NPCC establishes the processes that assure the reliable and efficient operation of the international, interconnected bulk power systems in Northeastern North America through development and enforcement of regionally-specific criteria that are not inconsistent with NERC broad-based continent-wide reliability standards.
# Table of Contents

About NPCC ........................................................................................................................................................ 1  
  Background ..................................................................................................................................................... 1  
  Criteria ............................................................................................................................................................. 2  
  Compliance ..................................................................................................................................................... 3  
  Development of Regional Reliability Criteria ................................................................................................... 3  
  Regional Reliability Council Functions & Services .......................................................................................... 4  
About NERC ........................................................................................................................................................ 6  
  Background ..................................................................................................................................................... 9  
  Standards ........................................................................................................................................................ 9  
  Compliance ................................................................................................................................................... 10  
  NERC Technical Services, Tools, & Databases ............................................................................................... 11
About NPCC

The Northeast Power Coordinating Council (NPCC) is the voluntary, non-profit international electric Regional Reliability Council formed in January, 1966 shortly after the November 9, 1965 Northeast Blackout that establishes the processes which assure the reliable and efficient operation of the interconnected power systems within its geographic area. That area includes New York, the six New England states, Ontario, Quebec, and the Maritime Provinces in Canada. The total population served is approximately 54 million. The area covered is approximately 1 million square miles.

From an electric load perspective, 20% of the Eastern Interconnection load is served within NPCC. For Canadian electricity requirements, 70% of Canadian load is located within the NPCC region. NPCC is the third largest of the ten Regional Reliability Councils located throughout the United States, Canada and portions of Mexico that together make up the North American Electric Reliability Council (NERC).

As a member of NERC, NPCC provides for the regionally specific implementation of broad based industry-wide reliability standards, and has developed a number of fundamental Criteria Documents that clearly define the principles which need to be followed to assure that it can accomplish its mission of promoting a reliable interconnected power system. The documents are reviewed periodically using the NPCC Open Process and revised when necessary to assure that they are current and meet the needs of the industry.

NPCC conducts regular reliability assessments through its Reliability Coordinating Committee (RCC) and its Task Forces & Working Groups, and utilizes a Reliability Assessment Program to monitor members' conformance with the Council's Criteria, Guides and Procedures.

The Program consists of two parts: Criteria Review & Development and Reliability Assessment. In addition, a Reliability Compliance and Enforcement Program (RCEP) establishes a mechanism to impose sanctions for non-compliance to a specified set of reliability requirements.

Current NPCC membership represents Transmission Providers and Transmission Customers serving the northeastern United States and central and eastern Canada; the NPCC Membership Agreement allows for non-voting membership to be extended to regulatory agencies with jurisdiction over participants in the electricity market in Northeastern North America, and also extends membership to public-interest organizations expressing interest in the reliability of electric service in Northeastern North America.

Background

NPCC initially was comprised of most of the entities that had previously participated in CANUSE (Canada-United States Eastern Interconnection), a much looser and less formal operating/planning organization. Its formation responded in part to Recommendation #4 of the (US) Federal Power Commission NORTHEAST POWER FAILURE November 9 and 10, 1965: A Report to the President:
4. The systems in the CANUSE area should plan their future growth and operate their systems on a fully coordinated basis if they are to achieve maximum reliability of service. Achievement of this goal requires close coordination of system planning and operation, which would be easier to achieve if the companies established one or more unified planning and operating groups which made this task their primary responsibility. We recommend the delegation to such planning and operating groups of sufficient responsibility to assure the performance of those functions which require close intersystem coordination.

The original Memorandum of Agreement (MOA) was signed by executives representing the electric systems in New York, New England, and Ontario on January 19, 1966, to “promote reliability and efficiency of electric service in the interconnected systems of the signatory parties by extending the coordination of their system planning and operating procedures.” The MOA called for establishing two standing committees; the System Design Coordinating Committee (recommends design guides that affect the operation of interconnected systems), and the Operating Procedure Coordinating Committee (recommends operating procedures and guides) and two technical task forces (Task Force on System Protection and Task Force on System Studies), all populated by representatives of the member companies.

Criteria

NPCC Criteria always focused on the reliability of the northeast interconnected bulk power system, not the underlying transmission network. This concept is exemplified by its performance-based definition of the bulk power system:

*The interconnected electrical systems within Northeastern North America comprising generation and transmission facilities on which faults or disturbances can have a significant adverse impact outside of the local area. In this context, local areas are determined by the Council members.*

NPCC Criteria development is a “bottom-up” process; Criteria is developed by the Task Forces, reviewed by the Coordinating Committees, and approved by the members.

The original Criteria that were put in place included the following:

- Basic Criteria for Design & Operation of Interconnected Power Systems—September 20, 1967;
- Bulk Power System Protection Maintenance Criteria—April 22, 1969;

Additional criteria relating to emergency operation, operating reserve and compliance enforcement were also adopted.

The criteria development process remains “bottom-up”. The NPCC “Open Process” website postings ensure that all interested parties have ample opportunity for comment with an assurance that their comments will be addressed. All criteria still require approval by the NPCC members before taking effect.
Compliance

Each NPCC member, as a signatory to the *NPCC Membership Agreement* (and its predecessor, the Memorandum of Agreement), is bound to:

…plan and design its bulk power system in compliance with Criteria, Guides, and Procedures established by the Council; and,
…conduct its operations in compliance with Criteria, Guides, and Procedures established by the Council.

In that sense, NPCC criteria have always been “mandatory”.

In the late 1990s, in response to issues raised by the deregulation of the electric power industry, NPCC formed the Compliance Monitoring and Assessment Subcommittee to consolidate the compliance monitoring efforts previously undertaken by the task forces, and to establish a program for enforcing compliance with specified NPCC criteria by means of a non-monetary sanctioning process.

The “enforceable” criteria as well as the complete monitoring and enforcement process are defined in an NPCC criteria document first adopted by the members in 2000 that adheres to the same “bottom-up” development, review, and approval process as any other criteria.

In a very real sense, NPCC is a self-governing body that operates on a consensus basis by the “consent of the governed”.

Development of Regional Reliability Criteria

NPCC maintains an Open Process for its development of regionally-specific reliability criteria, guidelines and procedures. Regional reliability requirements, infrastructure, and bulk power system disturbances are analyzed to assess need for more stringent or additional criteria.

NPCC develops its criteria assuring that they are neither inconsistent with, nor less stringent than, NERC continent-wide Reliability Standards, and are not anti-competitive in nature.

NPCC conducts regular, periodic reviews of its regionally-specific criteria, guidelines and procedures; NPCC currently has 9 criteria, 12 guidelines and 21 procedures.

NPCC established (and regularly reviews) the Bulk Power System Definition and identifies the elements of the Bulk Power System.

NPCC also participates in the NERC Reliability Standards Development process, and coordinates ballot body segments within its geographical area.
Regional Reliability Council Functions & Services

NPCC performs the following additional functions and services for the Northeast:

Coordination of Operation
- Coordinate implementation of NERC operating policies & NPCC criteria among the Area control rooms;
- Coordinate operating reserve requirements (10 minute and 30 minute);
- Coordinate reserve sharing procedures Coordinate interchange scheduling and time error correction procedures;
- Monitor Area control performance, frequency response characteristics and Area Control Error;
- Initiate weekly conference calls to coordinate demand, resources, and transmission maintenance outages among NPCC and neighboring Areas;
- Initiate pre-emergency conference calls;
- Initiate emergency calls during system emergencies, and coordinate NPCC Control Area response in the event of a physical threat to the security of the interconnected bulk power supply system;
- Identify security concerns in system operation;
- Coordinate Lake Erie line loading relief procedures;
- Coordinate need, development and application of operating tools;
- Establish and coordinate regional operator training program;
- Establish procedures to avert geomagnetically induced system problems;
- Coordinate individual Control Area restoration efforts;
- Identify mutual assistance potential among NPCC Areas during system restoration;
- Coordinate restoration training and exercises among the NPCC Control Areas;
- Inventory and monitor testing of key facilities and associated critical components for system restoration.

Coordination of Planning
- Establish Regional Reliability Plan;
- Coordinate Area planning activities on a Region-wide basis;
- Conduct Wide-Area collaborative planning initiative;
- Facilitate Inter-ISO Planning;
- Develop interregional resource adequacy model;
- Coordinate Regional ATC-TTC Methodology and webpage;
- Participate in neighboring regions’ working groups;
- Create the annual MMWG library of load flow cases and dynamics information for use in interregional studies;
- Develop a detailed NPCC library of power flow base cases;
- Develop a detailed NPCC library of dynamic base cases;
- Participate in MAAC-ECAR-NPCC (MEN) summer and winter studies;
- Perform additional base case and study work as necessitated by emergency conditions i.e. post-Blackout 2003 assessment.

Assessment of Reliability
- Conduct pre-seasonal assessment of NPCC system performance;
- Conduct pre-seasonal assessments of resource adequacy;
- Participate in NERC and inter-regional pre-seasonal assessments;
- Review operational readiness of NPCC for the coming operating period;
- Evaluate reactive power and voltage control practices;
- Report and analyze system disturbances;
- Review transmission studies performed by NPCC Areas;
- Conduct periodic overall transmission assessments;
- Perform Area transmission reviews;
- Analyze and periodically review Special Protection Systems;
Assessment of Reliability (continued)
- Maintain SPS database;
- Perform periodic review of under frequency load shedding effectiveness;
- Maintain UFLS database;
- Review on-line computer system performance during NPCC Area disturbances;
- Review NPCC on-line computer system status and plans;
- Assess NPCC Control Area restoration plans.

Compliance
- Assess compliance to NPCC Criteria and NERC Standards;
- Conduct Compliance Audits;
- Administer Compliance enforcement and appeal process;
- Conduct readiness audits, jointly with NERC.

Critical Infrastructure Protection
- Coordinate Regional Infrastructure Security and Technology activities;
- Coordinate IT security;
- Coordinate communications with NERC CIPC, other national (DHS, DOE) and international groups.

Market Reliability Interface
- To the extent possible, facilitate attainment of fair, effective and efficient competitive electric markets;
- Facilitate elimination of seams between adjacent markets;
- Develop and implement automated transaction checkout procedure;
- Review NAESB business practices to assure consistency with reliability criteria.

External Affairs
- State and Provincial liaison;
- Develop FERC filings, interventions and comments;
- Provide reliability testimony at Federal, State and Provincial levels;
- Aggregate data for EIA/DOE reporting;
- Interact with media;
- Develop public information materials.

Other Services
- Develop industry policy input;
- Facilitate and conduct NPCC Regional blackout investigations;
- Develop the Region’s status tracking of the 2003 Blackout Recommendations;
- Maintain NPCC Transmission Map;
- Compile load, capacity, fuels, energy, and transmission data;
- Maintain secure Regional website;
- Implement NPCC business continuity and disaster recovery planning;
- Provide web-based discussion forum capability;
- Coordinate inter-Area and inter-Regional data communications networks;
- Conduct various reliability focused workshops;
- Represent Northeastern North America on NERC committees.
About NERC

NERC's members (profiled below) are the ten Regional Reliability Councils whose members come from all segments of the electric industry: investor-owned utilities; federal power agencies; rural electric cooperatives; state, municipal and provincial utilities; independent power producers; power marketers; and end-use customers. These entities account for virtually all the electricity supplied in the United States, Canada, and a portion of Baja California Norte, Mexico.

**ECAR**
The East Central Area Reliability Coordination Agreement (ECAR) was established in 1967 as the forum to address matters related to the reliability of interconnected bulk electric systems in the east central part of the United States. ECAR members work cooperatively to maintain reliability through coordinated planning and operation of members' generation and transmission facilities.

**ERCOT**
The Electric Reliability Council of Texas (ERCOT) is a single point of control bulk electrical Interconnection, located totally within the state of Texas. ERCOT is managed by a non-profit corporation that oversees the operation of its more than 76,000 megawatts of generation and more than 37,000 miles of transmission lines. The corporation is responsible for the overall operation and reliability of the grid, including its future planning needs.

**FRCC**
The Florida Reliability Coordinating Council (FRCC) encompasses Peninsular Florida, east of the Apalachicola River. It is electrically unique since it is a peninsula and is only tied to the Eastern Interconnection on one side. FRCC is responsible for setting the reliability standards, procedures, and policies that all users of the electric transmission grid must follow when operating in Peninsular Florida.

**MAAC**
The Mid-Atlantic Area Council's (MAAC) mission is to preserve reliability in a restructured and competitive electric industry. To that end, under the MAAC Agreement, PJM members with assets in the MAAC region are MAAC members and are obligated to comply with MAAC and NERC operating policies and planning standards. As parties to the PJM Operating Agreement and in accordance with the PJM Tariff, MAAC members coordinate their operations, planning, and integration of generation and transmission facilities. Operation of the Allegheny Power (AP) facilities has been integrated into the PJM control area, and compliance with operating measures are reported through MAAC. However, AP is still obligated by the planning criteria of the ECAR region and compliance with those criteria will continue to be assessed by ECAR.

**MAIN**
As the year 2003 drew to a close, the Mid-America Interconnected Network (MAIN) began its fortieth year of service to the industry. However, the year began with the uncertainty caused not only by the continued migration of available transfer capability, OASIS, and reliability coordination services to overlapping independent system operators, but also by the notices submitted by two of its larger members of their intention to withdraw from MAIN by the end of 2003. A major consideration in these discussions was the goal to match the boundaries of the regional reliability organization with RTO/ISO boundaries. This goal was stymied by the fact that these boundaries appeared to be unstable. As a result, the two members agreed to stay in MAIN for at least another year (until December 31, 2004) in order to have better information on which to make a decision. This will continue to be a priority issue for MAIN in 2004.
MRO
In 2005, the Midwest Reliability Organization (MRO) became operational and replaced the MAPP Regional Reliability Council of NERC. This has resulted in a more effective and efficient reliability organization to administer and enforce reliability standards across a broader geographical region in the Midwest part of North America. The MRO's region spans eight states in the U.S. and two Canadian provinces: Minnesota, Iowa, Nebraska, North Dakota, South Dakota, Missouri, Kansas, Montana, Wisconsin, Michigan, Saskatchewan and Manitoba and includes roughly one million square miles and serves nearly 20 million people.

NPCC
The Northeast Power Coordinating Council (NPCC) is the voluntary, non-profit international electric Regional Reliability Council formed in January, 1966 shortly after the November 9, 1965 Northeast Blackout that establishes the processes which assure the reliable and efficient operation of the international bulk power systems in Northeastern North America through development and enforcement of regionally-specific criteria that are not inconsistent with NERC's broad-based continent-wide reliability standards. NPCC coordinates system planning, design and operations, assesses reliability, and monitors and enforces mandatory compliance with its reliability criteria. NPCC, to the extent possible, facilitates the attainment of fair, effective and efficient competitive electric markets.

SERC
SERC is the largest NERC region as measured by total generation and total load. The SERC region covers an area of about 464,000 square miles and includes parts or all of thirteen southeastern and south central states. SERC is divided geographically into four diverse sub regions Entergy (the geographical area of the Entergy Operating Companies and Associated Electric Cooperative, Inc.), Southern (the geographical area of the Southern electrical system), TVA (the Tennessee Valley Authority area), and VACAR (the Virginia-Carolinas area).

SPP
The Southwest Power Pool (SPP), founded in 1941, is a group of 48 electric utilities serving more than 4 million customers across all or parts of eight southwestern states. The SPP serves as a NERC regional reliability council and, since 1997, has provided independent security coordination and tariff administration, pursuant to a FERC-approved tariff, across a service area with more than 33,000 miles of transmission lines and a gross plant investment approaching $4 billion.

WECC
The Western Electricity Coordinating Council’s (WECC) 1.8 million square mile service territory is equivalent to more than half the contiguous area of the United States. WECC was formed in 1967 and at the close of 2003 had a membership of 157 organizations representing all segments of the electric industry. WECC is responsible for developing planning and operating reliability criteria and policies, overseeing compliance with these criteria and policies through its Compliance Monitoring Review Process and Reliability Management System, ensuring open and nondiscriminatory transmission access among its members, coordinating operating and planning activities, and facilitating a regional transmission planning process.

NERC's mission is to ensure that the bulk electric system in North America is reliable, adequate and secure. It has operated successfully as a voluntary organization, relying on reciprocity, peer pressure and the mutual self-interest of all those involved.

NERC is organized as a not-for-profit corporation; a ten-member independent Board of Trustees governs NERC with guidance and input from an industry Stakeholders Committee. The Stakeholders Committee elects the independent trustees, votes on amendments to bylaws, participates in the budget process and provides advice and recommendations to the Board on policy matters.
Activities overseen by NERC committees and working groups composed of representatives from all industry segments who provide expertise in the planning, engineering and operating aspects of electric system reliability, security, and competitive wholesale electricity markets. To fulfill its mission, NERC:

- Sets standards for the reliable operation and planning of the bulk electric system;
- Monitors, assesses and enforces compliance with standards for bulk electric system reliability;
- Provides education and training resources to promote bulk electric system reliability;
- Assesses, analyzes and reports on bulk electric system adequacy and performance;
- Coordinates with Regional Reliability Councils and other organizations;
- Coordinates the provision of applications (tools), data and services necessary to support the reliable operation and planning of the bulk electric system;
- Certifies reliability service organizations and personnel;
- Coordinates critical infrastructure protection of the bulk electric system;
- Enables the reliable operation of the interconnected bulk electric system by facilitating information exchange and coordination among reliability service organizations;
- Administers procedures for appeals and conflict resolution for reliability standards development, certification, compliance and other matters related to bulk electric system reliability;

In response to changes taking place in the industry, NERC promotes the passage of electric reliability legislation in the United States and the development of a new mandatory system of reliability standards and compliance, backstopped in the United States by the Federal Energy Regulatory Commission.

In the meantime, NERC encourages compliance with its reliability standards through an agreement with its members. NERC has implemented a new standards development process in 2002 designed to ensure that the development of reliability standards is fair, open, balanced and inclusive. Using a weighted-segment voting structure, registered members of nine industry segments vote to approve or reject proposed reliability standards. The nine segments are:

- Transmission owners;
- RTOs, ISOs, and Regional Reliability Councils;
- Load-serving entities;
- Transmission-dependent utilities;
- Electricity producers;
- Brokers, aggregators, marketers;
- End users (large);
- End users (small);
- Federal, state and provincial government agencies;

NERC signed a Memorandum of Understanding with the North American Energy Standards Board (NAESB) and the ISO/RTO Council to ensure that development of wholesale electric business practices and reliability standards is harmonized and that every effort is made to minimize duplication of effort.

A Joint Interface Committee, comprising representatives of NERC, NAESB, and the ISO/RTO Council, reviews all standards development proposals to determine whether NERC or NAESB should develop a proposed standard.
Background

NERC was formed in 1968 by the action of nine Regional Reliability Councils. Its precursor was created in 1962 when the Eastern interconnection was established. The Interconnected Systems Group (midwest/southern utilities), the PJM interconnection, and CANUSE formed the Interconnection Coordination Committee to recommend an informal operations structure, which led to the formation of the North American Power Systems Interconnection Committee. NAPSIC was an informal voluntary association of system operators that also included ERCOT and what ultimately became the WSCC.

The final (US) Federal Power Commission report on the 1965 Northeast Power Failure recommended:

power coordination made up of representatives from each of the nation’s regional coordinating organizations to exchange and disseminate information on regional coordinating practices to all of the regional organizations, and to review, discuss, and assist in resolving matters affecting interregional coordination

The National Electric Reliability Council (NERC) agreement was signed June 1, 1968, 2½ years after the formation of NPCC and other regional coordinating councils. It originally comprised ad hoc committees on operations and on planning and coordination.

Organizational objectives agreed upon in 1978 include: define/measure reliability; analyze and testify on legislation affecting reliability; study interregional interconnections; communicate with and educate others about reliability; collect and publish data on future electricity supply and demand.

NERC’s activities expanded as a result of the US National Energy Act (1978) to include development of planning guidelines for bulk electric systems. NAPSIC merged with NERC in 1980 and became the NERC Operating Committee; the NERC Technical Advisory Committee became the Engineering Committee.


Standards

In 1995, as a response to the US Federal Energy Regulatory Commission NOPR on Open Access, NERC filed a six-point action plan that included ensuring compliance with NERC rules in a comparable and fair manner.

In 1997, the Electric Reliability Panel, formed to recommend how to ensure that reliability could be maintained in a competitive marketplace, recommended NERC restructure as a self-regulating organization with authority to set, measure, and enforce reliability planning and operating standards (NAERO). The first NERC Planning Standards were approved by the NERC Board of Trustees (BOT), replacing the planning guides, in 1997.
Standards and compliance procedures were initiated in 1999, together with a pilot compliance program. The Standards Task Force undertook a review of the NERC reliability standards in 2000, together with the process used to develop standards. In 2001 they undertook to redesign the process to develop NERC standards, which will be used to prepare new organization standards. The new process was approved by the NERC BOT in 2002, and the Standards Authorization Committee was created. The process was accredited by ANSI in 2003. The first standard developed by new process (Cyber Security) was adopted by the NERC BOT in 2003.

New NERC Reliability Standards to Take Effect April 1, 2005

NERC has adopted reliability standards for the bulk electric system that incorporate the existing NERC operating policies, planning standards, and compliance requirements into an integrated and comprehensive set of measurable standards. The standards take effect on April 1, 2005, and will apply to all entities that play a role in maintaining the reliability of the bulk electric system in the United States and Canada.

There are presently 14 categories of standards containing a total of 91 standards.

Compliance

In 2001, nine of the ten regional councils signed an agreement for regional compliance and enforcement programs with NERC; the intent was to enforce compliance with NERC rules through contractual means. In 2004, the NERC BOT approved Guidelines for Reporting and Disclosure to provide transparency to the results of NERC and regional council audit and compliance programs.

Compliance Program Transitions to New Reliability Standards

On April 1, 2005, when the reliability standards replace the operating policies and planning standards, NERC will retire the compliance templates it has used to measure compliance with the former policies and standards. The compliance requirements within the new reliability standards will replace the compliance templates.

The 2005 Compliance Enforcement Program (CEP) currently consists of 18 operating templates and 27 planning templates. On April 1, the CEP will monitor compliance only with the reliability standards that correspond to the templates that are currently in the 2005 CEP. No new measures will be added to the program on April 1. In March, NERC will post information about the standards and requirements that correspond to the templates in the 2005 CEP. The goal is a seamless transition from the template-based compliance program to the reliability standards and requirements. The Compliance and Certification Managers Committee, however, may change how these new standards are monitored if problems are discovered during the transition.

The CEP will not actively monitor any new standards approved in 2005, but, as with all standards, NERC expects compliance with the new standards, whether they are actively monitored or not.
NERC Technical Services, Tools, & Databases

Examples of NERC technical services, tools, and databases include:

**Electricity Supply and Demand Database (ES&D)**
- Supports the assessment of the reliability of the interconnected bulk electric system in North America;
- Provides a summary of electric supply and demand projections for the United States and Canada;
- Presents aggregated electric utility ten-year projections of electricity demand, electric generating capacity, electricity production, fossil fuel requirements, transmission lines, and generating unit additions and retirements;
- Allows users to create custom queries, views, and exports of data.

**Electronic Tagging of Energy Transactions (E-Tag)**
- Database captures all wholesale electricity interchange transactions that are scheduled in the Eastern Interconnection — more than one million transactions recorded in 2003;
- Information contained in E-Tags is used to update the information contained in the Interchange Distribution Calculator.

**GADS Services**
- Generating Availability Data System (GADS) collects, records, and retrieves operating information for improving the performance of electric generating equipment;
- Information used to support equipment reliability and availability analyses and decision-making by GADS data users;
- Training — GADS Services instructs power plant owners/operators, consultants, and government officials in the fundamentals of data collection and use of statistics;
- Analytical Software — pc-GAR for Windows remains the premier software produced for analyzing power plant performance;
- Options were added to the program for analyzing equipment problems by cause codes;
- Used in 12 countries and is the model the World Energy Council (WEC) Performance of Generating Plant (PGP) Committee uses.

**Interchange Distribution Calculator (IDC)**
- Receives near real-time inputs on the current status of transmission facilities across the Eastern Interconnection;
- Computes the flow impacts of all scheduled wholesale electricity transactions on those facilities;
- An essential tool for quickly calculating electricity flows and comparing them to system operating limits to ensure that the transmission grid does not become overloaded;
- Supports NERC Transmission Loading Relief procedure, which is used as a backstop to curtail electricity transactions when the transmission system approaches or reaches established limits.

**System Data eXchange (SDX)**
- Used to communicate system load and topology data to the IDC and other reliability coordinators for ATC calculations;
- Internet-based, which allows reliability coordinators to automate outage reporting.