

**Q. Provide a detailed explanation of the communication and coordination that occurs with Newfoundland and Labrador Hydro regarding the Island Interconnected system demand and availability of generation, including Newfoundland Power's, to meet the Island Interconnected system load, both on a long term planning basis and on a short term operations basis.**

**A. 1. Introduction**

Newfoundland and Labrador Hydro ("Hydro") is primarily responsible for the availability of generation to meet the demand and energy requirements of electricity customers on the Island Interconnected System.<sup>1</sup> From both a long-term and short-term perspective, this requires input and information from Newfoundland Power, and requires the two utilities to coordinate certain activities.

Among other things, the utilities communicate with respect to load forecasting and planning of major electrical system modifications.<sup>2</sup> They also communicate on an ongoing basis in relation to the coordination of activities related to capital work and maintenance of major system components, and operational coordination of response to storms and other events affecting the system. Communication with respect to the various matters takes place on an ongoing basis as required between personnel at various levels of the two utilities.

Oversight of matters of joint concern related to system reliability is the responsibility of the Inter-Utility System Planning and Reliability Committee (the "Committee"). The Committee includes senior operations and engineering management from Newfoundland Power and Hydro, and meets twice a year to consider matters related to system reliability, including reliability targets, system contingency and restoration planning, generation availability and peak load management preparedness.<sup>3</sup>

<sup>1</sup> Newfoundland Power is responsible for the availability of its generation resources which includes approximately 97.5 MW of hydroelectric generation and approximately 41.5 MW of thermal generation; however, this represents less than 10% of the available generation resources on the Island Interconnected System.

<sup>2</sup> Major electrical system modifications would typically include transmission and transformation modifications. But, it has not included new generation facilities. The development of new generation facilities is a specific objective of Hydro under the *Hydro Corporation Act, 2007*. The Board has statutory oversight to ensure adequate planning occurs for the Island Interconnected System under Part II of the *Electrical Power Control Act, 1994*. This would include planning for new generation facilities. In practice, the Board has not fully exercised this oversight for new generation as the Lieutenant Governor in Council (the Provincial Cabinet) has authorized every major generation addition in the Province over the past 15 years or so via its direct authority under the *Public Utilities Act* and the *Electrical Power Control Act, 1994*.

<sup>3</sup> The Committee's membership includes Hydro's Vice-President and Newfoundland Power's Vice-President of Customer Operations and Engineering.

**2. Forecasting**

Newfoundland Power's and Hydro's respective forecasting personnel communicate on an ongoing basis. These discussions typically focus on the comparability of Newfoundland Power's energy and demand forecasts and Hydro's long range island load forecasts. Periodically, changes to Newfoundland Power's forecasts are made, either to update forecast methodology or to ensure the information provided is responsive to Hydro's requirements. In all cases, these changes are agreed between the two utilities.<sup>4</sup>

At least once each year, usually in the spring, Newfoundland Power provides Hydro with a 5-year forecast of its overall annual and monthly energy and peak load requirements (the "Energy and Demand Forecast"). The Energy and Demand Forecast is used by Hydro in developing its own forecast of energy and winter peak demand for the Island Interconnected System. For greater detail on this forecast please see the response to Request for Information PUB-NP-006.

Each year Newfoundland Power also provides Hydro with a forecast of winter peak demand and annual energy requirements for each of the interconnections where Newfoundland Power takes supply from Hydro.<sup>5</sup> This forecast is used to assess the capacity of system equipment at each of the points of supply. The forecast is reviewed by the utilities' respective planning personnel, including the Joint System Planning Subcommittee (the "Subcommittee").<sup>6</sup>

**3. Planning*****Electrical System Planning***

As part of its overall responsibility for availability of generation on the Island Interconnected System, Hydro evaluates options for meeting future supply requirements on the Island Interconnected System, and reports on such matters to the Board.<sup>7</sup> Newfoundland Power has not typically played a role in determining which potential future supply options best ensure adequate long-term generation capacity to meet customer load.<sup>8</sup>

For system planning purposes, it is necessary that the utilities maintain accurate models of the power system. In this regard, Newfoundland Power and Hydro

<sup>4</sup> See the response to Request for Information PUB-NP-012 for information on changes to Newfoundland Power's load forecasting methodology.

<sup>5</sup> Newfoundland Power takes power supply from Hydro at 24 metering points. These 24 metering points are at 21 locations.

<sup>6</sup> The Subcommittee includes planning personnel from both utilities. The Subcommittee was re-established in 2013.

<sup>7</sup> These matters are typically reported as part of Hydro's annual capital budget application filings.

<sup>8</sup> This is practically the result of the manner in which system planning for capacity additions has been undertaken since enactment of the *Electrical Power Control Act, 1994*. See Footnote 2.

regularly exchange information related to their respective generation, transmission and distribution assets, including information on Newfoundland Power's generation capacity.

#### ***System Reliability Oversight***

Oversight of the reliability of the Island Interconnected System is provided through the Committee. General oversight of system reliability by the Committee involves assessment of recent system performance and the sharing of information on planned and ongoing reliability initiatives being carried out by the respective utilities.<sup>9</sup> The Committee discussions would also include the exchange of information regarding the availability of each utility's generation and transmission components.<sup>10</sup>

In practice, the utilities keep each other informed of major planned transmission or transformer capacity additions.<sup>11</sup> On occasion, joint planning studies are undertaken to assess transmission and/or terminal station capacity constraints.<sup>12</sup> When required, they are carried out jointly by the utilities. These matters are coordinated through the Subcommittee.

### **4. Coordination**

#### ***Daily Operational Coordination***

Hydro's Energy Control Centre ("ECC") operates an energy management system that monitors and controls Hydro's generation and bulk transmission systems. The ECC's primary functions are the economic dispatch of generation and ensuring the balance of electrical system supply and demand for the Island Interconnected System.

Newfoundland Power's System Control Centre ("SCC"), operates a supervisory control and data acquisition system that monitors and controls Newfoundland Power's generation, transmission and distribution systems. Both Newfoundland Power's SCC and Hydro's ECC are staffed 24 hours a day, every day of the year.

The energy management system in Hydro's ECC is linked to the supervisory control and data acquisition system in Newfoundland Power's SCC.<sup>13</sup> This link provides each utility with near real time information concerning each other's electrical

<sup>9</sup> The Committee also considers longer term system planning matters as part of their general supervision of the Subcommittee.

<sup>10</sup> For example, the November 2013 meeting of the Committee included discussion of Hydro's request to locate Newfoundland Power's mobile generation at the Holyrood Thermal Generating Station, and the status of the Stephenville and Hardwoods gas turbines.

<sup>11</sup> While the utilities provide each other with information concerning their respective plans, they do not typically review engineering for specific proposed transmission or substation projects.

<sup>12</sup> A joint study is required when a potential capacity constraint is identified that may require upgrading of equipment of either or both utilities.

<sup>13</sup> This link meets the *Inter-Control Centre Communications Protocol* of International Electrotechnical Commission IEC 60870-6.

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operations on the Island Interconnected System.<sup>14</sup> Communication and coordination between Newfoundland Power's SCC and Hydro's ECC is continuous and is the central feature of daily operational coordination on the Island Interconnected System.

Newfoundland Power's SCC and Hydro's ECC ensure that routine daily electrical system operations such as generation dispatch and line and equipment switching are performed on a safe and reliable basis.

***Planned Outage Coordination***

Newfoundland Power and Hydro coordinate scheduling of work on their respective systems. This is done for two basic reasons. One is to ensure that one utility's actions will not unnecessarily affect the other utility's provision of service to its customers.<sup>15</sup> The other is to ensure that the *joint* actions of the two utilities are undertaken in a way which is least disruptive to the reliable delivery of electricity to customers.<sup>16</sup>

Coordination of planned outages on the Island Interconnected System requires a high degree of communication and cooperation which is coordinated by Newfoundland Power's SCC and Hydro's ECC. General oversight of the communication and cooperation between utilities is provided by the Committee.

***Electrical System Response***

Newfoundland Power's SCC and Hydro's ECC are central to the utilities' response to major electrical system events. Such events include damage caused by severe weather events, failure of major system components, and loss of supply.

When responding to major electrical system events, Newfoundland Power's SCC and Hydro's ECC work together to re-establish normal operations on the electrical system in a controlled and orderly fashion. Hydro's ECC operators typically take a lead role

<sup>14</sup> The operational information available between utilities via this link is not comprehensive. It does include status of some critical equipment and some generation.

<sup>15</sup> For example, Hydro routinely schedules maintenance of its 66/138kV radial transmission system from Bottom Brook to Port Aux Basques when customer load in the Port Aux Basques area is low, and Newfoundland Power's local and mobile generation is available. This coordination ensures service continuity to Newfoundland Power's customers on the southwestern portion of its service territory during Hydro's maintenance activities, which typically take 3-5 days to complete.

<sup>16</sup> For example, in 2012 Newfoundland Power relocated its mobile generation to enable scheduled maintenance of its 138kV radial transmission system serving the Baie Verte Peninsula with minimal disruption of service to customers. Hydro has a 138kV radial transmission system in the area which is supplied by the Newfoundland Power 138kV radial transmission system. Hydro coordinated its maintenance of its system in the same area for the same time. The coordination ensured that the overall disruption of electrical service to both utilities' customers was minimized.

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1 in informing Newfoundland Power's response to major electrical system events via  
2 the SCC.<sup>17</sup>

3  
4 Newfoundland Power's SCC relies upon Hydro's ECC to keep it updated on system  
5 demand on the Island Interconnected System.<sup>18</sup> Similarly, Newfoundland Power's  
6 SCC relies upon Hydro's ECC for information concerning the availability of Hydro's  
7 generation resources on a timely basis.<sup>19</sup>

8  
9 Newfoundland Power's electrical system is programmed so that, whenever system  
10 demand or availability of generation requires, customer load will be shed to protect  
11 the integrity of the Island Interconnected System.<sup>20</sup> Following such an event, Hydro's  
12 ECC cooperates with Newfoundland Power's SCC to ensure that customers  
13 disconnected from the system are reconnected to the system quickly while  
14 maintaining system integrity.

15  
16 In circumstances of forecast limitations on the availability of Hydro's generation,  
17 Newfoundland Power's SCC and Hydro's ECC cooperate to take the available steps  
18 to serve customer demand.<sup>21</sup> These have been infrequent and typically short-lived  
19 occurrences.<sup>22</sup>

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<sup>17</sup> Examples of the type of information provided by Hydro's ECC which would inform Newfoundland Power's response to a major electrical system event would include (i) the amount of Hydro generation capacity available on the Island Interconnected System, (ii) the status of the bulk transmission system, and (iii) the operating condition of major electrical system components such as power transformers and breakers. The availability and quality of this information is critical to effective system restoration efforts. For some major weather events where damage is more localized and not a system wide event, the information provided by Hydro's ECC will be less critical to Newfoundland Power's response efforts on an ongoing basis.

<sup>18</sup> Newfoundland Power's SCC monitors electrical demand on *Newfoundland Power's* electrical system on a real time basis. Newfoundland Power does not have information on the Island Interconnected System electrical demand on a real time basis; however, Newfoundland Power's electrical system accounts for approximately 85% of demand on the Island Interconnected System.

<sup>19</sup> The link between Hydro's ECC and Newfoundland Power's SCC provides Newfoundland Power with information on total Hydro supply online (with detail on thermal generation (Holyrood and gas turbines)). The link does not provide any information on Hydro's generation which is available but not serving demand. Newfoundland Power does not have real time access to information concerning the reserve margins available on the Island Interconnected System.

<sup>20</sup> This is the most common response to an imbalance of supply and demand on the Island Interconnected System. For a description of how Newfoundland Power's underfrequency load shedding system operates to restore the balance between electricity supply and demand, see the response to Request for Information PUB-NP-022.

<sup>21</sup> For Newfoundland Power the steps include (i) putting Newfoundland Power's generation online, (ii) curtailing Newfoundland Power's customers served under the curtailable service option, and (iii) operating Newfoundland Power's system voltages in a manner that permits the maximum number of customers to be served with available generation.

<sup>22</sup> These incidents tend to be infrequent and short-lived primarily due to a combination of two factors. First, the Island Interconnected System has a reserve margin of available generation. Second, periods of peak demand tend to be relatively short.