP. Any appeal from an arbitrator’s decision to the FERC or appropriate Canadian Regulatory Authority shall be based solely upon the record assembled by the arbitrator, unless otherwise determined by FERC or appropriate Canadian Regulatory Authority. All costs incurred by each of the NPCC and the Disputing Area in connection with such an appeal to FERC or appropriate Canadian Regulatory Authority shall be solely the responsibility of the
party that incurred such costs. Any initiation of a FERC or appropriate Canadian Regulatory Authority appeal by the NPCC pursuant to this section 3.5 must be authorized by the NPCC Executive Committee.

4.0 Sanctions

4.1 Violations of Reliability Criteria

Table 1 defines the sanctions for violations to the standard and criteria as described in the Compliance Templates shown in Appendix A.

Table 1 - NPCC Compliance Sanction Matrix

<table>
<thead>
<tr>
<th>Level of Non-Compliance</th>
<th>Occurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1st</td>
</tr>
<tr>
<td>1</td>
<td>Letter 1</td>
</tr>
<tr>
<td>2</td>
<td>Letter 2</td>
</tr>
<tr>
<td>3</td>
<td>Letter 3</td>
</tr>
<tr>
<td>4</td>
<td>Letter 4</td>
</tr>
</tbody>
</table>

Where,

**Letter 1**: to the relevant functional head (operations, planning) of the Area

**Letter 2**: to the Chief Executive of the Area with copy to the relevant functional head, other NPCC Areas, the NPCC Task Forces, the NPCC Reliability Coordinating Committee, the NPCC Executive Committee and NPCC Members.

**Letter 3**: to the Board of Directors of the Area with copies to the Chief Executive of the Area, the relevant functional head of the Area, other NPCC Areas, the NPCC Task Forces, the NPCC Reliability Coordinating Committee, the NPCC Executive Committee, NPCC Members, adjacent reliability Councils, and NERC (Secretary, President). Post on NPCC Web site

**Letter 4**: same as Level 3 with copies to State/Provincial regulatory agencies, FERC, DOE, State Governor and Legislators and National Energy Board of Canada
4.2 Policy on Lateness

All compliance reports are to be received by NPCC on time in accordance with the due dates established by CMAS. All reports are to be provided in easily readable electronic format and emailed to cmas@npcc.org.

Sanctions shall be applied if a complete report is not received by CMAS after a grace period of seven days has expired. CMAS shall assess the following level of non-compliance for lateness:

- Level 1: After 7 day grace period
- Level 2: After 30 days following due date
- Level 3: After 60 days following due date
- Level 4: After 90 days following due date or report never received

Levels are defined in Table 1.

Lead Subcommittee: Compliance Monitoring and Assessment Subcommittee

Reviewed for concurrence by: TFCP, TFCO, TFSP, TFSS and TFEMT

Review frequency: Annually

References:
- NPCC Membership Agreement
- NPCC Policy for Alternative Dispute Resolution
- NPCC Glossary of Terms (Document A-7)
- Guidelines for the Implementation of the Reliability Compliance and Enforcement Program (Document B-22)
- Review Process for NPCC Reliability Compliance Assessment and Enforcement Program (Document C-32)
APPENDIX A

FOR YEAR BEGINNING MARCH 1, 2001
Compliance Template CPS1

Control Performance Standard 1 – CPS 1

**Standard:** Statistical measure of a Control Area’s ACE with respect to the interconnection’s short-term frequency error.

Each Control Area shall monitor its control performance on a continuous basis against CPS 1.

**Calculation** - Over a year, the average of the clock-minute averages of a Control Area’s ACE divided by \(-10B\) (B is Control Area frequency bias) times the corresponding clock-minute averages of the Interconnection’s frequency error shall be less than a specific limit. This limit, \(e_1\), is a constant derived from a targeted frequency bound reviewed and set as necessary by the NERC Performance Subcommittee.

**References:** NPCC Emergency Operation Criteria (Document A-3); NPCC Control Performance Guide (Document B-2); NERC Operating Policy 1, Section E, Control Performance Standard; Performance Standard Training Document, Sections B and C.

### Responsibilities

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<tr>
<th>Reporting Responsibility:</th>
<th>Control Areas</th>
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<tbody>
<tr>
<td>Frequency of Reporting:</td>
<td>Monthly, no later than the 20(^{th}) day of the following month.</td>
</tr>
<tr>
<td>Compliance Monitoring and Assessment Responsibility:</td>
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</tr>
<tr>
<td>Enforcement Responsibility:</td>
<td>NPCC</td>
</tr>
</tbody>
</table>

**Full (100%) Compliance**

\(CPS 1 \geq 100\%\)

**Non-Compliance**

<table>
<thead>
<tr>
<th>Level</th>
<th>CPS 1 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(95% \leq CPS 1 &lt; 100%)</td>
</tr>
<tr>
<td>2</td>
<td>(90% \leq CPS 1 &lt; 95%)</td>
</tr>
<tr>
<td>3</td>
<td>(85% \leq CPS 1 &lt; 90%)</td>
</tr>
<tr>
<td>4</td>
<td>(CPS 1 &lt; 85%)</td>
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</tbody>
</table>
Compliance Template CPS2

Control Performance Standard 2 – CPS 2

**Standard:** This is a surrogate measure of a Control Area’s ACE with the respect to the Interconnection’s long-term frequency error, and is designed to limit significant unscheduled adverse power flows.

The average ACE for each of the six ten-minute periods during the hour (i.e. for the ten-minute periods ending at 10, 20, 30, 40, 50, and 60 minutes past the hour) must be within specific limits, referred to as $L_{10}$.

**References:** NPCC Emergency Operation Criteria (Document A-3); NPCC Control Performance Guide (Document B-2); NERC Operating Policy 1, Section E, Control Performance Standard; Performance Standard Training Document, Sections B and C.

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<tr>
<td>Reporting Responsibility:</td>
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<tr>
<td>Frequency of Reporting:</td>
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<tr>
<td>Compliance Monitoring and Assessment Responsibility:</td>
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<tr>
<td>Enforcement Responsibility:</td>
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</tbody>
</table>

**Full (100%) Compliance**

CPS 2 $\geq 90\%$

**Non-Compliance**

- **Level 1:** $85\% \leq \text{CPS 2} < 90\%$
- **Level 2:** $80\% \leq \text{CPS 2} < 85\%$
- **Level 3:** $75\% \leq \text{CPS 2} < 80\%$
- **Level 4:** CPS 2 $< 75\%$
Compliance Template DCS

Disturbance Control Standard - DCS

**Standard:**
ACE must be returned to zero or to its pre-disturbance level within 10 minutes following the start of a disturbance greater than or equal to eighty percent (80%) of the Control Area’s or Reserve Sharing Group’s most severe single contingency loss or a lower reporting threshold as selected by the Regional Reliability Council.

**References:**
- NPCC Operating Reserve Criteria (Document A-6);
- NPCC Monitoring Procedures for Operating Reserve Criteria (Document C-9);
- NERC Operating Policy 1, Section E, Control Performance Standard;
- Performance Standard Training Document, Sections B and C.

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<td><strong>Compliance Monitoring and Assessment Responsibility:</strong></td>
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<tr>
<td><strong>Enforcement Responsibility:</strong></td>
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</table>

**Full (100%) Compliance**
Control Area and Reserve Sharing Group returned the ACE to zero or its pre-disturbance level within 10 minutes following the start of all reportable disturbances.

**Non-Compliance**

- **Level 1:** $95\% \leq \text{DCS} < 100\%$
- **Level 2:** $90\% \leq \text{DCS} < 95\%$
- **Level 3:** $85\% \leq \text{DCS} < 90\%$
- **Level 4:** $\text{DCS} < 85\%$

**Additional Requirement for DCS Non-Compliance**
For each calendar quarter in which the average DCS is less than 100 percent, the Control Area shall be required to increase its operating reserves, for the first calendar quarter beginning after a final determination of non-compliance, to a level equal to the product of (i) the Control Area’s required operating reserves in the quarter of measurement (including any increased reserves due to a prior incident of non-compliance with this criterion), multiplied by (ii) a factor equal to 2 minus the average percentage DCS (expressed as a decimal) for the quarter of measurement. If the average percentage DCS is equal to 100 percent for a calendar quarter, required operating reserves would be set at appropriate level without consideration of any prior non-compliance.
Compliance Template A2-1

Area Transmission Review

Standard: The interconnected transmission systems shall be planned, designed, and constructed to reliably meet projected customer electricity demand and energy requirements in accordance with NPCC Basic Criteria for Design and Operation of Interconnected Power Systems (Document A-2). Studies shall be conducted in accordance with NPCC Guidelines for NPCC Area Transmission Reviews, Document B-4.

References: NPCC Documents A-2 and B-4

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<td>NPCC</td>
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<tr>
<td>Enforcement Responsibility:</td>
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<tr>
<td>NPCC</td>
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</table>

Full (100%) Compliance

Each Area provides annually an assessment report showing the system performance results of simulation tests of the systems under their responsibility for the near-term (1-3 years) and long-term (4-7 years) planning horizons. Assessments address both intra and inter area reliability. Format of study will be in accordance with NPCC Guidelines for NPCC Area Transmission Reviews, Document B-4. Studies demonstrate that the system meets the NPCC Basic Criteria for Design and Operation of Interconnected Power Systems (Document A-2). Detailed analyses and simulations testing need not be conducted for an Interim Review if the NPCC Task Force on System Study approves that changes to system conditions do not warrant such analyses.

Non-Compliance

Level 1: Area Transmission Review was completed for the prescribed planning horizons. Plans to achieve required system performance were identified, but no facility implementation schedules were addressed.

Level 2: Area Transmission Review of the systems was performed, but not for the prescribed planning horizons. Plans were developed to achieve required system performance for the period that was analyzed. Implementation schedules for system modifications were not developed.

Level 3: Area Transmission Review of the systems was completed for the prescribed horizons, but plans were not developed to achieve required system performance.

Level 4: Area Transmission Review of the systems was not completed for any part of the prescribed planning horizons. System performance under projected conditions cannot be determined.
Compliance Template A3-1

Underfrequency Load Shedding

**Standard:** Each NPCC Area shall plan and implement an Underfrequency Load Shedding Program as specified in sections 4.6.1 and 4.6.2 of the NPCC Emergency Operation Criteria (Document A-3). Documentation of the implementation of the Area's Underfrequency Load Shedding Program shall be provided to NPCC in accordance with the provisions of the Procedures for Compliance Monitoring and Surveys (Document C-26).

**References:** NPCC Documents A-3 and C-26.

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<th>Responsibilities</th>
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<tr>
<td><strong>Reporting Responsibility:</strong></td>
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<td><strong>Frequency of Reporting:</strong></td>
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<tr>
<td><strong>Compliance Monitoring and Assessment Responsibility:</strong></td>
</tr>
<tr>
<td><strong>Enforcement Responsibility:</strong></td>
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</table>

**Full (100%) Compliance**

The load-shedding program fully complies with the requirements of the NPCC Emergency Operation Criteria (Document A-3), sections 4.6.1 and 4.6.2. Compliance reporting is as defined in the Procedures for Compliance Monitoring and Surveys (Document C-26).

**Non-Compliance**

**Level 1:** Deficiencies in load shedding capability were reported together with a plan for correction within five (5) months of the end of the current reporting period.

**Level 2:** Deficiencies in load shedding capability were reported together with a plan for correction within twelve (12) months of the end of the current reporting period.

**Level 3:** Deficiencies in load shedding capability were reported without a plan for correction within twelve (12) months of the end of the current reporting period, or deficiencies from the previous reporting periods were not corrected.

**Level 4:** A load shedding capability report was not submitted.
Compliance Template A3-2

System Restoration Plan

**Standard:** To aid in System Restoration, each Area should have a System Restoration Plan (Section 4.10 of the NPCC Emergency Operation Criteria, Document A-3) including an inventory of key facilities and their critical components for generating units, transmission substations, telecom substations and control centers (See NPCC Guidelines for Identifying Key Facilities and Their Critical Components for System Restoration, Document B-20). Within a calendar year, the critical components associated to key facilities must be tested and remedial action taken as necessary (See NPCC Testing and Reporting Procedure for Key Facilities and Their Critical Components Required for System Restoration, Document C-31). The Restoration Plan must be documented in order to assess compliance.

**References:** NPCC Documents A-3; B-20 and C-31

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<thead>
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</thead>
<tbody>
<tr>
<td><strong>Reporting Responsibility:</strong> Areas</td>
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<td><strong>Frequency of Reporting:</strong> Annually</td>
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<td><strong>Compliance Monitoring and Assessment Responsibility:</strong> NPCC</td>
</tr>
<tr>
<td><strong>Enforcement Responsibility:</strong> NPCC</td>
</tr>
</tbody>
</table>

**Full (100%) Compliance**

The Area has:

i) A System Restoration Plan in accordance with Section 4.10 of A-3.

ii) Identified its key facilities and their critical components in accordance with B-20.

iii) Conducted the annual testing of its critical components associated to the key facilities and remedial actions have been taken, if necessary, in accordance with C-31.

**Non-Compliance**

**Level 1:** Failure to test critical components and to implement action as necessary.

**Level 2:** Failure to have identified key facilities and their critical components.

**Level 3:** Failure to have a System Restoration Plan in place as described above.
Compliance Template A4-1

Bulk Power System Protection Minimum Maintenance

**Standard:** Protection system owners shall implement a protection system maintenance and testing program that fulfills the requirements of the NPCC *Maintenance Criteria for Bulk Power System Protection* (Document A-4). Documentation of program implementation shall be provided to NPCC in accordance with the provisions of the *Procedures for Compliance Monitoring and Surveys* (Document C-26).

**References:** Document A-4 and Document C-26.

<table>
<thead>
<tr>
<th>Responsibilities</th>
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<tbody>
<tr>
<td><strong>Reporting Responsibility:</strong></td>
</tr>
<tr>
<td><strong>Frequency of Reporting:</strong></td>
</tr>
<tr>
<td><strong>Compliance Monitoring and Assessment Responsibility:</strong></td>
</tr>
<tr>
<td><strong>Enforcement Responsibility:</strong></td>
</tr>
</tbody>
</table>

**Full (100%) Compliance**

Area reports testing and maintenance of protection systems fully complies with the requirements of the NPCC *Maintenance Criteria for Bulk Power System Protection* (Document A-4). Compliance reporting is as defined in the *Procedures for Compliance Monitoring and Surveys* (Document C-26).

Exceptions to Document A-4 requirements are acceptable if a plan for removal of the exceptions within five (5) months of the end of the current reporting period is provided. For each reporting period, all exceptions from previous reporting periods must have been removed.

**Non-Compliance**

**Level 1:** Exceptions were reported together with a plan for their removal, but not all exceptions were planned to be removed within five (5) months after the end of the current reporting period.

**Level 2:** Exceptions were reported together with a plan for their removal, but not all exceptions were planned to be removed within twelve (12) months after the end of the current reporting period.

**Level 3:** Exceptions were reported with no plan for removal, or exceptions from previous reporting periods were not removed.

**Level 4:** No maintenance report was provided by the Area.
Compliance Template A6-1

Operating Reserve

Standard: Each CONTROL AREA shall operate its MW power resources to provide for a level of OPERATING RESERVE. Following loss of resources or load, a CONTROL AREA shall take appropriate steps to reduce its AREA CONTROL ERROR to meet the Disturbance Control Standard (DCS). Each CONTROL AREA will maintain at all times sufficient OPERATING RESERVE to cover its largest single (resource or load) contingency.

References: NPCC Operating Reserve Criteria (Documents A-6)

Responsibilities

Reporting Responsibility: Control Areas

Frequency of Reporting: Each hour that the Control Area’s OPERATING RESERVE is less than 100% of required reserve

Compliance Monitoring and Assessment Responsibility: NPCC

Enforcement Responsibility: NPCC

Full (100%) Compliance

The ten-minute reserve requirement in each Control Area shall be at least equal to its first contingency loss multiplied by the CONTINGENCY RESERVE ADJUSTMENT FACTOR for the most recently completed quarter.

The thirty-minute reserve in each Control Area shall equal one-half its second largest single contingency loss.

Expected compliance for OPERATING RESERVE is 100% except within the first 30 minutes following an event requiring activation of the Regional Thirty Minute OPERATING RESERVE

Non-Compliance

Level 3: Failure to meet Operating Reserve requirements as described above except during emergency operations resulting from a capacity deficiency.
Guidelines for Identifying
Key Facilities and Their Critical Components
for System Restoration

Approved by the Reliability Coordinating Committee on June 29, 2000
Note:

Terms in bold typeface are defined in the *NPCC Glossary of Terms* (Document A-7)
1.0 Introduction

Following an occurrence of a partial or total system blackout where a significant amount of load and generation has been lost, the prompt restoration of services is dependent on a number of critical elements such as:

- Power System Restoration Plan.
- Trained personnel.
- Blackstart Capability.
- Key Facilities and their Critical Components including Back-up power supply so that they continue to function.

This document establishes requirements and guidelines for the identification of Key Facilities and their Critical Components that are required for restoration of the power system following a partial or total system blackout. This document is intended to be used in conjunction with Document C-31 entitled Testing and Reporting Procedure for Key Facilities and Their Critical Components Required for System Restoration. The intent of this guide and the companion procedure is to identify and periodically verify that all Key Facilities and their Critical Components are operable so that their continued availability is assured in the event of a system blackout.

2.0 Definition

A Basic Minimum Power System consists of one or more generating stations, transmission lines, and substations operating in the form of an island. Such a Basic Minimum Power System can be restarted independently and supply as much load as its generation permits. The Basic Minimum Power System can be later synchronized to other islands or the main grid. The transmission elements to be included in the Basic Minimum Power System connect the units which have blackstart capability to those units without blackstart capability which have been designated in the restoration plan to be restarted in the first stages of the restoration process. Also to be included in the Basic Minimum Power System are selected tie lines and corresponding substations which are considered essential to the formation of a single unified power system. The intent is not to include all possible transmission elements in the bulk power system but to focus on the ability to create smaller electrical systems or islands which can be expanded and synchronized to other such islands and the main grid.
3.0 **Key Facilities**

Key Facilities are those required to establish a Basic Minimum Power System in a timely and safe manner following a system blackout. These facilities consist of selected generators, transmission elements plus control and communication facilities that are designated as essential in the Restoration Plan of the Control Area.

Key Facilities include:

3.1 Generating stations having blackstart units.

3.2 Transmission elements (transmission lines, substations, transformers) which are part of the Basic Minimum Power System. Only key substations and underground lines will be considered Key Facilities due to their Critical Components which are subject for testing.

3.3 Control Centers and Telecom Centers including their back-up control centers.

3.4 Telecommunication facilities which are necessary to support the following communications:

   3.4.1 Voice and data between and within Control Centers. Provide at least one main voice and data channel between control centers and key stations within a Control Area. In some cases, an alternate back-up channel may also be provided.

   3.4.2 Voice and data between Control Centers and key generating stations and transmission stations.

   3.4.3 Protection and control facilities.

4.0 **Critical Components**

Critical Components are those components required to ensure continued and proper operations of a Key Facility in the event of a total loss of AC supply to the Key Facility. A backup power supply is the most important Critical Component.

Critical Components include but are not limited to the following:

4.1 For generating stations: Blackstart units.

4.2 For substations: Back-up power supply (e.g. diesel generator, batteries)

4.3 For Control Centers and Telecom Centers:

   4.3.1 Back-up power supply (e.g. diesel generator, batteries, UPS).

   4.3.2 Computer room air conditioning.

   4.3.3 Critical communications.

4.4 For Telecommunications Facilities: Back-up power supply (e.g. diesel generator, batteries)
Coordinated by: Task Force on Coordination of Operation

Prepared by: Joint Working Group on System Restoration Facilities

Reviewed for concurrence by: TFEMT and TFSP

Review frequency: 3 years

References: Emergency Operation Criteria (Document A-3)

NPCC Glossary of Terms (Document A-7)

Testing and Reporting Procedure and Their Critical Components for Key Facilities Required for System Restoration (Document C-31)
NPCC
Guidelines for
the Implementation of the Reliability Compliance and Enforcement Program (RCEP)

Approved by the Reliability Coordinating Council on November 9, 2000
Note:

Terms in bold typeface are defined in the *NPCC Glossary of Terms* (Document A-7)
1.0 Introduction

The compliance assessment and enforcement process, described in Reliability Compliance and Enforcement Program (“A-8”), utilizes various NPCC functional entities to implement the Program.

This document describes the details of the following:

- Compliance Monitoring and Assessment Subcommittee (CMAS) selection of annual RCEP requirements
- **Area** reporting to CMAS
- Status reporting and workshop presentation by CMAS
- CMAS reporting to the Reliability Coordinating Committee (RCC)
- RCC reporting to the Enforcement Panel (EP)

The document also describes the implementation of the NPCC Policy for Alternative Dispute Resolution including the RCEP arbitration process for resolving any disputes and an option to appeal to FERC.

2.0 Guidelines

2.1 Compliance Monitoring and Assessment Subcommittee

2.1.1 Selection of Annual Program Requirements

CMAS will submit to the RCC, for review and approval, by June of each year a list of the Program requirements for the following year’s RCEP. Appendix A of Document A-8 may be amended to include additional requirements of the Program. The RCC will seek approval, from the EC and the NPCC membership, of the revised Appendix A by the end of the year. Upon approval by the EC and NPCC membership the amended RCEP will begin the following March.
2.1.2 Area Reporting and Compliance Assessment

Each Area shall furnish to CMAS, as per the established schedule, a compliance submittal for each of the requirements described in the Compliance Templates contained in Appendix A of A-8. Sanctions for late submittals are described in Section 4.2 of A-8.

CMAS shall review the submittals within 30 days or at their next scheduled meeting and assess them for compliance/non-compliance. CMAS may request the submission of reasonable supplemental or additional information to aid in the assessment.

In the event of a preliminary assessment of non-compliance CMAS shall notify the Area and the Area shall have thirty days from such notification to provide additional information or corrected data if it so desires. If the Area does not submit additional information or data in this time frame, CMAS will make its final determination and forward the compliance assessment to the Area and to the RCC. In the instance(s) of non-compliance CMAS will also provide a sanction recommendation to the RCC for their consideration. This sanction recommendation will be consistent with the NPCC Compliance Sanction Matrix contained in Section 4.1 of A-8.

2.1.3 Status Reporting

CMAS will provide status reports on the RCEP at each RCC meeting. These reports will also be available on the NPCC web page. At the first RCC meeting of the year CMAS will include a report on the Program for the previous year.

2.1.4 Workshop Presentation

Each year, until the Program is expanded to include all NPCC criteria, CMAS will sponsor a workshop that previews the requirements, including reporting instructions, for the coming year. Notification concerning the workshop will be disseminated via NPCC email and also posted on the NPCC web page.
2.2 Reliability Coordinating Committee (RCC)

CMAS will present its technical assessment(s) to the RCC for review and final determination. The CMAS submittal to the RCC will occur at least two weeks prior to an RCC meeting for discussion at that meeting. The RCC will make its final determination at its meeting or it may choose to remand the report back to CMAS for clarification. In that event CMAS will resolve the RCC concerns within thirty days and resubmit its report to the RCC. The review of the re-submittal need not wait for the next RCC meeting and can be conducted via e-mail or conference call as per the desires of the RCC.

RCC will notify the Area(s) of its Final Compliance Determination, which includes a technical assessment and in instance of non-compliance a sanction recommendation. The Area(s) will have fifteen days to review and respond to the final RCC compliance determination. No response will be considered acceptance of the RCC determination and the Final Compliance Determination will be forwarded to the EP for sanction implementation. If the Area disputes the RCC compliance determination, the Final Compliance Determination and a copy of the Area’s response will be forwarded to the EP for resolution.

2.3 Enforcement Panel (EP)

The EP will receive either an undisputed RCC determination of a compliance violation, including a sanction recommendation or a disputed technical assessment from the RCC.

The EP will take the following actions:

1. In case of an undisputed RCC determination it reviews the recommendation, determines the appropriate sanction and notifies the violator within 30 days. Upon receipt of such notice, the violator shall, within 7 days, notify the EP whether it will accept the sanction or whether it will contest the sanction. Sanctions are defined in Section 4.1 of Document A-8. After notifying the EP that it contests the sanction, the violator will have 15 days to provide the EP with relevant material in advance of the EP hearing. The EP will conduct the hearing and issue its Final Report within 15 days.

2. In the instance of a disputed technical assessment the EP will initiate a hearing within 30 days to resolve the technical dispute as well as determine the appropriate sanction if applicable. Upon completion of this hearing the EP will issue its Final Report within 15 days.
At any hearing by the Enforcement Panel, the EP Chairman shall preside. Parties may choose to be represented by counsel but neither civil nor criminal procedural rules nor the rules of evidence shall apply. The CMAS and the RCC may participate at the hearing.

Should the violator seek to dispute the EP Final Report it may do so by notifying the EP, in writing, that it wishes to invoke the NPCC Policy for Alternate Dispute Resolution utilizing the RCEP arbitration process specified below. Requests for resolution of a dispute using the NPCC Policy for Alternate Dispute Resolution must be initiated within fifteen (15) days after receipt of the EP Final Report.

3.0 RCEP Arbitration Process

An Area ("Disputing Area") may only seek review of an EP Final Report by invoking the arbitration provision described below:

a. Within fifteen (15) days of submission for arbitration of any dispute related to a determination of non-compliance with a reliability criterion and/or the assessment of a sanction, the Chairman of the EP and the Disputing Area shall select a single arbitrator. If the Chairman of EP and the Disputing Area are unable to agree on an arbitrator, they shall select an arbitrator from a list of qualified arbitrators maintained by the NPCC. Each NPCC Area may submit one name of an arbitrator to be included on such list. All arbitrators included on such list shall be knowledgeable with respect to electric utility industry matters.

The EP and the Disputing Area shall select the arbitrator from such list by (a) agreement, or in the absence of agreement, by (b) striking names from the list in turn (beginning with the party requesting arbitration) until only the selected arbitrator remains. The arbitrator selected shall not be an employee, director or officer of either the NPCC or the Disputing Area or any Affiliate thereof. Potential arbitrators who are employees, directors or officers of Members of the NPCC, but who are not themselves officers of the NPCC or members of the EP shall not be considered to be employees, directors or officers of the NPCC. The arbitrator shall agree in writing to be bound by the confidentiality obligations applicable to the NPCC Staff.

b. All arbitration proceedings shall be held in New York City, unless an alternate location is agreed to by the parties. The NPCC Staff will facilitate any such arbitration proceedings.
c. The arbitrator shall provide the EP and the Disputing Area the opportunity to be
heard and, except as otherwise provided herein, shall generally conduct the
arbitration in accordance with the Commercial Arbitration Rules of the American
Arbitration Association. The NPCC shall submit to the arbitrator all reports
provided by the CMAS to the RCC, the RCC Final Compliance Determination and
the EP Final Report and the data and information provided by the Area and by other
Areas to the CMAS. The EP and the Disputing Area shall be afforded a reasonable
opportunity to rebut any such evidence. The arbitrator shall create and maintain an
evidentiary record of sufficient detail to render an informed decision.

During the arbitration process, the NPCC and the Disputing Area shall make funds
available to the arbitrator as required by the arbitrator to pursue the arbitration.
Such conclusion of the arbitration shall be reimbursed as specified in (g) below.

d. In any arbitration either the EP or the Disputing Area may raise any issue regarding
the technical assessment and or sanction determination, including the factual basis
for the technical assessment and or sanction, or whether the procedures specified in
this document were properly followed. Neither the EP nor the Disputing Area,
however, may dispute the validity of the reliability criteria used in the RCEP.

e. If an arbitrator hearing a dispute between the NPCC and the Disputing Area
determines that data from another Area are relevant to the consideration of such
dispute, the arbitrator shall so notify such other Area, and such other Area shall
have fifteen (15) days, or a mutually agreeable extension thereof, to provide the
requested data.

f. As soon as practicable, but no later than ninety (90) days after initial selection of the
arbitrator, the arbitrator shall issue to the EP and the Disputing Area a written
decision resolving the dispute and explaining the basis for the conclusion. Such
decision shall include findings of fact to support the arbitrator's conclusion. Such
decision shall be final and binding on the parties.

g. Any and all costs associated with the arbitration (not including attorney and expert
witness fees which shall be borne by the respective parties) shall be borne by the
party whose arbitration position was not selected by the arbitrator, unless the NPCC
and the Disputing Area agree to an alternative method of allocating costs. If the
arbitration decision differs from the positions of both the EP and the Disputing Area,
the arbitrator shall specify how the costs are to be allocated. Such cost allocation
shall include reimbursement of any funds provided to the arbitrator by the NPCC
and the Disputing Area pursuant to the description contained in (c) above.
4.0 Appeal to FERC or Applicable Canadian Regulatory Authority

Either the NPCC or the Area (“Disputing Area”) may apply to the FERC or applicable Canadian Regulatory Authority to hear an appeal of any arbitrator’s decision resulting from implementation of the NPCC ADR process. Such an appeal shall be filed at FERC or applicable Canadian Regulatory Authority within fifteen (15) days of the arbitrator’s decision. The NPCC and the Disputing Area agree that in any appeal to the FERC or applicable Canadian Regulatory Authority the NPCC or the Disputing Area may raise any issues raised in the arbitration or the EP proceeding, including the factual basis for the technical assessment or sanction or whether the procedures were properly followed. Neither the NPCC nor the Disputing Area, however, may raise issues regarding the validity of the reliability standard and criteria in RCEP. Any appeal from an arbitrator’s decision to the FERC or applicable Canadian Regulatory Authority shall be based solely upon the record assembled by the arbitrator, unless otherwise determined by FERC or applicable Canadian Regulatory Authority. All costs incurred by each of the NPCC and the Disputing Area in connection with such an appeal to FERC or applicable Canadian Regulatory Authority shall be solely the responsibility of the party that incurred such costs. Any initiation of a FERC or applicable Canadian Regulatory Authority appeal by the NPCC pursuant to this section 4.0 must be authorized by the NPCC Executive Committee.

Prepared by: Compliance Monitoring and Assessment Subcommittee (CMAS)

Review frequency: Annually

References: NPCC Reliability Compliance and Enforcement Program (Document A-8)

NPCC Glossary of Terms (Document A-7)
Listing of NPCC Documents by Type

Updated: November 2000
Note:
Terms in bold typeface are defined in the *NPCC Glossary of Terms* (Document A-7).
### Criteria – type "A" Documents

<table>
<thead>
<tr>
<th>Document</th>
<th>Title</th>
<th>Latest Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-1</td>
<td><strong>Criteria For Review and Approval of Documents</strong></td>
<td>March 1997</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A-2</td>
<td><strong>Basic Criteria for Design and Operation of Interconnected Power Systems</strong></td>
<td>August 9, 1995</td>
</tr>
<tr>
<td></td>
<td></td>
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<tr>
<td>A-3</td>
<td><strong>Emergency Operation Criteria</strong></td>
<td>January 1999</td>
</tr>
</tbody>
</table>

**Description:**
- **A-1 Criteria For Review and Approval of Documents**
  - Appendix A - NPCC Glossary - has been superseded by the *NPCC Glossary of Terms* (Document A-7)
  - This guide outlines the review and approval procedures to be followed for all NPCC documents.
  - Lead Task Force: Task Force on Coordination of Planning
  - Reviewed for concurrence by: TFCO, TFSP and TFSS

- **A-2 Basic Criteria for Design and Operation of Interconnected Power Systems**
  - Criteria are established for proper design and operation concerning **Resource Adequacy and Transmission Capability**.
  - Lead Task Force: Task Force on Coordination of Planning
  - Reviewed for concurrence by: TFCO, TFSP, TFSS and the TFEMT Chairman

- **A-3 Emergency Operation Criteria**
  - Objectives, principles and requirements are presented to assist the NPCC Areas in formulating plans and procedures to be followed in an **emergency** or during conditions which could lead to an **emergency**.
  - Lead Task Force: Task Force on Coordination of Operation
  - Reviewed for concurrence by: TFCP, TFSP, and TFSS
### Criteria – type "A" Documents - continued

<table>
<thead>
<tr>
<th>A-4</th>
<th><strong>Maintenance Criteria for Bulk Power System Protection</strong></th>
<th>Latest Version</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Description: Establishes the maintenance intervals and practices which should result in dependable and secure protection system operation.</td>
<td>September 1998</td>
</tr>
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<td>Lead Task Force: Task Force on System Protection</td>
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<td>Reviewed for concurrence by: TFCO and TFSS</td>
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<thead>
<tr>
<th>A-5</th>
<th><strong>Bulk Power System Protection Criteria</strong></th>
<th>September 1998</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Description: This document establishes the minimum design objectives and recommends design practices to minimize the severity and extent of system disturbances and to minimize possible damage to system equipment.</td>
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<td>Lead Task Force: Task Force on System Protection</td>
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<td>Reviewed for concurrence by: TFCO, TFCP and TFSS</td>
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<tr>
<th>A-6</th>
<th><strong>Operating Reserve Criteria</strong></th>
<th>September 1998</th>
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<tbody>
<tr>
<td></td>
<td>Description: This Criteria establishes standard terminology and minimum requirements governing the amount, availability and distribution of operating reserve.</td>
<td></td>
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<td>Lead Task Force: Task Force on Coordination of Operation</td>
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<td>Reviewed for concurrence by: TFCP and TFSS</td>
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<table>
<thead>
<tr>
<th>A-7</th>
<th><strong>NPCC Glossary of Terms</strong></th>
<th>September 1998</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Description: This Glossary includes terms from NPCC Criteria (A), Guideline (B) and Procedure (C) Documents, as well as from the North American Electric Reliability Council (NERC) Glossary of Terms, August 1996.</td>
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<td></td>
<td>Lead Task Force: Task Force on Coordination of Planning</td>
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<td></td>
<td>Reviewed for concurrence by: TFCO, TFEMT, TFSP and TFSS</td>
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</tbody>
</table>
Criteria – type "A" Documents - continued

A-8  NPCC Reliability Compliance and Enforcement Program

Description:  This document describes the NPCC Reliability Compliance and Enforcement Program that is used to assess and enforce compliance with NPCC reliability criteria.

Lead Subcommitee:  Compliance Monitoring and Assessment Subcommittee (CMAS)

Reviewed for concurrence by:  TFCP, TFCO, TFEMT, TFSP and TFSS

Guides – type "B" Documents

B-1  Guide for the Application of Autoreclosing to the Bulk Power System

Description:  This document establishes guidelines for the application of automatic reclosing facilities to circuit breakers on the NPCC bulk power system.

Lead Task Force:  Task Force on System Protection
Reviewed for concurrence by:  TFSS, TFCO and TFCP

B-2  Control Performance Guide During Normal Conditions

Description:  Establishes a performance measure of NPCC Areas and systems within the Areas' ability to carry out their responsibilities regarding control performance.

Lead Task Force:  Task Force on Coordination of Operation
Reviewed for concurrence by:  TFCP, TFSS
Guides – type "B" Documents - continued

B-3 Guidelines for Inter-Area Voltage Control

Description: This document establishes procedures and principles to be considered for occasions where a deficiency or an excess of reactive power can affect bulk power system voltage levels in a large portion of an Area or in two adjacent Areas.

Lead Task Force: Task Force on Coordination of Operation
Reviewed for concurrence by: TFCP, TFSS

B-4 Guidelines for NPCC Area Transmission Reviews

Description: Guidelines to help TFSS ascertain that each Area's transmission expansion plan, based on its proposed generation additions, has been developed in accordance with the NPCC Basic Criteria for Design and Operation of Interconnected Power Systems (Document A-2).

Lead Task Force: Task Force on System Studies
Reviewed for comments by: TFCO and TFCP

B-5 Guideline B-5 was changed to Procedure C-22 as of February 8, 1994

B-6 The content of Guideline B-6 was incorporated into Guideline B-7 as of March 2, 1999
**Guides – type "B" Documents - continued**

**B-7 Automatic Underfrequency Load Shedding**

**Program Relaying Guideline**

**Latest Version**: March 2, 1999

**Description**: This guide presents relay application and testing requirements necessary to accomplish the objectives of the *Emergency Operation Criteria* (Document A-3) related to automatic underfrequency load shed and automatic underfrequency load shedding associated with generator underfrequency tripping.

Lead Task Force: Task Force on System Protection
Reviewed for comments by: TFCO, TFSS and TFCP

**B-8 Guidelines for Area Review of Resource Adequacy**

**Latest Version**: February 14, 1996

**Description**: Guidelines to help TFCP ascertain that each Area's resource plan is in accordance with the NPCC *Basic Criteria for Design and Operation of Interconnected Power Systems* (Document A-2).

Lead Task Force: Task Force on Coordination of Planning
Reviewed for comments by: TFSS

**B-9 Guide for Rating Generating Capability**

**Latest Version**: November 5, 1998

**Description**: Establishes standards for rating and verifying Net Generating Capability.

Lead Task Force: Task Force on Coordination of Operation
Reviewed for comments by: TFCP
Guides – type "B" Documents - continued

B-10  Guidelines for Requesting Exclusions to
Section 5.1(B) and 6.1(B) of the NPCC
Basic Criteria for Design and Operation
of Interconnected Power Systems

NOTE:  Member Representatives shall be advised of
approvals by the Reliability Coordinating
Committee of applications for exclusions.

Description: Establishes procedure for requesting
exclusion from a certain contingency in the
Basic Criteria (Document A-2).

Lead Task Force:  Task Force on System Studies
Reviewed for concurrence by:  TFCP, TFCO

B-11  Special Protection System Guideline

Description: This guideline categorizes a special
protection system (SPS) according to the
criteria fault for which it is designed and
the impact its failure would have on the
network.  It further provides guidelines for
the design, testing and operation of the
SPS.

Lead Task Force:  Task Force on System Protection
Reviewed for concurrence:  TFCO, TFSS

B-12  Guidelines for On-Line Computer System Performance
During Disturbances

Description: Establishes guidelines for the performance
of NPCC Area on-line computer systems
during a power system disturbance.

Lead Task Force:  Task Force on Energy Management Technology
Reviewed for concurrence:  TFCO
Guides – type "B" Documents - continued

B-13  Guide for Reporting System Disturbances

Latest Version: June 25, 1997

Description: This document establishes the Task Force on Coordination of Operation's (TFCO) requirements and guidelines for reporting system disturbances to enable the TFCO to review, with emphasis on inter-\textit{Area} implications, disturbances which affect a significant part of one \textit{Area}. (This Guide was formerly known as Procedure C-2).

Lead Task Force: Task Force on Coordination of Operation

B-20  Guidelines for Identifying Key Facilities and Their Critical Components for System Restoration

Latest Version: June 29, 2000

Description: This document establishes requirements and guidelines for the identification of Key Facilities and their Critical Components that are required for restoration of the power system following a partial or total system blackout.

Lead Task Force: Task Force on Coordination of Operation

B-22  NPCC Guidelines for the Implementation of the Reliability Compliance and Enforcement Program (RCEP)

Latest Version: November 9, 2000

Description: This document describes the various NPCC functional entities that are utilized to implement the compliance assessment and enforcement process, described in the \textit{Reliability Compliance and Enforcement Program} (Document A-8).

Lead Subcommittee: Compliance Monitoring and Assessment Subcommittee (CMAS)
<table>
<thead>
<tr>
<th>Document</th>
<th>Title</th>
<th>Description</th>
<th>Latest Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-0</td>
<td>Listing of NPCC Documents by Type</td>
<td>This listing describes all existing NPCC Criterion (type &quot;A&quot;), Guide (type &quot;B&quot;) and Procedure (type &quot;C&quot;) Documents.</td>
<td>November 2000</td>
</tr>
<tr>
<td>C-1</td>
<td>Procedure C-1, the former <em>Glossary of Standard Operating Terms</em>, was discontinued in September 1998 with the approval of the <em>NPCC Glossary of Terms</em> (Document A-7).</td>
<td></td>
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</tr>
<tr>
<td>C-2</td>
<td>Procedure C-2 was elevated to Guideline B-13 as of June 25, 1997</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C-3</td>
<td>Procedures for Communications During Emergencies</td>
<td>This Procedure addresses three separate but related areas of emergency of communications: 1) Operators’ communication during an emergency, 2) Communications with external agencies during extended Emergencies, and 3) Collection of data during or following a major system event. (The Procedure is a combination of three former Procedures: C-3, C23 and C-24).</td>
<td>March 8, 2000</td>
</tr>
<tr>
<td>C-4</td>
<td>Monitoring Procedures for <em>Guidelines for Inter-Area Voltage Control</em></td>
<td>This procedural document establishes TFCO's monitoring and reporting requirements for conformance with NPCC's <em>Guidelines for Inter-AREA Voltage Control</em> (Document B-3).</td>
<td>March 25, 1998</td>
</tr>
<tr>
<td>C-5</td>
<td>Monitoring Procedures for <em>Emergency Operation Criteria</em></td>
<td>May 15, 1997</td>
<td></td>
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</tr>
<tr>
<td><strong>Description:</strong></td>
<td>This procedural document establishes TFCO's monitoring and reporting requirements for conformance with NPCC's <em>Emergency Operation Criteria</em> (Document A-3).</td>
<td></td>
<td></td>
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<tr>
<td><strong>Lead Task Force:</strong></td>
<td>Task Force on Coordination of Operation</td>
<td></td>
<td></td>
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<table>
<thead>
<tr>
<th>C-6</th>
<th>Procedure C-6 has been discontinued as of February 8, 1994.</th>
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</thead>
<tbody>
<tr>
<td><strong>The sections that were under TFSS’s responsibility have been incorporated in Guide B-10.</strong></td>
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<tr>
<td><strong>The sections that were under TFCO’s responsibility have been incorporated in the new Procedure C-21.</strong></td>
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<tbody>
<tr>
<td><strong>Description:</strong></td>
<td>This procedural document establishes the TFCO's monitoring and reporting requirements for conformance with the NPCC, <em>Guide for Rating Generating Capability</em> (Document B-9).</td>
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<tr>
<td><strong>Lead Task Force:</strong></td>
<td>Task Force on Coordination of Operation</td>
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<tbody>
<tr>
<td><strong>Description:</strong></td>
<td>This procedural document establishes a performance measure for NPCC Areas and systems and outlines the reporting function for NPCC <em>Control Performance Guide During Normal Conditions</em> (Document B-2)</td>
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<tr>
<td><strong>Lead Task Force:</strong></td>
<td>Task Force on Coordination of Operation</td>
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</table>
Procedures – type "C" Documents - continued

C-9  Monitoring Procedures for Operating Reserve Criteria

Description: This procedural document establishes the TFCO's monitoring and reporting requirements for conformance with the NPCC Operating Reserve Criteria (Document A-6)

Lead Task Force: Task Force on Coordination of Operation

C-10  Procedure C-10 was discontinued as of July 11, 1991

C-11  Monitoring Procedures for Interconnected System Frequency Response

Description: This procedural document defines procedures for monitoring frequency responses to large generation losses.

Lead Task Force: Task Force on Coordination of Operation

C-12  Procedures for Shared Activation of Ten Minute Reserve

Description: This procedural document outlines procedures to share the activation of ten minute reserve on an Area basis.

Lead Task Force: Task Force on Coordination of Operation

C-13  Operational Planning Coordination

Appendix D - NPCC Critical Facilities List

Description: This document coordinates the notification of planned facility outages among the Areas. It also establishes formal procedures for Area communications in advance of a period of likely capacity shortages as well as for weekly and emergency NPCC conference call among the Areas.

Lead Task Force: Task Force on Coordination of Operation
C-14 Procedure C-14 was incorporated in Procedure C-13 as of May 15, 1997

C-15 Procedures for Solar Magnetic Disturbances on Electrical Power Systems

Description: This procedural document clarifies the reporting channels and information available to the operator during solar alerts and suggests measures that may be taken to mitigate the impact of a solar magnetic disturbance.

Lead Task Force: Task Force on Coordination of Operation

C-16 Procedure for NPCC Review of New or Modified Bulk Power System Special Protection Systems (SPS)

Description: This document outlines procedures for reporting new or modified bulk power system special protection systems.

Lead Task Force: Task Force on Coordination of Planning

C-17 Monitoring Procedures for Guidelines for On-Line Computer System Performance During Disturbances

Description: This document establishes TFEMT's monitoring and reporting procedures for conformance with NPCC's Guidelines for Computer System Performance During Disturbances (Document B-12).

Procedures – type "C" Documents - continued

C-18 Procedure For Testing and Analysis of Extreme Contingencies

Description: This document establishes a procedure for the testing and analysis of Extreme Contingencies.

Lead Task Force: Task Force on System Studies

C-19 Procedures During Shortages of Operating Reserve

Description: This procedure is intended to provide specific instructions for the redistribution of Operating Reserve among the Areas when one or more Area(s) are experiencing an Operating Reserve deficiency.

Lead Task Force: Task Force on Coordination of Operation

C-20 Procedures During Abnormal Operating Conditions

Description: This procedure is intended to complement the Emergency Operation Criteria (Document A-3) by providing specific instructions to the System Operator during such conditions in an NPCC Area or Areas.

Lead Task Force: Task Force on Coordination of Operation

C-21 Monitoring Procedures for Conformance with Normal and Emergency Transfer Limits

Description: This procedural document establishes TFCO monitoring and reporting requirements for transfer limits during normal and emergency operations as stipulated in the Basic Criteria for Design and Operation of Interconnected Power Systems (Document A-2).

Lead Task Force: Task Force on Coordination of Operation
<table>
<thead>
<tr>
<th>Procedure ID</th>
<th>Title</th>
<th>Latest Version</th>
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<tbody>
<tr>
<td>C-22</td>
<td><strong>Procedure for Reporting and Reviewing Proposed Protection Systems for the Bulk Power System</strong></td>
<td>April 14, 1999</td>
</tr>
<tr>
<td></td>
<td>Description: This procedure ensures that new facilities or modifications to existing facilities are presented to the TFSP in order to ascertain conformance with the principles of the <em>Bulk Power System Protection Criteria</em> (Document A-5). (This Procedure was formerly known as Guide B-5).</td>
<td></td>
</tr>
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<td></td>
<td>Lead Task Force: Task Force on System Protection</td>
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<tr>
<td>C-23</td>
<td>Procedure C-23 was incorporated in Procedure C-3 as of January 21, 1997</td>
<td></td>
</tr>
<tr>
<td>C-24</td>
<td>Procedure C-24 was incorporated in Procedure C-3 as of January 21, 1997</td>
<td></td>
</tr>
<tr>
<td>C-25</td>
<td><strong>Procedure to Collect Real Time Data for Inter-Area Dynamic Analysis</strong></td>
<td>February 1, 1996</td>
</tr>
<tr>
<td></td>
<td>Description: This procedure provides a mechanism to collect real time data following a power system disturbance for the purpose of analyzing the dynamic performance of the NPCC bulk power system.</td>
<td></td>
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<td>Lead Task Force: Task Force on System Studies</td>
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<tr>
<td>C-26</td>
<td><strong>Procedures for Task Force on System Protection Compliance Monitoring and Surveys</strong></td>
<td>November 3, 1999</td>
</tr>
<tr>
<td></td>
<td>Description: This procedure documents the TFSP's procedures for compliance monitoring and surveys.</td>
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<td>Lead Task Force: Task Force on System Protection</td>
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</table>
Procedures – type "C" Documents - continued

C-30 Procedure for Task Force on System Protection
Review of Disturbances

Description: This procedure documents the TFSP's procedures for review of disturbances that have occurred both inside and outside NPCC.

Lead Task Force: Task Force on System Protection

C-32 Review Process for NPCC Reliability Compliance Program

Description: This Procedure describes the process required to review Area compliance to the standards that comprise the NPCC Reliability Compliance Program (RCP) or its successor program.

Lead Subcommittee: Compliance Monitoring and Assessment Subcommittee
Procedures for Communications During Emergencies

Approved by the Task Force on Coordination of Operation on January 21, 1997

Revised: March 8, 2000
This Procedure is a consolidation of the following three former Procedures:

- **NPCC Procedures for the Use of the NERC Interregional Emergency Telephone Networks** (Document C-3).
- **Procedures for Crisis Management Communications** (Document C-23).
- **Procedures for the Collection of Data During a Major System Event on the Interconnected Bulk Power System** (Document C-24).

Document C-3 was first approved by the Task Force on Coordination of Operation on February 1, 1981. Prior to the January 21, 1997 consolidation with Documents C-23 and C-24, it was revised as follows:

- Revised: February 2, 1984
- Revised: June 17, 1986
- Revised: June 11, 1987
- Revised: February 9, 1989
- Revised: December 4, 1989
- Revised: May 9, 1991
- Revised: March 10, 1993
- Revised: September 28, 1994
- Revised: July 18, 1995

Document C-23 was approved by the Task Force on Coordination of Operation on November 15, 1995. It was never revised.

Document C-24 was approved by the Task Force on Coordination of Operation on September 28, 1995. It was never revised.

**Note:**

Terms in bold typeface are defined in the **NPCC Glossary of Terms** (Document A-7).
1.0 Introduction

Communication among control areas is essential to maintain the reliability of the interconnected systems and permit the implementation of appropriate NPCC Criteria, Guides and Procedures. Proper and effective communication is particularly critical during an emergency, or as an emergency situation evolves in order to mitigate the consequences of the event. Please refer to the NPCC Reference Manual Document A-7, NPCC Glossary of Terms, for terms in bold typeface.

Each Area is required to ensure that operational situations of an unusual nature are communicated promptly even though the situation may not appear to have an adverse impact on interconnected operations. Follow-up reports should be provided as deemed appropriate.

This Procedure addresses three separate but related areas of emergency of communications:

- Operators’ communication during an emergency.
- Communications with external agencies during extended emergencies.
- Collection of data during or following an emergency.

2.0 Operators’ Communication during an Emergency

2.1 Control Room Communications

It is the responsibility of the operator of any system or Area to inform the appropriate Security Coordinator, other systems and Areas whenever it anticipates or experiences an emergency. The Security Coordinator will assist the operator in dissemination of the information if requested. Prompt notice of such conditions should be communicated to:

a) the Interconnection through the NERC Interregional Emergency Telephone Networks as outlined in NERC Operating Policy 7, Telecommunications, Appendix 7A,” Regional and Interregional Telecommunications”.

b) neighboring utilities via the Security Coordinators’ Information System (formerly the GAPP Information System /Operating Regions of the Northeast Systems (ORNS) network).

NERC Operating Policy 7, Telecommunications is available on the NERC Home Page at:
2.2 Description of Emergency Conditions

The following are examples of conditions that warrant the use of the NERC Interregional Emergency Telephone Network:

a) sudden and unexplained change in frequency of at least 0.03 Hz from normally acceptable levels (0.5 Hz within the TransÉnergie system)

b) gradual, unexplained decay in frequency leading to frequency levels below 59.95 Hz (59.5 Hz within the TransÉnergie system)

c) sudden frequency changes sufficiently large to threaten an interconnection

d) unexplained transmission loadings in a region

e) sudden transmission loadings sufficiently large to threaten an interconnection

f) Generation Deficiency Alerts requiring the sudden need to import emergency power or energy from other Areas or regions

g) supplemental communications following a partial or major interconnection blackout

h) failure of other communications systems, either partially or totally

i) electromagnetic storms in progress

It is the responsibility of any system or Area to inform the appropriate Security Coordinators, other systems and Areas whenever it is not able to operate within the NPCC operating criteria or its status is burdening or reducing the reliability of the Eastern Interconnection.

2.3 Disseminating Information

Security Coordinators will disseminate information and provide coordination with other Security Coordinators via the NERC Interregional Emergency Telephone Network (Hotline) and relay appropriate information to the Control Areas within their Security Areas.

The ISO-NE Security Coordinator will relay messages to New Brunswick Power and New Brunswick Power will coordinate with Nova Scotia Power. Conversely, the ISO-NE Security Coordinator will place messages requested by the Maritimes Area to other Regions, (see Appendix A).
3.0 **Communications with external agencies during extended Emergencies.**

During extended emergencies, it is critical to effectively communicate with external agencies including the media, government and regulatory bodies to provide public awareness of the problem and effect cooperation from them and the public.

The essential elements required within the NPCC Areas to ensure timely and effective communications with the Interconnection and with the appropriate organizations outside of the industry are outlined below.

3.1 **Communications Logistics**

3.1.1 Communications Personnel

A crisis management team shall be designated by each control area and be accessible at all times. As appropriate, the crisis management team can be composed of operating room personnel, operations management and/or public relations personnel. The crisis management team must have an identified team leader and a designated media spokesperson.

The team leader is responsible for coordinating communication with his counterparts in other systems.

3.1.2 Communications Center

The crisis management team shall have access at all times to a communications center capable of acquiring and disseminating information to appropriate organizations. The communications center should be equipped with adequate communications facilities, e. g., telephone listings, telephones, telecopy machines and access to electronic bulletin boards to enable immediate access at all times to:

- other control areas
- the police, fire and emergency authorities
- the appropriate regulatory and government bodies
- the media
3.1.3 Media Interface

The media shall not be permitted in the control room during an emergency. A designated presentation area should be available for periodic presentations by the team.

3.2 Communications Requirements to other Areas

3.2.1 Operations Management

In crisis conditions, it is the responsibility of the Area’s operations manager or, if he/she is not available, the Control Area Operator to advise his/her counterpart in the other Areas of its situation and solicit assistance as directed in NPCC Document C-13, Operational Planning Coordination.

3.2.2 Crisis Management Team Communications

The crisis management team shall provide frequent status reports to other Areas (and to the press/media as required) of conditions throughout the course of an emergency.

If incidents of terrorism are suspected, the crisis management team should also be in communication with the Federal Bureau of Investigation (FBI) or the Royal Canadian Mounted Police (RCMP).

3.2.3 Examples of Crisis Reporting

Examples of Crisis Reporting are shown in Appendix A of NERC Policy 7 (attached).

3.2.4 Notice of Termination

The crisis management team shall immediately inform all parties with whom it has been communicating emergency information of the end of a system emergency and a return to normal operating conditions.

3.3 Training

All communication paths and crisis management team procedures should be tested on a routine basis.
4.0 **Collection of Data During or Following a Major System Event**

In the aftermath of a widespread system disturbance, it is essential that an accurate assessment of the interconnected **bulk power system** be available in a timely fashion. This requested data is necessary for initial reports to the appropriate regulatory agencies. Furthermore, it is important for the users of the transmission network to have access to this data so that they may begin an analysis of the events and establish lessons learned.

The North American Electric Reliability Council (NERC) has established a procedure to permit rapid data collection utilizing the Regional representatives. In this way NERC can quickly achieve an overview of the interconnection. The Regions shall ensure that all pertinent data is maintained and updated, including the original data disseminated to NERC.

4.1 ** Procedures**

The request for an event data collection will be initiated by the NERC Operating Committee. Each Regional representative to the OC is responsible for the collection of that Region’s data.

Within NPCC, the NERC/OC representative will direct the request to the NPCC Staff. The NPCC Staff will, in turn, request the designated contact or alternate in each NPCC Area to supply the requested information. The request will be made simultaneously via direct telephone, telecopy or, where available, e-mail and Bulletin Board System, within one working day.

4.2 **Contacts**

The list of data collection contacts and alternates is included as **Appendix B**. This list will be reviewed by the TFCO on a yearly basis.

4.3 **Data**

Data sheets to be completed by each **Area** will be distributed by the NERC office together with each request. The data sheets will be self contained and include all necessary definitions of the required data items.

The completed sheets will be sent to the NPCC office, which will consolidate the information and forward it to the NERC office within two working days from the time NERC issued the initial request.
4.4 Testing

NERC will conduct random testing of this data collection procedure at least once a year.

Prepared by: Task Force on Coordination of Operation

References: *Criteria for Review and Approval of Documents* (Document A-1)

*Operational Planning Coordination* (Document C-13)
APPENDIX A
NPCC Procedures for NERC Interregional Emergency Telephone Network

Regular Working Day

NERC
Inter Regional Emergency Telephone Network

NY SC
Senior Pool Dispatcher

ISO-NE SC
Shift Supervisor

Ontario IMO SC
Shift Superintendent

TransEnergie (Hydro-Québec) SC
Manager, System Control Sr. Coord., System Control

New Brunswick
W. Snowdon
Energy Coordinator

Nova Scotia
G. Cottreau
System Supervisor

Other Times

NERC
Inter Regional Emergency Telephone Network

NY SC
Senior Pool Dispatcher/ Security Coordinator

ISO-NE SC
Shift Supervisor

Ontario IMO SC
Shift Superintendent

TransEnergie (Hydro-Québec) SC
Manager, System Control Sr. Coord. System Control

New Brunswick
Energy Coordinator

Nova Scotia
System Supervisor
APPENDIX B

Data Collection Contacts

NPCC Staff

Mr. John G. Mosier, Jr.
(212) 840-1070
FAX: (212) 302-2782
e-mail: jmosier@npcc.org

Alternate:
Mr. Paul A. Roman
(212) 840-1070
FAX: (212) 302-2782
e-mail: proman@npcc.org

TransEnergie (Hydro-Québec)

Mr. Normand Lamothe
(514) 289-4556
FAX: (514) 289-2473
e-mail: normand.lamothe@ccr.hydro.qc.ca

Alternate: Senior Coordinator
(514) 289-2781
Pager: (514) 741-9895
e-mail: claude.landry@ccr.hydro.qc.ca

Maritimes

Mr. Wayne Snowdon
(506) 458-4610
FAX: (506) 458-4626
e-mail: WSnowdon@NBPower.com

Alternate:
Mr. Brian W. Scott
(506) 458-3053
FAX: (506) 443-6507
e-mail: BScott@NBPower.com
ISO-New England
Mr. Stephen (Steve) G. Whitley
(413) 535-4361
FAX: (413) 535-4343
e-mail: swhitley@iso-ne.com

Alternate: Mr. Donald (Don) L. Gates
(413) 535-4350
FAX: (413) 535-4343
e-mail: dgates@iso-ne.com

New York Independent
System Operator (NYISO)
Mr. James (Jim) D. Castle
(518) 356-6244
FAX: (518) 356-6119
e-mail: jcastle@nyiso.com

Alternate: Mr. Richard (Rick) Gonzales
(518) 356-6116
FAX: (518) 356-6118
e-mail: rgonzales@nyiso.com

Independent Electricity
Market Operator (IMO)
Ontario
Mr. Stuart Brindley
(905) 855-6108
Fax (905) 855-6270
e-mail: stuart.brindley@theIMO.com

Alternate: Mr. Kim Warren
(905) 855-6160
FAX: (905) 855-6479
e-mail: kim.warren@theIMO.com
Monitoring Procedures
for
Control Performance Guide

Approved by the Task Force on Coordination of Operation on December 3, 1984

Revised: January 25, 1988
Reviewed: September 29, 1993
Reviewed: May 10, 1995
Revised: March 3, 1999
Note:

Terms in bold typeface are defined in the *NPCC Glossary of Terms* (Document A-7)
1.0 Introduction

NPCC has adopted the NERC Operating Committee Policies, which establish basic principles for interconnected operation in North America, and, as charged in the NPCC Membership Agreement “... the Reliability Coordinating Committee shall from time to time establish or modify criteria for such elements of design as affect the operation of the interconnected bulk power systems of the members, and establish or modify criteria for such elements of operating procedure as affect the operation of the interconnected systems.”

This Operating Instruction establishes a performance measure for NPCC Areas and systems and outlines the reporting function for NPCC Control Performance Guide (Document B-2) commensurate with NERC Policy 1 – Generation Control and Performance.

2.0 Monitoring Standards

2.1 The criteria to be used in monitoring the Control Performance of an individual Area or system require that:

Control Performance Standard1 (CPS1)

Over a given period, the average of the clock-minute averages of an Area’s ACE divided by 10 times its bias multiplied by the corresponding clock-minute averages of frequency error shall be less than the targeted frequency bound established by NERC. This is expressed in the following equation:

\[ \epsilon_1^2 \geq AVG_{\text{period}} \left( \frac{ACE_i}{-10\beta_{CA}} \right) \times \Delta(F_a - F_s) \]

where:
- \( ACE_i \) = the clock-minute average of ACE,
- \( \beta_{CA} \) = the Area’s annual frequency bias setting,
- \( F_a \) = the actual frequency,
- \( F_s \) = the scheduled frequency,
- \( \epsilon_1 \) = the frequency bound set by NERC, and
- period = one month for NERC Performance Subcommittee review and one year for control area evaluation.
Control Performance Standard 2 (CPS2)

The average ACE for each of the six 10-minute periods in an hour must be within that Area’s Allowable Limit of the Average Deviation ($L_{10}$).

\[
(2) \quad L_{10} = 1.65\varepsilon_{10}\sqrt{(-10\beta_{CA})(-10\beta_{EI})}
\]

where:
- $\varepsilon_{10}$ = the frequency bound set by NERC,
- $\beta_{CA}$ = the Area’s annual frequency bias setting, and
- $\beta_{EI}$ = the total frequency bias for the Eastern Interconnection, published annually by NERC.

2.2 The criteria set in 2.1 above will be deemed satisfactory if, considered separately:

- the rolling 12 month average compliance with CPS1 is not less than 100%, and
- the monthly compliance with CPS2 is not less than 90%.

The NPCC objective is that these minimum Performance Standards, as established by NERC, will be met or exceeded.

3.0 Procedure For Reporting of Control Performance

3.1 Within 10 days after the end of each month, each Area representative will forward CPS1 and CPS2 compliance percentages to the NPCC Control Performance Working Group (CPWG).

3.2 Within 20 days after the end of each month, the CPWG will forward the CPS1 and CPS2 compliance percentages to the NERC office for review by the NERC Performance Subcommittee.

3.3 Within 20 days after the end of each month, the CPWG will prepare a running annual summary of the monthly compliance percentages for review by the NPCC Task Force on Coordination of Operation (TFCO).
3.4 The TFCO will report annually, or more as required, to the Reliability Coordinating Committee on the frequency of failures to achieve satisfactory control performance.

Prepared by: Task Force on Coordination of Operation

Review frequency: 3 years

References:

NPCC Glossary of Terms (Document A-7)

Control Performance Guide (Document B-2)

NERC Policy 1 – Generation Control and Performance

NERC Performance Standard Training Document
Procedures for Solar Magnetic Disturbances
Which Affect Electric Power Systems

Approved by the Task Force on Coordination of Operation on April 10, 1989

Revised: May 23, 1989
Revised: September 1, 1989
Revised: February 10, 1993
Revised: January 21, 1997
Reviewed: March 25, 1998
Revised: November 7, 2000
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Note:
Terms in bold typeface are defined in the NPCC Glossary of Terms (Document A-7)
1.0 Introduction

Solar Magnetic Disturbances (SMD) are events that occur on the sun which can affect man-made systems on earth, including power systems. The sun emits a stream of charged particles known as the solar wind which continuously moves outward from the sun past the earth. Solar activity (solar flares, disappearing filaments and coronal holes) affects the intensity of the solar wind, varying from very quiet levels to very active levels during major storms. Average sun to earth transit times for the charged particles vary from one day to six days. As the charged particles flow towards the earth, they interact with the earth's magnetic field which diverts the particles to the north and south polar regions. Large concentrations of these charged particles form what is known as electrojet currents and circulate in an east-west orientation above the earth. These currents change rapidly during a major storm, causing changes to the lines of flux in the earth's magnetic field. This induces voltage potentials in the earth's crust which in turn cause geomagnetically induced currents (GIC) to flow in transmission lines. GIC are ostensibly dc in nature and are usually more prevalent at northerly latitudes and in long transmission lines where there is a high resistivity to a considerable depth in the earth's crust, notably in areas of igneous rock.

2.0 Impacts on Power Systems

The flow of GIC in the transmission system may affect the following equipment:

2.1 General Effects

2.1.1 Power Transformers

The presence of GIC produces off-setting dc excitation in a transformer, resulting in some degree of core saturation. This can cause the production of harmonic currents which can distort system voltages and cause protective relay operation due to the flow of neutral current to ground. Core saturation can also result in internal localized heating of the core and windings, and degradation of winding insulation. Saturated transformers are reactive power sinks, using up system reactive capacity, resulting in voltage depression.
2.1.2 Instrument Transformers

The effects described in power transformers can also occur in other magnetic equipment such as potential and current transformers, resulting in the misoperation of protective relaying.

2.1.3 HVdc Systems and Static VAR Compensators

Operations at or near the minimum or maximum current rating of HVdc circuits increases the potential for commutation failures, jeopardizing continuity of service.

These systems require a sinusoidal voltage to properly commutate current transmission. Voltage distorted by harmonics may be severe enough to cause commutation failures and result in shutdown of such systems.

Filter banks, including capacitor banks, associated with these systems will tend to overload due to harmonic current and may result in tripping.

2.1.4 Shunt Capacitor Banks

Shunt capacitor banks will tend to overload due to harmonic current, typically the third harmonic.

2.1.5 Generators

Automatic voltage regulators (AVR) associated with generators require representative voltage signals to control the dc field current on generators. Distorted ac voltage input to the AVR may result in uncertain translation of the ac signals for control, possibly resulting in a cyclical level of excitation on the generator, and hence real and reactive power output may vary in an abnormal manner.

Overheating may occur in large generators due to imbalances in phase currents and harmonic distortion in voltages which result from the saturation of power transformers.

Turbine mechanical vibration may be excited by the presence of increased harmonic rotor current.
2.1.6 Transmission Lines

**Harmonic** frequencies in the system voltage can increase the magnitude of the voltage required to be switched by circuit breakers. **Harmonics** increase transmission losses and cause interference to communications systems.

2.1.7 Overall System Impact

Transformer saturation results in increased VAR consumption and **harmonic** injection into the system. These **harmonic currents** can result in capacitor bank overloading and their tripping, generator tripping and misoperation of **static VAR compensators**. This could further deplete the system of reactive VAR support and impact the overall system performance and security. The power systems are becoming more vulnerable to GIC effects due to longer transmission lines, decreased reactive margins and greater dependence on **static VAR compensators** and high voltage dc control.

3.0 Forecasts and Alerts and Warnings

The NPCC Areas receive SMD forecasts and alerts and warnings from two agencies, one in the United States and another in Canada. Forecasts of expected activity are based on solar measurements and observations and are provided up to three days in advance. Alerts and warnings are based on actual activity being measured by earth based magnetometers over a three hour period. Appendix A provides a summary data sheet for forecasts and alerts and warnings received from Ottawa, Ontario, and Boulder, Colorado.

3.1 Space Environment Center (SEC)

The Space Environment Center (SEC) of the National Oceanic and Atmospheric Administration (NOAA) is located in Boulder, Colorado, and provides warnings and alerts of geomagnetic activity to the New York ISO which subsequently disseminates this information to the other operating Areas within NPCC.

SEC warnings and alerts are issued in the form of a daily "A" index up to three days in advance. The "A" index is a measure of the expected geomagnetic activity, based on solar observations, for Fredericksburg, Virginia. The classification of Major Storm (A index of 50 and above) is
transmitted to the NPCC Areas. The SEC also includes a probability for “Major Storm” conditions to help users assess the confidence level of the forecast.

SEC warnings and alerts are also issued in the form of the K index, which is based on the maximum deviation of the horizontal magnetic field components of the earth relative to a quiet day, within a three hour time period. The Boulder K index is based on measurements from the Boulder magnetometer, and it is used at the SEC to define the alert thresholds. An warning or alert is issued for a K index of K-5 or greater. Most electrical power systems, however, are not affected until the K index reaches a level of 7 or higher.

Further information can be obtained from:

http://www.sec.noaa.gov/today.html

3.2 Geological Survey of Canada(GSC), Natural Resources Canada (NRCAN)

The Geological Survey of Canada, Department of Natural Resources Canada (NRCAN), located in Ottawa, Ontario, Canada, issues forecasts and warnings, based on magnetometer data from 12 observatories using the Canadian Automatic Magnetometer Observatory System (CANMOS) and on solar data received from sources around the world. The forecasts and warnings are made available to system control centers by electronic means, as shown in Appendix D. The forecasts and warnings are also available through the Internet.

GSC forecasts are updated and issued every hour. They are based on hourly range predictions of geomagnetic activity for up to two days in the future for the subauroral zone, the geographic region in which most of the NPCC Areas are located. The classifications which are of concern to the NPCC Areas are "Stormy" (corresponding to an approximate K index of 5 or 6), and "Major Storm" (corresponding to an approximate K index of 7,8, or 9). Several key observatories are continually monitored, and, when events are found that meet predefined criteria, a warning and updated forecast are issued.

Further information can be obtained from:

forecast@geolab.nrcan.gc.ca
http://www.geolab.nrcan.gc.ca/geomag
3.3 Communications

Appendix B provides a suggested form to be filled out by all operators prior to the dissemination of SMD forecasts and alerts and warnings. It will permit the consistent transmittal of information and will provide a means for historical record keeping on a consistent basis.

All time alerts are disseminated in Universal Time (Greenwich Mean Time), a constant scientific time reference. All references to Universal Time will be converted to prevailing Eastern Standard Time as described in Appendix C.

The communication channels for disseminating SMD forecasts and alerts from the SEC and the NRCAN are demonstrated in Appendix D.

4.0 Recommended Procedures

4.1 Utility Monitoring Procedures

Those utilities most affected by solar activity since 1989 have developed procedures which establish a safe operating posture which are initiated by criteria for their respective systems. The initiation of these procedures is communicated to the New York ISO for dissemination to the other NPCC Areas using the same communication path for SMD forecasts and alerts and warnings from the SEC as shown in Appendix D. For example, if SMD operating procedures have been instituted in the PJM Interconnection, this fact would in turn be communicated to the New York ISO and subsequently disseminated to the other NPCC Areas. The initiation of such procedures by one utility is useful information to other utilities.

4.2 Operational Planning

On receiving a forecast of SMD activity expected to result in K7-K9 intensity (major storm), operations should be reviewed for vulnerability to such storms. Actions should be considered which include, but are not limited to, those listed in Section 4.3 following. It must be recognized, however, that the current state of SMD forecasting is not always reliable due to the complexity of the solar phenomena.
4.3 Operator Action With the Onset of an SMD

On receiving an SMD warning or alert of K7-K9, or notification of significant SMD effects, system operators will evaluate the situation and implement the following actions as appropriate for their power system.

4.3.1 Discontinue maintenance work and restore out of service high voltage transmission lines to service. Avoid taking long lines out of service.

4.3.2 Maintain the system voltage within an acceptable operating range to protect against voltage swings.

4.3.3 Adjust the loading on HVdc circuits to be within the 40% to 90% range of their nominal rating.

4.3.4 Reduce the loading on interconnections, critical transmission facilities, and critical transmission interfaces to 90%, or less, of their operating security limit.

4.3.5 Reduce the loading on generators operating at full load to provide reserve power and reactive capacity.

4.3.6 Consider the impact of tripping large shunt capacitor banks and static VAR compensators.

4.3.7 Dispatch generation to manage system voltage, tie line loading and to distribute operating reserve.

4.3.8 Bring equipment capable of synchronous condenser operation on line to provide reactive power reserve.

4.3.9 Ensure with personnel at those locations where SMD measurements are to be taken that the monitoring equipment is in service.

4.4 Notification of SMD Activity

Any Area experiencing significant problems due to SMD activity should notify the New York ISO Pool Dispatcher for dissemination of such activity to other NPCC Areas.
SOLAR MAGNETIC DISTURBANCE DATA SHEET

DEPARTMENT OF NATURAL RESOURCES CANADA (NRCAN–OTTAWA)

WARNINGS—this condition has occurred

<table>
<thead>
<tr>
<th>K INDEX</th>
<th>NRCAN (OTTAWA)</th>
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<tr>
<td></td>
<td>nano Teslas (nT)</td>
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<td>0</td>
<td>0 to 7</td>
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<td>8 to 14</td>
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<td>500 to 749</td>
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<td>9</td>
<td>750 and above</td>
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FORECASTS—this condition is expected

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<tr>
<td>Stormy</td>
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<tr>
<td>Major Storm</td>
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</table>

NOTE: NRCAN data measured at Ottawa; forecasts are for the subauroral zone in which most of NPCC is located
Solar Magnetic Disturbance Data Sheet-Space Environment Services
(SEC–Boulder)

The following Warnings are issued by telephone from SEC to the NYISO. Warnings are predictions for a certain period in the future, that is, warnings come before the specified period.

- A-Index = 30
- A-Index = 50
- K-Index = 5
- K-Index = 6
- K-Index = 7 or above

The following Alerts are issued by telephone from SEC to the NYISO. Alerts are observations of activity that has occurred and generally, alerts are issued at the end of the specified period.

- A-Index = 30
- A-Index = 50
- K-Index = 5
- K-Index = 6
- K-Index = 7
- K-Index = 8

The following Rapid Alerts are issued by telephone from SEC to the NYISO. Rapid Alerts are observations of activity that has occurred, but they are issued immediately, without waiting for the end of the period.

- K-Index = 7
- K-Index = 8

Note: The SEC in some cases speaks of all of these messages, including warnings, alerts and rapid alerts, as “alerts,” and thus all of the messages carry an alert code.
### Solar Magnetic Disturbance Form

This form is to be used for the dissemination of warnings and alerts from the SEC in Boulder, Colorado, and for forecasts and warnings from NRCAN in Ottawa, Ontario, Canada. All times are to be in prevailing Eastern Standard Time (EST).

**Date/Time:**

**ALERT received by:**

<table>
<thead>
<tr>
<th>SEC (Boulder)</th>
<th>INTENSITY</th>
<th>DURATION</th>
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<td></td>
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<tr>
<td>ALERTS:</td>
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**Example:**

- A index of 50 or above
- K index of 7 or above

**VALID PERIOD (Date, Time, Duration)**

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<tr>
<td>WARNINGS:</td>
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**Major Storm Conditions**

**VALID PERIOD (Date, Time, Duration)**
Appendix C

TIME CONVERSION REFERENCE DOCUMENT

The time reference by the SEC and NRCAN is the scientifically accepted Universal Time, which is the same time as Greenwich Mean Time (GMT). The New York ISO will convert all time figures received to prevailing Eastern Time, which lags the GMT by 5 hours in the autumn and winter, and by 4 hours in the spring and summer. The GMT does not convert for daylight savings. The conversion for Atlantic Standard Time (AST) has been provided for those Areas in this time zone.

<table>
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<table>
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## Appendix D

### COMMUNICATION PATHS

#### SEC (Boulder, Colorado) Forecasts and Alerts

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<thead>
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<th>SEC-Boulder notifies:</th>
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<td>New Brunswick Power notifies:</td>
<td>Nova Scotia Power Incorporated</td>
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#### NRCAN (Ottawa) Forecasts and Alerts

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<td>New York ISO</td>
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<tr>
<td>ISO New England notifies:</td>
<td>New Brunswick Power</td>
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<tr>
<td>New Brunswick Power notifies:</td>
<td>Nova Scotia Power Incorporated</td>
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Procedures During Shortages
of
Operating Reserve

Approved by the Task Force on Coordination of Operation on November 13, 1991

Reviewed: July 18, 1995
Revised: January 18, 2000
Note:

Terms in bold typeface are defined in the *NPCC Glossary of Terms* (Document A-7)
1.0 Introduction

This procedure is intended to provide specific instructions for the redistribution of operating reserve among the Areas when any Area is forecasting or experiencing an operating reserve deficiency. NPCC Operating Criteria [Emergency Operation Criteria (Document A-3) and Operating Reserve Criteria (Document A-6)] provide objectives for operations personnel in dealing with emergencies and procedures for maintaining operating reserve.

The Areas participating in this procedure are the five NPCC Areas: New England, New York, Ontario, Quebec and the Maritimes.

2.0 Objectives

2.1 To alert other Areas when any Area is deficient, or anticipates being deficient, in operating reserve.

2.2 To maximize reliability within NPCC through the sharing of resources when any Area becomes deficient in operating reserve.

3.0 Procedures

3.1 When an Area forecasts that it will be unable to meet its thirty-minute reserve with available resources, they will implement the following actions, as applicable, when such shortfalls are forecast at least four hours in advance, or if the shortfall is expected to persist for more than four hours:

3.1.1 inform the Senior Shift Authority in each of the other Areas of NPCC.

3.1.2 advise the NPCC Staff of the appropriate Energy Emergency Alert level. The NPCC Staff will, if conditions warrant, establish NPCC Emergency Conference calls as stipulated in NPCC Document C-13, Operational Planning Coordination.

3.1.3 obtain firm capacity from outside the Area over secured transmission in accordance with transmission requirements. Such capacity shall not be from another Area’s operating reserve.
3.1.4 advise NPCC Security Coordinators of the appropriate Energy Emergency Alert level and follow procedures in NERC Policy 9 Appendix 9B.

3.1.5 recall planned generator and or transmission outages that will increase operating reserve or transfer capability, if it can reasonably be expected that additional purchases are available to improve operating reserve.

3.1.6 include interruptible customer load that can be reduced in 30 minutes in thirty-minute-reserve.

3.2 When an Area forecasts, at least thirty minutes in advance, that it will be unable to meet its ten-minute reserve with available resources, it will:

3.2.1 bring a sufficient amount of thirty-minute reserve to ten-minute reserve status.

3.2.2 obtain firm capacity from outside the Area over secured transmission in accordance with transmission requirements.

3.2.3 recall applicable exports respecting control area operating procedures.

3.2.4 include as ten-minute reserve voltage reduction attainable within ten minutes.

3.2.5 consider the use of Public Appeals if sufficient time exists to activate them or the shortfall is expected to last for an extended period of time.

3.3 When an Area has taken the steps in 3.1 and 3.2 and becomes deficient in ten-minute reserve with no recourse to reestablish its ten-minute reserve other than the shedding of firm load, it will:

3.3.1 initiate an NPCC Emergency Conference Call. In support of the call, the NPCC Staff will survey each Area to complete the information to be presented in Appendix A as follows:

3.3.1.1 each Area’s first contingency loss.

3.3.1.2 each Area’s required ten-minute reserve and thirty-minute reserve.
3.3.1.3 each Area’s available ten-minute reserve and thirty-minute reserve.

3.3.1.4 each Area’s Total Transfer Capability (TTC) to and from other Areas.

The results of the survey will be updated every four hours, or as necessary, until such time as all Areas have reestablished their ten-minute reserve.

3.3.2 advise the Senior Shift Authority in each of the Areas of the need to reestablish ten-minute-reserve in the deficient Area. The deficient Area will then:

3.3.2.1 coordinate transfers of energy between Areas to restore the ten-minute reserve of the deficient Area. If required, this energy will be made available by activating thirty-minute reserve energy in the other Areas. An assisting Area will have the option, consistent with its own policies or procedures, of how to supply such energy. The energy may have capacity associated with it and therefore may improve a deficient Area’s ten-minute reserve.

3.3.2.2 define the deficient Area’s responsibilities should a contingency occur

3.4 If NPCC ten-minute reserve becomes deficient (all thirty-minute reserve has been activated), the NYISO Shift Supervisor will coordinate the redispatch of available resources within or between Areas:

• to provide for maximum transfer capability between the Areas.

• to free bottled energy and/or bottled capacity.

• to allocate the remaining ten-minute reserve among the Areas in a manner which will provide maximum reliability and security considering each Area’s ability to control schedules on its interconnections and the Area’s ability to sustain its first contingency loss.
3.4.1 advise all Areas to review their responsibilities should a contingency occur within NPCC. These responsibilities will be expressed in terms of the acceptable postcontingency transfer levels between all Areas and the maximum time allowed to return transfers to those levels.

3.5 When an Area is deficient in spinning reserve it will implement the following actions

3.5.1 Convert any non spinning reserve to spinning reserve.

3.5.2 Obtain firm capacity from outside the Area over secured transmission in accordance with transmission requirements.

4.0 Obligations of the Areas

4.1 General Obligations

4.1.1 Provide timely reports of initial and changing system conditions to the Senior Shift Authority in each of the other Areas of NPCC and NPCC Staff.

4.1.2 To the extent that an assisting Area's security is not compromised, comply with requests made by any deficient Area, given the following conditions:

- An assisting Area will not provide energy from its ten-minute reserve to another Area under 3.4 above if, in so doing, it becomes more deficient than the deficient Area.

- Prior to receiving energy from the ten-minute reserve of another Area under 3.4 above, a deficient Area will implement all control actions except activating voltage reduction attainable within ten minutes or the shedding of firm load.

- An assisting Area, when providing energy from its ten-minute reserve to another Area under 3.4 above, will have the option, consistent with its own policies or procedures, of how to supply such energy. Should the assisting Area experience its first contingency loss, such energy will be immediately recalled.
4.1.3 Implement any and all control actions available, including the shedding of firm load.

4.2 Specific Obligations

The ISO-NE will relay communications between the NYISO and the Maritimes Area.

Prepared by: Task Force on Coordination of Operation

Review frequency: 3 years

References:
- *Emergency Operation Criteria* (NPCC Document A-3)
- *Operating Reserve Criteria* (NPCC Document A-6)
- *NPCC Glossary of Terms* (NPCC Document A-7)
- *Operational Planning Coordination* (NPCC Document C-13)
- NERC Operating Policy 5, *Emergency Operations*
- NERC Operating Policy 9, *Security Coordinator Procedures*
APPENDIX A

Reserve Summary

<table>
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<tr>
<th>Area</th>
<th>First Contingency Loss</th>
<th>Required 30 Minute Reserves</th>
<th>Available 30 Minute Reserves</th>
<th>Required 10 Minute Reserves</th>
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Total Transfer Capability

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Procedures During Abnormal Operating Conditions

Approved by the Task Force on Coordination of Operation on October 7, 1992

Revised: May 12, 1994
March 3, 1999
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   3.1 Scheduling
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   3.3 Correction of Transmission Loading if Exceeding Limits
   3.4 Correction of Voltage Conditions
   3.5 Light Load Conditions

4.0 Action to Contain an Emergency
   4.1 Action of an Area Experiencing the Problem
   4.2 Action of an Area Causing the Problem

5.0 Restoration
   5.1 Islanding
   5.2 Restoration Procedures from a Blackout

Note:
Terms in bold typeface are defined in the NPCC Glossary of Terms (Document A-7)
1.0 **Introduction**

The *Emergency Operation Criteria* (NPCC Document A-3) state the essential principles for operations personnel in anticipating and dealing with abnormal operating conditions. This procedure is intended to complement the *Emergency Operation Criteria* (NPCC Document A-3) by providing specific instructions to the system operator during such conditions in an NPCC Area or Areas.

2.0 **Objectives**

2.1 To minimize, when possible, the impact of an evolving event.

2.2 To contain and control an emergency.

2.3 To restore the bulk power system as quickly as possible following an Islanding or Blackout of any part of the system.

3.0 **Action to Mitigate Abnormal Operating Conditions**

It is recognized that provisions are made in the design of a power system for the satisfactory performance of the system during certain faults or incidents of equipment failure. It is also required that the power system be operated in a prescribed manner to withstand these contingencies.

The following is a summary of methods which can minimize the impact of an event through proper pre-event operation and, by which, recovery from abnormal loading or voltage conditions can be effected:

3.1 **Scheduling**

When planning for near term forecast conditions, each Area should develop operating strategies that provide for sufficient generation and transmission to meet the following:

3.1.1 Operating reserve requirements.

3.1.2 Automatic generation control requirement.

3.1.3 Line/tie line loadings within applicable normal operating limits.

3.1.4 Bulk power system voltage within normal limits.
3.2 **Reduction of Capacity Shortfall**

When an Area is experiencing or anticipating a shortage of capacity, the following steps are to be implemented as required and appropriate.

3.2.1 Purchase capacity.

3.2.2 Utilize emergency transfer capabilities.

3.2.3 Shed interruptible load.

3.2.4 Implement voltage reduction.

3.2.5 Obtain maximum reasonable assistance, only after comparable action(s) has been implemented by the requesting Area(s), Areas within or outside NPCC (see section 3.8 of Document A-3 (as revised); see also Document C - 19).

3.2.6 Appeal to customers for voluntary load reduction.

3.2.7 Prepare to quickly respond to needs for manual load shedding.

3.2.8 Shed firm load.

3.3 **Correction of Transmission Loading if Exceeding Limits**

When an Area is experiencing internal circuit or tie line loading in excess of applicable operating limits, the following steps are to be implemented as required and appropriate:

3.3.1 Adjust internal generation.

3.3.2 Restore out-of-service transmission facilities where possible.

3.3.3 Establish communication with areas inside and/or outside NPCC and request relief.

3.3.4 All Areas in a position to assist must take any available action, excluding the shedding of firm load, to keep loading from exceeding applicable operating limits. Assistance should normally only be requested after similar action has been implemented by the requesting Area or Areas.
3.3.5 The Area or Areas causing the overload (if identifiable) must adjust generation or institute load relief, as required, to keep loading below applicable operating limits.

3.3.6 The Area experiencing the problem must, when effective, open circuits or shed load to return the load on elements to within applicable operating limits.

3.4 Correction of Voltage Conditions

If an Area is experiencing abnormal voltage conditions, it should implement the steps provided in NPCC Document B - 3, Guidelines for Inter-AREA Voltage Control.

If the abnormal voltage is caused by conditions external to NPCC, the following steps should be implemented by the NPCC Area experiencing abnormal voltage conditions as required and appropriate:

3.4.1 Using available voltage and reactive power flow information, determine which system is causing the abnormal voltage or the trend toward abnormal voltage.

3.4.2 Establish communication with the system causing the abnormal voltage.

3.4.3 All NPCC Areas in a position to assist must take any available action to relieve the abnormal voltage condition, excluding the shedding of firm load or opening transmission circuits. Assistance should normally only be requested after similar action has been implemented by the requesting Area or Areas.

3.4.4 If the action in 3.4.3 above is insufficient, the Area experiencing the difficulty shall promptly take all steps necessary to relieve the abnormal voltage condition, including shedding firm load and/or opening transmission circuits.

3.5 Light Load Conditions

When an Area is anticipating or actually experiencing a Light Load Condition, the following steps, applicable to all utility and non-utility generators, shall be implemented as appropriate to ensure that reliability is maintained and that actual interchange flow is regulated to scheduled values.
3.5.1 Maximize the benefits to be obtained from schedule adjustments.

3.5.2 Increase load by scheduling available pumped storage facilities in the pumping mode.

3.5.3 Arrange for bilateral inadvertent payback.

3.5.4 Request that all hydro generation be reduced to the absolute minimum. The absolute minimum is that point at which hydro energy, if reduced further, would result in the spilling of water or a violation of minimum flow requirements.

3.5.5 Review all thermal unit “must-run” requirements. Determine if any may be temporarily removed or if more expensive generation with a lower generation limit could be brought on in place of normal “must-run” units.

3.5.6 Review all thermal unit “low-limits.” Any unit's “low-limit” that can be reduced should be temporarily reduced as low as possible.

3.5.7 Obtain maximum reasonable assistance from Areas within or outside NPCC.

3.5.8 Reduce nuclear generation.

3.5.9 Spill water.

4.0 Action to Contain an Emergency

If preventative measures as outlined under section 3.0 have not been adequate, action to contain the emergency must then be taken. This action must apply to both the Area or Areas causing the problem (if identifiable) and the Area or Areas experiencing the problem. The following is thus a continuation of the preventative measures implemented in section 3.0 above.
4.1 Action of an Area Experiencing the Problem

If an Area is in difficulty because of conditions in another Area, it shall:

4.1.1 Attempt to identify the problem source and communicate with adjacent Areas. Request assistance if required.

4.1.2 Shed firm load or reject generation as appropriate.

4.1.3 Communicate (if time permits) to the adjacent Area that the tie lines are to be opened if immediate action is not taken to correct the problem.

4.1.4 Open tie lines to prevent damage to equipment, if necessary.

4.2 Action of an Area Causing the Problem

If an Area is causing difficulty in another Area, it shall respond to requests for assistance from the Area in difficulty, including:

4.2.1 Attempt to identify the problem source and communicate with adjacent Areas. Request assistance if required.

4.2.2 Manually shed load until transmission loading and voltage return to acceptable values at all known problem locations.

4.2.3 Communicate (if time permits) to the adjacent Area that the tie lines are to be opened if immediate action is not taken to correct the problem.

4.2.4 Open or close such tie lines as required.

5.0 Restoration

Restoration from an Island or a Blackout situation requires concerted attention to both communications with other Areas and utilization of operating resources. A priority for restoration of the bulk power system is to return generation to service and to reestablish ties as soon as possible.
5.1 Islanding

In the event that an Area becomes isolated, the following action shall be taken:

5.1.1 Restore frequency to 60 hertz and voltage to normal levels by adjusting available generation or by shedding load, if required.

5.1.2 Disable automatic generation control (AGC) as appropriate (reference also section 4.5 of Document A - 3).

5.1.3 Establish communication with system operators of the adjacent Area or Areas.

5.1.4 Resynchronize with the adjacent Area or Areas.

5.1.5 Coordinate restoration of any load previously shed, recognizing that operating reserve and voltage control capability must be maintained.

Restoration of load concurrent with 5.1.1 and 5.1.2 above is permissible, provided that frequency is maintained at 60 hertz, other system constraints are not exceeded and resynchronizing with adjacent Area or Areas is not delayed.

5.2 Restoration Procedure from a Blackout

In the event an Area is shut down, plans for restoration shall be implemented as follows:

5.2.1 Bring units within the Area having black start capability into service and route unit output to the station service supply of power plants through the transmission system. Priority must be given to the expeditious return of nuclear units in order to retain the capacity of the plants.

5.2.2 Assess availability of inter-Area tie lines to supply AC power to restore generation.

5.2.3 Reestablish tie lines.
5.2.4 Coordinate support from interconnection(s) with the supplying Area. Limit deliveries to agreed upon values and use them to:

5.2.4.1 restore generation, and
5.2.4.2 pickup load to the extent that the restoration of generation is not impeded.

Restoration of load concurrent with the above actions is permissible, provided that frequency is maintained at 60 hertz, other system constraints are not exceeded and resynchronizing with adjacent Area or Areas is not delayed.

Prepared by: Task Force on Coordination of Operation

References:  Emergency Operation Criteria (Document A - 3)

NPCC Glossary of Terms (Document A-7)

Guidelines for Inter-AREA Voltage Control (Document B - 3)

Procedures During Shortages of Operating Reserve (Document C - 19)
Review Process
for
NPCC Reliability Compliance Program

Approved by the Compliance Monitoring and Assessment Subcommittee on June 23, 2000
Note:

Terms in bold typeface are defined in the *NPCC Glossary of Terms* (Document A-7)
1.0 **Introduction**

As part of the NPCC Reliability Compliance Program (RCP) or its successor program, a process is required to review Area compliance to the standards that comprise the program.

The principles in this process have been adapted from other NPCC review processes and peer review processes used in comparable industries for continuous quality improvement.

2.0 **Objectives**

The purpose of this Review process is to ensure that NPCC is meeting its obligations in the following areas:

a) Compliance assessment of planning and operating standards where the Area has the reporting obligation,
b) Oversight of Area compliance assessment.

The establishment of a Review process does not reduce or replace the obligation of an Area to meet NPCC RCP reporting requirements, nor will the Review alter a previous compliance assessment.

3.0 **Review Process**

3.1 *Standards to be reviewed* - Standards requiring periodic review plus two other randomly selected RCP standards will be evaluated at each Review.

3.2 *Frequency* -

3.2.1 NPCC/CMAS will target to schedule Reviews such that each Area would be reviewed at least once every 3 years. CMAS will publish a Review schedule and provide it to the Areas on an annual basis. The schedule will identify only the Areas to be reviewed and the dates upon which they will be reviewed but not the specific standards that will be included in the Reviews. The Area shall be notified of the specific standards a minimum of three weeks prior to the Review as described in Section 3.3.
3.2.2 CMAS may also trigger a Review following instances of non-compliance to Reliability Compliance Program standards. If an Area being reviewed in this situation has not been reviewed as part of the current three-year cycle, this Review would be counted as that routine Review. If the Area has already been reviewed for the current three-year cycle, this Review would be in addition to the routine Review requirements. If an Area is scheduled for a Review as part of the regular three-year cycle within the same calendar year as a Review that is triggered by non-compliance, CMAS may conduct both reviews concurrently. All Reviews carried out for non-compliance reasons shall follow the same format and criteria as routine Reviews.

3.3 Notification - CMAS shall notify the Area of the specific standards to be reviewed. This notification will include a list of information the Area may be required to produce. CMAS shall provide this notification a minimum of three weeks prior to a regularly scheduled Review or a specially scheduled Review that was triggered following instances of non-compliance.

3.4 Review Team - Each Area shall make available two candidates for the Review Team pool. Each Review Team will be made up of an NPCC staff member as Review Team Leader and three members from the Areas not being reviewed. CMAS will direct Areas performing the Review to supply the appropriate personnel. The Team Leader may request CMAS for additional team members as deemed appropriate.

The minimum credentials and core competencies of the candidates for the Review Team will be commensurate with the expertise deemed necessary based on the Review requirements.

3.5 Review Site - The Review will take place at a mutually agreed upon location.

3.6 Consistency of Reviews - To ensure consistency in application and carrying out the Reviews, standard report formats, criteria and question lists will be employed. This information will be made available on the NPCC website.
3.7 Other Reviews - To ensure efficiencies and avoid duplication of effort, reviews carried out for other purposes, e.g. regulatory requirements, will be given recognition in the CMAS Review.

3.8 Reporting -

3.8.1 The Review team shall produce a preliminary report within 10 business days of the date of Review completion following the general outline shown in Appendix 1. A copy of the preliminary report will first be made available to the Area being reviewed. The Area shall have 10 business days following receipt of the preliminary report, to provide comments to the Review Team. The Review Team final report together with the Area’s comments will be provided to CMAS.

3.8.2 Following completion of an Area review, CMAS will discuss problems or concerns identified through the Review with the Area that was reviewed. The intent is to improve future reporting and to facilitate process/reporting quality improvement among all participants.

3.8.3 CMAS will report the results of the Reviews to the NPCC Reliability Coordinating Committee. The Review material, including the report, the comments if any from the Area, and the Review Team’s notes and records, will be maintained by NPCC/CMAS and will be used to address any subsequent NERC audit.

Prepared by: Compliance Monitoring and Assessment Subcommittee
Review frequency: 3 years

References: Criteria for Review and Approval of Documents (Document A-1)

NPCC Reliability Compliance Program

NERC Pilot Program Standards and Templates
Appendix 1

Review Report Outline

1.0 Introduction

2.0 Objective

3.0 Review
   3.1 Review team members
   3.2 Standard(s) under review
   3.3 Information list provided in advance
   3.4 Assessment

4.0 Recommendations

5.0 Conclusions
Review Process for NPCC Reliability Compliance Program

June 23, 2000

Areas notified of schedule reviews

Review Team(s) established by CMAS

CMAS notifies Area of upcoming Review

Minimum 15 business days

Review Team conducts Review

Review completed

Review Team prepares Preliminary Report within 10 business days

Preliminary Report sent to Area for comments

Area provides comments to Review Team within 10 days of receipt of the Report

Review Team sends Final Report to CMAS

CMAS follows up with Area to discuss any problems or concerns identified in Report

Revision to Report required?

Yes

CMAS follows up with Area to discuss any problems or concerns identified in Report

No

CMAS reports results to RCC. Records will be maintained for any subsequent NERC audit.

Each Area makes available two candidates for Review Team pool, which will be made up of NPCC Staff as Team leader and three members not from Area being reviewed.

Area will be notified of the standard(s) and a list of information they may be required to produce for the Review.

Areas notified of schedule reviews

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