

Data specification for the Direction principale – Contrôle des mouvements d'énergie et exploitation du réseau

**Requirements and procedures for reporting information
and data needed to operate the Main Transmission
System (RTP) of the Québec Interconnection**

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Version history

Version	Description of changes	Date
1	New document	2016/12/23
2	<ul style="list-style-type: none"> – Hydro-Québec’s Direction principale – Contrôle des mouvements d’énergie et exploitation du réseau (CMEER) [system control and operations] department becomes the Reliability Coordinator for Québec – Removal of reference to IRO-010-1a – Document: Updating of functions covered <ul style="list-style-type: none"> Removal of telecommunications service providers and computer service providers Addition of transmission service providers (TSP) and resource planner (RP) Titles added to some tables – Section 1: Changes to text – Section 2: Changes to list of entities covered – Section 3: Reorganization of subsections – Section 3.1: Addition of measurements and signals now required for non-RTP designated elements <ul style="list-style-type: none"> New SOR hyperlink Removal of file on busbars since it is no longer needed Removal of file on load-shedding devices (see Section 3.2) – Section 3.2: New section, “Measurements and signals associated with load-shedding devices” – Section 3.4: New section, “Measurement reporting requirements” – Section 4: Table, addition of “Functions covered” column – Section 5: Changes to text <ul style="list-style-type: none"> Table, merger of rows associated with generating and transmission facilities – Section 6: Reorganization of some tables and changes to text – Section 7: Reorganization of section and changes to text – Section 8: New section, “Notification of a modification or change in status” – Section 9: Changes to text <ul style="list-style-type: none"> Change in email address to which entities should send data and information – Section 10: Updating of references 	2018/06/30
3	<ul style="list-style-type: none"> - Document title revised - Requestors added to data tables 	2019/05/01

Version	Description of changes	Date
	<ul style="list-style-type: none">- Table 3.1: Minor revision- Table 3.2 and 3.3 : Addition of communication links- Table 3.4.1. : Review of the reading uncertainty characteristics- Section 4: Minor revision- Section 5 : Minor revision- Table 6.1: Clarification and revision of table- Table 6.3.2 : Minor revision- Table 6.4: Addition of definition for "small generating station"- Sections 6.4 and 6.5: Clarification of entities subject to these sections	

1. Objective

The objective of this document is to ensure that Hydro-Québec TransÉnergie’s Direction principale – Contrôle des mouvements d’énergie et exploitation du réseau (CMEER) [senior directorate – system control and operation] has all the data and information it needs to monitor and meet its obligations to assess the operation of the Québec Interconnection, including to perform its Operational Planning Analyses, Real-time monitoring, and Real-time Assessment, as Reliability Coordinator (RC), Balancing Authority (BA) and Transmission Operator (TOP), in accordance with the IRO-010-2 and TOP-003-3 reliability standards.

This data specification includes, but is not limited to:

- A list of the data and information needed by the RC, BA and TOP, including non-RTP data and external system data, as deemed necessary by CMEER
- Provisions for the notification of any current protection system and special protection system status or degradation that may impact System reliability
- A periodicity for providing data
- The deadline by which the specified data must be provided

CMEER’s data and information requirements are already set out in several documents referenced herein. This document is therefore an “integrating” document that collates all the data and information CMEER needs to fulfill its RC, BA and TOP roles.

Additionally, the scope of this document is broadened to include functions other than those covered by reliability standards IRO-010-2 and TOP-003-3, in accordance with other applicable standards (see [References](#))

Any entity unable to provide the data or information required under this document as of its effective date must inform CMEER of that fact as soon as possible. The entity must then agree with CMEER on a timetable for providing the data or information within two months of the effective date of this document.

Please note that this document does not under any circumstances exempt covered entities from complying with other reliability standard requirements applicable to them. The data and information reporting requirements set out in this document complement the requirements of other applicable reliability standards.

This document is available in the [Documentation](#) section of the Québec Reliability Coordinator website.

2. Functions covered

Entities performing the functions listed below must provide the data and information indicated in this document to CMEER whenever applicable:

- Reliability coordinators (RC) adjacent to (neighboring) the Québec Interconnection
- Transmission operators (TOP) adjacent to (neighboring) the Québec Interconnection (TOP-adj)
- Balancing authorities (BA) adjacent to (neighboring) the Québec Interconnection (BA-adj)
- Generator Owners (GO)
- Generator Operators (GOP)
- Transmission Owners (TO)
- Load Serving Entity (LSE)
- Distribution Providers (DP)
- Planning Coordinator (PC)
- Transmission Planner (TP)
- Transmission Service Providers (TSP)
- Resource Planner (RP)

3. Data and information for real-time monitoring and control

Element measurements and signals are used by both operating personnel and several computer applications critical to real-time decision-making by CMEER system operators. Measurements and signals must be provided through ICCP points or via another CMEER-specified communication tool.¹ When CMEER updates the following list of data and information to be provided, it will grant entities a reasonable time to submit the new measurements and signals.

3.1 Measurements and signals for RTP elements and non-RTP designated elements

The table below lists HQT's Standard Operating Requirements (SORs), which specify CMEER requirements for real-time measurements and signals related to Main Transmission System (RTP) elements.

SORs are available through this link: [FICHES BENEX](#)

In addition, real-time measurements and signals required by CMEER for certain designated elements not associated with the RTP are also indicated in the SORs.

Please note that CMEER sends each covered entity a list of non-RTP elements for which measurements or signals are required.

In the SORs, measurements and signals required for RTP elements are shown in uppercase, and measurements and signals required for non-RTP designated elements are shown in lowercase.

¹ Inter-Control Center Communications Protocol

Table 3.1: Measurements and Signals for RTP Elements and Designated Elements

Element	SOR	Requestors	Functions covered
Buildings	BNX-N-BATIMENT	TOP	TO
Generating stations and dams	BNX-N-CENTRALES	BA	GOP
Static compensators (CLC)	BNX-N-CLC	TOP	TO/TOP-adj
Synchronous compensators (CS)	BNX-N-CS	TOP	TO/TOP-adj
Series compensators (CXC)	BNX-N-CXC	TOP	TO/TOP-adj
Capacitors (XC)	BNX-N-XC_SHUNT	TOP	TO/TOP-adj
Circuit breakers	BNX-N-DISJ	BA/TOP	GOP/TO/TOP-adj
Wind turbines²	BNX-N-EOLIEN	BA	GOP
Converter units (GC)	BNX-GC	TOP	TO/TOP-adj
Generating units	BNX-N-ALT	BA	GOP
Reactors (XL)	BNX-N-INDUCTANCE_SHUNT	TOP	GOP/TO/TOP-adj
Lines	BNX-N-LIGNE	TOP	TO/TOP-adj
Disconnect switches (except disconnect switches that serve only to isolate a circuit breaker)	BNX-N-SECTIONNEUR	BA/TOP	GOP/TO/TOP-adj
Transformers	BNX-N-TRANSFO_ART	TOP	GOP/TO/TOP-adj

² All measurements and signals required from wind farms are grouped under the same equipment category (i.e., Wind turbines).

3.2 Measurements and signals for load-shedding devices

The load-shedding devices covered are those that are controlled by special protection systems (SPS/RAS) and underfrequency load shedding systems.

The covered TOs and DPs are those that own or operate these load-shedding devices.

Data/Information	Unit of measurement	Requestors	Functions covered	Update frequency	Communication protocol or interchange method	Format	Deadline for reporting data/information (when applicable)
Measurement of voltage on high-voltage side of substation where load-shedding device is located	kV	BA/TOP	TO/DP	Every 5 s	HQT “Serial load-shedding device” protocol	Serial (RS-232)	N/A
Load-shedding device and its communication links status (ON/OFF)	N/A	BA/TOP	TO/DP				
For control substations only (point calculated at the telecontrol center (CT) used by DCY [rotating load shedding] software), calculated total real power of facility (sum of transformer power)	MW	BA/TOP	TO/DP				

3.3 Measurements and signals for special protection systems (SPS/RAS)

The list of special protection systems (SPS/RAS)³ monitored by the CMEER System Control Center (CCR) may be made available on request subject to a confidentiality agreement between CMEER and the requestor. CMEER nevertheless reserves the right to refuse to release this list if it considers that the required conditions have not been met to its entire satisfaction or that there are insufficient grounds for the request.

For all SPS/RAS in Québec, there is a Standard Operating Requirements (SOR) specification setting out CMEER's requirements in regards to measurements and signals. At a minimum, the ON/OFF status of all special protection systems (SPS/RAS) is reported to the system control center (CCR). CMEER will contact entities involved in one or more special protection systems (SPS/RAS) on this list to inform them of the requirements regarding measurements and signals.

Data/Information	Unit of measurement	Requestors	Functions covered	Update frequency	Communication protocol or interchange method	Format	Deadline for reporting data/information (when applicable)
Status of special protection systems (SPS/RAS), its communication links and their components (ON/OFF and degradation)	N/A	RC/BA/TOP	GOP TO	On change of status	ICCP	N/A	N/A
Status of special protection systems (SPS/RAS) that may affect the operating limits of the Main Transmission System (RTP) or those of the interconnections or else may affect protection of the integrity of its elements against severe system phenomena (ON/OFF and degradation)	N/A	RC/BA/TOP	TOP-adj	On change of status	ICCP	N/A	N/A

Since each special protection system (SPS/RAS) has unique features, states and signal elements, it is essential to review their Standard Operating Requirements (SORs) to identify any additional information that must be provided.

³ Remedial Action Scheme (RAS) and Special Protection System (SPS)

3.4 Measurement reporting requirements

Unless there are different instructions from CMEER, data reporting requirements are set out in detail below.

3.4.1 Measurements of electrical quantities

3.4.1.1. Measurement chain uncertainty

The table below shows the tolerated uncertainty for each parameter measured.

Reading uncertainty characteristics			
Parameter	Range p.u.	Analog chain ±% reading (RSS) ⁴	IED chain ⁵ ±% reading (RSS)
Voltage	1.1	≤1.25	≤0.85
	1	≤1.3	≤0.85
	0.9	≤1.35	≤0.85
Current	1	≤1.15	≤0.75
	0.6	≤1.55	≤0.75
	0.2	≤3.3	≤0.92
Real power ±	1	≤1.4	≤1
	0.5	≤1.95	≤1
	0.1	≤6.25	≤1
Reactive power ±	1	≤1.4	≤1.75
	0.5	≤1.95	≤1.75
	0.1	≤6.25	≤1.75
Frequency (generator)	1.08	≤0.3	≤0.02
	1	≤0.35	≤0.02
	0.92	≤0.35	≤0.02
Frequency (system)	1.08	≤0.3	≤0.02
	1	≤0.35	≤0.02
	0.92	≤0.35	≤0.02
Energy		As per needs (hydrology and business commitments) and Measurement Canada requirements	

Note 1 : These requirements do not consider uncertainty caused by dead band. The displayed value may differ from the actual value if it is within the dead band defined in Section 3.4.1.3.

⁴ Root Sum Square

⁵ Intelligent Electronic Device. IEDs receive data from sensors, equipment (electrical and mechanical), and can issue control commands, such as tripping circuit breakers if they detect voltage or current anomalies, or rise/fall the voltage levels to maintain the desired level. Types of IEDs are protection relays, tap-changer controllers, automatic reclosing devices, voltage regulators, temperature monitoring units, etc.

Note 2 : A minimum threshold display value of 0.5% of the nominal (rated) value is allowed; below this, zero may be displayed.

Measurement chain uncertainty for interconnection lines must be defined at the design stage.

3.4.1.2. Measurement units and resolution

The table below shows the unit prefix and symbol, and desired resolution for each parameter.

Parameter	Unit prefix and symbol	Resolution (display)
Voltage $>44\text{kV}$	kV	Unit
Voltage $\leq 44\text{kV}$	kV	Tenth
Voltage <small>s.a. 600 V</small>	V	Unit
Current	A	Unit
Real and reactive power	MW, MX	Tenth
Real and reactive power <small>s.a. 600 V</small>	kW, kX	Tenth
Energy	MWh	Unit
Frequency ^{Note 3}	Hz	Hundredth

Note 3 : Target range: 55–65 Hz

3.4.1.3. Dead band

The dead band for all measurement parameters must not exceed four tenths of one percent (0.4%) of full scale. The dead band is usually set at 4 counts out of 1,600, i.e., 0.25%.

3.4.1.4. Availability

In the event of an auxiliary AC power supply outage, whether partial or total, all measurements must remain functional. A backup measurement is required at the panel control.⁶ It can be provided by a dedicated measuring device, a protective relay or an intelligent electronic device (IED). When the measurement is provided by a protective relay and there are redundant protection systems (protections “A” and “B”), the default measurement at the central control unit must be provided by protection A and the backup must be provided by protection B, with switching assured via an automatic device. Given medium-voltage line feeders with two metal-clad circuit breakers, the current for each circuit breaker must be measured at the panel control, and the currents must then be added together at the Central Control Unit.^{7,8}

⁶ Control from a panel, plant panel or auxiliary service cabinet.

⁷ Part of the system having a nominal phase-to-phase voltage of between 750 V and 34.5 kV, inclusive.

⁸ Main control level of the facility. Includes all the elements required for the operation and is located at the control room of the main building.

4. Modeling data and test results

The Planning Coordinator (PC) for the Québec Interconnection must make validated modeling data for the RTP elements available to CMEER. Among other things, this data serves as input to the system control center (CCR) computer tools used for real-time and planning assessments. These tools are primarily used for pre- and post-contingency analyses. Their uses include calculating stability limits.

Table 4.1: Transmission System Modeling Data

Element to be modeled	Requestors	Functions covered	Parameters to be provided	Data reporting method and format	Update frequency and deadline, when applicable
Generation (e.g., generators and step-up transformers)	RC/TOP	PC	See Section 3 of the document below*	See Section 7 of the document below *	See Section 7.2 of the document below *
Transmission (e.g., lines, transformers, busbars, reactors and compensation equipment)	RC/TOP	PC	See Section 4 of the document below *	See Section 7 of the document below *	See Section 7.2 of the document below *
Load modeling	RC/TOP	PC	See Section 5 of the document below *	See Section 7 of the document below *	See Section 7.2 of the document below *

* Document: [“Exigences et procédures relatives à la transmission de données pour la modélisation du réseau de transport” \[Transmission System Modeling Data Requirements and Reporting Procedures\]](#)

Data relating to the tests described in Procedure IQ-P-001 (Verification of Maximum Real and Reactive Power Capabilities of Main Transmission System (RTP) Generating Facilities and Synchronous Compensators) must be reported to CMEER, as indicated in the table below.

Table 4.2: Maximum Real and Reactive Power Testing Data

Data/Information	Unit of measurement	Requestors	Functions covered	Update frequency	Communication protocol or interchange method	Format	Reporting deadline (when applicable)
Data on station testing of maximum real and reactive power	MW/Mvar	BA/TOP	GO				See IQ-P-001
Data on unit testing of maximum real and reactive power	MW/Mvar	BA/TOP	GO TO				

5. Data and information related to outage management

Outage management data and information are provided in accordance with the applicable documents for the different entities. The table below gives the applicable document(s) for each entity.

Outages may be requested for maintenance (scheduled or unscheduled), long-term operability or expansion purposes; however, such outages must be coordinated in order to ensure safe, reliable Main Transmission System (RTP) operation. Emergency outage requests must also be sent to CMEER.

Entities	Applicable outage management documents
Hydro-Québec TransÉnergie (HQT)	TEC-GES-N-02 Outage Management GEN-D-007 Outages Requiring System Operations and Control (DCME) Approval
Hydro-Québec Production (HQP)	PP-01-00-00, Generation Outage Request Management
Other	Common Instructions between the entity and HQT

Table 5.1: Outage Management Related Data and Information

Data/Information	Unit of measurement	Requestors	Functions covered	Update frequency	Communication protocol or interchange method	Format	Reporting deadline (when applicable)
RTP and non-RTP designated elements	N/A	RC/BA/TOP	Associated GO or GOP TO TOP-adj	Annual planning OR Scheduled, unscheduled or emergency outage request	Telephone, email or web interface (HQ internal)		See above-referenced documents
Equipment associated with a telecommunication system, special protection system (RAS/SPS) or other protection system ⁹	N/A	RC/BA/TOP	Associated GO or GOP TO TOP-adj	Annual planning OR Scheduled, unscheduled or emergency outage request	Telephone, email or web interface (HQ internal)		See above-referenced documents

⁹ Outages of this type of equipment can affect special protection systems (RAS/SPS) and/or other protection systems used to provide stability and safety for the Main Transmission System (RTP), interconnections and related facilities. As soon as any component of these systems is unable to perform its function, its status must be reported to CMEER immediately, with no intentional delay.

6. Forecast data, mitigating actions and other data needed for generation/load balancing

6.1 Data needed to calculate operating reserves

Hydro-Québec Production (HQP) is the only Generator Operator (GOP) required to report the necessary operating reserves data in order to provide its Interconnected Operations Services. The information required in Table 6.1 is used to determine the data for calculating operating reserves, by means of the data below:

- Normal effective capacity per generator
- Stability effective capacity per generator
- Upper regulating margin for Automatic Generation Control (AGC/RFP)

Data/ Information	Unit of measurement	Requestors	Functions covered	Update frequency	Communication protocol or interchange method	Format	Reporting deadline (when applicable)
The CMEER dynamic calculation module uses the following data: <ul style="list-style-type: none"> • Water level indicator upstream of generating station • Water level indicator 	Metres (m) and number of units	BA	GOP	At least once per hour	Dynamic calculation module	Numerical values	N/A

Data/ Information	Unit of measurement	Requestors	Functions covered	Update frequency	Communication protocol or interchange method	Format	Reporting deadline (when applicable)
upstream of downstream generating station <ul style="list-style-type: none"> • Availability of station's units 							
Update of generating station characteristics		BA	GOP	Twice a year or as needed	Email	.typ et .con	November and April
Capacity that is recallable or load can be interrupted in less than 10 or 30 minutes	MW	BA	BA-adj	At least once per hour	Interchange schedules with neighboring system or contractual value agreed upon with customer	Hourly schedule in a text file or via an e- Tag in webTag	N/A
Capacity that is callable in less than 10 or 30 minutes	MW	BA	BA-adj	At least once per hour	Interchange schedules with neighboring system or contractual value agreed upon with customer	Hourly schedule in a text file or via an e- Tag in webTag	N/A

6.2 Data needed to calculate or correct Area Control Error (ACE)

The power system has two systems for controlling frequency: primary regulation, which involves active speed governor control, and secondary regulation, which is related to a special protection system (SPS/RAS) called “Réglage Fréquence-Puissance” (RFP) [Automatic Generation Control (AGC)]. The required data below is related to secondary regulation by AGC/RFP.

Data/ Information	Unit of measure ment	Requestors	Functions/ Entities covered	Update frequency	Communication protocol or interchange method	Format	Reporting deadline (when applicable)
Frequency	Hz	BA	HQT (TO)	<1 s	Interdepartmental exchange CME–HQT (TO)	N/A	N/A
Automatic Generation Control (AGC/RFP) control status of units	ON/OFF	BA	GOP with AGC participatio n	On change of status	ICCP	N/A	N/A

The actual output of units is also needed by AGC/RFP, but that data is already required under the SORs listed in Section 3.

The accuracy of measurement data must stay within the ranges specified in Section 3.4.

6.3 Load forecasting

Please note that the data and information required under this section is used to forecast the Québec Interconnection energy requirements, i.e., the “Besoins Québécois” (BQ) [Québec requirements]. Additional data and information required by the Balancing Authority can be provided on request, as stipulated in reliability standard [MOD-031-2](#).

6.3.1 Short-term data

6.3.1.1 Québec requirements (BQ) forecasting

Note that the data and information listed below do not include weather data, which is obtained through public/government services, e.g., Environment Canada.

This section includes the data and information required by CMEER to determine the validated actual last 7-day and forecast next 42-day hourly variations of major customers by BQ region and subsystem.¹⁰ Electricity-use data calculations also take into account actual hourly data from the CMEER data acquisition system.

The required data and information may be reported to CMEER through Hydro-Québec Distribution (HQD) when an agreement is in place between the DP and HQP.

¹⁰ A major customer is any customer whose consumption is 5 MW or more.

Data/ Information¹¹	Unit of measurement	Requestors	Entities covered	Update frequency	Communication protocol or interchange method	Format	Reporting deadline (when applicable)
Actual last 7-day hourly consumption of major customers	MW	BA	DP	Twice daily AND on request	IT transfer Email or phone (on request)	Oracle File (on request)	8:00 a.m. and 2:00 p.m.
One-off and calendar month forecasts of consumption variations (drops and interruptions) of major customers	MW	BA	DP	Weekly AND on request	Email	File	
Daily and monthly energy values of meters	MWh	BA	GO TO for inter- TO lines	Twice daily	Integration bus (HQT interdepartmental exchanges)	XML	8:00 a.m. and 2:00 p.m.
Monthly energy values of meters for each calendar month	MWh	BA	GO TO for inter- TO lines	Monthly	Email	File	First week of next month

¹¹ Quebec requirements (BQ) forecast calculations also take into account the following items provided by CMEER every 5 minutes: Gross actual last 1-day consumption per minute by BQ region and subsystem, and calculations, configurations, adjustments and hourly corrections.

6.3.2 Long-term data

Data/ Information¹²	Unit of measur ement	Requestors	Function s/ Entities covered	Update frequency	Communication protocol or interchange method	Format	Reporting deadline (when applicable)
Two-year monthly forecast of the Electric Power Carrier's local load and energy ¹³	MW and GWh	BA	DP	Annual planning	Email	Excel file	End of July
Ten-year forecast of the Electric Power Carrier's local load and energy	MW and GWh	BA	DP	Annual planning	Email	Email	End of July
Most recent update of the normalized peak power of a feeder connected to a load-shedding device	MW	BA	DP	Annually	Email	Excel file	October 1 every calendar year
Most recent update of the feeder priority	Rank	BA	DP	Annually	Email	Excel file	October 1 every calendar year

¹² Long-term data also includes the calculations, configuration, and hourly and weekly adjustments that CMEER provides yearly at the end of September.

¹³ Hydro-Québec when carrying on electric power transmission activities as defined in the Act respecting the Régie de l'énergie (R-6.01).

6.4 Generation forecasting

The data in this section is requested from the entities whose generating stations supply the native load in Québec.

The required data or information may be transmitted to CMEER through Hydro-Québec Distribution (HQD) or Hydro-Québec Production (HQP) when an agreement is in place between the GOP and HQD, or the GOP and HQP.

Data/ Information¹⁴	Unit of measur ement	Requestors	Functions/ Entities covered	Update frequency	Communication protocol or interchange method	Format	Reporting deadline (when applicable)
7-day wind generation forecast (by farm and/or point of connection)	MW	BA	GOP	Non-firm	Web service/IT transfer	File containing hourly schedules	N/A
2-year wind generation forecast (by farm and/or point of connection)	MW	BA	GOP	Every 6 months or upon request	Web service/IT transfer SFTP	File containing hourly schedules	N/A
Forecast of daily average flows of non-adjustable hydropower stations	m ³ /s	BA	GOP	When changed or upon request	Web service/IT transfer	File containing hourly schedules	Before 10:00 a.m.

¹⁴ In case of loss of real-time data acquisition, the forecast maximum capacity of RTP generating stations is used as the default value. CMEER provides this information once daily before 10:00 a.m. for the next 240 hours.

Data/ Information¹⁴	Unit of measur ement	Requestors	Functions/ Entities covered	Update frequency	Communication protocol or interchange method	Format	Reporting deadline (when applicable)
Forecast of generation station downtime	N/A	BA	GOP	When changed or upon request	Web service/IT transfer	SOAP XML	N/A
Restriction forecast (hydropower stations and seasonal stations)	N/A	BA	GOP	When changed or upon request	Web service/IT transfer	SOAP XML	N/A
Stress transfer forecast	N/A	BA	GOP	When changed or upon request	Web service/IT transfer	SOAP XML	N/A
Forecast of maximum power (PPM) of non-adjustable hydropower stations and thermal stations	MW	BA	GOP	When changed or upon request	Web service/IT transfer	SOAP XML	N/A
Forecast of generation of non-adjustable hydropower stations and thermal stations	MW	BA	GOP	When changed or upon request	Web service/IT transfer	SOAP XML	N/A

Data/ Information¹⁴	Unit of measur ement	Requestors	Functions/ Entities covered	Update frequency	Communication protocol or interchange method	Format	Reporting deadline (when applicable)
Generating strategies for adjustable hydropower stations	N/A	BA	GOP	When changed	Email	File	N/A
Hourly generation schedule for -1 (validated actual) to +28 (forecast) days for independent power producer (IPP) output by BQ region and subsystem	MW	BA	GOP	Twice daily Twice daily	FTP or SFTP	ASCII	9:00 a.m. and 2:00 p.m.

6.5 Interchange forecasts

The data in this section is requested from the entities involved in supplying the native load in Québec.

The required data or information may be transmitted to CMEER through Hydro-Québec Distribution (HQD) or Hydro-Québec Production (HQP) when an agreement is in place between the GOP and HQD, or the GOP and HQP.

Data/ Information	Unit of measur ement	Requestors	Entities covered	Update frequency	Communication protocol or interchange method	Format	Reporting deadline (when applicable)
Interchange forecast	MW	BA	TSP	Once a day for next 240 hours	Web service/IT transfer	File containing hourly schedules	N/A
1-year hourly forecast for independent power producers	MW	BA	GOP	6 months	Email	Excel file	End of July and end of January
Current and future official independent power producer (IPP) list		BA	RP	On demand	Email	Excel file	

6.6 Mitigating actions

6.6.1 Sequence of Hydro-Québec Production mitigating actions

Data/ Information	Unit of measu remen t	Requestors	Entities covered	Update frequency	Communication protocol or interchange method	Format	Reporting deadline (when applicable)
List of mitigating actions ¹⁵	N/A	BA	HQP (GOP)	Once an hour	FTP or SFTP	.CSV	Every hour at 40 minutes past the hour

¹⁵ This list includes interruptible loads under contract with Hydro-Québec Production (HQP). Note that the data and information required under Section 6.6.2 is required for these interruptible loads as well.

6.6.2 Interruptible loads

Hydro-Québec Production (HQP) is the only Generator Operator (GOP) to report interruptible load data in order to provide its Interconnected Operations Services (operating reserves).

Please note that changes to the interruptible load schedule should only be allowed between March 31 and December 1 to ensure a quality peak load forecast.

In addition, notice of any change to the schedule must be emailed to CMEER at least one week in advance.

Data/ Information	Unit of measure ment	Requestors	Entities covered	Update frequency	Communication protocol or interchange method	Format	Reporting deadline (when applicable)
Prior notice – Weekdays	hrs	BA	HQD (DP/RP) HQP (GOP)	Annually or when changed	Email	File	December 1 every calendar year
Prior notice – Weekend	Hour/ Day	BA	HQD (DP/RP) HQP (GOP)	Annually or when changed	Email	File	December 1 every calendar year
Maximum number of interruptions per day	Integer	BA	HQD (DP/RP) HQP (GOP)	Annually or when changed	Email	File	December 1 every calendar year
Minimum time between 2 successive interruptions	hrs	BA	HQD (DP/RP) HQP (GOP)	Annually or when changed	Email	File	December 1 every calendar year

Data/ Information	Unit of measurement	Requestors	Entities covered	Update frequency	Communication protocol or interchange method	Format	Reporting deadline (when applicable)
Maximum number of interruptions per winter period	Integer	BA	HQD (DP/RP) HQP (GOP)	Annually or when changed	Email	File	December 1 every calendar year
Duration of interruption	hrs	BA	HQD (DP/RP) HQP (GOP)	Annually or when changed	Email	File	December 1 every calendar year
Maximum duration of interruptions per winter period	hrs	BA	HQD (DP/RP) HQP (GOP)	Annually or when changed	Email	File	December 1 every calendar year
Contract validity period	Days or months	BA	HQD (DP/RP) HQP (GOP)	Annually or when changed	Email	File	December 1 every calendar year

7. Additional data and information

7.1 Other data and information for analysis and forecasting purposes

Other data and information is also required for analysis and forecasting purposes. The data listed below is needed for the proper operation of several CMEER applications (e.g., climate monitoring). System operators use such applications to support decision-making. CMEER will inform the Transmission Owners (TOs) and Generator Owners (GOs) of the list of targeted facilities 24 months before the data is required.

Data/ Information	Unit of measurement	Requestors	Entities covered	Update frequency	Communication protocol or interchange method	Format	Reporting deadline (when applicable)
Phasor or data needed to calculate angular displacement	Real and imaginary voltage values	RC/TOP	TO	1/60 s	Macrodyne OR equivalent Tools (e.g., C37.118)	Macrodyne or equivalent data (e.g., synchrophasor or PMU)	N/A
Voltage harmonic distortion OR data to calculate it (e.g., even harmonic values)	% (or real and imaginary harmonic values)	TOP	TO	<5 s	Macrodyne OR equivalent	Macrodyne OR equivalent	N/A
Latitude/longitude of lightning strike	Degrees	TOP	TO	On detection	Modem	Owner	N/A
Time of lightning strike	Month/day/hour/ minute/s/ms	TOP	TO	On detection	Modem	Owner	N/A

Data/ Information	Unit of measurement	Requestors	Entities covered	Update frequency	Communication protocol or interchange method	Format	Reporting deadline (when applicable)
Lightning discharge	kA	TOP	TO	On detection	Modem	Owner	N/A
Temperature	Degrees C	TOP	TO	<1 minute	Modem	Owner	N/A
Humidity	%	TOP	TO	<1 minute	Modem	Owner	N/A
Wind speed	m/s	TOP	TO	<1 minute	Modem	Owner	N/A
Wind direction	Degrees	TOP	TO	<1 minute	Modem	Owner	N/A
Number of frost sensor resets	Integer	TOP	TO	<1 minute	Modem	Owner	N/A
Accumulated weight of ice	Newton (N) (force sensor)	TOP	TO	<1 minute	Modem	Owner	N/A
Functional status of sensors	Fault/Alarm/Nor mal	TOP	TO	<1 minute	Modem	Owner	N/A

7.2 Documentation associated with special protection system (SPS/RAS) operation

Entities owning one or more special protection systems (SPS/RAS) covered in Section 3.3 of this document, must also send CMEER technical documentation describing the operating logic of these special protection systems (SPS/RAS). Microsoft Office and PDF file formats are accepted.

8. Notification of a modification or change in status

8.1 Real time

In the event of an unplanned outage of 30 minutes or more affecting telemetering and control equipment, monitoring and assessment capabilities, or associated communication channels between CMEER and a GOP, TO or neighboring TOP, the entities in question must advise the system control center (CCR) operator immediately.

Reference: [TOP-001-3](#) Requirement 9.

The neighboring TOP and the neighboring BA must notify the system control center (CCR) operator of any change in the status of their special protection systems (SPS/RAS) and protection systems in their area or any degradation of these systems that affects the Québec Interconnection. The neighboring TOP and the neighboring BA must take corrective action as soon as possible.

Reference: [PRC-001-1](#) Requirement 6, [TOP-003-3](#) Requirements 1, 1.2, 2 and 2.2, [TOP-001-3](#) Requirements 10 and 10.2.

The GOP and the TO must notify the system control center operator of any change in the status of their special protection system (SPS/RAS) and protection systems or any degradation of such systems that affects system reliability. The GOP and the TO must take corrective action as soon as possible.

Reference: [PRC-001-1](#) Requirements 2, 2.1, 2.2 and 6, [TOP-003-3](#) Requirements 1, 1.2 and 2.2, [TOP-001-3](#) Requirements 10, 10.1 and 11.

The GOP and TO must report any real-time change in the rating of a component (e.g., limitation of a generating unit) to the system control center operator.

8.2 Off line

The GO and TO must each provide CMEER with facility ratings for their solely or jointly owned facilities that are new, modified or re-rated, at least three months prior to commissioning of such facilities. If applicable, these entities must also provide the designation of the most limiting facility component at the same time.

Reference: [FAC-008-3](#) Requirements 7 and 8.

The TO, GO, GOP or DP reporting to reliability agencies under EOP-004-2 must immediately send CMEER a copy of any such report.

Reference: [EOP-004-2](#) Requirements 1 and 2.

The GOP, TO and neighboring TOP must coordinate all new protection systems and all protection system changes with CMEER at least three months prior to commissioning of such systems.

The GOP must notify CMEER prior to any changes in generation or operating conditions that could require changes to a TO's protection systems, by email, at the address specified in Section 9 of this document.

The neighboring TOP must notify CMEER prior to any changes in generation, transmission, load or operating conditions that could require changes in a TO's protection systems, by email, at the address specified in Section 9 of this document.

Reference: [PRC-001-1](#) Requirements 3, 4 and 5.

The GO and TO must report any addition, replacement, modification or dismantling of a component of a facility or a special protection system (SPS/RAS) to CMEER at least three months before the component in question is to be commissioned or dismantled. Such notice must be given by email at the address provided in Section 9 of this document.

The neighboring TOP and the neighboring BA shall report any addition, replacement, modification or dismantling of a component of a facility or special protection system (SPS/RAS) whose commissioning or dismantling affects the Québec Interconnection, at least three months before the component in question is to be commissioned or dismantled, by email, at the address specified in Section 9 of this document.

9. Other conditions

In this document, CMEER has specified, when available, the data formats, communication protocols and interchange methods that are acceptable to it. Any entity wishing to propose alternatives must submit a request to the email address shown in the next section.

9.1 Data reporting

Data and information may be reported in accordance with the terms and conditions already agreed upon with the relevant entities. All communications regarding requirements and procedures for reporting the data and information needed to plan the operation of the Québec Interconnection Main Transmission System (RTP) must be sent to the following email address:

CMEDonneespourlafiability@hydro.qc.ca

Should a computer or telecommunication problem prevent real-time data reporting to CMEER, the affected entity must contact CMEER either directly or through a HQT regional business place, as stipulated in the Common Operating Instructions.

9.2 Inconsistent data

If CMEER detects inconsistent data, it will contact the entity concerned. CMEER will work with the entity to resolve the inconsistency in a manner that is acceptable to both parties and that ensures Main Transmission System (RTP) reliability.

9.3 Security protocol

CMEER and Reliability Coordinators (RCs), Transmission Operators (TOPs) and Balancing Authorities (BAs) adjacent to (neighboring) the Québec Interconnection shall use NERCnet for data exchanges. NERC is responsible for NERCnet technical support and maintenance.

Hydro-Québec units may also submit their data through Hydro-Québec's file storage system, HydroDoc (Enterprise Connect).

CMEER will ensure that data transfers comply with the security protocol jointly selected with the other entities.

10. References

- [1] [BAL-005-0.2b](#) *Automatic Generation Control*
- [2] [EOP-004-2](#) *Event Reporting*
- [3] [FAC-008-3](#) *Facility Ratings*
- [4] [IRO-010-2](#) *Reliability Coordinator Data Specification and Collection*
- [5] [IRO-017-1](#) *Outage Coordination*
- [6] [MOD-020-0](#) *Providing Interruptible Demands and Direct Control Load Management Data to System Operators and Reliability Coordinators*
- [7] [MOD-025-2](#) *Verification and Data Reporting of Generator Real and Reactive Power Capability and Synchronous Condenser Reactive Power Capability*
- [8] [MOD-031-2](#) *Demand and Energy Data (for recurring data and information required by BA)*
- [9] [MOD-032-1](#) *Data for Power System Modeling and Analysis*
- [10] [PRC-001-1](#) *System Protection Coordination*
- [11] [TOP-001-3](#) *Transmission Operations*
- [12] [TOP-003-3](#) *Operational Reliability Data*
- [13] [Transmission System Modeling Data Requirements and Reporting Procedures](#)
- [14] [IQ-P-001](#) *Verification of Maximum Real and Reactive Power Capabilities of RTP Generating Facilities and Synchronous Compensators*