

- 1 **Q. Assuming transfer of operation of all Hydro retail-level service operations (both**  
2 **Island and Labrador and both interconnected and isolated) to Newfoundland Power**  
3 **(termed the “Retail Transfer Option” hereafter in this set of questions), please:**  
4 **a. Provide all assumptions, data, and calculations associated with**  
5 **Newfoundland Power’s analyses of staffing required on a steady state basis.**  
6 **b. Specifically detail all assumptions supporting Newfoundland Power’s**  
7 **projected ability to operate the distribution assets in the scenario with fewer**  
8 **FTEs than Newfoundland Hydro’s current staffing.**  
9 **c. Describe what efficiencies, if any, Newfoundland Power would realize in**  
10 **operating the Labrador Interconnected and Labrador and Newfoundland**  
11 **isolated systems.**  
12 **d. Detail such efficiencies narratively (qualitative) and quantitative (annual**  
13 **costs).**  
14  
15 A. a. Newfoundland Power completed an assessment of the incremental resources it  
16 would require on a steady state basis to operate specific distribution and customer  
17 service (i.e. retail) assets of Newfoundland and Labrador Hydro (“Hydro”) on the  
18 Island Interconnected System. The *pro forma* results of this assessment are  
19 provided as Attachment A to this response. See Appendix B of the assessment for  
20 the assumptions, data and calculations used to develop the estimates.  
21  
22 b. The assumptions used in Newfoundland Power’s assessment are contained in  
23 Appendix B of Attachment A to this response.  
24  
25 Newfoundland Power’s resource assessment regarding the consolidation of retail  
26 operations on the Island Interconnected System does not include a comparison to  
27 Hydro’s current number of FTEs or staffing model. More information would be  
28 required to complete such a comparison.  
29  
30 c. Newfoundland Power has not assessed what efficiencies the Company would  
31 realize in operating distribution or customer service assets on the Labrador  
32 Interconnected System or the Labrador or Island isolated systems. Additional  
33 information would be required to determine whether Newfoundland Power would  
34 operate the Labrador Interconnected System and the Labrador and Island isolated  
35 systems any differently than how these systems are currently operated by Hydro.  
36  
37 However, there are obvious efficiencies resulting from having a single retail  
38 operator for all electricity customers in Newfoundland and Labrador. Examples  
39 include the consolidation of 2 existing customer contact centres, 2 existing  
40 customer billing systems, and 2 distribution planning functions.  
41  
42 d. Please see part (c).

**Newfoundland Power Inc.**  
***Consolidation of Retail and Transmission Operations on the Island Interconnected System:  
A Resource Assessment***

# Consolidation of Retail and Transmission Operations on the Island Interconnected System: **A Resource Assessment**



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## 1.0 Executive Summary

The integrated electrical system on the Island of Newfoundland (the “Island Interconnected System”) serves approximately 291,000 customers. Both Newfoundland Power Inc. (“Newfoundland Power” or the “Company”) and Newfoundland and Labrador Hydro (“Hydro”) own and operate assets that provide transmission, distribution and customer service to these customers.

As part of the *Reference on Rate Mitigation Options and Impacts*, the Newfoundland and Labrador Board of Commissioners of Public Utilities (the “Board”) is examining whether transferring certain responsibilities from Hydro to Newfoundland Power may assist in mitigating the potential customer rate impacts associated with Nalcor Energy’s Muskrat Falls Project. The Board has requested Newfoundland Power to estimate the incremental resources required to operate assets of Hydro which deliver transmission, distribution and customer service on the Island Interconnected System.

The provincial power policy requires a utility to deliver least-cost, reliable service to its customers. Newfoundland Power’s existing transmission, distribution and customer service operations meet this standard. Newfoundland Power applied this standard in estimating the incremental resources required to operate assets of Hydro on the Island Interconnected System.

Newfoundland Power estimates that, on a *pro forma* basis, it would require incremental resources associated with approximately 117.5 Full-Time Equivalent employees to operate the transmission, distribution and customer service assets of Hydro on the Island Interconnected System. This represents an increase of approximately 19% over Newfoundland Power’s current resource levels. For customers to benefit in the form of lower rates as a result of this consolidation, the additional resources incurred by Newfoundland Power would have to be more than offset by reductions in resource expenditures by Hydro.

## 2.0 Overview

### a. Context

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In September 2018, the Provincial Government issued a reference to the Board to examine options for mitigating the impact of Nalcor Energy’s Muskrat Falls Project on customer rates. This followed significant cost overruns on the project and heightened customer concerns regarding the future price of electricity.<sup>1</sup>

Newfoundland Power has participated in the *Reference on Rate Mitigation Options and Impacts* (the “Reference”) to assist in assessing potential options to mitigate the impact of Nalcor Energy’s Muskrat Falls Project on its customers’ rates.<sup>2</sup>

Rates paid by customers served by the Island Interconnected System represent the aggregate cost of service from both Newfoundland Power and Hydro. Both utilities perform transmission, distribution and customer service functions. This duplication suggests that consolidation of transmission, distribution and customer service operations may provide tangible benefits to customers by way of reduced aggregate costs.

The Board’s consultant, The Liberty Consulting Group (“Liberty”), has indicated the potential for avoided costs and service quality improvements through the transfer of retail operations from

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<sup>1</sup> By June 2017, the estimated cost of the Muskrat Falls Project had increased from a sanctioned cost of \$7.4 billion in December 2012 to an estimated cost of \$12.7 billion. See Nalcor Energy’s *Muskrat Falls Project Update, June 23, 2017* presentation, slide 10.

<sup>2</sup> On March 8, 2019, Newfoundland Power filed a *Request for Standing* to participate in the Reference. The *Request for Standing* was approved by the Board on March 13, 2019.

1 Hydro to Newfoundland Power.<sup>3</sup> Newfoundland Power’s submission noted that greater  
2 economies of scale may exist beyond retail operations.<sup>4</sup> In its Interim Report, the Board  
3 indicated it will examine whether there are rate mitigation opportunities associated with  
4 transferring certain responsibilities from Hydro to Newfoundland Power.<sup>5</sup>

5  
6 On May 22, 2019, the Board issued a series of Information Requests requiring Newfoundland  
7 Power to provide estimates, on a Full-Time Equivalent (“FTE”) basis, of the incremental resources  
8 required for Newfoundland Power to operate specific Hydro retail and transmission assets. To  
9 enable it to provide meaningful responses to the Information Requests provided by the Board,  
10 Newfoundland Power undertook an assessment of the incremental resources it would require to  
11 operate specific Hydro retail and transmission assets on the Island Interconnected System.

12  
13 This report provides the *pro forma* results of Newfoundland Power’s assessment.

14  
15 The results of Newfoundland Power’s assessment provide a reasonable estimate of the  
16 additional resources required by Newfoundland Power to operate Hydro retail and transmission

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<sup>3</sup> In its Phase One Report, Liberty stated: *“The options involving Newfoundland Power arise from areas of territorial proximity. They also derive from the greater focus that Newfoundland Power, as an electric distribution company, places on infrastructure, systems, and organizations that get electricity from transmission substations to the meter, supported by a large customer service organization. A primary source of engagement with Newfoundland Power will concern Hydro’s distribution customers. The Phase Two work in this area will address Hydro costs avoided by a transfer of some level of control over its retail operations, and resulting onsets to Newfoundland Power costs. Phase Two work will also consider likely changes in service reliability and quality. As one example, a change with nominal cost reduction benefits may produce a significant expected improvement in customer service.”* See Liberty’s *Final Report on Phase One of Muskrat Falls Project Potential Rate Mitigation Opportunities*, December 31, 2018, Page 7.

<sup>4</sup> Newfoundland Power’s Phase One Submission states: *“The Company shares Liberty’s view that avoided costs (presumably resulting from economies of scale) and service quality improvements may be achievable through the transfer of retail operations from Hydro to Newfoundland Power. In addition, the Company observes the construction, maintenance and operation of transmission systems require substantially similar physical, technical and human resources as required for distribution systems. This implies that greater economies of scale could exist beyond retail operations. This, in turn, could provide additional value to customers in terms of reduced costs and improved service quality.”* See Newfoundland Power’s *Submission on Phase One of Muskrat Falls Project Rate Mitigation*, January 18, 2019, Page 9, Line 17, to Page 10, Line 4.

<sup>5</sup> The Board stated its focus as part of the Reference will include *“whether there are rate mitigation opportunities associated with expanding Newfoundland Power’s role into what are currently Hydro responsibilities.”* See the Board’s *Interim Report on Rate Mitigation Options and Impacts*, February 15, 2019, Page 24.

1 assets on the Island Interconnected System. It does not estimate the reduction in resources  
2 required by Hydro as a result of any consolidation. Without this information, the magnitude of  
3 potential customer benefits resulting from Newfoundland Power's operation of Hydro's retail  
4 and transmission assets on the Interconnected Island System cannot be estimated at this time.<sup>6</sup>

## 6 **b. Current Retail and Transmission Operations**

---

7 Electricity retail and transmission operations on the Island Interconnected System are currently  
8 divided among 2 utilities: Newfoundland Power and Hydro.

9  
10 Newfoundland Power currently serves approximately 268,000 customers, representing 92% of  
11 all electricity customers on the Island Interconnected System. The remaining 8% of customers  
12 on the Island Interconnected System are served by Hydro.<sup>7</sup>

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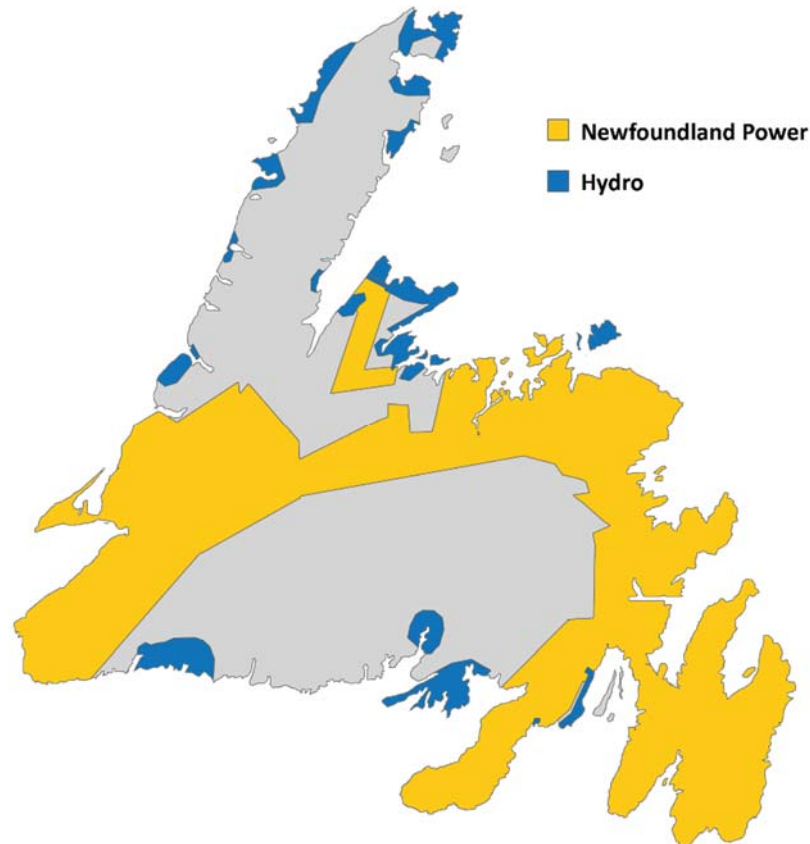
<sup>6</sup> In response to Information Request PUB-NP-052, Newfoundland Power noted: *"Transferring operations from Hydro to Newfoundland Power would result in added costs to Newfoundland Power's operations. Avoiding an increase in customer rates would require equal or greater cost savings to be achieved from within Hydro's operations. Any arrangement where added costs are not offset by sufficient cost savings would result in an increase in customer rates. This, in Newfoundland Power's view, may preclude or hinder consolidation."*

<sup>7</sup> Hydro also serves customers on the Labrador Interconnected System and the Labrador and Island Isolated Systems. Hydro's *2018 Operating Load Forecast for Hydro Rural Systems* indicates Hydro currently serves approximately: (i) 23,000 customers on the Island Interconnected System; (ii) 11,300 customers on the Labrador Interconnected System; (iii) 800 customers in Island Isolated areas; and (iv) 3,600 customers in Labrador Isolated areas. Hydro's *2018 Operating Load Forecast for Hydro Rural Systems* was filed in response to Information Request PUB-Nalcor-011 as part of the Reference. Hydro also serves Industrial customers on the Island and Labrador Interconnected Systems. Additional information would be required to estimate the incremental resources necessary to serve these customers. Service to Industrial customers is therefore not included in this assessment.



- 1 Figure 1 shows the current service territories of Newfoundland Power and Hydro on the Island
- 2 Interconnected System.

**Figure 1:**  
**Newfoundland Power and Hydro Service Territories**  
**Island Interconnected System**



- 3 Newfoundland Power currently operates approximately 81% of the distribution lines on the
- 4 Island Interconnected System, with 19% operated by Hydro.<sup>8</sup> Newfoundland Power also
- 5 operates approximately 37% of the transmission lines on the Island Interconnected System, with
- 6 63% operated by Hydro.<sup>9</sup> Of the 172 substations on the Island Interconnected System, 68% are

<sup>8</sup> Of the approximately 12,900 km of distribution line on the Island Interconnected System, 10,500 km are operated by Newfoundland Power ( $10,500 / 12,900 = 0.81$ , or 81%) and 2,400 km are operated by Hydro ( $2,400 / 12,900 = 0.19$ , or 19%).

<sup>9</sup> Of the approximately 5,700 km of transmission line on the Island Interconnected System, 2,100 km are operated by Newfoundland Power ( $2,100 / 5,700 = 0.37$ , or 37%) and 3,600 km are operated by Hydro ( $3,600 / 5,700 = 0.63$ , or 63%). This calculation does not include the Labrador-Island Link and transmission lines owned by Emera Incorporated.

1 solely operated by Newfoundland Power, 24% are solely operated by Hydro, and 8% are jointly  
2 operated by both utilities.<sup>10</sup>

3

## 4 **3.0 Service Standard, Methodology and Limitations**

### 5 **a. Service Standard**

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6 Newfoundland Power manages its operations in a manner consistent with the least-cost delivery  
7 of reliable service to customers, as required by the provincial power policy.<sup>11</sup>

8

9 The Company targets a 2-hour response time to customer outages 24 hours a day. This is  
10 achieved by deploying skilled employees and adequate resources throughout the Company's  
11 service territory.<sup>12</sup> This approach, in addition to Newfoundland Power's construction and  
12 maintenance standards, allows the Company to provide service to customers that is more  
13 reliable than the Canadian average.<sup>13</sup>

14

15 Newfoundland Power also provides customer service in a manner consistent with customers'  
16 expectations. This is achieved through the combination of online self-service options, a  
17 centralized Customer Contact Centre that is equipped to respond to customers' calls and

---

<sup>10</sup> Of the 172 substations on the Island Interconnected System, 116 are solely operated by Newfoundland Power (116 / 172 = 0.68, or 68%), 42 are operated by Hydro (42 / 172 = 0.24, or 24%), and 14 are jointly operated by both utilities (14 / 172 = 0.08, or 8%).

<sup>11</sup> Between 1997 and 2017, Newfoundland Power reduced both the duration and frequency of customer outages by 39%. Over the same period, Newfoundland Power reduced its contribution to customer rates by 24% on an inflation-adjusted basis and maintained a consistent level of customer satisfaction averaging 87%. For more information on Newfoundland Power's performance, see response to Information Request PUB-NP-055.

<sup>12</sup> In 2018, Newfoundland Power responded to 85% of customer trouble calls within 2 hours.

<sup>13</sup> Over the 10-year period from 2008 to 2017, the duration of outages experienced by Newfoundland Power's customers was approximately ½ the Canadian average under normal operating conditions. The frequency of customer outages was broadly consistent with the Canadian average. For more information, see the Company's 2019/2020 General Rate Application, Volume 1, Application, Company Evidence and Exhibits, Section 2: Customer Operations, Page 2-24 et seq.

1 emails,<sup>14</sup> and area customer service staff that provide local support throughout the Company's  
2 service territory.<sup>15</sup>

3  
4 In Newfoundland Power's view, operating conditions throughout the Island Interconnected  
5 System are sufficiently similar that Newfoundland Power's existing customer service standards  
6 should be reasonably achievable in all areas of the Island Interconnected System.<sup>16</sup> Application  
7 of these standards would also be consistent with the provincial power policy.<sup>17</sup>

8  
9 For these reasons, the Company has chosen to apply these customer service standards in the  
10 assessment of the requirements associated with serving additional customers and operating  
11 additional assets on the Island Interconnected System.

12

### 13 **b. Methodology**

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14 The primary differences between Newfoundland Power's and Hydro's existing operations on the  
15 Island Interconnected System relate to geography and customer density.

16

17 Newfoundland Power and Hydro serve customers in distinct geographic areas. However,  
18 approximately ½ of all Hydro customers on the Island Interconnected System are located within

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<sup>14</sup> Newfoundland Power's Customer Contact Centre responded to approximately 74,000 emails and 469,000 calls from customers annually over the period 2013 to 2017. For more information, see the Company's *2019/2020 General Rate Application, Volume 1, Application, Company Evidence and Exhibits, Section 2: Customer Operations, Page 2-3 et seq.*

<sup>15</sup> Newfoundland Power currently maintains 8 Area and Regional offices that provide local customer service support. These offices are located in St. John's, Carbonear, Clarenville, Salt Pond, Gander, Grand Falls-Windsor, Corner Brook and Stephenville.

<sup>16</sup> For example, the primary engineering standard for electrical systems is Canadian Standards Association ("CSA") standard *C22.3 No.1-15, Overhead Systems*. This standard establishes the same requirements for all areas on the Island Interconnected System outside the Avalon and Bonavista peninsulas, indicating the operating conditions are substantially similar. Additionally, Provincial Government policy requires that all customers on the Island Interconnected System be charged the same rates for service, implying the same metering and billing practices are achievable regardless of location.

<sup>17</sup> The provincial power policy is contained within Section 3 of the *Electrical Power Control Act, 1994*. Section 3(b)(ii) states that consumers in the province must have equitable access to an adequate supply of power. Section 3(b)(iii) states that utility operations must be managed in a manner that would result in power being delivered to customers at the lowest possible cost consistent with reliable service.

1 100 km of an existing Newfoundland Power office, implying economies of scale in relation to  
2 territorial proximity are achievable.<sup>18</sup>

3  
4 The majority of Newfoundland Power’s customers are located in more densely populated areas  
5 of the province, whereas Hydro’s customers are typically located in more rural areas. However,  
6 more remote sections of Newfoundland Power’s service territory are reasonably comparable in  
7 terms of customer density to Hydro’s service territory on the Island Interconnected System.

8  
9 In assessing the incremental FTEs that would be required to operate Hydro’s current retail and  
10 transmission assets, Newfoundland Power:

- 11
- 12 (i) Reviewed Hydro’s Island Interconnected System operations, including the  
13 number and location of customers served, and the quantity and type of  
14 distribution and transmission assets in operation;<sup>19</sup>
  - 15 (ii) Applied Newfoundland Power’s existing practices to specific areas of Hydro’s  
16 operations, using quantifiable metrics where practical (e.g. number of field  
17 crews per dispatcher); and
  - 18 (iii) Completed adjustments to account for differences in geography and customer  
19 density to ensure all customers are served under the same customer service  
20 standard.

21  
22 This methodology reasonably accounts for the primary differences in the service territories of  
23 Newfoundland Power and Hydro.

---

<sup>18</sup> This is consistent with the findings of Liberty’s Phase One Report which states: *“The options involving Newfoundland Power arise from areas of territorial proximity. They also derive from the greater focus that Newfoundland Power, as an electric distribution company, places on infrastructure, systems, and organizations that get electricity from transmission substations to the meter, supported by a large customer service organization.”* See Liberty’s *Final Report on Phase One of Muskrat Falls Project Potential Rate Mitigation Opportunities*, page 7.

<sup>19</sup> A list of the assets included in this assessment is provided as Appendix A to this report.

## 1 **c. Limitations**

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2 The results of this assessment are subject to limitations.

3

4 The estimates provided in this report are based on the most up-to-date information available to  
5 Newfoundland Power at the time of the assessment. The scope and detail of this information is  
6 not commensurate with that available in a typical due diligence exercise. For this reason, the  
7 results of this assessment should be seen as broadly indicative as opposed to precisely accurate.

8

9 Changes in the number of FTEs can be used as a reasonable indicator for changes in a utility's  
10 overall costs. The use of FTEs will not, however, capture *all* costs. Changes in certain costs, such  
11 as those associated with vehicles, buildings and employee technology, will be reasonably  
12 reflected in changes in FTEs. Changes in contracted operating and capital costs, on the other  
13 hand, will not be reflected in changes in FTEs.

14

15 This assessment indicates the number of FTEs associated with steady state utility operations.  
16 The assessment does not account for transitional issues associated with achieving this steady  
17 state. Nor does it assess conditions or circumstances that may preclude or hinder the  
18 consolidation of utility operations.<sup>20</sup>

19

20 Finally, this assessment does not consider the resources required to serve customers or operate  
21 electrical system assets on the Labrador Interconnected System, Labrador Isolated Systems, or  
22 Island Isolated Systems. It also does not include the Labrador-Island Link or the functions  
23 completed by the Newfoundland and Labrador System Operator ("NLSO"). Each of these  
24 systems, or groups of systems, has unique characteristics. As a result, the indications contained  
25 in this assessment will not apply to these systems.

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<sup>20</sup> Conditions or circumstances that may preclude or hinder consolidation were are outlined in the response to Information Request PUB-NP-052 as part of the Reference.

## 4.0 Resource Assessment

### a. Retail Operations Assessment

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Retail operations encompass 2 primary functions: (i) customer service delivery; and (ii) distribution system operation and maintenance.

Of the 23,000 customers on the Island Interconnected System currently served by Hydro, approximately: (i) 43% are located on the Northern Peninsula; (ii) 27% are located on the Baie Verte Peninsula and South Brook; (iii) 22% are located on the South Coast of Newfoundland; and (iv) 8% are located in Fogo - Change Islands. To serve these customers, Hydro currently operates approximately 2,400 km of distribution line and 24 substations that supply distribution feeders.<sup>21</sup>

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<sup>21</sup> The Retail Operations Assessment also includes 2 backup diesel generators on the Northern Peninsula in Hawke's Bay and St. Anthony. The response to Information Request PUB-Nalcor-129 indicates these generators have an installed capacity of 5.0 MW and 9.7 MW, respectively.

- 1 Table 1 provides a *pro forma* estimate of the incremental FTEs required for Newfoundland Power
- 2 to assume responsibility for Hydro’s retail operations on the Island Interconnected System.

<b>Table 1: Pro Forma FTE Estimate Retail Operations</b>	
<b>Position</b>	<b>FTEs</b>
<b>MANAGEMENT &amp; ENGINEERING</b>	
Manager	1.0
T&D Engineering	5.0
Engineering/Asset Management	3.0
Protection and Controls	2.0
Transportation	1.0
Technology	1.0
Operations Support	1.5
Human Resources	1.0
<b>Subtotal</b>	<b>15.5</b>
<b>CRAFT &amp; SUPERVISION</b>	
Line Supervisor	3.0
Line Operations	24.0
Planner	1.0
Stores	1.0
Maintenance Supervisor	1.0
Electrical Maintenance	4.0
Plant Operations	4.0
Area Customer Representative	1.0
Customer Service Supervisor	1.0
Customer Service	5.0
Meter Technician	0.5
Power System Operator	1.0
<b>Subtotal</b>	<b>46.5</b>
<b>TOTAL</b>	<b>62.0</b>

1 The incremental 62.0 FTEs outlined in Table 1 are consistent with Newfoundland Power’s  
2 existing customer service standard.

3  
4 In total, 51.0 FTEs are associated with operating and maintaining an increased number of  
5 distribution assets. This includes 24.0 Powerline Technicians to respond to customer outages  
6 and other customer-driven work requests. It also includes an additional 27.0 FTEs to engineer,  
7 operate and maintain the additional distribution assets to ensure adequate reliability is  
8 maintained for customers, including operation of backup diesel generation on the Northern  
9 Peninsula.

10  
11 An additional 7.5 FTEs are associated with customer service functions. This includes 3.0 FTEs to  
12 ensure a timely response to an increased number of customer inquiries and an additional 4.5  
13 FTEs to provide local customer service support, meter reading and collections in areas currently  
14 outside of the Company’s service territory.

15  
16 The remaining 3.5 FTEs relate to corporate functions, such as human resources, and are  
17 primarily driven by the increased number of staff that would be employed by Newfoundland  
18 Power if the Company were to assume responsibility for all retail operations on the Island  
19 Interconnected System.

20  
21 More detailed descriptions of the FTEs outlined in Table 1 are provided in Appendix B.

22

## 23 **b. Transmission Operations Assessment**

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### 24 *General*

25 Transmission operations include the operation and maintenance of both transmission lines and  
26 substations (collectively, “transmission systems”).



1 Consistent with the Information Requests received from the Board on May 22, 2019,  
 2 Newfoundland Power has considered the incremental FTEs required to operate and maintain:  
 3 (i) radial transmission lines operated by Hydro that are within Newfoundland Power’s current  
 4 service territory; (ii) all 66 kV and 138 kV transmission systems operated by Hydro; and (iii) all  
 5 transmission systems currently operated by Hydro, including the 230 kV transmission system.

6  
 7 ***i. Radial Transmission Lines***

8 Hydro currently operates and maintains 4 radial transmission lines that are within Newfoundland  
 9 Power’s current service territory: (i) TL214 and TL215, which supply Newfoundland Power’s  
 10 customers in the Codroy Valley and Port aux Basques areas; and (ii) TL212 and TL219, which  
 11 supply Newfoundland Power’s customers on the Burin Peninsula. The voltage of these  
 12 transmission lines ranges from 66 kV to 138 kV.<sup>22</sup>

13  
 14 Table 2 provides the *pro forma* estimate of the incremental FTEs required for Newfoundland  
 15 Power to operate the 4 radial transmission lines within its current service territory.

Table 2: <i>Pro Forma</i> FTE Estimate Radial Transmission Lines	
Position	FTEs
<b>MANAGEMENT &amp; ENGINEERING</b>	
Engineering/Asset Management	1.0
Power System Support	0.5
<b>Subtotal</b>	<b>1.5</b>
<b>CRAFT &amp; SUPERVISION</b>	
Line Operations	2.0
Planner	1.0
<b>Subtotal</b>	<b>3.0</b>
<b>TOTAL</b>	<b>4.5</b>

<sup>22</sup> Transmission lines TL214, TL212 and TL219 are 138 kV. Transmission line TL215 is 66 kV.

1 Newfoundland Power estimates that 2.0 FTEs would be required as Powerline Technicians to  
 2 respond to customer outages. An additional 2.5 FTEs would be required to provide power  
 3 system support and to implement the Company’s inspection and maintenance practices to  
 4 ensure the reliability of these transmission assets.<sup>23</sup>

5

6 ***ii. All 66 kV and 138 kV Transmission Systems***

7 Hydro currently operates and maintains approximately 1,800 km of 66 kV and 138 kV  
 8 transmission lines and associated substations on the Island Interconnected System, including the  
 9 radial lines previously described.

10

11 Table 3 provides the *pro forma* estimate of the incremental FTEs required for Newfoundland  
 12 Power to operate all Hydro 66 kV and 138 kV transmission systems on the Island Interconnected  
 13 System.<sup>24</sup>

Table 3: <i>Pro Forma</i> FTE Estimate All 66 kV and 138 kV Transmission Systems	
Position	FTEs
<b>MANAGEMENT &amp; ENGINEERING</b>	
Engineering/Asset Management	4.0
Protection and Controls	1.0
Power System Support	1.0
<b>Subtotal</b>	<b>6.0</b>
<b>CRAFT &amp; SUPERVISION</b>	
Line Operations	5.0
Planner	4.0
Electrical Maintenance	3.0
<b>Subtotal</b>	<b>12.0</b>
<b>TOTAL</b>	<b>18.0</b>

<sup>23</sup> Newfoundland Power’s inspection and maintenance practices for transmission and substation assets are outlined in Attachments A and B to response to Information Request PUB-NP-056 as part of the Reference.

<sup>24</sup> The analysis provided is cumulative, meaning the FTE estimates provided in Table 2 are also included in Table 3.

1 Including the 4.5 FTEs required to operate the radial transmission lines, a total of 18.0 FTEs are  
2 estimated to be required for Newfoundland Power to operate and maintain all 66 kV and 138 kV  
3 transmission systems on the Island Interconnected System. Of these, 5.0 incremental FTEs are  
4 Powerline Technicians to provide a response to customer outages and 13.0 incremental FTEs are  
5 associated with engineering, operating and maintaining these transmission systems to ensure an  
6 adequate level of reliability is experienced by customers.

7

### 8 *iii. All Transmission Systems*

9 In addition to approximately 1,800 km of 66 kV and 138 kV transmission line, Hydro also  
10 operates and maintains approximately 1,800 km of 230 kV transmission line. The 230 kV  
11 transmission lines and associated substations are commonly referred to as the “bulk  
12 transmission system” and spans virtually the entire Island Interconnected System from the  
13 Stephenville area to the Avalon Peninsula. Substation equipment operated at 230 kV is typically  
14 more complex and require a higher reliability standard than substations of lower voltage.

- 1 Table 4 provides the *pro forma* estimate of the incremental FTEs required for Newfoundland
- 2 Power to operate all Hydro 66 kV, 138 kV and 230 kV transmission systems on the Island
- 3 Interconnected System.<sup>25</sup>

<b>Table 4: Pro Forma FTE Estimate All Transmission Systems</b>	
<b>Position</b>	<b>FTEs</b>
<b>MANAGEMENT &amp; ENGINEERING</b>	
Manager	2.0
T&D Engineering	2.0
Engineering/Asset Management	12.0
Protection and Controls	4.0
Power System Support	2.0
Safety and Environment	1.0
Technology	1.0
Operations Support	0.5
Human Resources	1.0
<b>Subtotal</b>	<b>25.5</b>
<b>CRAFT &amp; SUPERVISION</b>	
Line Supervisor	2.0
Line Operations	10.0
Planner	9.0
Maintenance Supervisor	1.0
Electrical Maintenance	8.0
<b>Subtotal</b>	<b>30.0</b>
<b>TOTAL</b>	<b>55.5</b>

<sup>25</sup> The analysis provided is cumulative, meaning the FTE estimates provided in Table 3 are also included in Table 4.

1 Newfoundland Power estimates that a total of 55.5 FTEs would be required to operate all  
 2 existing Hydro transmission systems on the Island Interconnected System. This includes: (i) 42.0  
 3 FTEs to engineer, operate and maintain transmission lines and substations; (ii) 10.0 FTEs as  
 4 Powerline Technicians to ensure a timely response to customer outages; and (iii) 3.5 FTEs related  
 5 to corporate functions, such as human resources, which are principally based on the increased  
 6 staffing levels that would be required.

7  
 8 **c. Total Operational Requirements**

9 Table 5 provides a summary of the total incremental FTEs that are estimated to be required for  
 10 Newfoundland Power to assume responsibility for all existing Hydro retail and transmission  
 11 operations on the Island Interconnected System.

Table 5: <i>Pro Forma</i> FTE Estimate All Retail and Transmission Operations			
Category	FTEs		
	Retail Operations	All Transmission Systems	Total
Management & Engineering	15.5	25.5	41.0
Craft & Supervision	46.5	30.0	76.5
<b>TOTAL</b>	<b>62.0</b>	<b>55.5</b>	<b>117.5</b>

12 In total, Newfoundland Power estimates that 117.5 FTEs would be required to assume  
 13 responsibility for Hydro’s existing retail and transmission operations on the Island  
 14 Interconnected System as described in this report. This represents an increase of approximately  
 15 19% over the Company’s current resource levels.<sup>26</sup>

16  
 17 These resources would perform a mix of capital and operating work that would vary by position.  
 18 Estimated capital-operating labour splits are provided in Appendix D to this report.

<sup>26</sup> At year-end 2018, Newfoundland Power maintained approximately 619 FTEs (117.5 / 619 = 0.19, or 19%).

## 5.0 A Comment on Transition

The success of any consolidation of operations of Newfoundland Power and Hydro would be appropriately measured by: (i) reduced Island Interconnected System customer rates; and/or (ii) an improved quality of service for a significant portion of customers served by the Island Interconnected System.

Newfoundland Power has experience in restructuring utility operations to respond to extraordinary circumstances. In 1992, the province of Newfoundland and Labrador experienced a crisis in its fishery which profoundly affected the local economy.<sup>27</sup> Following this, Newfoundland Power recognized the need to restructure its operations to achieve more efficient service delivery.

The improved productivity arising from the restructuring was beneficial in terms of both cost and service. It enabled the Company to reduce its contribution to customer rates in real terms for an extended period of time. It also enabled Newfoundland Power to materially improve the reliability of the service experienced by its customers.<sup>28</sup>

The specific transitional measures and costs associated with a potential consolidation of operations of Newfoundland Power and Hydro would depend on a variety of factors. This includes the terms of any transaction or contractual arrangements involved in the consolidation.

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<sup>27</sup> Between 1992 and 2002, the population of Newfoundland and Labrador declined from approximately 580,000 to 519,000 people, a reduction of 10% over 10 years. The unemployment rate over this period was approximately 18%.

<sup>28</sup> Following the onset of the fisheries crisis, the Company reduced its workforce primarily through a series of early retirement programs which reduced staffing by approximately 35%. No permanent Newfoundland Power employee was laid off as part of these workforce reductions. The Company also improved its efficiency through a variety of initiatives which also resulted in improvements in overall electrical system reliability of approximately 40%. See response to Information Request PUB-NP-055 for greater detail on Newfoundland Power's performance over the last 2 decades.

## 1 Appendix A: List of Retail and Transmission Assets

- 2 Tables A-1 through A-5 provide lists of the assets included in Newfoundland Power’s Retail  
 3 Operations Assessment and Transmission Operations Assessment for the Island Interconnected  
 4 System.<sup>29</sup>

Table A-1: Distribution Feeders		
Area	Substations	Distribution Feeders
Bay d’Espoir	Monkstown (“MKS”) <sup>30</sup> Bay L’Argent (“BLA”) <sup>31</sup> Farewell Head (“FH”) Conne River (“CR”) English Harbour West (“EH”) Barachoix (“BA”) Bay d’Espoir (“BD”)	MKS-02-R BLA-01-R FH1-CB1 CR1-R1 EH1-R1 BA1-R1 BA4-R1 BD1-R1
Burgeo	Grandy Brook (“GB”)	GB1-R1 GB2-R1
Port Saunders	Wiltondale (“WD”) Rocky Harbour (“RH”) Glenburnie (“GL”) Sally’s Cove (“SC”) Cow Head (“CH”) Parson’s Pond (“PP”) Daniel’s Harbour (“DH”) Hawkes Bay (“HB”)	WD1-R1 RH1-R1 RH2-R1 GL1-R1 GL2-R1 SC1-R1 CH1-R1 PP1-R1 DH1-R1 HB1-R1 HB3-R1

<sup>29</sup> The list of assets is based on information provided by Hydro to Newfoundland Power, including single line diagrams and other documentation.

<sup>30</sup> Monkstown Substation is owned and operated by Newfoundland Power. In addition to serving Newfoundland Power’s customers on the Burin Peninsula, Monkstown Substation also provides service to Hydro’s customers in Monkstown and South East Bight via distribution feeder MKS-02-R.

<sup>31</sup> Bay L’Argent Substation is owned and operated by Newfoundland Power. In addition to serving Newfoundland Power’s customers on the Burin Peninsula, Bay L’Argent Substation also provides service to Hydro’s customers in Petite Forte via distribution feeder BLA-01-R.

Table A-1: Distribution Feeders		
Area	Substations	Distribution Feeders
Springdale	South Brook ("SB") Bottom Waters ("BW") Hampden ("HA") Taylor's Pond ("TP") <sup>32</sup> Jackson's Arm ("JA") Coney Arm ("CA")	SB1-R1 SB7-R1 BW1-R1 BW2-R1 BW3-R1 BW9-R1 HA1-R1 TP1-R1 JA1-R1 JA2-R1 CA1-R1
St. Anthony	Plum Point ("PP") Bear Cove ("BC") Main Brook ("MB") Roddickton Wood Chip ("RO") St. Anthony Diesel Plant ("SA")	PP1-R1 PP2-R1 BC4-R1 BC6-R1 MB1-R1 RO1-R1 RO3-R1 RO4-R1 SA1-R1 SA2-R1 SA3-R1

Table A-2: Radial Transmission Lines <sup>33</sup>		
Transmission Line	Voltage	Substations
TL214	138 kV	Bottom Brook to Doyles
TL215	66 kV	Doyles to Grand Bay (NP)
TL212	138 kV	Sunnyside to Linton Lake (NP)
TL219	138 kV	Sunnyside to Salt Pond (NP)

<sup>32</sup> Taylor's Pond Substation only serves the Labrador-Island Link Fibre Optic Repeater Site.

<sup>33</sup> Three of Hydro's radial transmission lines terminate at Newfoundland Power substations. "NP" is used to indicate these substations.



Table A-3: 66 kV and 138 kV Transmission Lines		
Transmission Line	Voltage	Substations
TL250	138 kV	Bottom Brook to Grandy Brook
TL226	66 kV	Deer Lake to Wiltondale Wiltondale to Rocky Harbour Wiltondale to Berry Hill
TL229	66 kV	Wiltondale to Glenburnie
TL227	66 kV	Glenburnie to Sally's Cove Sally's Cove to Cow Head Cow Head to Parson's Pond Parson's Pond to Daniel's Harbour
TL262	66 kV	Daniel's Harbour to Peter's Barron
TL221	66 kV	Peter's Barron to Hawkes Bay
TL257B	66 kV	St. Anthony Airport to Main Brook
TL257A	66 kV	Main Brook to Roddicktown Wood Chip
TL261	66 kV	St. Anthony Airport to St. Anthony Diesel Plant
TL239	138 kV	Deer Lake to Berry Hill
TL259	138 kV	Berry Hill to Peter's Barron
TL241	138 kV	Peter's Barron to Plum Point
TL244	138 kV	Plum Point to Bear Cove
TL256	138 kV	Bear Cove to St. Anthony Airport
TL245	138 kV	Deer Lake to Howley
TL243	138 kV	Howley to Hinds Lake
TL251	66 kV	Howley to Hampden Tap Hampden Tap to Hampden
TL252	66 kV	Hampden Tap to Jackson's Arm Tap Jackson's Arm Tap to Jackson's Arm
TL253	66 kV	Jackson's Arm Tap to Coney Arm Jackson's Arm Tap to Rattle Brook
TL260	138 kV	Seal Cove Road (NP) to Bottom Waters
TL224	138 kV	Howley to Indian River
TL223	138 kV	Indian River to Springdale (NP)
TL222	138 kV	Springdale (NP) to South Brook South Brook to Stoney Brook
TL210	138 kV	Stoney Brook to Cobb's Pond (NP)
TL254	66 kV	Boyd's Cove (NP) to Farewell Head
TL264	66 kV	Buchans to Duck Pond
TL280	66 kV	Buchans to Star Lake
TL220	66 kV	Bay d'Espoir to English Harbour West English Harbour West to Barachoix

Table A-4: 230 kV Transmission Lines		
Transmission Line	Voltage	Substations
TL234	230 kV	Bay d'Espoir to Upper Salmon
TL263	230 kV	Upper Salmon to Granite Canal Tap
TL270	230 kV	Granite Canal Tap to Granite Canal
TL231	230 kV	Bay d'Espoir to Stoney Brook
TL204	230 kV	Bay d'Espoir to Stoney Brook
TL205	230 kV	Stoney Brook to Buchans
TL232	230 kV	Stoney Brook to Buchans
TL228	230 kV	Buchans to Massey Drive
TL233	230 kV	Buchans to Bottom Brook
TL211	230 kV	Massey Drive to Bottom Brook
TL209	230 kV	Bottom Brook to Stephenville
TL202	230 kV	Bay d'Espoir to Sunnyside
TL206	230 kV	Bay d'Espoir to Sunnyside
TL267	230 kV	Bay d'Espoir to Western Avalon
TL203	230 kV	Sunnyside to Western Avalon
TL207	230 kV	Sunnyside to Come By Chance
TL237	230 kV	Come By Chance to Western Avalon
TL208	230 kV	Western Avalon to Voisey's Bay Nickel Mine
TL201	230 kV	Western Avalon to Soldiers Pond
TL217	230 kV	Western Avalon to Soldiers Pond
TL265	230 kV	Soldiers Pond to Holyrood Generating Station
TL268	230 kV	Soldiers Pond to Holyrood Generating Station
TL242	230 kV	Soldiers Pond to Hardwoods
TL266	230 kV	Soldiers Pond to Hardwoods
TL236	230 kV	Hardwoods to Oxen Pond
TL218	230 kV	Holyrood Generating Station to Oxen Pond

Table A-5: Substations		
Station	Transmission Voltage	Distribution Voltage
Barachoix	66 kV	25 kV
Bay d'Espoir	66 kV 230 kV	-

Table A-5: Substations		
Station	Transmission Voltage	Distribution Voltage
Bear Cove	138 kV	12.5 kV
Berry Hill	66 kV 138 kV	-
Bottom Brook	66 kV 138 kV 230 kV	-
Bottom Waters	138 kV	25 kV
Buchans	66 kV 230 kV	12.5 kV
Cat Arm	230 kV	-
Come By Chance	230 kV	-
Coney Arm	66 kV	12.5 kV
Conne River	66 kV	12.5 kV
Cow Head	66 kV	12.5 kV
Daniel's Harbour	66 kV	12.5 kV
Deer Lake	66 kV 138 kV 230 kV	-
Doyles	66 kV 138 kV	25 kV
Duck Pond	66 kV	-
English Harbour West	66 kV	25 kV
Farewell Head	66 kV	25 kV
Glenburnie	66 kV	12.5 kV
Grandy Brook	138 kV	25 kV
Granite Canal	230 kV	-
Granite Canal Tap	230 kV	-
Hampden	66 kV	25 kV
Hampden Tap	66 kV	-
Hardwoods	66 kV 230 kV	12.5 kV 25 kV
Hawkes Bay	66 kV	12.5 kV
Hinds Lake	138 kV	-
Holyrood Generating Station	66 kV 138 kV 230 kV	-
Howley	66 kV 138 kV	4.16 kV 25 kV

Table A-5: Substations		
Station	Transmission Voltage	Distribution Voltage
Indian River	138 kV	25 kV
Jackson's Arm	66 kV	12.5 kV
Jackson's Arm Tap	66 kV	-
Main Brook	66 kV	4.16 kV
Massey Drive	66 kV 230 kV	-
Oxen Pond	66 kV 230 kV	12.5 kV
Parson's Pond	66 kV	12.5 kV
Peter's Barron	66 kV 138 kV	-
Plum Point	138 kV	12.5 kV
Rattle Brook	66 kV	-
Rocky Harbour	66 kV	12.5 kV
Roddickton Wood Chip	66 kV	12.5 kV
Sally's Cove	66 kV	7.2 kV
Soldiers Pond	230 kV	-
South Brook	138 kV	25 kV
Springdale (NP)	138 kV	25 kV
St. Anthony Airport	66 kV 138 kV	-
St. Anthony Diesel Plant	66 kV	25 kV
Star Lake	66 kV	-
Stephenville	66 kV 230 kV	-
Stoney Brook	138 kV 230 kV	-
Sunnyside	138 kV 230 kV	25 kV
Taylor's Pond	66 kV	7.2 kV
Upper Salmon	230 kV	-
Voisey's Bay Nickel Mine	230 kV	-
Western Avalon	66 kV 138 kV 230 kV	12.5 kV
Wiltondale	66 kV	12.5 kV

## 1 Appendix B: Descriptions and Assumptions – Retail 2 Operations Assessment

3 The following are brief descriptions of the functions completed by the FTEs outlined in the Retail  
4 Operations Assessment and the assumptions and calculations used to determine the estimates  
5 provided in Table 1.

### 6 7 *i. Management and Engineering*

#### 8 9 **Manager (1.0)**

10 Newfoundland Power currently employs 7 Managers of Area Operations responsible for  
11 overseeing field operations in the Company’s service territory. On average, each Manager of  
12 Area Operations is responsible for service to approximately 38,000 customers and 1,500 km of  
13 distribution line. The Retail Operations Assessment includes 1 additional Manager of Area  
14 Operations to accommodate a 23,000 increase in the number of customers served and a 2,400  
15 km increase in distribution line. Realignment of responsibilities among managers is assumed to  
16 be required to balance the deployment of resources to meet customers’ service needs.<sup>34</sup>

#### 17 18 **T&D Engineering (5.0)**

19 Transmission and Distribution (“T&D”) Engineering staff are primarily Technologists within  
20 regional operations. The day-to-day work of T&D Engineering staff is driven by customer-driven  
21 work requests, but also includes outage response and reconstruction projects. The Retail  
22 Operations Assessment includes 5 additional T&D Engineering FTEs, an increase of 14% above  
23 the Company’s current resources. This compares to a 9% increase in customers and a 23%  
24 increase in kilometres of distribution line.

#### 25 26 **Engineering/Asset Management (3.0)**

27 Engineering and Asset Management functions are principally completed by Technologists and  
28 Engineers. For retail-related operations, the day-to-day work of Engineering and Asset  
29 Management staff is primarily driven by the quantity of substation assets being maintained.  
30 Newfoundland Power currently employs 14 Engineering and Asset Management staff to manage  
31 130 substations. The Retail Operations Assessment includes 3 additional Engineering and Asset  
32 Management FTEs, an increase of 21%, to manage an 18% increase in the number of  
33 substations. For detailed calculations, see Table C-1 of Appendix C.

---

<sup>34</sup> Newfoundland Power’s operations are currently organized in 3 Operating Regions: (i) St. John’s Region, which services the Northeast Avalon; (ii) Eastern Region, which services the Avalon, Burin and Bonavista peninsulas; and (iii) Western Region, which extends from Gander to Port aux Basques. For virtually all of Hydro’s customers on the Island Interconnected System (99%), the nearest Newfoundland Power office is within the Company’s Western Region.

1 **Protection and Controls (2.0)**

2 Protection and Controls staff include Technologists and Engineers. The day-to-day work of  
3 Protection and Controls staff primarily relates to the quantity of substation assets being  
4 supported. Newfoundland Power currently employs 1 Protection and Controls FTE per 12  
5 substations. The Retail Operations Assessment includes an additional 2 Protection and Controls  
6 FTEs to support an additional 24 substations. For detailed calculations, see Table C-3 of  
7 Appendix C.

8  
9 **Transportation (1.0)**

10 Newfoundland Power currently has 2 Transportation Specialists who have overall responsibility  
11 for ensuring the maintenance of Newfoundland Power’s fleet of vehicles. Currently,  
12 Newfoundland Power employs 1 Transportation Specialist for every 35 Line Trucks and 50  
13 passenger vehicles. The Retail Operations Assessment assumes an additional 12 Line Trucks and  
14 23 passenger vehicles would be required.<sup>35</sup> This results in the need for 1 additional  
15 Transportation Specialist.

16  
17 **Technology (1.0)**

18 Newfoundland Power currently maintains 1 Information Technology employee per  
19 approximately 52 Company employees. These employees provide technical support to  
20 operations and other Company staff on a day-to-day basis. The Retail Operations Assessment  
21 includes the addition of 61.0 FTEs, which would require 1 additional Information Technology  
22 Analyst, for a total of 62.0 FTEs.

23  
24 **Operations Support (1.5)**

25 Operations Support encompasses Newfoundland Power’s centralized dispatching process for  
26 completing field work, including response to customer outages. Dispatchers primarily schedule  
27 work for line crews. Newfoundland Power currently maintains 1 Dispatcher per 14 line trucks.  
28 The addition of 12 line crews (see “Line Operations”) in the Retail Operations Assessment would  
29 require an additional dispatcher. Newfoundland Power currently employs 2 GIS Specialists  
30 responsible for routine updates of the Company’s GIS. The Retail Operations Assessment  
31 includes ½ an additional FTE to maintain the GIS, an increase of 25% over current requirements.  
32 This reflects a 23% increase in the kilometres of distribution line to be routinely updated in the  
33 system.

34  
35 **Human Resources (1.0)**

36 Newfoundland Power currently maintains 1 Human Resources employee per 60 Company  
37 employees. The Retail Operations Assessment includes the addition of 61.0 FTEs, which would  
38 require 1 additional Human Resources employee, for a total of 62.0 FTEs.

---

<sup>35</sup> The number of line trucks is a function of the number of Powerline Technicians, with 2 Powerline Technicians per truck. This assessment includes 24 Powerline Technicians (24 / 2 = 12). This assessment also includes 23 FTEs that would require passenger vehicles as part of their day-to-day work.

1 ***ii. Craft and Supervision***  
2

3 **Line Supervisor (3.0)**

4 Line Supervisors primarily provide supervision of Powerline Technicians. In smaller operating  
5 areas, their responsibility may also include supervising other staff, such as mechanical and  
6 electrical maintenance staff. On average, Newfoundland Power currently employs 1 Line  
7 Supervisor per 11 Line Operations staff. Ratios are higher in urban areas and lower in rural  
8 areas, ranging from 5 to 15 Line Operations staff per Line Supervisor. The Retail Operations  
9 Assessment includes an additional 3 Line Supervisors to provide supervision of an additional 24  
10 Line Operations FTEs. This equates to a ratio of 8 to 1, which falls within Newfoundland Power’s  
11 existing practices.

12  
13 **Line Operations (24.0)**

14 Line Operations staff are primarily Powerline Technicians who directly maintain and construct  
15 transmission and distribution lines and respond to customer outages and other customer-driven  
16 work requests. Line Operations staff also perform work on substation equipment and  
17 transmission lines. Newfoundland Power currently employs 143 Powerline Technicians  
18 throughout its service territory. The Retail Operations Assessment includes an additional 24  
19 Powerline Technicians, an increase of 17%. This reflects a combination of a 23% increase in  
20 kilometres of distribution line and a 9% increase in the number of customers served.<sup>36</sup> It also  
21 provides adequate resources for increased substation work.

22  
23 **Planner (1.0)**

24 Planners are staff that inspect and develop work orders for maintaining distribution and  
25 transmission lines. The primary driver of their work is the annual inspection of transmission lines  
26 and the inspection of distribution lines on a 7-year cycle. The Retail Operations Assessment  
27 includes 1 additional Planner for the inspection and maintenance of additional kilometres of  
28 distribution lines. For detailed calculations, see Table C-6 of Appendix C.

29  
30 **Stores (1.0)**

31 Newfoundland Power’s existing practice is to provide materials storage throughout its service  
32 territory.<sup>37</sup> This ensures timely access to materials by crews completing emergency repairs and  
33 other work in the field. The Retail Operations Assessment assumes field crews and associated  
34 materials storage will be located in areas currently outside of Newfoundland Power’s service  
35 territory to facilitate a timely response to customer outages and other field work. The addition  
36 of a Materials Handler to oversee the stores function is therefore included in the assessment.

---

<sup>36</sup> Geographic considerations are a primary driver of the number of Powerline Technicians required to provide a 2-hour response to customer outages. As examples, Newfoundland Power would require Powerline Technicians located in St. Anthony, Hawke’s Bay, Rocky Harbour, Fogo - Change Islands, the Connaigre Peninsula and Burgeo in order to maintain the delivery of reliable service to customers.

<sup>37</sup> A list of Newfoundland Power’s existing materials storage sites is provided in response to Information Request PUB-NP-040 as part of the Reference.

1 **Maintenance Supervisor (1.0)**

2 Maintenance Supervisors primarily supervise electrical and mechanical maintenance staff.  
3 Newfoundland Power currently employs 1 Maintenance Supervisor per 7 maintenance staff. The  
4 Retail Operations Assessment includes 1 additional Maintenance Supervisor to supervise 8  
5 additional maintenance staff.  
6

7 **Electrical Maintenance (4.0)**

8 Electrical Maintenance personnel are responsible for maintaining electrical system equipment,  
9 primarily at substations. The Company currently has 24 Electrical Maintenance FTEs maintaining  
10 a total of 130 substations. The Retail Operations Assessment includes an additional 4 Electrical  
11 Maintenance FTEs, an increase of 17% above the Company's existing resources. This reflects an  
12 18% increase in the number of substations to be maintained. For detailed calculations, see Table  
13 C-7 of Appendix C.  
14

15 **Plant Operations (4.0)**

16 Plant Operators/Maintenance personnel are primarily responsible for operating and maintaining  
17 generation equipment. The Retail Operations Assessment includes 4 Plant Operators associated  
18 with maintaining backup diesel generation units on the Northern Peninsula in Hawke's Bay and  
19 St. Anthony.  
20

21 **Area Customer Representative (1.0)**

22 Newfoundland Power's current practice is to maintain Area Offices to provide local customer  
23 service and operations support throughout its service territory. The Retail Operations  
24 Assessment includes realignment of the responsibilities of existing staff and the addition of an  
25 Area Customer Representative to provide local support to customers.  
26

27 **Customer Service Supervisor (1.0)**

28 Newfoundland Power's current practice is to locate a Customer Service Supervisor in Area  
29 Offices with local customer service staff, including Meter Readers and Field Services  
30 Representatives. The Retail Operations Assessment includes realignment of the responsibilities  
31 of existing staff and the addition of 1 Customer Service Supervisor to supervise additional  
32 customer service staff (see "Customer Service").



1 **Customer Service (5.0)**

2 Newfoundland Power operates a Customer Contact Centre to respond to customers’ inquiries.  
3 The Customer Contact Centre includes 39 Customer Service Representatives that primarily  
4 respond to customers’ calls and emails. The Retail Operations Assessment includes 3 FTEs in the  
5 Customer Contact Centre to respond to an assumed 10% increase in customer calls and 6%  
6 increase in customer emails.<sup>38</sup> Customer Service FTEs also include 1 Meter Reader and 1 Field  
7 Services Representative (“FSR”) to provide meter reading and collections functions, respectively.  
8 Newfoundland Power currently maintains approximately 38,000 customers per Meter Reader  
9 and FSR. An additional Meter Reader and FSR would be required to serve an additional 23,000  
10 customers.

11  
12 **Meter Technician (0.5)<sup>39</sup>**

13 Meter Technicians are responsible for the installation and maintenance of revenue metering at  
14 customers’ premises. On average, Newfoundland Power maintains 1 Meter Technician per  
15 67,000 customers. The ratio is lower in more rural areas, generally reflecting the distances  
16 necessary to travel to customers. The Retail Operations Assessment includes ½ an FTE to provide  
17 the Meter Technician function for an additional 23,000 customers. The lower ratio reflects  
18 geographic considerations.

19  
20 **Power System Operator (1.0)**

21 Power System Operators work at the Company’s System Control Center. They are responsible  
22 for operating Newfoundland Power’s electrical system assets, such as substation breakers and  
23 downline reclosers. The Company currently has 12 Power System Operators, with 4 teams of 3  
24 operators providing power system operations 24 hours a day, 7 days a week. The Retail  
25 Operations Assessment includes an additional Power System Operator during regular business  
26 hours to accommodate an increased amount of scheduled line work during the day.

---

<sup>38</sup> Hydro’s 2017 General Rate Application indicates it received an average of approximately 44,000 customer calls and 4,000 customer emails per year over the period 2014 to 2016 (see Chapter 2: Customers, Page 2.4, Table 2-3 Customer Initiated Contacts). Newfoundland Power received an average of 437,000 customer calls and 66,000 customer emails per year over this period ( $44,000 / 437,000 = 0.10$ , or 10%;  $4,000 / 65,000 = 0.06$ , or 6%).

<sup>39</sup> This assessment does not include FTEs related to Hydro’s accredited meter testing facility.

## 1 Appendix C: Descriptions and Assumptions – Transmission 2 Operations Assessment

3 The following are brief descriptions of the functions completed by the FTEs outlined in the  
4 Transmission Operations Assessment and the assumptions and calculations used to determine  
5 the estimates provided in Tables 2 through 4.

### 6 7 *i. Management and Engineering* 8

#### 9 **Manager (2.0)**

10 Newfoundland Power estimates it would employ a total of 8 Managers of Area Operations based  
11 on the Retail Operations Assessment. The Transmission Operations Assessment determined that  
12 existing responsibilities can be rebalanced and no additional managers would be required to  
13 transfer operation of Hydro's 66 kV and 138 kV transmission lines. However, this assessment  
14 includes the addition of 1 Manager in both Newfoundland Power's Eastern Region and Western  
15 Region to oversee operation and maintenance of approximately 1,800 km of 230 kV transmission  
16 line and associated substations.

#### 17 18 **T&D Engineering (2.0)**

19 T&D Engineering staff are primarily Technologists within regional operations. The day-to-day  
20 work of T&D Engineering staff is driven by customer-driven work requests, but also includes  
21 outage response and reconstruction projects. Given the majority of T&D Engineering work  
22 occurs on the distribution system, the Transmission Operations Assessment assumes that the  
23 additional T&D engineering FTEs included in the Retail Operations Assessment will have capacity  
24 to complete this function for 66 kV and 138 kV transmission assets. However, the Transmission  
25 Operations Assessment includes 2 T&D Engineering FTEs to support operation and maintenance  
26 of approximately 1,800 km of 230 kV transmission line.

#### 27 28 **Engineering/Asset Management (12.0)**

29 Engineering and Asset Management functions are completed by Technologists and Engineers.  
30 The day-to-day work of Engineering and Asset Management staff is primarily driven by the  
31 quantity of substations and transmission assets. The Transmission Operations Assessment  
32 separately considered the Engineering and Asset Management resources required for  
33 substations and transmission assets, as shown in Tables C-1 and C-2.

**Table C-1:  
FTE Calculation - Engineering and Asset Management (Substations)**

	NP Current Operations	Incremental Requirements			
		Retail Operations	Radial Transmission Lines Only	All 66 kV and 138 kV Transmission Lines	All Transmission Lines
Substation Quantity	130	24	1	10	19
Weighting	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>2</u> <sup>40</sup>
Weighted Substation Quantity	130	24	1	10	38
Cumulative Substation Quantity	130	154	155	165	203
Increase from Current	-	18%	19%	27%	56%
Cumulative FTE Requirements	14	17	17	18	22
Total Incremental FTEs	-	3	3	4	8
<b>Incremental Transmission-Related FTEs</b>	-	-	-	<b>1</b>	<b>5</b>

**Table C-2:  
FTE Calculation - Engineering and Asset Management (Transmission Lines)**

	NP Current Operations	Incremental Requirements			
		Retail Operations	Radial Transmission Lines Only	All 66 kV and 138 kV Transmission Lines	All Transmission Lines
Transmission Line length (km) <sup>41</sup>					
66 kV <sup>42</sup>	1,596	-	29	550	-
138 kV	472	-	411	812	-
230 kV	-	-	-	-	1,790
Total Line Length (km)	2,068	-	440	1,362	1,790
Cumulative Line Length (km)	2,068	2,068	2,508	3,870	5,660
Increase from Current	-	-	21%	87%	174%
Cumulative FTE Requirements	4	4	5	7	11
Total Incremental FTEs	-	-	1	3	7
<b>Incremental Transmission-Related FTEs</b>	-	-	<b>1</b>	<b>3</b>	<b>7</b>

<sup>40</sup> The weighting factor of 2 reflects the higher reliability requirements for the 230 kV system based on an assumed redundancy of all substation components.

<sup>41</sup> Lines lengths are provided in responses to Information Requests PUB-NP-035 and PUB-Nalcor-129 as part of the Reference.

<sup>42</sup> Includes 6 km of 33 kV transmission lines.

1 **Protection and Controls (4.0)**

2 Protection and Controls staff include Technologists and Engineers. The day-to-day work of  
3 Protections and Controls staff primarily relates to the quantity of substation assets being  
4 supported. Table C-3 outlines the calculation of Protection and Controls FTEs included in the  
5 Transmission Operations Assessment based on the increased quantity of substation equipment.

**Table C-3:  
FTE Calculation – Protection and Controls**

	NP Current Operations	Incremental Requirements			
		Retail Operations	Radial Transmission Lines Only	All 66 kV and 138 kV Transmission Lines	All Transmission Lines
Substation Quantity	130	24	1	10	19
Weighting	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>2</u> <sup>43</sup>
Weighted Substation Quantity	130	24	1	10	38
Cumulative Substation Quantity	130	154	155	165	203
Increase from Current	-	18%	19%	27%	56%
Cumulative FTE Requirements	11	13	13	14	17
Total Incremental FTEs	-	2	2	3	6
<b>Incremental Transmission-Related FTEs</b>	-	-	-	<b>1</b>	<b>4</b>

6 **Power System Support (2.0)**

7 Power System Support staff provide technical support to Engineering and System Control Center  
8 personnel to complete technical evaluations of the power system, such as load flow and fault  
9 studies. There are currently 2 staff providing Power System Support. This work is primarily  
10 related to the amount of substation and transmission line assets that are part of the Company's  
11 operations. The calculations used to determine the additional Power System Support staff for  
12 the Transmission Operations Assessment are provided in Table C-4.

<sup>43</sup> The weighting factor of 2 reflects the higher reliability requirements for the 230 kV system based on an assumed redundancy of all substation components.

**Table C-4:  
FTE Calculation – Power System Support (Substation and Transmission)**

	NP Current Operations	Incremental Requirements		
		Radial Transmission Lines Only	All 66 kV and 138 kV Transmission Lines	All Transmission Lines
<b>Increased Substation and Transmission Requirements</b>				
Percent Increase Substation Work (Table C-1)	-	19%	27%	56%
Percent Increase in Transmission Work (Table C-2)	-	21%	87%	174%
Combined Average Increase	-	20%	57%	115%
<b>Incremental Power System Support FTEs</b>	<b>2</b>	<b>0.5</b>	<b>1</b>	<b>2</b>

**1 Safety and Environment (1.0)**

2 Newfoundland Power currently maintains 1 Safety Advisor per 100 field employees. The  
3 Transmission Operations Assessment includes 1 additional Safety Advisor to support the  
4 combined addition of 116.5 FTEs under the Retail Operations and Transmission Operations  
5 assessments, for a total of 117.5 FTEs.

**7 Technology (1.0)**

8 Newfoundland Power currently maintains 1 Information Technology Analyst per approximately  
9 52 Company employees. These analysts provide technical support to operations and other  
10 Company staff on a day-to-day basis. The Transmission Operations Assessment includes the  
11 addition of 54.5 FTEs, which would require 1 additional Information Technology employee, for a  
12 total of 55.5 FTEs.

**14 Operations Support (0.5)**

15 Newfoundland Power has a centralized dispatching process for completing field work.  
16 Dispatchers primarily schedule work for line crews. Newfoundland Power currently maintains 1  
17 Dispatcher per 14 line crews. The addition of 5 field crews (see “Line Operations”) in the  
18 Transmission Operations Assessment would require ½ an FTE to complete additional dispatching  
19 requirements.

**21 Human Resources (1.0)**

22 Newfoundland Power currently maintains 1 Human Resources employee per 60 Company  
23 employees. The Transmission Operations Assessment includes the addition of 54.5 FTEs, which  
24 would require 1 additional Human Resources employee, for a total of 55.5 FTEs.

1 **ii. Craft and Supervision**

2

3 **Line Supervisor (2.0)**

4 Line Supervisors primarily provide supervision of Powerline Technicians. On average,  
5 Newfoundland Power currently employees 1 Line Supervisor per 11 Line Operations staff.  
6 Ratios are higher in urban areas and lower in rural areas, ranging from 5 to 15 Lines Operations  
7 staff per Line Supervisor. The Transmission Operations Assessment includes an additional 2  
8 Line Supervisors to provide supervision of an additional 10 Line Operations FTEs when assuming  
9 operational responsibility for all transmission systems. This equates to a ratio of 5 to 1, which  
10 falls within Newfoundland Power’s existing practices and reflects the need to establish  
11 dedicated transmission line operation staff in both Newfoundland Power’s Eastern Region and  
12 Western Region.

13

14 **Line Operations (10.0)**

15 Line Operations staff are Powerline Technicians who primarily maintain and construct  
16 distribution lines and respond to customer outages and other customer-driven work requests.  
17 It is estimated that about 6% of Line Operations work is completed on substation and  
18 transmission lines. This equates to approximately 9 of the 143 Powerline Technicians currently  
19 employed by Newfoundland Power (143 x 6% = 9). The calculations used to determine the  
20 additional Line Operations staff for the Transmission Operations Assessment are provided in  
21 Table C-5.

Table C-5: FTE Calculation – Line Operations (Substation and Transmission Requirements)				
	NP Current Operations	Incremental Requirements		
		Radial Transmission Lines Only	All 66 kV and 138 kV Transmission Lines	All Transmission Lines
<b>Increased Substation and Transmission Requirements</b>				
Percent Increase Substation Work (Table C-1)	-	19%	27%	56%
Percent Increase in Transmission Work (Table C-2)	-	21%	87%	174%
Combined Average Increase	-	20%	57%	115%
<b>Incremental Line Operations FTEs</b>	<b>9</b>	<b>2</b>	<b>5</b>	<b>10</b>

22 **Planner (9.0)**

23 Planners are staff that inspect and develop work orders for maintaining distribution and  
24 transmission lines. The primary driver of their work is the annual inspection of transmission  
25 lines and the inspection of distribution lines on a 7-year cycle. The assumptions and  
26 calculations used to determine the additional Planners for the Transmission Operations  
27 Assessment are provided in Table C-6.

Table C-6: FTE Calculation – Planner					
	NP Current Operations	Incremental Requirements			
		Retail Operations	Radial Transmission Lines Only	All 66 kV and 138 kV Transmission Lines	All Transmission Lines
Distribution 1/7 Line Length (km) <sup>44</sup>	1,497	339	-	-	-
Transmission Line Length (km)					
66 kV	1,596	-	29	550	-
138 kV	472	-	411	812	-
230 kV	-	-	-	-	1,790
Total Length Inspected/Year (km)	3,565	339	440	1,362	1,790
Cumulative Length Inspected/Year (km)	3,565	3,904	4,344	5,706	7,496
Increase from Current	-	10%	22%	60%	110%
Cumulative FTE Requirements	9	10	11	14	19
Total Incremental FTEs	-	1	2	5	10
<b>Incremental Transmission-Related FTEs</b>	-	-	<b>1</b>	<b>4</b>	<b>9</b>

1 **Maintenance Supervisor (1.0)**

2 Maintenance Supervisors primarily supervise electrical and mechanical maintenance staff.  
3 Newfoundland Power currently employs 1 Maintenance Supervisor per 7 maintenance staff. The  
4 Transmission Operations Assessment includes 1 additional Maintenance Supervisor to supervise  
5 8 additional maintenance staff.

6

7 **Electrical Maintenance (8.0)**

8 Electrical Maintenance personnel are responsible for maintaining electrical system equipment,  
9 primarily at substations. The Company currently has 24 Electrical Maintenance FTEs maintaining  
10 a total of 130 substations. The day-to-day work requirements of Electrical Maintenance  
11 employees is primarily driven by the amount of electrical equipment at substations. Higher  
12 voltage substations typically include more equipment and would require more electrical  
13 maintenance work. The assumptions and calculations used to determine the Electrical  
14 Maintenance FTEs in the Transmission Operations Assessment are provided in Table C-7.

<sup>44</sup> Reflects the fact that distribution lines are inspected on a 7-year cycle.

**Table C-7:  
FTE Calculation – Electrical Maintenance**

	NP Current Operations	Incremental Requirements			
		Retail Operations	Radial Transmission Lines Only	All 66 kV and 138 kV Transmission Lines	All Transmission Lines
<b>Quantity<sup>45</sup></b>					
Substations	130	24	1	10	19
Breaker	443	13	1	85	124
Power Transformers	195	28	-	22	51
Recloser	174	37	-	-	7
Regulator	50	47	-	-	-
<b>Weighting Factors<sup>46,47</sup></b>					
Substations	175	175	175	175	228
Breakers	7	7	7	7	9
Power Transformers	18	18	18	18	23
Recloser	2	2	2	2	3
Regulator	5	5	5	5	7
Total Weighted Quantity	29,559	5,104	182	2,741	6,642
Cumulative Quantity	29,559	35,063	35,245	37,986	44,628
Increase from Current	-	17%	18%	29%	51%
Cumulative FTE Requirements	24	28	28	31	36
Total Incremental FTEs	-	4	4	7	12
<b>Incremental Transmission-Related FTEs</b>	-	-	-	<b>3</b>	<b>8</b>

<sup>45</sup> Equipment quantities is for the equipment contained within substations. Estimates of the quantity of Hydro’s equipment was determined from Hydro substation drawings available to Newfoundland Power.

<sup>46</sup> Weighting factors reflect the approximate number of hours needed to complete a particular work requirement. The work requirements for substations include items such as regularly scheduled inspections, battery and switch maintenance, oil sampling, and hours associated with completing the Company’s capital programs.

<sup>47</sup> Electrical maintenance work on 230 kV assets were increased by 30% to reflect increased work requirements such as the increased size and complexity of the equipment and increased inspection cycles



## 1 Appendix D: Estimated Labour Capitalization by Position

- 2 Table D-1 provides the estimated labour capitalization by position, based on 2018 data, for the  
3 FTEs provided in the Retail Operations Assessment and the Transmission Operations Assessment.

Table D-1: Estimated Labour Capitalization by Position			
Position	Capital	Operating	Total
<b>MANAGEMENT &amp; ENGINEERING</b>			
Manager	68%	32%	<b>100%</b>
T&D Engineering	92%	8%	<b>100%</b>
Engineering/Asset Management	71%	29%	<b>100%</b>
Protection and Controls	93%	7%	<b>100%</b>
Power System Support	3%	97%	<b>100%</b>
Safety and Environment	0%	100%	<b>100%</b>
Transportation	80%	20%	<b>100%</b>
Technology	26%	74%	<b>100%</b>
Operations Support	47%	53%	<b>100%</b>
Human Resources	0%	100%	<b>100%</b>
<b>CRAFT &amp; SUPERVISION</b>			
Line Supervisor	91%	9%	<b>100%</b>
Line Operations	66%	34%	<b>100%</b>
Planner	36%	64%	<b>100%</b>
Stores	90%	10%	<b>100%</b>
Maintenance Supervisor	10%	90%	<b>100%</b>
Electrical Maintenance	42%	58%	<b>100%</b>
Plant Operations	45%	55%	<b>100%</b>
Area Customer Representative	23%	77%	<b>100%</b>
Customer Service Supervisor	12%	88%	<b>100%</b>
Customer Service	9%	91%	<b>100%</b>
Meter Technician	90%	10%	<b>100%</b>
Power System Operator	39%	61%	<b>100%</b>