NPCC, Inc.

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Real Time Operating Subcommittee (RTOS) Endorsement

Northeast Power Coordinating Council, Inc.
Regional Reliability Plan
Version 2.0

Approved by the NPCC Task Force on Coordination of Operations
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Version History

Version	Date	Action	Change Tracking (New, Errata or Revisions)
1			New
1.1	June 5, 2013	1. Editorial changes and reference updates. Removal of the detailed Appendices and explicit compliance language.	Revisions
1.2	June 1, 2016	1. Editorial changes and reference updates, including: • references to "Directives" were changed to "Operating Instructions" • references to "violations" were changed to "exceedances" • Reference to ISN was changed to EInet • references to "CPS" were changed to "BAAL"	Revisions
2.0	Month, date, 2020	1. Added content specified in the NERC Reliability Coordinator Reliability Plan Reference Document, including: • Version History • List of BAs and TOPs in each RC's footprint • Pseudo-ties • Congestion management • Plan updates and changes provisions 2. Editorial changes and reference updates, including: • Reference to the applicable registration sections of NERC ROP • Eliminated/replaced references to the "unknown operating state" with "Real-time Assessment" • Updates to the applicable functional entities • Reference to ISN was changed to EIDSN • Updated SPS references with RAS • Eliminating section referencing "Beyond Real Time" as it is outside of the Regional of NERC's RC Reliability Plan scope 3. Changes conforming with Directory revisions, including: • Directory 5 - eliminating processes and implementation of Regional Reserve, • Directory 8 – eliminating processes for establishing, reviewing and maintaining Regional Restoration Plan.	Revisions

I. EXECUTIVE SUMMARY

The Northeast Power Coordinating Council (NPCC) Reliability Plan describes the procedures, practices and requirements implemented to facilitate the reliable operation of the **Bulk Power System** (**BPS**) within the NPCC Region.

The NPCC Reliability Plan outlines the following objectives:

- Identifies the regional entities that are registered with NERC in accordance with the Section 500 – "Organization Registration and Certification" and Appendices 5A and 5B of the FERC-approved NERC Rules of Procedure who are responsible for performing specified reliability functions to which requirements of mandatory NERC Reliability Standards are applicable and summarizes the operating functions that will be performed by those registered entities.
- Identifies the essential industry practices to promote effective **Wide Area** reliability among the **Reliability Coordinators (RC)** within the NPCC Region: the Ontario Independent Electricity System Operator (IESO), the New York ISO (NYISO), ISO New England, Inc. (ISO-NE), New Brunswick Power SO (NBP-SO) and Hydro-Québec TransÉnergie.
- Identifies the **Wide Area** view that provides for reliability monitoring and assessment among the **Reliability Coordinators**.
- Documents the procedures and tools necessary for NPCC's **Reliability Coordinators** to monitor and direct the real-time operation of their RC **Area** in coordination with their neighboring **Reliability Coordinators**.
- Documents the **Reliability Coordinators'** authority to direct other responsible entities to take corrective actions to maintain the reliability and integrity of their respective RC **Areas**.

The NPCC Reliability Plan identifies the coordination and monitoring in both the current day and day ahead timeframes. The plan describes procedures for normal and **emergency** states of operation and presents the processes for the sharing and dissemination of information utilizing NPCC procedures, conference calls and NERC communication tools.

The NPCC Reliability Plan identifies the procedures to maintain reliable operations through coordinated analysis and **Real-time Assessments** during **emergencies** caused by abnormal voltage conditions or transmission loading, unanticipated parallel flow, **operating reserve** deficiencies, and **frequency deviations.** The NPCC Reliability Plan also provides an overview of the RC plans and procedures for system restoration and training.

II. RELIABILITY PLAN ELEMENTS

1. Terms

Bolded expressions used in the NPCC Reliability Plan have the meanings ascribed thereto in the "Glossary of Terms Used in NERC Reliability Standards" and the "NPCC Glossary of Terms".

2. NPCC Reliability Coordinators

The NPCC **Reliability Coordinators** along with their **Transmission Operators** and **Balancing Authorities** for the Eastern and Québec Interconnections are:

- Independent Electricity System Operator (IESO), for the province of Ontario (known as the Ontario **Area**);
  - BAs: IESO
  - TOPs: IESO, Hydro One Networks, Inc.
- New York Independent System Operator (NYISO), for the state of New York (known as the New York **Area**);
  - BAs: NYISO
  - TOPs: NYISO, Consolidated Edison Co of NY, Inc, Long Island Power Authority, Niagara Mohawk Power Corporation, New York State Electric & Gas, Orange and Rockland Utilities, Inc., Rochester Gas and Electric, Central Hudson Gas & Electric Corporation, Alcoa Power Generating Inc.-Long Sault Division
- Independent System Operator of New England (ISO-NE), for the New England six states: MA, CT, RI, NH, VT, and all of ME except for Maine Public Service Company and Eastern Maine Electric Cooperative (known as the New England **Area**);
  - BAs: ISO-NE
  - TOPs: ISO-NE, Central Maine Power Company, Eversource Energy Service Company, New England Power Company, Vermont Transco LLC
- New Brunswick Power – System Operator (NBP-SO), for New Brunswick Power, Nova Scotia Power Incorporated, the province of Prince Edward Island, Maine Public Service Company and the Eastern Maine Electric Cooperative. The province of Prince Edward Island, Maine Public Service Company and the Eastern Maine Electric Cooperative are not part of the **Bulk Power System**.
  - BAs: NBP, NSPI
  - TOPs: NBP, NSPI
- System Control and Operations Department (Direction Contrôle et exploitation du réseau), Hydro-Québec TransÉnergie (HQT) for the Québec Interconnection and the transmission lines between Churchill Falls Generating Station (Labrador) and HQT system (known as the Québec **Area**).
  - BAs: HQT

- TOPs: HQT

To maintain the operational reliability of the NPCC Region, the NPCC **Reliability Coordinators** carry out the following tasks:

- Plan for next-day operations and analyze current day operating conditions, which includes reliability analyses such as pre- and post-**contingency** thermal monitoring, **operating reserves**, area reserves, **reactive reserves**, voltage limits, **stability**, etc., that may identify operating conditions for which special procedures may be needed;
- Implement procedures to mitigate **System Operating Limit** (**SOL**) and **Interconnection Reliability Operating Limit** (**IROL**) exceedances on the transmission system. Regardless of the process, the **Reliability Coordinator** is required to ensure that the transmission system is returned to within **Interconnection Reliability Operating Limits** as soon as possible, but no longer than 30 minutes.
- Monitor the **Wide Area** and observe the **Interconnection Reliability Operating Limits**. **Wide Area** monitoring is described as the ability to monitor the complete **Reliability Coordinator Area**, including critical flow, **Pseudo-Tie** flow (if applicable) and status information from adjacent **Reliability Coordinator Areas** as determined by detailed system studies.

2.1. Responsibilities

2.1.1. Reliable Operation

The **Reliability Coordinator** is responsible for the reliable operation of its **Reliability Coordinator Area** in accordance with NPCC and NERC Standards. The **Reliability Coordinator** will assess transmission reliability and coordinate **emergency** operations among the operating entities within the region and across the regional boundaries.

2.1.2. Wide Area View

The **Reliability Coordinator** is responsible for having the **Wide Area** view, the operating tools, processes and procedures, including the authority, to prevent or mitigate **emergency** operating situations in both next-day analysis and during real-time conditions.

2.1.3. Authority

The **Reliability Coordinator** has clear decision-making authority to act and to direct actions to be taken by **Transmission Operators**, **Balancing Authorities**, **Generator Operators**, and **Distribution Providers** within its **Reliability Coordinator Area** to preserve the integrity and reliability of the **Bulk Power System** (**BPS**).

2.1.4. Delegation

If a **Reliability Coordinator** delegates tasks to others, the **Reliability Coordinator** retains its responsibilities for complying with NERC and regional standards.

All responsibilities for complying with NERC and regional standards applicable to **Reliability Coordinators** remain with the **Reliability Coordinator**.

2.2. Standards of Conduct and Confidentiality

2.2.1. Standards of Conduct

The NPCC **Reliability Coordinator** adheres to the NERC Confidentiality Agreement for "Electric System Reliability Data" and the NPCC Code of Conduct

2.3. Authorizations

2.3.1. Serving the interests of the NPCC Reliability Coordinator Areas

The **Reliability Coordinator** acts in the interests of reliability first for the overall **Reliability Coordinator Area** and the Interconnection before the interests of any other entity.

2.3.2. Compliance with Reliability Coordinator Operating Instructions

Transmission Operators, **Balancing Authorities**, **Generator Operators**, and **Distribution Providers** comply with **Reliability Coordinator Operating Instructions** unless such actions would violate safety, equipment, or regulatory or statutory requirements. Under these circumstances, these entities immediately inform the **Reliability Coordinator** of the inability to perform the **Operating Instruction** so that the **Reliability Coordinator** may implement alternate remedial actions.

2.4. Delegation of Tasks

2.4.1. Delegating Tasks

The **Reliability Coordinator** may delegate tasks to other entities, if this delegation is accompanied by formal operating agreements, with each entity to which tasks are delegated. The **Reliability Coordinator** verifies that all delegated tasks are understood, communicated, and addressed within its **Reliability Coordinator Area**. **The Reliability Coordinator** lists within its reliability plan all entities to which the **Reliability Coordinator** has delegated tasks. **Reliability Coordinators** that delegate tasks consist of the following:

- ISO-NE: None

- NYISO: None
- IESO: None
- NBP-SO: None
- HQT: None

Each **Transmission Operator**, **Balancing Authority**, and **Reliability Coordinator** staffs all operating positions that meet both of the following criteria with personnel that are NERC certified for the applicable functions:

(i) Positions that have the primary responsibility, either directly or through communications with others, for the real-time operation of the interconnected **BPS**.

(ii) Positions directly responsible for complying with NERC standards.

3. Normal Operations

3.1. Next Day and Current Day Operations

3.1.1. Common Tasks to Next Day and Current Day Operations

3.1.1.1. Assess Contingency Situations

The **Reliability Coordinator** conducts **Operational Planning Analysis** and **Real-time Assessments** based on thermal, voltage and **stability** limits to coordinate current day and next day operations within applicable **SOL** and **IROL**. The **Wide Area** view of the **Reliability Coordinator** is modeled to meet the requirements of coordinated operations.

3.1.1.2. Determine IROL

The **Reliability Coordinator** determines an **IROL** based on local, Regional and inter-Regional studies. The **Reliability Coordinator** must recognize that an **IROL** exceedance can be created during multiple, normally non-critical outage conditions and, as such, the **Reliability Coordinator** must be knowledgeable of events that could lead to such an occurrence. The **Reliability Coordinator** is responsible for disseminating this information within its **Reliability Coordinator Area** and to neighboring **Reliability Coordinators.**

3.1.1.3. Ensure that each Reliability Coordinator Area Does Not Burden Adjacent Reliability Coordinator Area

The **Reliability Coordinator** operates to prevent the likelihood that a **disturbance**, action, or non-action in its **Reliability Coordinator Area** will result in a **SOL** or **IROL** exceedance in another **Area** of the **Interconnection**. In instances where the derived **operating limits** differ from one **Area** to another, the **Reliability Coordinators** operates the **BPS** to the most limiting parameter.

Each **Reliability Coordinator** monitors parallel flows which can place an unacceptable or undue burden on an adjacent **Reliability Coordinator Area**.

3.1.1.4. Transfer Capability Coordination

The **Reliability Coordinator** makes known to **Transmission Service Providers** within its **Reliability Coordinator Area**, **SOLs** or **IROLs** within its **Wide Area** view. The TSP respects these **SOLs** or **IROLs** in the determination of **transfer capabilities**, in accordance with filed tariffs and/or regional **TTC**/**ATC** calculation processes.

3.1.1.5. Communicate Effectively

The **Reliability Coordinator** issues **Operating Instruction**s in a clear, concise and definitive manner.

3.1.1.6. Maintain Flows Within Limits

The **Reliability Coordinator** identifies the cause of the potential or actual **SOL** or **IROL** exceedance and initiates the control action or **emergency** procedure to relieve the potential or actual **SOL** or **IROL** exceedance consistent with NERC Reliability Standards.

The **Reliability Coordinator** evaluates actions taken to address an **IROL** or **SOL** exceedance and, if the actions taken are not appropriate or sufficient, direct actions required to return the system to within limits.

3.1.1.7. Maintain a Wide Area View

Each **Reliability Coordinator** monitors all **BPS** facilities, which may include sub-transmission information, within its **Reliability Coordinator Area** and adjacent **Reliability Coordinator Areas** via the Eastern Interconnection Data Sharing Network (EIDSN), as necessary to ensure that, at any time, regardless of prior planned or unplanned events, the **Reliability Coordinator** is able to determine any potential **SOL**

and **IROL** exceedances within its **Reliability Coordinator Area**.

Each **Reliability Coordinator** notifies specific neighboring **RCs** when an element listed in the NPCC Facilities Notification List[1] is scheduled to be removed from service or has been removed from service due to a forced outage event.

Each **Reliability Coordinator** is aware of the current status of all critical facilities whose failure, degradation or disconnection could result in an **SOL** or **IROL** exceedance. **Reliability Coordinators** are aware of the status of any facilities that may be required to assist area restoration objectives.

3.1.1.8. Inter-Area/Inter-Regional Coordination

Reliability Coordinators are responsible for addressing inter-**Area** or inter-Regional operational concerns by coordinating their actions with other **Reliability Coordinators** from the NPCC **Region** and other **Regions**. This includes both foreseen and unforeseen events. **Reliability Coordinators** are responsible for taking immediate actions to contain an operating problem and to request or provide assistance from or to other **Reliability Coordinators**.

The **Reliability Coordinator** coordinates with other **Reliability Coordinators** and other responsible entities as needed to develop and implement action plans to mitigate potential or actual **SOL**, **IROL**, **BAAL** exceedances or **DCS** violations. This includes coordination of pending generation and transmission maintenance outages in both the current-day and next-day timeframes. It also includes coordination of any actions, including **emergency** assistance, required to mitigate any operational concerns.

When a **Reliability Coordinator** is aware of an operational concern, such as declining voltages, excessive reactive flows, or an **IROL** exceedance, in a neighboring **Reliability Coordinator Area**, it contacts the **Reliability Coordinator** in whose **Area** the operational concern was observed. The two **Reliability Coordinators** coordinate any actions, including **emergency** assistance, required to mitigate the operational concern.

[1] NPCC Regional Reliability Reference Directory # 1 - Design and Operation of the Bulk Power System, Appendix F – Procedure for Operational Planning Coordination, Section 4.2 – "The Facilities Notification List is developed by each RC Area and specifies all facilities that, if removed from service, may have a significant, direct or indirect impact on another RC Area's transfer capability. The cause of such impact might include stability, voltage, and/or thermal considerations."

3.1.2. Next-Day Operations

3.1.2.1. Reliability Analysis and System Studies

The **Reliability Coordinator** conducts next-day **Operational Planning Analysis** for its **Reliability Coordinator Area**.

3.1.2.1.1. Contingency Analysis

The **Reliability Coordinator** conducts **contingency** analysis studies to identify potential **interface** and other **SOL** and **IROL** exceedances.

3.1.2.1.2. Parallel Flows

Each **Reliability Coordinator** monitors parallel flows which place an unacceptable or undue burden on an adjacent **Reliability Coordinator Area**.

3.1.2.2. Information Sharing

Each responsible entity in the **Reliability Coordinator Area** provides to its **Reliability Coordinator** all information required for system studies, such as critical facility status, load, generation, **Operating Reserve** projections and known **interchange** transactions.

3.1.2.3. Action Plan Development

The **Reliability Coordinator**, in conjunction with its responsible entities, develops action plans that address operational concerns by reconfiguring the transmission system, re-dispatching generation, reducing or curtailing **interchange** transactions, or reducing firm load to return the transmission loading to within acceptable **SOL** and **IROL**.

3.1.2.4. Sharing of Study Results

When conditions warrant or upon request, the **Reliability Coordinator** shares the results of its system studies with responsible entities within its **Reliability Coordinator Area** or with other **Reliability Coordinators**.

When required, the **Reliability Coordinator** initiates a conference call or other appropriate communications to address the results of its reliability analyses.

3.1.2.5. Issuing Notifications

If after applying all possible mitigation action plans, the study results indicate potential **SOL** or **IROL** exceedances, the **Reliability Coordinator** issues the appropriate notifications and directs its responsible entities to take the necessary actions to address the potential **SOL** or **IROL** exceedance.

3.1.2.6. Compliance with Reliability Coordinator Operating Instructions

All responsible entities comply with the **Operating Instruction**s of their **Reliability Coordinator** based on the next day assessments in the same manner in which they would comply during real time operating events.

3.1.3. Current Day Operations

3.1.3.1. Status of Facilities

The **Reliability Coordinator** must be aware of the status of all facilities whose failure, degradation or disconnection could result in an **SOL** or **IROL** exceedance. **Reliability Coordinators** must also be aware of the status of any facilities that may be required to assist **Area** restoration objectives.

3.1.3.2. Situational Awareness

The **Reliability Coordinator** maintains awareness of operating conditions within its **Reliability Coordinator Area** and includes this information in its **Real-time Assessment**, including but not limited to the following, where applicable:

- Current status of the **BPS,** including, the status of automatic voltage regulators (AVR) and special protection systems (SPS) / Remedial Action Schemes (RAS).
- Current pre-**contingency** and post-**contingency** element conditions (voltage, thermal, or **stability**).
- **Operating Reserve.**
- Reactive Reserves.
- Capacity and energy adequacy conditions.
- Current **ACE** for all its **Balancing Authorities**.
- **Area** congestion management or TLR procedures in effect.
- Planned generation dispatches.
- Planned transmission or generation outages
- **Contingency** events.

3.1.3.3. Interchange Transaction Monitoring

The **Reliability Coordinator** monitors **interchange**.

3.1.3.3.1. Interchange Transaction Information

The **Reliability Coordinator** is aware of all **interchange** transactions that wheel-through, source, or sink in its **Reliability Coordinator Area**.

3.1.3.3.2. Pending Interchange Schedules to Identify Potential Flow Impacts

As portions of the transmission system approach or exceed **SOLs** or **IROLs**, the **Reliability Coordinator** works with its responsible entities to evaluate and assess any additional **Interchange Schedules** that would exceed those limits. If the potential or actual **SOL** or **IROL** exceedance cannot be avoided through proactive intervention, the **Reliability Coordinator** initiates control actions or **emergency** procedures to relieve the exceedance. All resources, including the shedding of firm load, are available to the **Reliability Coordinator** to address a potential or actual **SOL** or **IROL** exceedance.

3.1.3.4. Time Error Correction (TEC) and Geomagnetic Disturbance Notification

Each **Reliability Coordinator** communicates and implements start and end times for **time error corrections** to the relevant responsible entities within its **Reliability** Coordinator **Area,** in accordance with the NERC Time Monitoring Reference Document.

NPCC contracts with the Solar Terrestrial Dispatch (STD) for a solar notification and communication system used by the five Reliability Coordinators, the Geomagnetic Storm Mitigation System (GSMS). An active communications software package installed on the system operator's console provides each of the NPCC RCs with geomagnetic storm alerts and the status of solar activity. Upon receipt of a geomagnetic storm alert of $K_p = 6$ or higher, the GSMS simultaneously provides:

- visual and / or audible alarms;
- a main screen providing the system operator with all information currently known about possible solar activity; and

- a dialog box permitting instantaneous communication among all NPCC Reliability Coordinators of any observed solar magnetic phenomenon.

Complementing the notification system, NPCC also established its Document C-15, "Procedures for Geomagnetic Disturbances Which Affect Electric Power Systems," establishing protective measures which can be taken to minimize the vulnerability of the system to solar phenomenon. After reviewing the available data provided by the GSMS, the **Reliability Coordinator** may choose to enact one or more of the actions presented in Document C-15."

3.1.3.5. System frequency and resolution of significant frequency errors, deviations and real-time trends.

The **Reliability Coordinator** monitors system frequency and its **Balancing Authorities**' performance and directs any necessary re-balancing to return to **BAAL** and **DCS** compliance. The **Transmission Operators** and **Balancing Authorities** utilizes all resources, including the shedding of firm load, as directed by its **Reliability Coordinator** to relieve the emergent condition.

The **Reliability Coordinator** identifies sources of large **Area Control Errors** that may be contributing to **Frequency Error**, **Time Error**, or **Inadvertent Interchange** and discusses corrective actions with the appropriate **Balancing Authority**. If a sustained and unexplained **Frequency Error** is observed the **Reliability Coordinator** may initiate a NERC hotline call to discuss the **Frequency** with other **Reliability Coordinators.**

3.1.3.6. Monitoring of Special Protection Systems (SPS)/Remedial Action Schemes (RAS)

Whenever an **SPS/RAS** that may have an inter-**Balancing Authority**, inter-**Transmission Operator**, or inter-**Reliability Coordinator Area** impact (e.g., could potentially affect transmission flows resulting in a **SOL** or **IROL** exceedance) is armed, the **Reliability Coordinators** are aware of the impact of the operation of that **SPS/RAS** on inter-area flows. The **Transmission Operator** immediately informs the **Reliability Coordinator** of the status of the **SPS/RAS** including any degradation or potential failure to operate as expected.

3.1.3.7. Congestion management

The **RCs** utilize security constrained dispatch to provide a secured solution for the internal transmission system, including generator dispatch and transaction scheduling.

RCs have a number of control actions available in order to manage congestion on internal and external (i.e. shared) constraints; some or all of these control actions may be used as applicable to manage congestion. These control actions include adjusting phase angle regulators, arming **SPS/RAS**, suspending or decreasing inadvertent payback, recalling outages, adjusting internal generation and dispatchable load through re-dispatch of resources, curtailing import/export transactions.

Additionally, where applicable, for external constraints management control actions include using the NERC transmission loading relief (TLR) procedure.

3.1.3.8. Congestion management agreements

Neighboring **RCs** within NPCC have agreements that address coordinated transaction scheduling and congestions management protocols. The list of the agreements can be found in the applicable coordination agreements, as specified in the Appendix A - Agreements with external entities.

4. Emergency Operations

Emergency Operations Plans - Each Reliability Coordinator shall have a comprehensive Operating Plan to prepare for and mitigate Operating Emergencies on the Bulk Power System. The Operating Plan may consist of numerous procedures or processes. The purpose of an Emergency Operations Plan is to identify the RC, BA, and TOP roles, responsibilities and processes to prepare for and mitigate Operating Emergencies.

4.1. Precedence Over Commercial Operations

The integrity and reliability of the **BPS** is of paramount importance and takes precedence over the interest of any other entity.

4.2. Action that would Lead to an Emergency Condition

Reliability Coordinators and **Transmission Operators**, **Generator Operators** and **Balancing Authorities** do not take any action, or refrain from taking any action, that would, knowingly lead to an **emergency** condition within their **Area** or a neighboring **Area**.

4.3. Exercising Specific Authority to Prevent and Mitigate Emergencies

Reliability Coordinators and **Balancing Authorities** and **Transmission Operators** have the responsibility and decision-making authority for maintaining the reliability of the **BPS** and exercise their specific authority to prevent and mitigate **capacity** and **energy emergencies**.

4.4. Exercising specific Authority for Load Shedding

The **Reliability Coordinator** has clear decision-making authority to act and to direct actions to be taken by **Transmission Operators**, **Balancing Authorities**, **Generator Operators**, , and **Distribution Providers** within its **Reliability Coordinator Area** to preserve the integrity and reliability of the **BPS**.

A **Balancing Authority** and **Transmission Operator** operating with insufficient generation or transmission capacity has the capability and authority to shed load.

4.5. Communication and Coordination

4.5.1. Effective Communication

Effective communication is critical during an **emergency** or as an **emergency** situation evolves. In order to mitigate the consequences of the event, NPCC **Reliability Coordinators** issue **Operating Instruction**s in a clear, concise and definitive manner.

4.5.2. Notification of Potential Problems/Emergency

An NPCC **Reliability Coordinator** who foresees a transmission problem (such as an **SOL** or **IROL** exceedance, loss of reactive reserves, any **emergency** operating conditions, etc.) within its **Reliability Coordinator Area** notifies all impacted **Transmission Operators** and **Balancing Authorities** in its **Reliability Coordinator Area**, and all impacted **Reliability Coordinators** within the **Interconnection.**

4.5.3. Disseminating/Sharing Information

NPCC **Reliability Coordinators** use the NERC Hotline to disseminate information and exercise coordination with other **Reliability Coordinators**. Appropriate information is then disseminated to individual **Balancing Authorities** and **Transmission Operators** within their **Reliability Coordinator Area**.

4.5.4. NERC Hotline

For **emergency** situations that involve or affect the **BPS,** or when time is of the essence in the recognition, prevention, mitigation or

resolution of the **emergency**, **Reliability Coordinators** may employ the NERC Hotline.

4.5.5. NERC RCIS

NPCC **Reliability Coordinators** may use the **RCIS** or other methods to provide notification of potential or actual **emergency** conditions. Such notifications include information regarding abnormal system conditions, which have the potential to **burden** neighboring **Reliability Coordinators Areas** such as:

- Extreme weather conditions that are likely to adversely impact the reliability of the **BPS**;
- **Energy Emergency** Alert;
- Request for **emergency** energy assistance;
- Major forced transmission and generation outages that have, or are likely to have, an adverse impact on the reliability of the **BPS**;
- Abnormal voltage and frequency conditions.

4.5.5.1. NPCC Emergency Preparedness Conference Calls

To quickly exchange information about the current status of the **BPS**, to facilitate inter-**Area emergency** assistance, or to evaluate a physical threat to the systems, **the Reliability Coordinators** in NPCC may initiate an "NPCC Emergency Preparedness Conference Call." It may include representatives from PJM and MISO, as necessary.

4.5.6. Communication During Extended Emergencies

During extended **emergencies**, NPCC **Reliability Coordinators** provide effective, timely and accurate information to key entities such as media, government and regulatory bodies to facilitate public awareness and cooperation.

4.5.7. Energy Emergency Alerts

A **Reliability Coordinator** that is forecasting a potential, or experiencing an actual **Energy Emergency** within its **Reliability Coordinator Area** initiates an **Energy Emergency** Alert via the **RCIS**.

4.6. Emergency Operations Criteria

4.6.1. Disconnecting Facilities

NPCC **Transmission Operators** and **Generator Operator** notify and coordinate with their **Reliability Coordinator** and **Balancing Authority,** as applicable and adjacent **Transmission Operator** before removing **BPS** facilities from service if removing those facilities would **burden** a neighboring **Area**.

For a generator outage, the **Generator Operator** notifies and coordinates with the **Transmission Operator** and **Balancing Authority**. The **Transmission Operator** and **Balancing Authority** notifies the **Reliability Coordinator** and other affected **Transmission Operators** and coordinates the impact of removing the **BPS** facility.

For a transmission facility, the **Transmission Operator** notifies and coordinates with its **Reliability Coordinator**. The **Transmission Operator** notifies other affected **Transmission Operators** and coordinates the impact of removing the **BPS facility**.

When time does not permit such notifications and coordination, or when immediate action is required to prevent a hazard to the public, lengthy customer service interruption, or damage to facilities, the **Generator Operator** notifies the **Transmission Operator** and **Balancing Authority** and the **Transmission Operator** notifies its **Reliability Coordinator** and adjacent **Transmission Operators**, at the earliest possible time.

The NPCC Reliability Coordinators maintain the NPCC list of "Facilities for Notification" that, if removed from service, may directly or indirectly **burden** a neighboring **Transmission Operator**.

4.6.2. Operating Within Limits

The **Reliability Coordinator** makes available to its operators a comprehensive set of **operating limits** for both normal and **emergency** conditions, including clear instructions describing the circumstances when these limits are to be used.

Where inter-**Area** reliability is affected, the **Reliability Coordinator** establishes limits and operates so that the **contingencies** can be withstood without adversely affecting other **Areas.** During **emergencies**, the **Reliability Coordinator** is required to operate within the applicable **emergency System Operating Limits** (**SOL**) and **Interconnection Reliability Operating Limits** (**IROL**). The **Reliability Coordinator** is required to implement **emergency** measures, including shedding of firm load, to maintain the operation of the power system within the applicable **emergency** limits.

In instances where there is a difference in derived limits, the **Reliability Coordinator** operates the **BPS** to the most limiting parameter.

The **Reliability Coordinators** and **Transmission Operators** have sufficient real time information and analysis tools to determine potential **SOL or IROL** exceedances. This analysis is conducted in all operating timeframes. The **Reliability Coordinator** uses the results of these analyses to determine the causes of the exceedances and identify mitigating actions.

Each **Reliability Coordinator** identifies the cause of any potential or actual **SOL** or **IROL** exceedances. The **Reliability Coordinator** initiates the control action or **emergency** procedure to relieve the potential or actual **IROL** exceedance without delay, and no longer than 30 minutes. The **Reliability Coordinator** is able to utilize all resources, including load shedding, to address an **IROL** exceedance.

When an **SOL** or **IROL** exceedance is imminent, **Reliability Coordinators** must be aware that Transmission Loading Relief (TLR) procedures may not be able to address the exceedance in a timely fashion. In such circumstances the **Reliability Coordinators** have the authority and obligation to immediately direct their **Transmission Operators**, **Generation Operators** and **Balancing Authorities** to re-dispatch generation, reconfigure transmission, manage **interchange** transactions, or reduce system demand which may include shedding of firm load. These actions are used in conjunction with the TLR procedure to restore the system to normal state. The **Reliability Coordinator** coordinates these **emergency** control actions with other **Reliability Coordinators** as needed.

4.6.3. Frequency Control

The **Reliability Coordinator** identifies sources of large **Area Control Error** that may be contributing to **frequency error**, **time error**, or **inadvertent interchange** and discusses corrective actions with the appropriate **Balancing Authority**. If a **Frequency Error**, **Time Error**, or inadvertent problem occurs, the **Reliability Coordinator** initiates a NERC hotline call to discuss the **frequency error**, **time error**, or **inadvertent interchange** with other **Reliability Coordinators**, as appropriate. The **Reliability Coordinator** directs its **Balancing Authorities** to comply with **BAAL** and **DCS**.

During a system **emergency**, the **Reliability Coordinator** complies with NERC **BAL Standards**. The **Reliability Coordinator** does not rely on the frequency bias of the other **Transmission Operators**, **Generation Operators** and **Balancing Authorities** to provide energy during the **emergency** because doing so reduces the

Interconnection's ability to recover its frequency following additional generator failures.

If the **Reliability Coordinator** determines that **Balancing Authorities** within its **Area** cannot comply with the **NERC BAL Standards**, then it declares an **Energy Emergency** and implement remedies such as requesting assistance from other **Reliability Coordinators**, or implementing load reduction through public appeals, **voltage reduction**s, curtailing interruptible loads and shedding firm load to return **ACE** to acceptable **BAAL** and **DCS** criteria.

4.6.4. Reactive Power Balance and Voltage Control

When an **Area** is experiencing abnormal voltage conditions, its **Reliability Coordinator** takes action to restore the reactive power balance. The **Reliability Coordinator** implements corrective control actions, which include requesting **emergency** assistance. If these actions are still not adequate to mitigate the reactive power imbalance then the **Reliability Coordinator** takes all necessary steps to relieve the abnormal voltage conditions, including firm **load shedding.**

4.6.5. Inter-Area Voltage Coordination

Adjacent **Reliability Coordinator Areas** coordinate voltage criteria and procedures and mutually agreed upon procedures for inter-**Reliability Coordinator Area** voltage control.

4.6.6. Parallel Flows

If an **emergency** is caused in whole or in part by parallel power flows, the **Reliability Coordinator Area** or **Areas** contributing to parallel power flows takes all steps, including firm **load shedding**, to eliminate the circulating power flow contributing to the **emergency**. The **Area** experiencing the **emergency** implements all steps up to and including firm **load shedding** in accordance with local or NERC TLR procedures.

4.6.7. Maintaining Adequate Operating Reserve

Balancing Authorities in coordination with their respective **Reliability Coordinator** maintain specific instructions for maintaining and reestablishing of **Operating Reserve** of each **Area** when any **Area** is forecasting or experiencing an **Operating Reserve** deficiency.

4.6.8. Emergency Operating Plans

Reliability Coordinator, Transmission Operators, **Generation Operators** and **Balancing Authorities** develop, maintain, and implement as necessary, a set of plans to resolve operating **emergencies**. These plans are coordinated with each other, as appropriate.

The purpose of these plans is to present the basic factors to be considered in formulating procedures to be followed in an **emergency** or during conditions which could lead to an **emergency**, in order to facilitate mutual assistance and coordination within NPCC.

4.7. Plans for Loss of Primary Control Center Functionality

Each **Reliability Coordinator**, **Transmission Operator** and **Balancing Authority** maintains a plan to continue reliable operations in the event its primary control center becomes inoperable.

5. System Restoration

After a system collapse, the **Reliability Coordinator** and its affected responsible entities coordinate their restoration actions. Restoration priority is given to establishing the transmission system and providing station service supply to power plants. **Transmission Operators**, **Generation Operators** and **Balancing Authorities** avoid any action that would cause a subsequent collapse of the **BPS**. Customer load is restored as generation and transmission equipment becomes available, recognizing that load and generation must remain in balance at normal frequency.

5.1.Reliability Coordinator Restoration Plan

The **Reliability Coordinator** is aware of, and maintains a copy of, the restoration plan for each **Transmission Operator** in its **Reliability Coordinator Area** in accordance with NERC and Regional requirements. During system restoration, the **Reliability Coordinator** monitors restoration progress and coordinates any needed assistance.

The **Reliability Coordinator** maintains an **Area** restoration plan that provides for the reliable restoration of its **Area** and coordination with its responsible operating entities and the neighboring **Reliability Coordinators.**

5.2. Reliability Coordinator is the Primary Contact

The **Reliability Coordinator** serves as the primary contact for disseminating information regarding restoration to neighboring **Reliability Coordinators** and to responsible entities within its **Reliability Coordinator Area** not immediately involved in restoration.

5.3. Reestablishing Normal Operations

The **Reliability Coordinator** takes actions in accordance with its restoration plan to restore normal operations once the operating **emergency** has been mitigated. Following a **disturbance** that caused the electrical isolation of one or more parts of the **BPS**, control actions are implemented to return the **BPS** to normal. These actions include:

5.3.1. Evaluate the Condition of the Bulk Power System

The affected **Transmission Operators** and **Balancing Authorities** work in conjunction with their **Reliability Coordinator(s)** to determine the extent and condition of the isolated areas.

5.3.2. Restore Frequency

The affected **TOPs and BAs** under the direction of **Reliability Coordinator** take the necessary action to restore the **BPS** frequency to normal, including adjusting generation, placing additional generators on line, or shedding load.

5.3.3. Review Interchange Schedule

The **Reliability Coordinator** reviews the **interchange schedules** within the affected areas and make the necessary adjustments to facilitate restoration. The **Reliability Coordinator** makes all attempts to maintain the adjusted **interchange schedules** irrespective of whether generation control is manual or automatic.

5.3.4. Re-synchronize

The **Reliability Coordinator** approves, communicates and coordinates the re-synchronization of major system **islands** or synchronization points so that the adjacent **Reliability Coordinator Areas** are not **burdened**.

5.4. Priority to Supply Power to Nuclear Plants

The affected **Transmission Operators** and **Balancing Authorities** work in conjunction with their **Reliability Coordinator to** give the highest priority to restore the power supply to nuclear stations.

5.5. Communication and Coordination

Effective communication and coordination is critical during the restoration process. **Reliability Coordinators** issue **Operating Instruction**s in a clear, concise and definitive manner.

6. Reliability Monitoring and Coordination

6.1. Coordination Agreements

The **Reliability Coordinator** has clear, comprehensive coordination agreements with adjacent **Reliability Coordinators** to identify the actions of adjacent **Reliability Coordinator Areas** to coordinate the mitigation of **SOL** or **IROL** exceedances.

6.2. Data Requirements

Each **Reliability Coordinator** determines the data requirements to support its Reliability Coordination tasks and requests such data from its **Transmission Operators**, **Balancing Authorities**, **Transmission Owners**, **Generation Owners**, **Generation Operators**, and **Distribution Providers**, or adjacent **Reliability Coordinators**.

6.3. Data Exchange

Each **Reliability Coordinator** provides, or arranges provisions for, data exchange to other **Reliability Coordinators** or **Transmission Operators** and **Balancing Authorities** via a secure network.

6.3.1. Voice Communications

Each **Reliability Coordinator**, **Transmission Operator** and **Balancing Authority** provides adequate and reliable telecommunication facilities to ensure the exchange of interconnection and operating information necessary to maintain reliability. These facilities are provided between the **Reliability Coordinator** and its responsible entities and with other **Reliability Coordinators** as necessary to maintain reliability. Where applicable these facilities are redundant and diversely routed.

Each **Reliability Coordinato**r and its responsible entities manage alarm, test and/or actively monitor vital telecommunications facilities. Special attention is given to **emergency** telecommunications facilities and equipment not used for routine communications.

6.3.2. Data Monitoring

Each **Reliability Coordinator** maintains detailed real-time monitoring capability of its **Reliability Coordinator Area** and sufficient monitoring capability of its surrounding **Reliability Coordinator Areas** to identify potential or actual **System Operating Limit** or **Interconnection Reliability Operating Limit** exceedances. The information provided can be easily understood and interpreted by the **Reliability Coordinator**'s operating

personnel, giving particular emphasis to alarm management and awareness systems, automated data transfers, and synchronized information systems, over a redundant and highly reliable infrastructure.

6.4. Coordination and Monitoring

6.4.1. Intra-Area Monitoring and Coordination

Each of the five **Areas** in NPCC (New York, New-England, Ontario, Québec and the Maritimes) monitors and controls operating problems and events affecting reliability within their jurisdiction. Each **TOP and BA** is responsible for notifying their respective **Reliability Coordinator** of any abnormal conditions that require Inter-**Area**/Regional action.

6.4.2. Inter-Area/Regional Monitoring and Coordination

Monitoring and coordination for most operating concerns between **RCs**, **TOPs and BAs** either within the Region or with **RCs**, **TOPs and BAs** in other Regions, are carried out by the **Reliability Coordinators**. This includes both foreseen and unforeseen events.

The **Reliability Coordinator** coordinates with other **Reliability Coordinators**, including actions to mitigate abnormal operating conditions, actions to contain an **emergency**, and actions for system restoration.

6.4.3. Inter-Regional Monitoring and Coordination

6.4.3.1. Real-time:

Through use of the Eastern Interconnection Data Sharing Network (EIDSN) **RCs**, **TOPs and BAs** share specific operating information relevant to Inter-Regional operation as prescribed by NERC Reliability Standard such as Inter-tie flows, line and **flowgate** limits, **ACE**, generator status, load and frequency.

In addition, **Reliability Coordinators** use the **Reliability Coordinator Information System** (**RCIS**), EIDSN and the **Interchange Distribution Calculator** (**IDC**) for providing reliability and transaction information. Each communication tool is used to share and monitor essential operating parameters and/or system reliability status between **Reliability Coordinators** and respective **Reliability Coordinator Areas**. Information exchanged includes peak load, expected and required reserve, largest **single contingency**, MW available in 24 hours, generator and major transmission outages, unusual operating and weather conditions. The **RCIS** is used to send, in

template format, text information to report on **emergencies** and share critical operating information with other **Reliability Coordinators**.

6.5. NPCC Conference Calls

6.5.1. Daily Area Control Room Coordination Conference Calls

Each morning, the NPCC **Reliability Coordinator** control rooms, NPCC Staff,MISO and PJM, take part in a regularly scheduled conference call. The goal of this call is to alert all neighboring **Reliability Coordinators** of any potential emerging problems which could lead to reliability concerns in the course of the day's operations.

Subjects for discussion are limited to credible events which could impact the ability of a **Reliability Coordinator** to serve its load and meet its **operating reserve** obligations, or which would impose a burden to the neighboring NPCC **Areas** or the **Eastern Interconnection**.

6.5.2. Weekly Conference Calls

NPCC Staff convenes weekly conference calls to discuss expected operating conditions for the coming 7-day period. PJM and MISO also participate in these conference calls.

6.5.3. Emergency Conference Calls

NPCC has procedures in place to initiate an **"Emergency Preparedness** Conference Call" among the RCs of NPCC and NPCC Staff to discuss issues related to the adequacy and security of the interconnected bulk power supply system of the Northeast Power Coordinating Council. MISO and PJM also participate, as needed.

7. Reliability Applications

7.1. Analysis Tools

Each **Reliability Coordinator** has adequate analysis tools such as state estimation, pre- and post-**contingency** analysis capabilities (thermal, **stability**, and voltage), and **Wide Area** overview displays as required for maintaining **BPS** reliable operations.

7.2. Communication Facilities

Each **Reliability Coordinator** maintains adequate communications facilities (voice and data links) to appropriate entities within its **Reliability Coordinator Area**. These communications facilities are staffed and available to act in addressing a real-time **emergency** condition.

7.3. Real Time Monitoring

Each **Reliability Coordinator** continuously monitors its **Reliability Coordinator Area**. Each **Reliability Coordinator** has provisions for backup facilities that are utilized if the main monitoring system is unavailable. Each **Reliability Coordinator** ensures that **SOL** and **IROL** monitoring and calculations continue if the main monitoring system is unavailable.

8. Staffing and Training

8.1. Reliability Coordinator Staffing Requirements

The **Reliability Coordinator** is staffed with adequately trained and NERC-Certified **Reliability Coordinator** operators, 24 hours/day, seven days/week.

8.2. Certification

Each **Transmission Operator**, **Balancing Authority**, and **Reliability Coordinator** staffs all operating positions that meet either one or both of the following criteria with personnel that are NERC-certified for the applicable functions:

- Positions that have the primary responsibility, either directly or through communications with others, for the real-time operation of the interconnected **BPS**.
- Positions directly responsible for complying with NERC standards.

While in training, an individual without the proper NERC certification credential may not independently fill a required operating position. Trainees may perform critical tasks only under the direct, continuous supervision and observation of the NERC certified individual filling the required position.

8.3. Staff Expertise

Reliability Coordinator operating personnel have an extensive understanding of the **Balancing Authorities**, **Transmission Operators**, and **Generation Operators** within the **Reliability Coordinator Area**, including the operating staff, operating practices and procedures, restoration priorities and objectives, outage plans, equipment capabilities, and operational restrictions.

8.4. Training

8.4.1. Training Requirements

All **Reliability Coordinators, Transmission Operators and Balancing Authorities** provide their **System Operators** with a coordinated training program that is designed to promote the reliable operation of the **BPS**. This program includes objectives based on the NERC Standards and NPCC documentation.

9. NPCC Operating Considerations

9.1. ISO-NE

a) Is the **Reliability Coordinator** for the New England **Area**.
b) Has the coordination responsibility to provide interconnection protection against large source **contingencies** in ISO-NE.
c) The ISO-NE reliability role is to limit the magnitude of the **contingencies** noted above to levels which will not result in exceedance of NYISO and PJM (RF) operating criteria and will not jeopardize the reliability of the **BPS**. ISO-NE is responsible to control the size of these potential **contingencies** to achieve this objective. If necessary, ISO-NE will reduce imports on Phase II HVdc or order reduction of generation.

9.2. NYISO

a) Is the **Reliability Coordinator** for the New York **Area**.
b) Is the coordinator for "Simultaneous Activation of Reserve" (SAR).
c) Interacts closely with PJM and IESO to monitor and control parallel flow effects on the Michigan-Ontario, New York–Ontario, and New York-PJM **flowgates** as well as NY's internal **interfaces** (such as Dysinger East and Central East) which may be impacted by Lake Erie circulation.
d) Coordinates changes with adjacent **Reliability Coordinators** on the phase shifters with IESO, ISO-NE and PJM.

9.3. The Independent Electricity System Operator (IESO)

a) Is the **Reliability Coordinator** for the Ontario **Area**.
b) Interacts closely with NYISO, MISO and PJM to monitor and control parallel flow effects on the Michigan – Ontario, New York – Ontario, and New York – PJM **flowgates** as well as Ontario's internal **flowgates** (such as Queenstown Flow West and Bruce Longwood Input) which may be impacted by Lake Erie circulation.
c) Coordinates with adjacent **Reliability Coordinators** changes on the phase shifters with Manitoba Hydro, Minnesota Power and Light, MISO, NYISO and PJM.

9.4. System Control Department (Direction Contrôle des mouvements d'énergie), Hydro-Québec TransÉnergie

a) Is the **Reliability Coordinator** for the Québec **Interconnection**.
b) Is connected to the **BPS** through DC facilities only and selected isolated generation or isolated load.
c) Coordinates operations with NYISO, ISO-NE, IESO and the Maritimes.

9.5. New Brunswick Power – System Operator (NBP-SO)

a) Is the **Reliability Coordinator** for the Maritimes **Area**.
b) Coordinates operations with ISO-NE through its synchronous ties to the Eastern **Interconnection**, and with HQT through DC facilities.
c) The NBP-SO serves as the **Reliability Coordinator** for New Brunswick Power, Nova Scotia Power Incorporated, the province of Prince Edward Island, Maine Public Service Company and the Eastern Maine Electric Cooperative. The NBP-SO serves as the **Balancing Authority** for New Brunswick Power, the province of Prince Edward Island, Maine Public Service Company and the Eastern Maine Electric Cooperative. The province of Prince Edward Island, Maine Public Service Company and the Eastern Maine Electric Cooperative are not part of the **Bulk Power System**.

9.6. Descriptions of Specific Operating Considerations

9.6.1. Central-East Interface (NYISO)

This **interface** consists of numerous transmission lines in Mohawk Valley region of upstate New York. Central–East tends to load in an easterly direction. **Contingencies**, such as large generation loss east of the **interface** can lead to voltage collapse or instability in the New York **Area** if the established limits are not respected. The Central-East **interface** is monitored by the NYISO and procedures are in place (NYISO Emergency Operations Manual) such that generation re-dispatch and/or curtailment of transactions or **load shedding** can be initiated by NYISO as required to maintain (or regain) a safe margin on the **interface**. In addition to NYISO, the impact of these changes can involve IESO, ISO-NE, HQT and/or PJM depending on conditions in effect at the time.

9.6.2. Hydro-Québec TransÉnergie Phase II HVdc Exports

The Phase II Exports to ISO-NE are monitored by ISO-NE to ensure that interface or voltage limits ranging from the west of PJM through NYISO will not be violated. Using real-time data from both PJM and NYISO, ISO-NE coordinates with the Québec **Reliability Coordinator** the maximum allowable exports from HQT on Phase

II in order to maintain the interconnected system in a secure operating state (as per ISO-NE Transmission Operating Guides "Procedure to Protect for the Loss of Phase II Imports").

9.6.3. Maritimes Area-New England Minimum Tie Flow

During facility out conditions, within the NBP-SO or ISO-NE areas, the 345 kV **interface** from northern New England to the Maritimes **Area** may require that minimum export levels be maintained from the Maritimes **Area** in order to avoid **stability** and voltage problems in both **Areas** following large source **contingencies** in the Maritimes **Area**. The amount of power flow required is monitored by ISO-NE and NBP-SO. The minimum tie flow limits are based on a number of variables including: the element that is out of service, size of the largest Maritimes **Area** source **contingency**, generator dispatch in Maine, Generator and Madawaska HVDC dispatch in NB, Status of the Lepreau Nuclear Generating Station, status of the Chester SVC, status of the Coopers Mills STATCOM, status of the Dogtown SVC, and status of Orrington Series Capacitors.

9.6.4. New Brunswick – Nova Scotia Interconnection Controlled Separation and Under Frequency Load Shedding

The province of Nova Scotia (NS) is radially connected to the Eastern **Interconnection** through synchronous ties with New Brunswick (NB). During heavy **interface** flows from NB to NS, a single **contingency** will initiate a controlled separation of NS from NB and the Eastern **Interconnection**. Upon separation, the generation deficiency in Nova Scotia may be significant enough for NS to experience frequency decline to the point of triggering the first and possibly second stage of under frequency **load shedding**. The risk associated with separation and under frequency **load shedding** has been deemed acceptable to the province of NS. The separation of NS and the potential for under frequency **load shedding** does not have a significant adverse impact on the Eastern **Interconnection** as the loss of **load** due to controlled separation of NS is taken into consideration for all planning and operational studies within the Maritimes **Area**.

10. Plan Updates and Changes

This reliability plan will be reviewed every three years for changes. The plan should be updated, re-coordinated and re-endorsed by the NERC Real Time Operating Subcommittee (RTOS) for significant changes to the way NPCC RCs plan to meet the functional requirements.

Changes to the plan that would initiate an off-cycle update, re-coordination and re-endorsement can include but are not limited to:

- Significant changes to RC footprint BAs or TOPs (excluding new pseudo-ties)
- Significant changes to RC congestion management processes
- Changes that could have a significant impact on neighboring entities

Appendix A - Agreements with External Entities

1. Coordination Agreements:

- ISO-NE:
    i. Coordination Agreement between ISO-NE and NBP-SO
    ii. Coordination Agreement between ISO-NE and NYISO
    iii. Interconnections Operators Agreement between ISO-NE and HQ
- NYISO:
    i. NYISO Joint Operating Agreements with neighboring RCs
- NBP-SO:
    i. Interconnection Operators Agreement between NBP-SO and HQ-TransÉnergie
    ii. Coordination Agreement between ISO-NE and NBP-SO
- IESO:
    i. Ontario IESO interconnection agreements with neighbouring RCs (NY-ISO, HQ-TE, MISO)
- HQ-TE:
    i. Common Instructions between Hydro-Quebec TransÉnergie and IESO
    ii. Common System Operating Instructions between Hydro-Quebec TransÉnergie and NBP-SO
    iii. Communications Instructions for Hydro-Quebec TransÉnergie and NYISO
    iv. Common Instructions between Hydro-Quebec TransÉnergie and ISO-NE
    v. Common System Operating Instructions between Hydro-Quebec TransÉnergie and Velco.
    vi. Common System Operating Instructions between Hydro-Quebec TransÉnergie and NYPA
    vii. Common System Dispatch Instructions between Hydro-Quebec TransÉnergie and ISO-NE
    viii. Common System Dispatch Instructions between Hydro-Quebec TransÉnergie and ISO-NE
    ix. Common Operating Instructions for Niagara Mohawk Power Corporation, d/b/a National Grid.