

Aluminium  
400-1190 Avenue des Canadiens-de-Montréal  
Montreal (Quebec) H3B 0E3  
Canada  
T +1 (514) 848 1406

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Ms. Cheryl Blundon  
Director Corporate Services & Board Secretary  
**Board of Commissioners of Public Utilities**  
Prince Charles Building  
120 Torbay Road, P.O. Box 21040  
St. John's, NL A1A 5B2  
email: [cblundon@pub.nl.ca](mailto:cblundon@pub.nl.ca)

**Re: Newfoundland and Labrador Hydro (“NLH”) 2018 Capital Budget Application  
Muskrat Falls to Happy Valley Interconnection Update**

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Dear Ms. Blundon:

On November 30, 2018, NLH reapplied for the approval of the capital budget to construct the Muskrat Falls to Happy Valley transmission line (“**MFA-HVY Interconnection**”) as described in its Updated Project proposal.

The proposed 20 million dollars transmission project was initially part of the NLH 2018 Capital Budget Application. In its Order P.U. 43 (2017) the Board questioned the least-cost nature of the project and in Order P.U. 9 (2018) it further instructed NLH to address the transmission investment in the broader physical and financial Labrador context.

In Order P.U. 43 (2017), the Board addressed the cost implication of the project:

**“Board Findings**

*The proposed expenditures for the Muskrat Falls to Happy Valley - Goose Bay interconnection are material and approval of this project may significantly impact customer rates on the Labrador Interconnected system. Nevertheless, the Board acknowledges the evidence that was provided in relation to the capacity and load forecasts for this system. While the evidence suggests that expenditures may be required to address a forecast increase in load on this system, such a significant project should be supported with detailed evidence that demonstrates how the proposed project is consistent with the provision of least-cost reliable service, considering both short and long-term needs on this system.*

*Based on the information provided the Board believes that there are a number of outstanding issues in relation to this project which have not been addressed. [...]”*  
(page 12) (our emphasis)

In the same vein, the Board pursued its investigation of the most appropriate solution to serve Labradorians in Order P.U. 9 (2018), when it further instructed NLH:

***“Board Findings***

*In Order No. P.U. 43(2017) the Board deferred consideration of the proposed Muskrat Falls to Happy Valley-Goose Bay Interconnection project on the basis that the evidence did not demonstrate that the project was necessary and consistent with the least-cost provision of service.” (page 7)*

*“The Board is persuaded by the arguments of the Labrador Interconnected Group, representing the majority of the communities in Labrador East, and IOC that this project should be deferred until further information is provided by Hydro. This information should include:*

- 1. An expansion study for the Labrador Interconnected system (both Labrador East and Labrador West) for a reasonable planning horizon, which addresses: i) planning criteria, including a discussion of the current reliability concerns and future reliability criteria; ii) base load forecasts and sensitivities; iii) expansion plans to meet the various load forecast scenarios; iv) the condition of existing assets and an estimate of remaining life; v) cost benefit analysis of the alternatives; and vi) estimated projected rate impacts associated with the proposed expansion scenarios.*
- 2. A network addition policy setting out how new customers will be treated in regards to their impact on the system and how costs will be allocated among customers for reliability, economic, transmission, and load upgrades, either in the cost of service or through contributions in aid of construction.” (page 9)*

It does without saying that Order P.U. 9 (2018) will be rendered meaningless if the Board accepts the request by NLH to approve the proposed MFA-HVY Interconnection before the parties have a chance to consider the requested Labrador Expansion Study and Network Addition Policy. Once the capital is sunk and included in NLH's rate base, the impact on customers will be felt for the next 25+ years and any valid argument by ratepayers will be moot.

On this basis alone, the Board should deny the application.

IOC therefore maintain its opposition to the proposed capital budget approval and MFA-HVY Interconnection, at least until such time as the Board has ruled on the requested Labrador Expansion Study and Network Addition Policy<sup>1</sup>.

Furthermore, IOC intends to demonstrate that the concerns raised by the Board in its Orders P.U. 43 (2017) and P.U. 9 (2018) are still present and would in any case lead it to reject the application.

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<sup>1</sup> The Network Addition Policy would not address the ratepayers' concerns *ex post facto* as the Town Council of Happy-Valley erroneously believes in its letter dated January 15, 2019 supporting the project.

**No Evidence that the MFA-HVI Interconnection is the Least-cost Alternative**

Relying on the yet untested Expansion Study<sup>2</sup>, NLH asserts that the proposed MFA-HVY Interconnection is the least-cost, reliable solution transmission system addition to meet Labrador East’s capacity requirement.

This assertion is based on several assumptions, including that: (1) a physical addition to the network is the best, if not the only solution, (2) NLH’s obligation to serve is absolute, (3) the solution must last at least 25 years although the expected load may not, and (4) reliability must be improved at all costs.

IOC argues, based on its review of the Expansion Study that NLH only conceives long term transmission system additions as a solution to meet customers’ demand and that NLH does not entertain the possibility that customers may prefer shorter term solutions or a lower cost load management program to long term capital investments earning a return on equity.

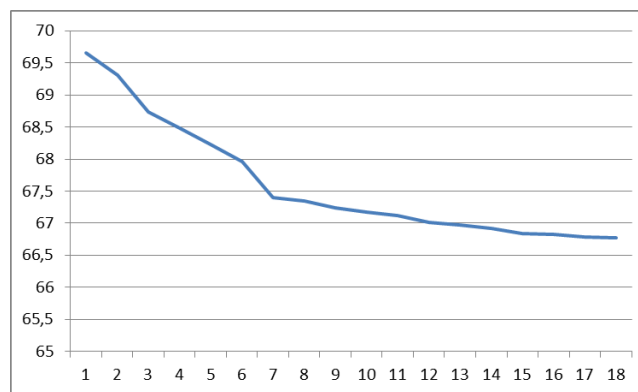
IOC suggests that many if not all of the assumptions are questionable and must be addressed through the review of the Expansion Study and Network Addition Policy before the solution is chosen. To examine possible solutions once the MFA-HVY Interconnection is approved would amount to overturning previous Board orders without cause.

**Load Forecast and Duration**

The Labrador East Transmission System can serve a load of 77 MW.

NLH’s MFA-HVY Interconnection is meant by design and nature to serve a permanent load. Unfortunately, growth in Labrador East is not a certainty, nor is it of a magnitude and nature to warrant a permanent long term solution.

Since 2016<sup>3</sup>, the Labrador East Transmission System’s historical peak is 71.1 MW<sup>4</sup>. It only peaked above 65 MW for a few hours, even as it reached its historical peak<sup>5</sup>. A focus on the smallest number of peak hours clearly indicates the short lived nature of the marginal load to serve<sup>6</sup>.



<sup>2</sup> ... while refusing to answer questions that test or challenge this evidence. See LAB RFIs to NLH.

<sup>3</sup> Historical data prior to 2016 is not relevant as the system experience a load reduction.

<sup>4</sup> LAB-NLH-036.

<sup>5</sup> LAB-NLH-043, table 1.

<sup>6</sup> Data from the NLH Excel spreadsheet attached to response LAB-NLH-008 from January 2016 to February 2018 inclusive, sorted by demand. X axis in hours, Y axis in MW. See also IOC-NLH-009 that includes the load duration curve for the Labrador East Transmission system for the last three years and LAB-NLH-043.

The fine peak that triggers the project only lasts a few hours.

Furthermore, compared to the situation before the Board last year when the Board denied the application, NLH now also benefits from an additional tool to manage peak load. The Board has approved the Interruptible service agreement with Labrador Lynx Ltd for up to 5.5 MW<sup>7</sup>.

NLH's load forecast is also too high. NLH's forecast of the Labrador East Base Coincident Peak is front loaded with a sudden growth in 2018 and 2019 while NLH admits that the system faces no immediate constraint<sup>8</sup>.

The only evidence of immediate and sudden growth in the region results from requests for service from so-called data centers whose activities are focused on cryptocurrencies.

There is great doubt that such data centers load will materialise.

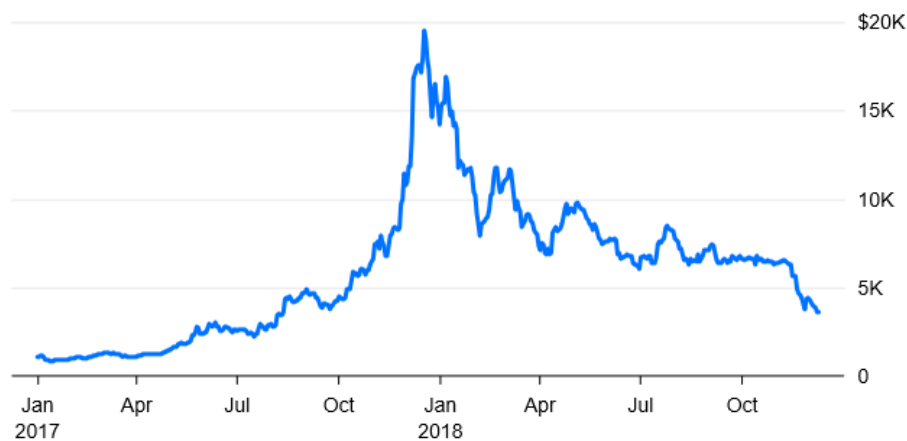
A pending request for 1.2 MW included in the forecast comes from a firm known as Crypto Boreas<sup>9</sup>. This request seems to form the bulk of the additional 1 700 kW forecasted in 2019. As it happens, Crypto Boreas' construction permit was denied by the local municipality in early November 2018. Without such permit, Crypto Boreas cannot erect premises that can connect to NLH's system.

More importantly, the cryptocurrency hype is over.

The Bitcoin that once created this sudden surge in requests for service when it went as high as 20 000 USD a year ago, has plummeted to a mere 3500 USD in a single year<sup>10</sup>.

### One More Crash for the Record Books

Bitcoin intraday highs



Source: Bloomberg

<sup>7</sup> Order P.U. 37 (2018).

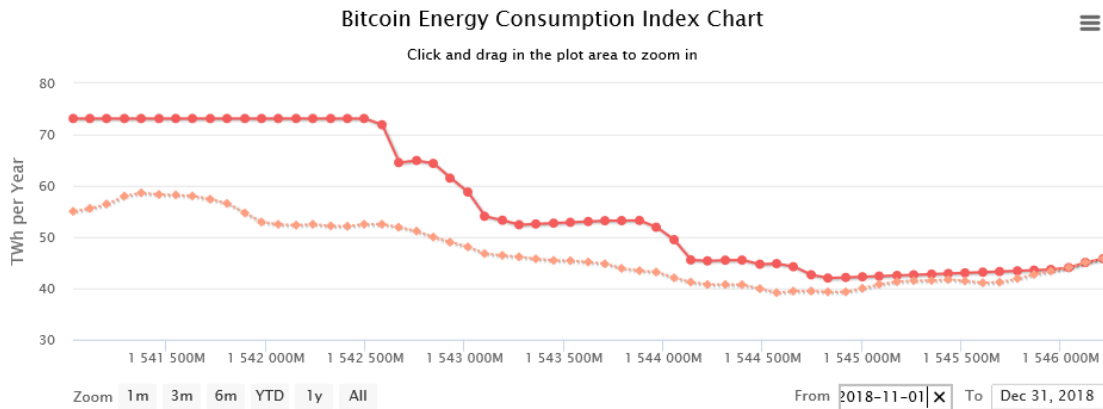
<sup>8</sup> LAB-NLH-055.

<sup>9</sup> IOC-NLH-011.

<sup>10</sup> *Yep, Bitcoin was a bubble. And it popped.*, Bloomberg, December 11, 2018:

[www.bloomberg.com/opinion/articles/2018-12-11/yep-bitcoin-was-a-bubble-and-it-popped](http://www.bloomberg.com/opinion/articles/2018-12-11/yep-bitcoin-was-a-bubble-and-it-popped)

At a price below 4000 USD, cryptocurrency miners are reported to be closing down. The worldwide demand for electricity to support this industry is already down 35 % from 73 TWh to about 46 TWh<sup>11</sup>.



Since NLH does not offer a forecast for the Bitcoin, IOC believes that there is no evidence to support the expected growth from this industry that supports the load forecast<sup>12</sup>.

Notwithstanding this industry trend, the solution devised by NLH rests on an expectation of significant growth. Appendix A to its Expansion Study reads:

***“Impact of Sudden Load Growth in HVGB***

*Given the current economic environment in Labrador with low electricity rates, there is a high likelihood of unforeseen load growth in the HVGB area. An initiative has therefore been undertaken to assess the impact of load growth beyond the baseline forecast. Such loads would include new large customers such as data centres and/or the possibility of a Central Heating Plant Conversion at the Department of National Defense (DND) facility. Hydro’s plan will involve a phased approach depending on the magnitude of incremental load growth in HVGB.”* (Appendix A, page 3) (our emphasis)

The evidence rather shows that the Labrador East Transmission System is able to manage the current and expected load; that the load forecast is overstated as an important client cannot legally connect to the system (1.2 MW); that a whole industry is unlikely to remain connected or to materialise (up to 7.2 MW); and that even if it materialises, NLH can manage the expected load through lesser cost alternatives, including an Interruptible service as is currently offered to Labrador Lynx (5.5 MW)<sup>13</sup>:

*“If Hydro were to assume that a similar arrangement was approved by the Board of Commissioners of Public Utilities to interrupt additional data centre loads in the winter of 2019-2020, over and above Labrador Lynx Ltd. and subsequently reduce the peak load to below 77 MW, additional diesel generation would not be required to meet peak forecasted load.”* (page 2) (our emphasis)

<sup>11</sup> The industry electricity consumption is estimated by the number of mathematical operations performed to extract cryptocurrencies, or hash. <https://digiconomist.net/bitcoin-energy-consumption>

<sup>12</sup> LAB-NLH-047, answer c), page 2.

<sup>13</sup> LAB-NLH-055, page 2, line 9.

As this answer indicates, should load management be adopted in Labrador, there will be no immediate need for the MFA-HVY Interconnection and no need to tax Labrador ratepayers with an expensive project.

### **Not All Solutions Require a Capital Investment**

The proposed 20 m\$ project is unnecessary and unsound. IOC believes that lower cost, less capital intensive regulatory solutions must be developed to address the needs of the Happy Valley – Goose Bay community until such time as a significant long term load that can support the cost of the additions to the rate base comes along and triggers the need for a system reinforcement.

And if NLH is correct when it asserts that it does not have the authority to curtail customers<sup>14</sup>, than the appropriate answer is not to sink 20.8 m\$ of capital that will remain largely unused.

The proper solution is to empower NLH to responsibly manage the system peak load.

In 2018, NLH requested and was granted the right to provide an interruptible service to Labrador Lynx. IOC supported this outcome and argued that such contracts should be opened to more customers through a transparent process.

Interruptible service agreements are useful and should be pursued – as they are in other jurisdictions – to address peak issues at a lower cost. If NLH does not intend to develop such solution<sup>15</sup>, then the Board should instruct NLH to rapidly develop it<sup>16</sup>.

With the Labrador Lynx Interruptible service agreement, NLH is able to address all transmission demand in Labrador East this winter. Nothing precludes NLH from seeking a renewal of this agreement, as it does with other Island industrial customers.

Nothing precludes the Board from imposing rate conditions to mandate interruptibility, as other jurisdictions are currently doing.

### **Supply-side Solutions**

NLH indicated that it could with adequate maintenance ensure the longer term reliability of the North Side Diesel Plant. This alternative solution, costing 1.4 m\$<sup>17</sup> would firm up 4 MW<sup>18</sup>.

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<sup>14</sup> LAB-NLH-036 and LAB-NLH-037.

<sup>15</sup> IOC-NLH-007.

<sup>16</sup> The potential for an interruptible service from data centers alone is around 1.5 MW according to IOC-NLH-003 in NLH 2018 Distribution System Upgrades Happy Valley – Goose Bay Distribution System Application, plus other customers who may elect to participate as they are financially incentivised.

<sup>17</sup> Distribution System Upgrades – Happy Valley – Goose Bay Distribution System Application, IOC-NLH-004, page 3, line 7.

<sup>18</sup> IOC-NLH-012 and LAB-NLH-057, page 2, line 16. Plus the cost of operating the North Side Diesel Plant or other diesel generators is overestimated. The estimate is based on a cost of fuel of 1.35 \$/litre while NLH has estimated the cost of fuel in a more recent filing in its 2017 GRA at 1.23 \$/litre (PUB-NLH-179) and where IOC estimates from service contracts the delivered price of no 2 diesel in Labrador to close to 1.00 \$/litre. When asked to support the forecast, NLH could not provide a supporting document (IOC-NLH-013).

NLH is set in a long term paradigm to address a short term concern. When an issue is uncertain or short lived, it should be met with a short term solution. If the goal is to secure the supply of the Happy Valley – Goose Bay area until a new long term larger load that can significantly contribute to the cost of network additions, then NLH should envisage a solution with few fixed costs, even if operating costs momentarily increase.

For example, NLH can rent diesel generators rather than sink the capital and commit to permanent O&M costs. Such solution will be less expensive than the proposed MFA-HVY Interconnection.

NLH did consider additional diesel generation but significantly overestimates its cost. NLH estimates that it would cost 11 m\$ over two years to add new diesel generation<sup>19</sup>.

IOC estimates that the cost would be somewhere between 0.5 and 0.75 m\$ per year (before interconnection costs) to add two 2 MW generation units to serve additional peak load:

Rental	Standby service	600 hr/yr	22 800 \$ /month
	Winter months		6 months
Opex	Maintenance		9 \$ /hour
	Diesel	361 l/hour	379 \$ /hour
		1,05 \$/l	

**Rental cost of 2 MW units**

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2	units		273 600 \$
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**Rental cost w/ maintenance + diesel**

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2	units	300 hr/yr	506 430 \$
		600 hr/yr	739 260 \$

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NLH cannot remain closed to the idea and set in the old view that “[...] mobile generation is a short-term solution and not consistent with least-cost, reliable service”<sup>20</sup>.

**Order P.U. 36 (2018) Temporary Load Restriction should be Extended**

Pending resolution of the matter, Board should extend the relief provided in Order P.U. 36 (2018) for a few more months, until such time as rules for growth are determined and a load management rate is in place, such as the one agreed with Labrador Lynx:

“Schedule A  
 Order No. P.U. 36(2018)  
 Page 1 of 1

**NEWFOUNDLAND AND LABRADOR HYDRO  
 RULES AND REGULATIONS**

**17. TEMPORARY RESTRICTION FOR LOAD ADDITIONS TO LABRADOR  
 EAST**

<sup>19</sup> LAB-NLH-055.

<sup>20</sup> Distribution System Upgrades – Happy Valley – Goose Bay Distribution System Application, IOC-NLH-004, page 3, line 1.

*Effective September 11, 2018 and until May 30, 2019, Hydro will not provide service connections or service upgrades to an Applicant that will result in the addition of load requirements of greater than 100 kW on the Labrador East System. The load addition limit applies to Applicants for single service connection requests for load additions in excess of 100 kW and to Applicants requesting multiple service connections for which the total load addition of the multiple service requests exceeds 100 kW. The load addition limit to Applicants for multiple services will apply to both service requests made concurrently and service requests made at different times for the period while this regulation is in effect.*

*All Applicants for new services and for name changes on existing services shall complete a written Electrical Service Contract. Hydro will review name change requests on existing serviced premises to ensure that the additional load required to serve the new applicant does not exceed 100 kW. The review of name change requests will also include the review of multiple name change requests and/or new service connection requests from the same Applicant to ensure that the total additional load provided to an individual Applicant will not exceed 100 kW.*

*When Hydro has reason to believe there are special circumstances surrounding an application for service in Labrador East that will result in the addition of load requirements of greater than 100 kW, where it may be appropriate to approve service connections and upgrades, Hydro may apply to the Board for a variance or exemption to this Regulation.*

*Hydro will notify the Board of all service connection or service upgrade applications refused by Hydro between September 11, 2018 and May 30, 2019.”(our emphasis)*

### **Impact of the Labrador Settlement Agreement**

In its Updated Project Proposal, NLH plans to partially commission a portion of the MFA-HVY Interconnection at the very end of 2019 to integrate almost half of its capital cost in its rate base and earn a return on the capital invested pursuant to the terms of the Labrador Settlement Agreement dated August 24, 2018:

#### **“MATTERS AGREED UPON**

##### ***Muskrat Falls to Happy Valley Interconnection Capital Project***

7. *The Parties agree to the following in relation to the Muskrat Falls to Happy Valley Interconnection Capital Project (the “MF-HV Project”):*
  - a. *Exclusion of the MF-HV Project from Hydro’s rate base in the 2018 Test Year and in the calculation of depreciation expense for the 2018 Test Year;*
  - b. *Inclusion of the MF-HV Project in Hydro’s closing rate base for the 2019 Test Year, if approved by the Board for construction to be completed in 2019 prior to Hydro’s 2017 GRA Compliance filing;*



- c. *If, at the time of Hydro's 2017 GRA Compliance filing, the MF-HV Project is not approved by the Board for construction to be completed in 2019, the Parties agree that the MF-HV Project will be excluded from the 2019 Test Year rate base; and*
- d. Exclusion of depreciation associated with the MF-HV Project in the calculation of 2019 Test Year revenue Requirement. (our emphasis)

At the time of the Settlement Agreement, the MFA-HVY Interconnection project was supposed to be proposed for construction and fully commissioned in 2019. This assumption supported IOC's participation in the Labrador Settlement Agreement.

It is IOC's view that the intent of the bargain struck by the parties require that the whole project be commissioned to be included in the 2019 closing rate base.

As proposed, the project, if approved should only impact rates further to a future Rate Application by NLH when it is "used and useful". Until fully commissioned, the MFA-HVY Interconnection does not provide firm redundant service as it is designed to provide.

#### **An Unnecessary and Unacceptable Rate Impact**

In a nutshell, the proposed MFA-HVY Interconnection would not serve any Industrial transmission customers. Yet, its approval would impose the recovery of an addition of 17.7 m\$ to the rate base<sup>21</sup>.

The Labrador East Transmission System may be called to serve a handful of megawatts above the current limit of 77 MW, mainly for data centers who could instead curtail their operations for a few hours annually. The absence of significant long term growth also means that newcomers will not significantly contribute to the cost of the project, leaving the burden on incumbent customers, mainly in Labrador West.

As it became apparent in the NLH 2017 General Rate Application, the MFA-HVY Interconnection forms the most significant portion of the proposed increase to the Labrador Industrial Transmission rate<sup>22</sup>. Should the approval be refused or simply delayed, it is IOC's position, as more explicitly detailed in its comments filed February 16, 2018 on the NLH 2018 Approval of Industrial Customer 2018 Interim Rates application, that the current rate would remain unchanged<sup>23</sup>.

The Board accepted this argument<sup>24</sup>:

*"In relation to the Labrador Industrial Transmission rate the Board notes that the proposed rate is 18% higher than current rates and results in a regulated billing impact of 13%. Further, the financial impact on IOC, the largest customer using this rate, is estimated to be \$618,156. The Board believes that the proposed increase in the Labrador Industrial Transmission rate is so high as to raise*

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<sup>21</sup> LAB-NLH-041, table 2, page 3.

<sup>22</sup> This point was raised by IOC to successfully challenge the imposition of Interim rates in 2018. See IOC Comments dated February 16, 2018, page 3.

<sup>23</sup> [www.pub.nf.ca/applications/NLH2018InterimRates/correspondance/From IOC - Comments - 2018-02-16.PDF](http://www.pub.nf.ca/applications/NLH2018InterimRates/correspondance/From%20IOC%20-%20Comments%20-%202018-02-16.PDF)

<sup>24</sup> Board Order P.U. 7 (2018), page 6, lines 13 to 34.

*concerns in relation to rate shock. While Hydro suggested that the Board consider that regulated costs account for only 12% of IOC's total forecast 2018 billings, the Board does not believe that it is appropriate to include unregulated energy charges in the rate impact analysis. The Board has no oversight of these charges and has no information as to whether these charges have recently changed or will change in the future.*

*Further, while Hydro submitted that the proposed rates are supported on the basis that the rates were designed to recover 70% of the increase in the 2018 cost of service similar to the proposals for the Island Industrial customers, the largest driver of the proposed increase in costs is the Muskrat Falls to Happy Valley-Goose Bay Interconnection project. This project has not yet been approved by the Board and has been contentious in both the general rate application and in the capital budget application. If this project does not proceed in 2018 the Board believes that the proposed Labrador Industrial Transmission rate may not be justified based on the costs on the Labrador Interconnected system. The Board also notes that, given that IOC uses 99.9% of the service provided under this rate and there is no opportunity for new customers to avail of this rate without a further Order of the Board, there are no concerns in relation to intergenerational equity. In the circumstances the Board finds that approval of the proposed Labrador Industrial Transmission rate has not been justified." (Our emphasis)*

The Board already indicated that the approval of the proposed MFA-HVY Interconnection may create a rate shock for Labrador industrial customers. The Board should err on the side of prudence before it determines its faith.

Currently, all the available evidence is not before the Board as the Expansion Study and Network Addition Policy have not been examined. Once, and only once those are examined or approved by the Board, as was requested in its Order P.U. 9 (2018), can the Board for an informed view of the current application for capital expenditures.

### **Recommendations**

IOC respectfully recommends the Board to reject the NLH 2018 Capital Budget application relating to the MFA-HVY Interconnection for the time being.

Last year, NLH framed the question best in its response to LAB-NLH-034:

*"The issue [...] is one of a balance between reliability (i.e. unavailability and expected unserved energy) and the impact on rates (i.e. how much are the customers willing to pay to improve reliability)."*

IOC on behalf of Labrador industrial customers express the view that they are unwilling to pay for it without a convincing demonstration that the proposed capital expenditure is needed and is the best approach to serve loads on the Labrador Transmission System.

Labrador customers seek to benefit from a sustainable economic growth in Labrador as well as an adequate continuity of service. The proposed MFA-HVY line fails to meet both objectives.

If the MFA-HVY Interconnection is approved now, cryptocurrency miners that do not allow NLH to recover the cost of network additions would receive undue benefits from incumbent customers.

IOC is not against reliability, to the contrary, but with the right project. Reliability will improve in the future when sustainable growth from new customers paying for the burden they impose on the system comes along.

The Board, with its Order P.U. 9 (2018) set on a path to obtain the necessary information to form a clear view of the options to support growth in Labrador and to develop a fair approach on how costs should be shared. We must complete this worthy exercise before an enlightened decision can be made on the MFA-HVY Interconnection.

Respectfully submitted,



Benoit Pepin  
Director Energy, North America  
Rio Tinto Aluminium  
Counsel for IOC