

1 Q. **Reference: Response to NP-NLH-099**

2 Hydro states that its operational practice is generally to request that Newfoundland Power
3 maximize available hydraulic generation before committing higher cost standby generation
4 resources.

5 a) Provide the most recent copy of Hydro's operational practice for dispatching generation
6 resources showing the order of priority for each resource.

7 b) When establishing the position on the dispatch order for Newfoundland Power's run of
8 the river hydro plants, what if any consideration was given to the limited amount of
9 storage available throughout the winter season?

10 c) Explain what is meant by the phrase *maximize available hydraulic generation*. In the
11 response, discuss the expectation for generators that were on before the request and
12 for generators that were offline before the request and the impact, if any, on the
13 efficient operation of Newfoundland Power's generation.

14 d) What is Hydro's understanding of the impact the number of requests by Hydro each
15 year to maximize available hydraulic generation on Newfoundland Power's annual
16 energy production? In the response, comment on whether the Generation Credit and
17 Newfoundland Power's requirement to meet Normal Production annually work together
18 or does one negatively impact the other?

19 e) Considering the current operation of the Island Interconnected System with the
20 Labrador Island Link in service, where does Hydro see the greatest value with
21 Newfoundland Power's hydraulic generation, either in providing low-cost energy to the
22 system or in supporting capacity requirements during system peak days?

23
24
25 A. a) Please refer to PUB-NLH-177, Attachment 1.

- 1 **b)** Each day, Newfoundland Power Inc. (“Newfoundland Power”) provides its available
2 hydraulic capacity to Newfoundland and Labrador Hydro (“Hydro”), including the capacity
3 available to meet peak load requirements. Newfoundland Power is responsible for
4 managing the dispatch of its hydraulic generation, including consideration of its available
5 water and storage. Hydro may request that Newfoundland Power maximize its Avalon or all
6 hydraulic generation when required for system conditions, but Newfoundland Power
7 determines how its individual generating resources are dispatched to respond to that
8 request.
- 9 **c)** Please refer to Hydro’s response to part b).
- 10 **d)** Please refer to Hydro’s response to part b). The recommended generation credit is a
11 reflection of what Newfoundland Power has historically provided when Hydro has requested
12 them to maximize hydraulic production. Because it is based on the actual hydraulic
13 generation, this generation also contributes towards Newfoundland Power’s annual normal
14 production requirement.
- 15 **e)** It is Hydro’s opinion that the greatest value of Newfoundland Power’s hydraulic generation
16 is to support capacity requirements during system peak days. While economic benefits help
17 reduce costs, providing reliable supply during system peak is paramount.



BA-P-012

Operating Reserves¹

General

Purpose

This procedure outlines the requirements to assess and maintain sufficient operating reserve to meet current and anticipated customer needs under normal operating conditions and for specific contingency situations that result in reductions to resources. Contingency events may also occur that cause the Labrador Island Link (LIL) and Maritime Link (ML) Frequency controllers to activate to support the Island frequency. Balance to the neighbouring utilities (Nova Scotia Power and Hydro Quebec) must be restored within 15 minutes of the event. Resources are comprised of contributions provided by supply-side and demand-side facilities and/or actions. Supply-side facilities include utility and non-utility generation and may include reserve assistance or imports from neighbouring systems. Demand-side facilities include measures for reducing load, such as interruptible load, demand management and conservation and reducing ML exports.

In order to ensure that customer service is maintained, the Energy Control Centre (ECC) shall exercise its authority to reduce risks to resources and maintain sufficient operating reserve to meet current and anticipated customer demands. The ECC shall be prepared to deal with generation and other resource capacity shortages and take appropriate actions, including stakeholder notification, in order to communicate and maintain the reliability of the Island Interconnected System.

Operating reserve^{2,3,4} is required to replace resource capacity lost as a result of an equipment forced outage as well as to cover performance uncertainties in generating units and tie-line capacity, or to cover unanticipated increases in demand. Sufficient operating reserve is required to meet current and forecasted demands under the largest resource contingency:

- the largest generating unit on the island interconnected system. This is covered fully by 10 minute reserves;
 - the largest combination of generating units on a single interface (e.g., generation connected to the transmission system via a single transmission line). This is covered fully by 10 minute reserves;
- or

¹Part of the Emergency Response Plan.

²*Operating Reserve*, for the Island Interconnected System, is defined as the capability above firm system demand required to provide for regulation, load forecasting error, equipment forced and scheduled outages and includes 10 minute and 30 minute reserve.

³10 minute reserve is included in Operating Reserve and is reserve that is fully available within 10 minutes of a request and includes both spinning and non spinning (non connected generation and demand reduction) components.

⁴30 minute reserve is included in Operating Reserve and is reserve that is fully available within 30 minutes of a request and includes both spinning and non spinning components.



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- the largest import over a single transmission interface. This would include the LIL Bipole when in operation.⁵

⁵ 30 minute reserves will be carried for a trip of the LIL Bipole delivered at Soliders Pond less exports over the Maritime Link (i.e. Net DC deliveries to the Island system). See section 1.1 for details.

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1 Procedure

1.1 Maintaining 10/30 minute Reserve and On-Line Regulating Reserve

Under normal operations the ECC shall take action to meet a targeted 10-minute Reserve that is sufficient to cover the loss of the largest single resource contingency on the Island Interconnected System. Typically this is Holyrood Unit 1 or 2 (170 MW) or Bay d'Espoir Unit 7 (154.4 MW).

For the LIL, if the amount of LIL being sunk on the Island (i.e. the LIL amount delivered at Soldiers Pond less Maritime Link Exports), is greater than what would normally be maintained for 10 minute reserve, there shall be 30 minute reserve (additional to the 10 minute reserve) to cover the full Loss of the LIL and what is being sunk on the Island⁶.

During real time and contingency operations the ECC shall take steps to maintain a minimum Regulating Reserve of 70 MW for system frequency regulation. Such actions include the following: placing in service all available generating capacity, cancelling outages to generating units that have a short recall, recalling export transactions, increasing LIL deliveries above current schedule (if possible), deploying all available standby and demand side resources, including Corner Brook Pulp and Paper Capacity Assistance and Vale Generation as well as Newfoundland Power curtailable load, cancelling industrial interruptible load, and further reducing system load through procedures such as voltage reductions.

The ECC should request capacity and energy from the market through Energy Marketing group (EM) when it deems that resources and load reduction strategies are not sufficient to reliably meet current or forecasted demand. Under a contingency event, the ECC can request Reserve Assistance from the Nova Scotia Power System Operator (NSPSO) which, if available, can be activated within ten minutes and extended for up to 120 minutes. Following the 120 minutes, Emergency Energy may be made available from NSPSO under commercial arrangements. **Note that Reserve Assistance and Emergency Energy are not firm products and may not be available or may be recalled by the NSPSO at any time following its activation.**

The following guideline shall be followed by the ECC Shift Supervisor – Reliability, and System Operator – Balancing and Interchange in the sequence outlined in order to maintain sufficient on-line Regulating and 10-minute Reserve in order to maintain the reliability of the Island Interconnected System.

- **Sequence for Maintaining 10-minute and On-Line Regulating Reserve *****

⁶ This will include staffing gas turbines as required.

1.1.1 Resource Dispatch

*** Note that under a contingency event (e.g. the sudden loss of a large generating unit) – perform the actions in Section 1.3 – Reserve Assistance and Emergency Energy to provide time to carry out the steps listed below, while market-based real-time energy transactions are being sought and implemented.

1. Place in service all of Hydro's available hydroelectric generation.
2. Increase LIL above current delivery schedule (to the extent possible while respecting LIL/ML relationship and Labrador reserve requirements).
3. Request Newfoundland Power to maximize their hydroelectric generation.
4. Maximize Holyrood thermal generation.
5. Make a request to cancel outage(s) to hydroelectric generating unit(s) that have a short recall.
6. Curtail recallable export transactions (export transactions on non-firm transmission service) while respecting LIL/ML relationship in accordance with the priority set forth in the NL Transmission Policies and Procedures and as described in BA-P-005.
7. Start and load standby generators, both Hydro and Newfoundland Power units⁷.
8. Request Corner Brook Pulp and Paper for Capacity Assistance (up to 90 MW of load reduction in block sizes of 20, 40, 60, or 90 MW)⁸.
9. Request Vale Generation (up to 10.8 MW – standby diesels).
10. Request Newfoundland Power to interrupt its Curtailable loads (typically up to 10 MW and can take up to two hours to implement).

1.1.2 Load Reduction

1. Cancel all non-firm power delivery to customers and ensure all industrial customers are within contract limits.
2. Inform Newfoundland Power of Hydro's need to reduce supply voltage at the major delivery points to minimum levels to facilitate load reduction. Implement voltage reduction.
3. Request Newfoundland Power to implement voltage reduction on its distribution system.

1.2 Maintaining Frequency near the Standard 60 Hz

If the Regulating Reserve continues to decrease below the minimum level and all resources and load interruption strategies have been deployed, the system frequency should be watched closely. In order to protect the integrity of the system, and to avoid the potential for cascading outages the system frequency shall be maintained above 59.8 Hz. **If not already performed, the ECC should request capacity and energy from the market through the Energy Marketing group (EM), while respecting LIL/ML relationship to support the system frequency and minimize any customer impact.**

⁷ At this point in time it is important the ECC notify customers taking non-firm power and energy that if they continue to take non-firm power, the energy will be charged at higher standby generation rates.

⁸ Up to 90 MW contractually available from November 1 – April 30.

Sequence for maintaining frequency near the standard 60 Hz ***

1.2.1 Activation of Labrador Reserve

When resources have become depleted in maintaining 10 minute reserve and there is a risk of not being able to regulate frequency (i.e. a deficient regulating reserve), the LIL will be increased (while continuing to adhere the LIL/ML scheduling relationship so as not to risk system instability) to the point that the required reserve in Labrador may not be maintained⁹.

1.2.2 Firm Load Interruption

*** Note that under a contingency event (e.g. the sudden loss of a large generating unit) – perform the actions in Section 1.3 – Reserve Assistance and Emergency Energy to provide time to carry out the steps listed below, while market-based real-time energy transactions are being sought and implemented.

1. Request Industrial Customers to shed non-essential loads, informing them of system conditions.
2. Request Newfoundland Power to shed load by rotating feeder interruptions and Nova Scotia Power to curtail ML firm deliveries.¹⁰ At the same time, shed load by rotating feeder interruptions in Hydro's rural distribution areas. Follow instruction for rotating outages, CMN-P-020.

1.3 Contingency Event

In the event of a sudden resource contingency, the Regulating Reserves may go below 70 MW. Contingency events include a trip of a unit or sudden deration, a requirement for a sudden offload and shut of a unit, or a failed start. In this case, the LIL and ML frequency controllers could activate to help support the island frequency.¹¹ For the LIL, once the frequency returns to 59.7 hZ, the frequency controller will deactivate. For the ML, once the frequency returns to 59.5 hZ, the frequency controller will deactivate. For these scenarios, actions may be required to return the LIL and ML power flows to pre contingency levels within 15 minutes. Actions outlined in section 1.1.1 will still be implemented. However, because of the time limitations, increasing HRD (if capacity still available) and requesting CBBP Capacity assistance maybe the quicker options.

In the event of a LIL Bipole trip, automatic runbacks and/or frequency response will occur to reduce the flow on the ML. The ECC System Operator will immediately call the Nova Scotia System Operator and will curtail any remaining ML flow related to the Nova Scotia Block. Following the activation of runbacks and/or frequency response and when the system frequency stabilizes, the Nova Scotia System Operator shall adjust the Maritime Link Power flow to the pre contingency power flow value minus the Nova Scotia Block.

As well. Please note that only under a contingency event can the ECC request Reserve Assistance or Emergency Energy from the Nova Scotia System Operator (NSPSO) – per instruction BA-P-007 - NLSO - NSPSO Reserve Assistance Responsibility and Activation and BA-P-037 -NLSO - NSPSO Emergency and Security Energy Transactions and Activation.

⁹ In the event a Muskrat Falls unit trip, balancing with Hydro Quebec may not be achievable in 15 minutes.

¹⁰ This will be done on a pro-rata basis for NP, NSPI and NLH.

¹¹ LIL frequency controller activates at 59.7 hZ and ML frequency controller activates at 59.5 hZ.

Reserve Assistance

- Reserve Assistance is available as a short term product (within 10 minutes) following a contingency event. The ECC System Operator may request Reserve Assistance up to 50% of the contingent loss to a maximum of 100 MW. The initial period is up to 30 minutes.
- During the initial 30-minute Reserve Assistance period the ECC System Operator should perform the steps as outlined above in Sections 1.1.1 to 1.1.2. If sufficient resources are not available the ECC System Operator shall request a market based solution (i.e. contact Energy Marketing).
- In the event that on-line Regulating and 10-minute Reserve requirements are not able to be met by internal resources in 30 minutes, Reserve Assistance can be extended for an additional 90 minutes (only if available from the NSPSO system).
- All energy provided under Reserve Assistance is treated as inadvertent.

Emergency Energy

- Emergency Energy can be sought from NSPSO as a last resort, when market-based real-time energy transactions are not available in a timely fashion in order to maintain on-line Regulating and 10-minute Reserve requirements.
- Emergency Energy is a commercial product with pre-defined energy rates.

1.4 Calculation, Assessment and Notification of Available Reserve¹²

Available Reserve shall be calculated in the manner indicated below:

- Available generation¹³ of NLH (Hydro + Thermal + Standby¹⁴ + Purchases¹⁵); plus
- Scheduled firm Import transactions on the Maritime Link; plus
- Scheduled deliveries on the Labrador-Island Link; plus
- Available generation of Newfoundland Power (Hydro + Standby); plus
- Available generation of Deer Lake Power (60 Hz Hydro); plus
- Vale Generation¹⁶ (Standby Diesels); less
- Forecasted Island peak load (adjusted for Corner Brook Pulp and Paper Capacity Assistance, Newfoundland Power Curtailable and Voltage Reduction)¹⁷; less
- Scheduled Exports on the Maritime Link with firm and non firm transmission service.

The Available Reserve will be calculated for the current day and the following six days for the peak demand hour forecast for each day. An assessment will be made against the criteria in the table below with

¹² Available Reserve calculations will include the LIL deliveries sinking on the island

¹³ Available generation is generation that is in service or planned to be in service..

¹⁴ Standby generation includes gas turbine/diesel generation.

¹⁵ NLH Purchases include wind generation for the current day based on actual wind output, but assumes no wind generation for the following six days.

¹⁶ Refer to Schedule 1 at the end of this procedure for the details of the agreement.

¹⁷ Up to 20 MW of load reduction (on peak) is expected to be achieved through the reduction of voltage at the major delivery points on the island interconnected system as well as on Newfoundland Power's distribution system.

notifications to be issued to stakeholders when Available Reserve is below the stated thresholds for anytime within the next week.

Available Reserve ¹⁸	Expected Action	Level
> [Largest Single Contingency + 70 MW]	None	0
> [Largest Single Contingency] and < [Largest Single Contingency + 70 MW]	Prepare for Potential Load Reduction	1
> [½ Largest Single Contingency] and < [Largest Single Contingency]	Load Reduction	2
> [Zero or deficit] and < [½ Largest Single Contingency]	Conservation	3
> [Zero or deficit; hold f=59.8 Hz]	Rotating Outages	4

Based on the assessment above, perform the following:

- **Level 0**
 - If the Available Reserve is anticipated to be greater than the largest single contingency plus 70 MW, the ECC is not expected to perform any further actions, other than to advise the appropriate stakeholders that Available Reserve has returned to normal following a prior Level 1, 2, 3, or 4 notice.
- **Level 1**
 - If the Available Reserve is anticipated to be less than the largest single contingency plus 70 MW, the ECC will notify Newfoundland Power's Control Centre and NLSO On Call to advise them of the possible requirement for load reduction strategies should the Available Reserve decrease.
- **Level 2¹⁹**
 - If the Available Reserve is anticipated to be less than the largest single contingency, the ECC will notify Hydro's Exec On-Call under the Corporate Emergency Response Plan (CERP),²⁰ Corporate Communications On Call,²¹ Newfoundland Power and NLSO On Call to advise them of the requirement for load reduction strategies should the generation shortfall not be corrected. The ECC shall also notify the Nova Scotia System Operator (NSPSO) of the potential deficit in Available Reserves.
- **Level 3**
 - If the Available Reserve is anticipated to be less than half of the largest single contingency, the ECC will notify Hydro's Exec On-call (CERP), Corporate Communications On Call, Newfoundland Power and NLSO On Call to advise them of a requirement for customer conservation strategies should the generation shortfall not be corrected. The ECC shall also notify the NSPSO of the potential deficit in Available Reserves.

¹⁸ Hydro plans to have Available Reserve to cover its largest resource contingency (e.g., largest generating unit) plus an additional 70 MW. The assessment of Available Reserves is currently used by Corporate Communications for purposes of the joint communication plan between NLH and Newfoundland Power.

¹⁹ Level 2 alerts could be issued for Emergency LIL Monopole operation. See section LIL Monopole operation below.

²⁰ As part of the CERP, the Exec On-Call makes the decision to activate the Corporate Emergency Operations Centre (CEOC).

²¹ Corporate Communications is responsible for activating the joint communication plan between NLH and Newfoundland Power.

- **Level 4**

- If the Available Reserve is anticipated to approach zero or fall into a deficit, the ECC will notify Hydro's Exec On-call (CERP), Corporate Communications, Newfoundland Power and NLSO On Call to advise them of a requirement for rotating outages should the generation shortfall not be corrected. The ECC shall also notify the NSPSO of the potential deficit in Available Reserves.

LIL Monopole Operation

In the event of unplanned monopole operation of the LIL:

- The NLSO will endeavor to activate on-Island reserve to bring the remaining pole back to monopole limits.
- Under monopole limits, LIL flows will be reduced such that if there is a trip of the remaining pole there is enough ML runback to prevent underfrequency load shedding (UFLS) and customer impact on the Island.
- In the event that the LIL cannot be reduced to monopole limits, it will be operated in "emergency mode". Once it is determined that the LIL will be operated in "emergency mode", then a public notification of a Power Watch (as per the above Level 2) will be issued. Operating in emergency mode, is outside of the normal operating criteria in that a single contingency (i.e. the loss of the remaining LIL pole) can result in customer interruption. Available Reserves will also be reassessed to determine the impact of the next largest contingency and if further alert level notification is required.
- Under no circumstances will the LIL be operated in monopole configuration such that there is a risk of stability or system collapse if the remaining pole trips. The ECC shall adhere to "Emergency" LIL monopole limits when operating under these conditions.

The following is the standard message that will be communicated by Corporate Communications and posted on the NLSO OASIS website if it is anticipated that a notification is to be made under Level 2, 3, or 4 or a return to Level 0 (note that a Level 1 notification is only communicated between the two control centres of Newfoundland Power and the NLSO):

"The NLSO is advising that the Available Island reserve is at (or has returned to) a notification level [0, or 2–4] for [insert date here]. The Available Reserve is expected to be [insert reserve amount in MW], calculated from an available resource capacity of [insert available capacity in MW] and a peak load forecast of [insert peak forecast in MW]."

Refer to CMN-P-008 *NLSO OASIS Communication Protocol* for further information on posting messages in OASIS.

Reference Documents

CMN-P-008 *NLSO OASIS Communication Protocol*

CMN-P-020 *Rotating Outages*

BA-P-005 *Curtailment, Interruption and Reload Procedures*

BA-P-007 *NLSO - NSPSO Reserve Assistance Responsibility and Activation*

BA-P-037 *NLSO - NSPSO Emergency and Security Energy Transactions and Activation*

NLH and NSPI Interconnection Operators Agreement, 07/31/2012, Schedules A2, C9 and C10

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Schedule 1 – Capacity Assistance Arrangements

(as at December 1, 2025)

Provider	Contracted Capacity	Conditions
Corner Brook Pulp and Paper	<u>Winter (Nov 1–Apr 30)</u> Up to 80 MW (or another higher amount as tested and agreed by the parties) in the following increments: • 20 MW • 30 MW • 60 MW • 80 MW • Other if tested and agreed* <u>Summer (May 1 – Oct 31)</u> Up to 50 MW	• Notification Period: 10 minutes • Interruption Period: 4 hours (minimum) to 6 hours (maximum) • Maximum Number of Curtailments*: 2 per day, 30 per year • Total Assistance Period: 180 hours per year* • Expiry: 15 years (2023/24 – 2038/39) • Test: Tested annually in Sept – Oct* *90 MW tested for Winter 2025-26. • *An additional 90 hours/30 calls available at a variable rate
Vale Generation	<u>Winter (Dec 1–Mar 31)</u> Up to 7.5 MW* Requested amount based on annual test *unit rated for 10.8 MW but tested to 7.5 MW	• Notification Period: 20 minutes • Interruption Period: Up to 6 hours (maximum) • Maximum Number of Curtailments: 2 per day, 20 per winter • Total Assistance Period: 100 hours per winter • Term: December 1 2025 to March 31 2026 • Test: Tested annually* * 7.5 MW tested for Winter 2025-26 on November 27, 2025

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24	J. Tobin	Minor edit to fix Section reference	2020/04/14
25	J. Tobin	Modifications throughout the document on how the LIL will be treated in the interim. Added Section 1.3 on contingency event. Modification on LIL for Available Reserves (Section 1.4). Modifications to Schedule 1 for Capacity Assistance agreements.	2023/12/01
26	J. Tobin	Added wording on LIL Monopole operation in Section 1.4.	2023/12/15
27	J. Tobin	Revised wording in Section 1.4 on LIL Monopole operation	2023/12/21
28	S. Wadhawan	Annual Review, added 2025 Capacity Assistance Arrangements (Schedule 1)	2025/10/10

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Position	Signature	Approval Date
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