
Newfoundland & Labrador

BOARD OF COMMISSIONERS OF PUBLIC UTILITIES

IN THE MATTER OF THE

2018 CAPITAL BUDGET APPLICATION

FILED BY

NEWFOUNDLAND AND LABRADOR HYDRO

**DECISION AND ORDER
OF THE BOARD**

ORDER NO. P.U. 43(2017)

BEFORE:

**Darlene Whalen, P.Eng.
Vice-Chair**

**Dwanda Newman, LL.B.
Commissioner**

**NEWFOUNDLAND AND LABRADOR
BOARD OF COMMISSIONERS OF PUBLIC UTILITIES**

AN ORDER OF THE BOARD

NO. P.U. 43(2017)

IN THE MATTER OF the *Electrical Power Control Act, 1994*, SNL 1994, Chapter E-5.1 (the “EPCA”) and the *Public Utilities Act*, RSNL 1990, Chapter P-47 (the “Act”), as amended, and regulations thereunder; and

IN THE MATTER OF an application by Newfoundland and Labrador Hydro for an Order approving, pursuant to Section 41 of the *Act*:

- (a) its 2018 capital purchases and construction projects in excess of \$50,000;
- (b) its 2018 Capital Budget; and
- (c) its estimated contributions in aid of construction for 2018.

BEFORE:

Darlene Whalen, P.Eng.
Vice-Chair

Dwanda Newman, LL.B.
Commissioner

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1 **I BACKGROUND**

2
3 **1. The Application**

4
5 Newfoundland and Labrador Hydro (“Hydro”) filed its 2018 Capital Budget Application (the
6 “Application”) with the Board of Commissioners of Public Utilities (the “Board”) on July 27,
7 2017. In the Application Hydro requests that the Board make an Order approving:

- 8
9 a) its 2018 capital purchases and construction projects in excess of \$50,000;
10 b) its 2018 Capital Budget of \$206,172,600; and
11 c) its estimated contributions in aid of construction for 2018.

12
13 Notice of the Application, including an invitation to participate, was published on August 7,
14 2017. The Application and related documentation was made available on the Board’s website.

15
16 Intervenor submissions were received from: i) the Consumer Advocate, Dennis Browne, Q.C.
17 (the “Consumer Advocate”); ii) Newfoundland Power Inc. (“Newfoundland Power”); and, iii)
18 Corner Brook Pulp and Paper Limited, NARL Refining LP, and Vale Newfoundland and
19 Labrador Limited (the “Industrial Customer Group”).

20
21 A total of 94 Requests for Information (“RFIs”) were issued to Hydro by the Board, the
22 Consumer Advocate, Newfoundland Power and the Industrial Customer Group.

23
24 The intervenors did not file evidence and did not request a technical conference or an oral
25 hearing of the Application. Written submissions were filed by Newfoundland Power on October
26 6, 2017, the Industrial Customer Group on October 11, 2017, and the Consumer Advocate on
27 October 12, 2017.

28
29 On October 19, 2017 Hydro filed a reply submission. On October 26, 2017 the Consumer
30 Advocate filed a request for clarification of some items in Hydro’s reply submission. Hydro filed
31 its response to the Consumer Advocate’s request on October 30, 2017.

32
33 During the process Hydro filed several revisions to the Application. The revised proposed 2018
34 Capital Budget is \$198,925,200.

35
36
37 **2. Board Authority**

38
39 Section 41 of the *Act* requires a public utility to submit an annual capital budget of proposed
40 improvements or additions to its property for approval of the Board no later than December 15th
41 in each year for the next calendar year. In addition, the utility is also required to include an
42 estimate of contributions toward the cost of improvements or additions to its property which the
43 utility intends to demand from its customers.

44
45 Subsection 41(3) prohibits a utility from proceeding with the construction, purchase or lease of
46 improvements or additions to its property without the prior approval of the Board where (a) the
47 cost of the construction or purchase is in excess of \$50,000, or (b) the cost of the lease is in
48 excess of \$5,000 in a year of the lease.

II PROPOSED 2018 CAPITAL BUDGET

Hydro provided information to support the overall capital budget for 2018 as well as many of the proposed individual project expenditures, including a project description, justification, costing methodology and, if applicable, future commitments. In compliance with previous Board Orders the Application also included other information which was required by the Board to be filed, including a report on 2017 capital expenditures, a schedule of capital expenditures for the period 2013-2022, and a five-year capital plan for the period 2018-2022.

1. Overview

During the proceeding Hydro filed the following amendments to the proposed capital budget:

- Muskrat Falls to Happy Valley Interconnection Project - scope of project revised¹
- Install Plant Heating System - Holyrood Thermal Generating Station Project - project withdrawn²

The revised proposed 2018 Capital Budget is as follows:

Proposed 2018 Capital Budget (\$000s)	
2018 Single Year Projects	
Generation	\$13,123.4
Transmission and Rural Operations	22,877.1
General Properties	2,659.4
Allowance for Unforeseen Events	1,000.0
Projects under \$50,000	302.6
Multi-year (2018 Expenditures)	
Multi-year projects commencing in 2018	61,443.6
Multi-year projects commenced in 2017	45,201.6
Multi-year projects commenced prior to 2017	52,317.5
Total 2018 Capital Budget	198,925.2

The Application explained that approximately 68% of the proposed expenditures relate to transmission and rural operations, 28% relate to generation, and 4% relate to general properties.³ Multi-year projects account for \$159.0 million of which \$97.5 million relates to multi-year projects which commenced in 2017 or prior years. The proposed total capital expenditure for new projects in 2018 is \$102.9 million. In its *2018 Capital Projects Overview* Hydro highlighted its aging asset base, noting that the majority of its installed assets, such as the hydroelectric installation at Bay d'Espoir, the Holyrood Thermal Generating Station, the Stephenville and Hardwoods gas turbines, and much of its transmission and distribution systems are more than 40 years old. Hydro stated that the projects proposed for 2018 address both the need to sustain the

¹ Application, Volume 1, page C-44 and Volume 2, Tab 13. Revised project proposal filed by Hydro on August 30, 2017. The 2018 proposed expenditure is reduced from \$23,513,900 to \$17,731,500 and the total cost for the two-year project is reduced from \$23,895,200 to \$19,978,500.

² Hydro's Submission, page 4. Hydro advised that it had completed further review and would re-evaluate the project to ensure it is the least-cost option. The total cost of the two-year project was \$5,685,000 (\$1,465,000 in 2018, \$4,220,000 in 2019).

³ These percentages relate to the original, not revised, proposed expenditures.

1 existing asset base and to grow the asset base in response to growing customer demand while
 2 improving reliability and adhering to Hydro's principles with respect to safety and environmental
 3 responsibility.

4
 5 According to the 2018-2022 Capital Plan Hydro intends to invest \$809 million in plant and
 6 equipment over the next five years. Annual capital expenditures are forecast to average
 7 approximately \$162 million, with the highest spending in 2018 and the lowest in 2021 at \$143
 8 million. Hydro attributes the levelling of capital expenditures going forward to Hydro's shift
 9 from the growth in the asset base to sustaining the asset base into the foreseeable future.

10
 11 Newfoundland Power submitted that the principal question for the Board is whether Hydro's
 12 proposed capital expenditures are reasonably required for Hydro to meet its statutory obligation
 13 to provide reasonably safe and adequate, least-cost service to its customers, including
 14 Newfoundland Power.

15
 16 The Consumer Advocate submitted that the Application "comes at a time of transition" and that,
 17 with the Muskrat Falls project not yet complete, it is difficult to determine what is reasonable in
 18 a capital budget which projects into the future. The Consumer Advocate noted that rate pressures
 19 and affordability are topical and submitted that each and every expenditure requires rigorous
 20 examination by the Board. According to the Consumer Advocate the Board must ascertain if the
 21 "projects, maintenance and expenditures are reasonable" given the circumstances. The Consumer
 22 Advocate argued that the Board's findings in relation to the recent prudence review and the
 23 prudence review standard have impacted Hydro's proposals for the 2018 Capital Budget straying
 24 toward perfect foresight rather than reasonable foresight. The Consumer Advocate raised the
 25 issue of increasing levels of planned capital for both utilities in the province, stating:

26
 27 Annual Capital Budget expenditures by both Newfoundland Power and NLH are at
 28 levels which are not sustainable. These Capital Budget expenditure applications are
 29 therefore outmoded. The rate base system does not fit into the Muskrat Falls equation.
 30 New systems have to be devised following hearings and public consultations.
 31 Legislative changes will be required. This will be our focus going forward to ensure
 32 affordable electricity.⁴

33 34 **2. Holyrood Capital Spending**

35
 36 The Application included the following reports in relation to the Holyrood Thermal Generating
 37 Station:

- 38 • *Holyrood Overview: Future Operation and Capital Expenditure Requirements July 2017*
 39 (*"Holyrood Overview Report"*) as directed in Order No. P.U. 45(2016)
- 40 • *Plan of Projected Operating Maintenance Expenditures 2018-2027 for Holyrood*
 41 *Generating Station July 2017* as directed in Order No. P.U. 14(2004)

42
 43 In the *Holyrood Overview Report* Hydro confirmed that the Holyrood Thermal Generating
 44 Station is still intended to be used for primary generation until "satisfactory operating
 45 experience" is obtained over the Labrador Island Link ("LIL") and Maritime Link ("ML"). At
 46 that time the Holyrood Thermal Generating Station will be placed in standby mode but will still

⁴ Consumer Advocate's Submission, October 12, 2017, page 5.

1 maintain full generation capability until the end of the 2021 winter season. The planned phases
2 of operation are as follows:

- 3
- 4 - Phase 1: Normal Production (2016 through to second quarter 2018): All three units are
5 available for primary power generation with Unit 3 also available for synchronous
6 condenser operation.
 - 7 - Phase 2: Standby Production (second quarter 2018 to the end of winter 2021): As
8 appropriate off-Island supply is secured Units 1 and 2 will be placed in standby mode and
9 Unit 3 will be operated in synchronous condenser mode as required. While in standby
10 mode, the Holyrood Thermal Generating Station can be called upon to provide energy
11 and capacity to the Island Interconnected system as required.
 - 12 - Phase 3: Post-Interconnection (Post winter 2021): Muskrat Falls assets are in-service and
13 have operating experience. Units 1 and 2 are in standby mode until decommissioning is
14 determined to be appropriate. Holyrood Unit 3 continues to operate as a synchronous
15 condenser. There will be no power production from the Holyrood Thermal Generating
16 Station after the remaining excess fuel has been burnt.
- 17

18 Hydro explained that the maintenance strategy employed at the Holyrood Thermal Generating
19 Station will be a function of the operational phase. Phase 1 requires no change in terms of
20 maintenance strategy. Scheduled overhauls of plant equipment, such as auxiliary system pumps,
21 will continue through this period to ensure plant reliability. Phase 2 starts the evolution of the
22 plant maintenance strategy. Although significant changes are not expected to be made at this
23 point, given the importance of unit reliability during the standby period equipment maintenance
24 schedules may change. In Phase 3 assets with operational requirements beyond winter 2021 will
25 continue to be maintained with investment reflecting continued requirement. The forecast system
26 equipment maintenance costs are \$7.5 million, \$7.7 million, and \$4.9 million for 2018, 2019, and
27 2020 respectively, falling below \$1.7 million in subsequent years.⁵

28

29 The 2018 capital plan for the Holyrood Thermal Generating Station identified capital
30 expenditures of approximately \$12 million. Hydro stated that the proposed projects are necessary
31 to ensure that the Holyrood facility is capable of providing reliable service to its customers in
32 advance of the full in-service of the Muskrat Falls project assets. The planned level of
33 expenditures for the Holyrood Thermal Generating Station over the 2018 to 2022 period ranges
34 from a high of \$15.2 million in 2019 to a low of \$3.1 million in 2021, with an annual average
35 expenditure of \$9.7 million.

36

37 The Consumer Advocate noted that, although Hydro anticipates the closure of the Holyrood
38 Thermal Generating Station, the proposed capital expenditures for the facility are significant.
39 According to the Consumer Advocate there are no certain answers provided as to the sources of
40 supply if the back-up capability of the Holyrood Thermal Generating Station is no longer
41 available. The Consumer Advocate submitted that it is incumbent on the Board to continue to
42 assess the adequacy and reliability of supply now, prior to and after the integration of the Island
43 Interconnected system. Following the filing of Hydro's reply submission the Consumer
44 Advocate requested clarification of Hydro's plans to close the Holyrood Thermal Generating
45 Station and questioned whether the costs for converting the facility to synchronous condensing
46 mode should be charged to the Muskrat Falls project.

⁵ Plan of Projected Operating Maintenance Expenditures (2018 - 2027) for Holyrood Generating Station July 2017, Appendix A, page A-2.

1 Hydro responded that the detailed plans for the Holyrood Thermal Generating Station are on the
 2 record and clarified that, while the generation capabilities at the plant may be decommissioned,
 3 aspects required for reliability will remain, including maintaining the present synchronous
 4 condensing capability for Unit 3. According to Hydro “there are no costs that can be associated
 5 with the continued use of Holyrood as a synchronous condensing facility that fall to the Muskrat
 6 Falls Project.”⁶ Hydro also stated that maintaining generation capability at Holyrood until 2021
 7 requires capital expenditures to ensure reliable operation until the final decision is made to
 8 decommission the generation capability and that it will continue to propose capital expenditures
 9 for the Holyrood Thermal Generating Station as required.

10
 11 Given the importance of the Holyrood Thermal Generating Station facility to the Island
 12 Interconnected system the Board believes that Hydro should continue to file an updated
 13 *Holyrood Overview Report* and a plan of projected operating expenditures as part of its capital
 14 budget applications, at least until the Holyrood Thermal Generating Station enters the Phase 3
 15 operational stage.

16 17 **3. Transmission Line Upgrade from Bay d’Espoir to Western Avalon (TL 267 Project)**

18
 19 As part of the *2018-2022 Capital Plan* Hydro filed a report on the status of the \$291.7 million
 20 project to construct a 230 kV line from the Bay d’Espoir Generating Facility to the Western
 21 Avalon Terminal Station.⁷ This report included an update on work progress and the expenditure
 22 and budget status. While the initial planned completion date for the project was May 1, 2018,
 23 given that the project would have a material impact on system reliability and would eliminate
 24 system constraints, the schedule was accelerated to provide for an in-service date of October 31,
 25 2017.

26
 27 The Board notes that as of the report date the project was on budget and on schedule. The only
 28 risk identified to meeting the planned in-service date was the possible impact of a workplace
 29 incident during the transmission line construction which resulted in two fatalities. According to
 30 the report the line was expected to be energized by year-end but project activities such as access
 31 road and environmental reclamation, material and inventory reconciliation, demobilization of
 32 construction forces, as-built submittals and project close out documentation will continue into
 33 2018 with forecast costs of \$17.4 million.^{8, 9}

34 35 **4. Capital Projects Over \$50,000**

36
 37 The Application seeks approval of the proposed individual projects with expenditures in excess
 38 of \$50,000, based on the supporting documentation provided for each project which included a
 39 project description, justification, costing methodology and, if applicable future commitments.
 40 For some projects the information provided included technical/engineering reports.

⁶ Hydro’s October 30, 2017 letter, page 2.

⁷ This status report was directed as part of the approval of the project in Order No. P.U. 53(2014). Up until September 2017 the Board also required monthly status reports to be filed on the 15th of each month. These were changed to bi-weekly status reports until the line was energized and in-service.

⁸ In its December 8, 2017 status report Hydro reported that the transmission line and terminal station components of the project were complete and the line was successfully energized and placed in service on December 6, 2017.

⁹ *2018-2022 Capital Plan*, page A-8. Expenditures to 2017 were reported as \$274.2 million.

1 Newfoundland Power provided submissions on proposed capital projects related to the gas
2 turbines at Holyrood, Hardwoods, and Stephenville, as well as the proposed project to install a
3 new heating system at the Holyrood Thermal Generating Station, the proposed project to
4 increase the capacity of the transmission system supplying the Upper Lake Melville area, and the
5 proposed projects associated with refurbishment and modernization of hydraulic generation.
6

7 The Industrial Customer Group did not object to any specific project proposed for 2018 but
8 reserved the right to address, in Hydro's 2017 General Rate Application, the correctness of the
9 specific assignment of the frequency converter to Corner Brook Pulp and Paper Limited. The
10 Industrial Customer Group also identified issues with respect to the justification and the
11 proposed specific assignment for projects for 2019 and 2021 that are referenced in IC-NLH-011
12 (Revision 1) and reserved the right to issue requests for information and submissions on these
13 projects and their proposed specific assignment. To minimize similar issues in future capital
14 budget applications the Industrial Customer Group submitted it would be reasonable for the
15 Board to order Hydro to clearly identify and provide detailed justification for capital
16 expenditures and the allocation of the capital expenditures to specific Island Industrial
17 customers. The Industrial Customer Group stated that Newfoundland Power's submission in
18 relation to several projects are carefully reasoned and reasonable and supported the measures
19 proposed by Newfoundland Power.
20

21 The Consumer Advocate did not object to any specific projects but referenced the submissions of
22 both the Industrial Customer Group and Newfoundland Power, stating that no exception is taken
23 to either submission.
24

25 In its reply submission Hydro addressed the issues raised by the intervenors and submitted that
26 the proposed projects should be approved, with the exception of the project to install a plant
27 heating system at the Holyrood Thermal Generating Station. Hydro explained that it was
28 withdrawing this project as it had completed further review incorporating new information and
29 that it planned to re-evaluate the project to ensure it is the least cost solution. With respect to the
30 issues related to the specific assignment of assets, Hydro committed to engaging further with the
31 individual members of the Industrial Customer Group. Hydro also committed to itemizing and
32 clearly identifying, in advance, proposed capital expenditures to be specifically assigned to its
33 Industrial customers, as well as in future Capital Budget Applications.
34

35 The Board has reviewed the evidence filed by Hydro in support of the proposed 2018 capital
36 projects and expenditures, the submissions filed by the intervenors and Hydro's reply
37 submission. The following sections set out the Board's findings with respect to the proposed
38 expenditures related to the gas turbines at Holyrood, Hardwoods, and Stephenville, the Muskrat
39 Falls to Happy Valley interconnection project, and the hydraulic generation refurbishment and
40 modernization project. The Board is satisfied that the issues raised in relation to specifically
41 assigned charges can be addressed in Hydro's ongoing general rate application process.
42

43 4.1 Holyrood Gas Turbine Projects 44

45 The 123.5 MW gas turbine at Holyrood was commissioned in February 2015. Hydro advised that
46 since the unit was placed into service it has been operated more frequently and for longer
47 durations than planned to facilitate spinning reserve requirements and to provide generation
48 supply during planned and unplanned outages as well as for operational needs. Hydro explained
49 that it anticipates that the unit may be required more often and for longer periods for emergency

1 situations in the future. Hydro proposed specific projects that arise as a result of the increased
2 past and expected future use of the unit, including increasing fuel storage, expanding the water
3 treatment capacity, and a turbine hot gas path level 2 inspection and overhaul.

4
5 i) Increase Fuel and Water Treatment System Capacity
6

7 This combined two-year project would increase fuel storage and water treatment system capacity
8 for the Holyrood gas turbine, with total proposed expenditures of \$11,842,600.¹⁰
9

10 The first part of this project involves the installation of additional water treatment equipment to
11 increase the capacity to produce the demineralized water used to reduce nitrous oxide emissions,
12 with proposed expenditures of \$946,700. According to Hydro the expansion of the water
13 treatment system is required to meet the conditions of the plant's Certificate of Approval. No
14 issues were raised with respect to the proposed expansion of the water treatment system capacity.
15

16 The second part of this project involves the construction of two additional 1.25 million litre fuel
17 tanks to increase on-site fuel storage capacity from 2.5 million to 5 million litres, with proposed
18 expenditures of \$10,895,900. Hydro submitted that the increased fuel storage is necessary to
19 meet expected system operating requirements in the future.
20

21 Newfoundland Power submitted that, while it supports reasonable expansion of the on-site fuel
22 supply, the evidence does not establish that an additional 2.5 million litres of storage is required.
23 Newfoundland Power noted that 5 million litres of fuel storage will allow the Holyrood gas
24 turbine to generate at 100% capacity for ten days with normal daily fuel deliveries and for five
25 days without any fuel deliveries. Newfoundland Power noted that, to date, the longest period the
26 Holyrood gas turbine has run at 100% capacity is 14 hours. Newfoundland Power also noted
27 that, despite interruptions in fuel delivery in 2015, 2016 and 2017, including two delays of 48
28 hours, there have been no occasions when the unit could not be operated due to inadequate fuel
29 supply.
30

31 The Industrial Customer Group stated that Newfoundland Power's submission in relation to the
32 project to increase fuel and water treatment system capacity is carefully reasoned and reasonable
33 and that the group supported the measures proposed by Newfoundland Power.
34

35 In its reply submission Hydro stated that the proposed increase of on-site fuel storage is prudent
36 to ensure the unit is available to supply emergency power during a significant winter event.
37 Hydro further stated that, once the Holyrood Thermal Generating Station enters Phase 3 of
38 operation, the Holyrood gas turbine will be the largest emergency back-up generation source for
39 the Avalon Peninsula and may be required to operate for extended periods in the event of
40 protracted system issues.
41

42 *Board Findings*
43

44 The only contested aspect of this project is the proposal to increase the fuel storage capacity. The
45 evidence shows that the Holyrood gas turbine has been operated more frequently and for longer

¹⁰ Application, Volume I, page C-8.

1 periods than forecast since it was commissioned in 2015.¹¹ The forecast operating hours for 2018
2 and 2019 are 410 hours and 380 hours.¹²

3
4 According to Hydro its proposal to increase fuel storage capacity is intended to address the
5 potential for longer duration events such as an extended outage to a Holyrood thermal unit or 230
6 kV transmission line serving the Avalon Peninsula. Hydro explained that the proposed
7 construction of two additional 1.25 million litre tanks to increase the on-site storage of fuel from
8 2.5 million litres to 5 million litres would allow the Holyrood gas turbine to generate full load for
9 five days with no deliveries. In its response to NP-NLH-013 Hydro indicated that the risks of
10 fuel delivery interruption and not the annual forecast hours are the primary reason for the
11 proposed increase in fuel storage. These delivery risks include possible fuel production
12 limitations at the refinery, poor weather and road conditions, truck and driver availability, and
13 unloading issues. The Board accepts that providing for fuel storage which would allow for five
14 days of generation at full load is reasonable given the delivery risks. Further the Board notes that,
15 following interconnection, the Holyrood gas turbine will be the largest emergency back-up
16 generation source and may be required to run at rated capacity as a primary power source for an
17 extended period in the event of extended supply issues. The Board is satisfied that this project
18 would provide enhanced reliability and security of supply and should be approved.

19
20 ii) Turbine Hot Gas Path Level 2 Inspection and Overhaul

21
22 This proposed two-year project involves a hot gas path level 2 inspection and overhaul on the
23 Holyrood gas turbine with a total capital expenditure of \$11,146,500.¹³ The planning and
24 procurement would be completed in 2018 (\$6.54 million) and the inspection and overhaul would
25 be completed in 2019 (\$4.61 million). Hydro explained that the manufacturer recommends that a
26 hot gas path level 2 inspection and overhaul be completed when the unit's total equivalent starts
27 reaches 800. Hydro's current forecast is that the unit will reach 800 total equivalent starts in
28 2019.

29
30 This project also includes the installation of an access hatch in the powerhouse roof to allow for
31 lifting major components out of the building during the inspection and overhaul, at an estimated
32 cost of \$1,025,800.¹⁴ The original 2015 construction of the Holyrood gas turbine building
33 allowed for deconstruction of a section of the building roof deck. Hydro advised that it evaluated
34 the cost of installing an access hatch as compared to the original design and determined that it
35 would be more cost effective to install the hatch.

36
37 Newfoundland Power submitted that Hydro's current forecast of equivalent starts of the
38 Holyrood gas turbine in 2019 does not take into account completion of transmission line TL267
39 or the interconnections to Nova Scotia and Labrador. Newfoundland Power noted that Hydro
40 indicated that it will defer the planned hot gas path inspection and overhaul beyond 2019 if the
41 800 equivalent starts threshold is not met in 2019 as anticipated, provided the overhaul can be
42 safely deferred beyond the 2019-2020 winter operating season. Newfoundland Power submitted
43 that the impending system changes may affect the number of equivalent starts forecast and that

¹¹ The operating hours in 2015 were 788 compare to planned hours of 184; in 2016 the operating hours were 1,818 compared to planned hours of 294; and in 2017 the operating hours to June 30, 2017 were 570 compared to planned annual hours of 529.

¹² NP-NLH-012

¹³ Application, Volume I, page C-11.

¹⁴ NP-NLH-009

1 Hydro should be required to provide, with its next capital budget application, an updated
 2 equivalent starts forecast and information regarding the impact of the updated forecast on the
 3 schedule for the planned hot gas path overhaul. In relation to the access hatch, Newfoundland
 4 Power does not take issue with the proposed installation but submitted that, prior to approval of
 5 inclusion of the associated costs in Hydro's rate base, justification should be provided as to why
 6 it is reasonable that customers bear the cost of both the access hatch and the provision for access
 7 in the original construction of the building.

8
 9 The Industrial Customer Group stated that Newfoundland Power's submission in relation to the
 10 turbine hot gas path level 2 inspection and overhaul is carefully reasoned and reasonable and that
 11 the group supported the measures proposed by Newfoundland Power.

12
 13 Hydro replied that the timing of the work will be based on the actual and forecast operation of
 14 the unit and will be undertaken as close to the 800 equivalent starts threshold as possible while
 15 ensuring that the unit is reliable for the following winter season. Hydro committed to continuing
 16 to analyse the actual and planned usage for the Holyrood gas turbine and to provide an update in
 17 its 2019 Capital Budget Application. Any deferral of the project would be discussed in its Capital
 18 Expenditures and Carryover Report. In relation to the access hatch, Hydro submitted that the
 19 issue of customers bearing incremental cost is not directly relevant to the approval of capital
 20 projects that are demonstrated to be prudent and cost-effective. According to Hydro "there was
 21 no identifiable or material incremental cost to the overall design and construction of the building
 22 to provide that feature as compared to a fixed roof construction arrangement."¹⁵

23 24 *Board Findings*

25
 26 The concerns raised with the proposed hot gas path level 2 inspection and overhaul relate
 27 primarily to when the threshold of 800 equivalent starts will be met, triggering the need for the
 28 inspection and overhaul. According to Hydro, based on its current operating forecast, this
 29 threshold will be reached in 2019. Hydro has acknowledged the uncertainty with respect to when
 30 this threshold level will be met and has indicated it will provide an update in its 2019 Capital
 31 Budget Application to be filed in August 2018. The Board accepts that this project is necessary
 32 and that, based on the information currently available, it should proceed as proposed and
 33 according to the manufacturer's specifications. The Board believes that, considering the
 34 importance of the Holyrood gas turbine to system reliability, it is prudent for Hydro to proceed
 35 with planning and procurement in 2018. Hydro should, as agreed, provide an update on the
 36 planned and actual operations of the Holyrood gas turbine in its 2019 Capital Budget Application
 37 and the impact, if any, on the timing of the inspection and overhaul planned for 2019. With
 38 respect to the proposal to install an access hatch in the powerhouse roof, based on the
 39 information provided, the Board is satisfied that this expenditure should be approved. The Board
 40 notes that issues related to the prudence of these expenditures may be raised in Hydro's
 41 application for approval of its rate base.

42 43 4.2 Gas Turbine Equipment and Refurbishment - Hardwoods and Stephenville

44
 45 This combined two-year capital project to replace the existing demisters at both the Hardwoods
 46 and Stephenville plants and to refurbish the air intake and exhaust stack structures at the
 47 Hardwoods plant involves total capital expenditures of \$1,427,200 (2018: \$997,900; 2019:

¹⁵ Hydro's Submission, pages 3 and 4.

1 \$429,300).¹⁶ According to Hydro the existing demisters are no longer able to completely capture
2 the oil mist created from the operation of the turbines which presents concerns for possible oil
3 leaks and contamination of surrounding soil. The second project to refurbish the air intakes and
4 exhaust stack structures at Hardwoods is based on recent condition assessments which showed
5 structural deficiencies that need to be addressed to ensure continued structural integrity.
6

7 While Newfoundland Power supported this proposed capital expenditure it noted that there has
8 been no material update on the long-term need and role for these gas turbines on the Island
9 Interconnected system since Hydro's report in January, 2017 and Liberty's recommendations in
10 its February 2017 report. Newfoundland Power submitted that Hydro should be ordered to
11 complete a comprehensive analysis of short and long-term options for these units as soon as
12 possible, including the options of replacing the existing units with modern, reliable gas turbine
13 technology.
14

15 The Industrial Customer Group stated that Newfoundland Power's submission in relation to the
16 Hardwoods and Stephenville gas turbine projects is carefully reasoned and reasonable and that
17 the group supported the measures proposed by Newfoundland Power.
18

19 Hydro agreed with Newfoundland Power that a comprehensive analysis of the Hardwoods and
20 Stephenville gas turbines is prudent but stated it would not be appropriate to perform such an
21 analysis in isolation of the overall system studies and reviews that are ongoing. Hydro noted that
22 a broader analysis of appropriate planning criteria for the Island Interconnected system is
23 ongoing and will be communicated to the Board in 2018. Operational studies for the future
24 interconnected system will also be completed in 2018. Hydro submitted that, should additional
25 resources be recommended as an outcome of the planning criteria review and the operational
26 studies, a number of alternatives will be compared including, but not be limited to, continuation
27 of the Hardwoods and Stephenville gas turbines as well as the options suggested by
28 Newfoundland Power. Hydro noted that it continually assesses the operational reliability of the
29 Hardwoods and Stephenville gas turbines, which is addressed Hydro's *Near-Term Generation*
30 *Adequacy Report* submitted every six months to the Board. Hydro further stated that, given the
31 uncertainty around the longer term requirements of these units, it remains judicious in its
32 assessment of any proposed capital expenditures for the Hardwoods and Stephenville gas
33 turbines.
34

35 *Board Findings* 36

37 The issues raised in relation to the proposed Hardwoods and Stephenville gas turbine project
38 relate to planning. The Board acknowledges and shares Newfoundland Power's concern
39 regarding planning in relation to these units and agrees that a comprehensive analysis is needed.
40 The Board is cognizant that Hydro's system studies are ongoing, including the review of
41 planning criteria applicable following interconnection and the "Resource Adequacy" report that
42 will follow this review. This report is expected to be filed late in 2018 and will address both
43 near-term and long-term resource adequacy.¹⁷ The Board agrees that a review of the long-term
44 options for the Stephenville and Hardwoods gas turbines should take place in the context of this

¹⁶ Application, Volume I, page C-25. The project to replace the demisters is a two-year project starting in 2018.

¹⁷ This work is ongoing as part of the Board's Investigation and Hearing into Supply Issues and Power Outages on the Island Interconnected system. A timeline for the filing of this information was set out in correspondence to the Board dated August 4, 2017.

1 ongoing work. The Board believes that future proposed spending in relation to the Hardwoods
2 and Stephenville gas turbines should be fully justified taking into account the best information
3 available at the time in relation to near-term and long-term issues. As such, Hydro will be
4 directed to file a report with its 2019 Capital Budget in relation to the near-term and long-term
5 plans for these units setting out the information upon which the plans are based and the dates that
6 any significant relevant outstanding information will be available and whether approval of the
7 proposed expenditures can be deferred until the outstanding information is available.

8
9 The Board notes that aside from the issues raised by Newfoundland Power related to planning no
10 objections were made to this proposed project to replace and refurbish gas turbine equipment at
11 Hardwoods and Stephenville. The Board is satisfied that the evidence shows that this work is
12 necessary to ensure environmental protection and continued reliable operation of the gas turbines
13 and that this project should be approved.

14 15 4.3 Muskrat Falls to Happy Valley - Goose Bay Interconnection

16
17 This proposed two-year project to add a new transmission section from Muskrat Falls to Happy
18 Valley involves a total estimated cost of \$19,978,500 (2018: \$17,731,500; 2019: \$2,247,000).¹⁸
19 This project would include the construction of: i) a six kilometre segment of a 138 kV wood pole
20 transmission line from Muskrat Falls 315 kV/138 kV Terminal Station (MFAT2) to L1302; ii) a
21 partial 138 kV ring bus at MFATS2 with future expansion possible for a second, and iii)
22 modifications to the Happy Valley - Goose Bay Terminal Station, including upgrade of reclosers
23 and circuit breakers and the addition of a new 138/25kV-50MVA transformer and a new control
24 building. Hydro explained that the transmission interconnection would be in-service by
25 December 2018 and the commissioning of the 50 MVA transformer in Happy Valley would be
26 completed by December 2019. Hydro stated that the project is necessary to reliably support load
27 levels beyond 77 MW in the Upper Lake Melville area. Hydro explained that the load for the
28 area is forecast to grow from 79.9 MW in 2017 to 104.0 MW in 2042 and the capacity of the
29 transmission system must be increased to support loading levels beyond its current 77 MW limit.

30
31 Newfoundland Power noted that the project is Phase I of a two-phased approach to supplying
32 power to Happy Valley-Goose Bay and surrounding communities and that Hydro has indicated
33 that it will submit a capital budget application for the construction of Phase II when load
34 forecasts indicate loads will exceed the capacity of the Phase I interconnection. Newfoundland
35 Power submitted that there is evidence on the record of potential costs savings with possible
36 system changes that have not been considered in the planning study. While acknowledging that
37 Hydro is required to undertake capital expenditures in the 2018-2019 timeframe to address load
38 growth in the Upper Lake Melville area, Newfoundland Power stated that proceeding with Phase
39 I in the absence of a more comprehensive consideration of possible Phase II configurations may
40 not be consistent with the provision of least-cost service. Newfoundland Power submitted that,
41 prior to approving this project, the Board should direct Hydro to revise its planning study to
42 include consideration of whether other options, including elimination of transmission line L1301
43 and the existing gas turbine, among others, may be more cost-effective. According to
44 Newfoundland Power reconsideration of available options should not materially alter the
45 proposed project schedule.

¹⁸ Application, Volume I, page C-44, revised August 30, 2017.

1 Hydro replied that the proposed project represents the least-cost option when considering
2 lifecycle costs including those associated with the continued operation of L1301 and the Happy
3 Valley Gas Turbine. Hydro submitted that the Muskrat Falls to Happy Valley Interconnection
4 project should be approved.

5

6 *Board Findings*

7

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

16

17 Based on the information provided the Board believes that there are a number of outstanding
18 issues in relation to this project which have not been addressed. For example, Hydro does not yet
19 have an agreement in place with the Department of National Defence in relation to the forecast
20 increase in load of 12.5 MW in 2020. Hydro explained that it is in consultation with the customer
21 and "...the current expectation is an agreement will be established in accordance with the
22 customer's schedule in 2020."¹⁹ In addition the Board notes that revised operational and
23 maintenance plans for the existing 25 MW gas turbine at Happy Valley - Goose Bay have not yet
24 been determined.²⁰ Further Hydro did not show how it reflected the longer term considerations
25 associated with Phase II in developing Phase I of this project.

26

27 The Board also notes that the information provided does not demonstrate whether this project has
28 implications in the short term. Based on the information provided the forecast load surpasses the
29 system's delivery capability to the Happy Valley Terminal Station in 2017. The proposed
30 transmission interconnection would be in-service by December 2018 and the commissioning of
31 the transformer in Happy Valley - Goose Bay would be completed by December 2019. The
32 information provided does not adequately explain the near-term implications of the project and
33 how the expected load will be served prior to completion of Phase I.

34

35 The Board finds that the evidence does not demonstrate that the proposed approach is necessary
36 and consistent with the least-cost provision of service. To allow for the proper consideration of
37 the issues related to this project the Board believes that further information should be provided
38 by Hydro addressing the relevant short-term and long-term issues. These issues include costs
39 associated with the Happy Valley Gas Turbine, the Churchill Falls 138 kV Terminal Station, the
40 Muskrat Falls Terminal Station 3 and wood pole management of L1301. In addition information
41 should be provided with respect to how the proposed project addresses system requirements in
42 2018 and 2019 and thereafter, especially given the outstanding issues in relation to the forecast
43 increase in load associated with the requirements of the Department of National Defence.

44

45 Given the Board's finding that further information is required, consideration of this project will
46 be deferred. The Board will direct Hydro in relation to the specific information which should be

¹⁹ NP-NLH-023

²⁰ NP-NLH-026

1 filed and a schedule for further review of this project will be developed in consultation with the
2 parties taking into account the necessary timing for approval of this project.

3 4 4.4 Hydraulic Generation Refurbishment and Modernization

5
6 This proposed consolidated two-year project includes twelve capital projects to be undertaken at
7 a number of Hydro's hydroelectric generating stations, with a total forecast expenditure of
8 \$14,608,500 (2018: \$10,325,400; 2019: \$4,283,100) In support of this project Hydro provided
9 two reports: i) *Hydraulic Generation Refurbishment and Modernization*, and ii) *Hydraulic*
10 *Generation Asset Management Overview*.

11
12 The presentation of these projects represents a new approach by Hydro whereby the proposed
13 hydraulic generation projects are part of a single combined project rather than proposed as
14 individual projects as had been done in the past. Hydro explained:

15
16 In the 2018 Capital Budget Application, Hydro has consolidated program, pooled, and
17 stand-alone type hydraulic generation projects into a single project, Hydraulic Generation
18 Refurbishment and Modernization Project, and will respond to hydraulic generation in-
19 service failures using the Hydraulic Generation In-Service Failures Project, where
20 applicable. Moving forward, these projects are proposed for work to address the required
21 refurbishment or replacement of assets and have similar justifications and other
22 information presented each year.²¹

23
24 According to Hydro:

25
26 This allows asset management personnel to establish, where possible, consistent practices
27 as it applies to equipment specification, placement, maintenance, refurbishment,
28 replacement and disposal. These practices ensure that monitoring, assessing, justifying for
29 capital refurbishment, and replacing for asset sustaining purposes are consistently
30 executed.²²

31
32 Hydro submitted that the past approach "resulted in a segmented view of the expenditures to
33 sustain generation assets".²³ According to Hydro, combining the projects into a consolidated
34 program provides the opportunity to "increase regulatory efficiency and provide a more focused
35 presentation of Hydro's sustaining efforts for hydraulic generation".²⁴ Hydro suggested that this
36 approach could save \$10,000 in review costs per individual project, resulting in overall savings
37 of \$120,000.

38
39 Newfoundland Power noted that the Capital Budget Application Guidelines identify the
40 supporting information to be provided in justifying capital expenditures. It was also noted that
41 capital expenditures in excess of \$500,000 are considered "significant expenditures which must
42 be supported with more comprehensive and detailed documentation than other expenditures".²⁵
43 Newfoundland Power submitted that the supporting reports do not include comprehensive and
44 detailed documentation in a number of instances. According to Newfoundland Power the

²¹ Application, Volume I, page C-5.

²² *Hydraulic Generation Asset Management Overview*, page 4.

²³ *Hydraulic Generation Asset Management Overview*, page 4. Hydro noted that, in 2017, there were 14 individual projects submitted.

²⁴ Ibid.

²⁵ Newfoundland Power's Submission, page 15.

1 expenditure proposals are presented referencing generic descriptions of how such equipment is
2 assessed and what the work typically entails but at times lacks information with respect to any
3 specific assessment of the condition of the assets on which capital is proposed to be expended.
4 Newfoundland Power identified two 2018 expenditure proposals that it submits are unsupported
5 by comprehensive and detailed documentation: i) Turbine Major Refurbishment (\$2.0 million),
6 and ii) Refurbish Surge Tanks (\$2.8 million). Newfoundland Power submitted that the Board
7 should not approve capital expenditure proposals included in the Hydraulic Generation
8 Refurbishment and Modernization project where such proposals are not supported by evidence
9 meeting the requirements of the Capital Budget Application Guidelines.

10
11 The Industrial Customer Group stated that Newfoundland Power's submission in relation to the
12 Hydraulic Generation Refurbishment and Modernization project is carefully reasoned and
13 reasonable and that the group supported the measures proposed by Newfoundland Power.

14
15 In its reply submission Hydro disagreed that the projects are not properly justified and do not
16 meet the Capital Budget Application Guidelines. Hydro provided a summary of the evidence
17 provided in support of the proposals and submitted that this project should be approved.

18 19 *Board Findings*

20
21 In the Application Hydro combined twelve hydraulic generation refurbishment and
22 modernization projects into one two-year project with estimated expenditures of \$10,325,400 in
23 2018 and \$4,283,100 in 2019. The proposed projects include the major refurbishment of the Bay
24 d'Espoir Unit 2 turbine (\$2,011,400), refurbishment and replacement of control gates
25 infrastructure Hinds Lake and Bay d'Espoir (\$3,416,300), refurbishment of surge tanks
26 (\$2,798,600), as well as six-year turbine and generator overhauls and other
27 replacement/improvement projects at various sites.

28
29 The Board supports new approaches by the utilities which contribute to the more efficient and
30 effective review of capital budget proposals. The Board appreciates that the new approach with
31 respect to the presentation of hydraulic generation projects aligns with Hydro's asset
32 management program which groups assets at each location by asset classification – in this case
33 hydraulic generating units, hydraulic structures, reservoirs, site buildings and services, and
34 auxiliary equipment. Further the Board acknowledges that this approach was adopted in an effort
35 to increase regulatory efficiency and to provide a more focused presentation of Hydro's
36 sustaining efforts for hydraulic generation. While the Board accepts that this new approach may
37 provide benefits to Hydro, the presentation of these projects did not assist the Board in its review
38 of the proposed hydraulic generation capital work.

39
40 Under section 41 of the *Act* prior approval of the Board is required for any capital project where
41 the expected expenditure exceeds \$50,000. Each of the projects proposed under this program
42 have expenditures in excess of \$50,000, and a number of the projects involve significant
43 expenditures in excess of \$500,000 which the Capital Budget Application Guidelines require be
44 "supported with more comprehensive and detailed documentation than other expenditures".
45 Hydro classified the twelve projects under this program spending as "Normal" capital, meaning a
46 capital expenditure that is required based on identified need or on historical patterns of repair and
47 replacement. The Capital Budget Application Guidelines, established by the Board in
48 consultation with the utilities and the Consumer Advocate, set out the following requirements for
49 justification of capital projects classified as "Normal":

- 1 • Evidence of the need (i.e, historical spending patterns, maintenance history, reliability
2 data, growth)
- 3 • All reasonable alternatives, including deferral, have been considered
- 4 • The expenditure as proposed is the least-cost option
- 5 • Unit and/or aggregate cost data including, where available, similar costs for the preceding
6 five (5) years
- 7 • Net present value

8
9 In the Board's view the approach taken with respect to the hydraulic generation refurbishment
10 and modernization project does not satisfy the requirements of the legislation and is not
11 consistent with the Capital Budget Application Guidelines. In PUB-NLH-18 the Board requested
12 the information required by the Capital Budget Application Guidelines for each project. In
13 response Hydro provided additional information and independent engineering reports. This
14 information should have been provided in the Application to fully explain the proposals and
15 allow an opportunity to ask questions through the RFI process. The Board has reviewed the
16 information which was provided and is not satisfied that sufficient evidence is on the record to
17 justify the proposed work and to show that the associated capital expenditures are prudent and
18 necessary. In addition the Board notes that the way the information is provided makes it difficult
19 to identify and track spending in relation to the specific projects within this consolidated project.
20 To ensure that the proposed projects are consistent with least-cost service the Board believes that
21 more information should be provided to detail the proposed expenditures, the justifications and
22 the alternatives which were considered.

23
24 Given the Board's finding that further information is required, consideration of this project will
25 be deferred. The Board will direct Hydro in relation to the specific information which should be
26 filed and a schedule for further review of this project will be developed in consultation with the
27 parties taking into account the necessary timing for approval of this project.

28 29 **5. Summary of Board Findings**

30
31 The Board has considered the information and submissions filed in relation to the proposed 2018
32 Capital Budget and the proposed 2018 capital projects. The Board has, as discussed earlier,
33 found that the proposed capital projects with expenditures in excess of \$50,000 should be
34 approved with the exception of the Muskrat Falls to Happy Valley - Goose Bay interconnection
35 project and the hydraulic generation refurbishment and modernization project. Both of these
36 projects will be deferred for consideration in a subsequent order of the Board following the filing
37 of further information by Hydro.

38
39 The Board is satisfied that the 2018 Capital Budget should be approved in the amount of
40 \$170,868,300 which reflects the removal of the two deferred projects not approved in this Order.
41 The approved 2018 Capital Budget may be subsequently revised if expenditures in relation to the
42 two deferred projects are approved.

43 44 **6. Costs**

45
46 The Industrial Customer Group submitted that they contributed to an effective and efficient
47 resolution of issues related to specifically assigned charges for 2018 and that their intervention
48 warrants an award of costs.

1 The Board is satisfied that the Industrial Customer Group participated responsibly and
2 contributed to the understanding of the Board and should be granted an award of costs. The
3 Board will grant leave to the Industrial Customer Group to file a claim for costs within 30 days
4 of this Order.

5
6 **III ORDER**

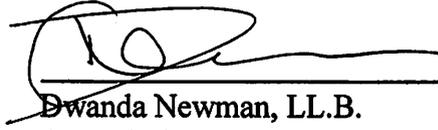
7
8 **IT IS THEREFORE ORDERED THAT:**

- 9
- 10 **1. Hydro's proposed construction and purchase of improvements or additions to its**
11 **property in excess of \$50,000 to be completed in 2018, as set out in Schedule A to this**
12 **Order, are approved.**
13
 - 14 **2. Hydro's proposed multi-year construction and purchase of improvements or additions**
15 **to its property in excess of \$50,000 to begin in 2018, as set out in Schedule B to this**
16 **Order, are approved.**
17
 - 18 **3. Hydro's proposed contributions in aid of construction for 2018 are approved.**
19
 - 20 **4. Hydro's 2018 Capital Budget for improvements or additions to its property in an**
21 **amount of \$170,868,300, as set out in Schedule C to this Order, is approved.**
22
 - 23 **5. Unless otherwise directed by the Board Hydro shall file with its 2019 Capital Budget**
24 **Application:**
 - 25
 - 26 **a. an updated overview in relation to capital expenditures for the Holyrood Thermal**
27 **Generating Station; and**
 - 28 **b. a report setting out near-term and long-term plans for the Hardwoods and**
29 **Stephenville gas turbines.**
 - 30
 - 31 **6. Unless otherwise directed by the Board Hydro shall file an annual report on its 2018**
32 **capital expenditures by March 1, 2019.**
33
 - 34 **7. Unless otherwise directed by the Board Hydro shall provide, in conjunction with the**
35 **2019 Capital Budget Application, a status report on the 2018 capital budget**
36 **expenditures showing for each project:**
 - 37
 - 38 **(i) the approved budget for 2018;**
 - 39 **(ii) the expenditures prior to 2018;**
 - 40 **(iii) the 2018 expenditures to the date of the application;**
 - 41 **(iv) the remaining projected expenditures for 2018;**
 - 42 **(v) the variance between the projected total expenditures and the approved budget;**
43 **and**
 - 44 **(vi) an explanation of the variance.**
 - 45
 - 46 **8. The Industrial Customer Group may file a claim for costs within 30 days of this Order.**
47
 - 48 **9. Hydro shall pay all costs and expenses of the Board incurred in connection with the**
49 **Application.**

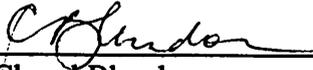
DATED at St. John's, Newfoundland and Labrador this 22nd day of December, 2017.



Darlene Whalen, P.Eng.
Vice-Chair



Dwanda Newman, LL.B.
Commissioner



Cheryl Blundon
Board Secretary

Schedule A
Order No. P.U. 43(2017)
Single Year Projects over \$50,000
Issued: December 22, 2017

NEWFOUNDLAND AND LABRADOR HYDRO
2018 CAPITAL BUDGET
SINGLE YEAR PROJECTS OVER \$50,000
(\$000)

PROJECT DESCRIPTION	2018
<i>GENERATION</i>	
<u>HYDRAULIC PLANT</u>	
Refurbish Backfill Penstock 1 - Bay d'Espoir	1,630.4
Hydraulic In-Service Failures	1,251.1
TOTAL HYDRAULIC PLANT	2,881.5
<u>THERMAL PLANT</u>	
Condition Assessment and Miscellaneous Upgrades - Holyrood	2,749.6
Overhaul Unit 1 Turbine Valves - Holyrood	2,485.7
Install Raw Water Line - Holyrood	1,252.6
Thermal In-Service Failures	1,250.0
Overhaul Unit 1 Generator - Holyrood	1,005.0
Overhaul Pumps - Holyrood	438.3
Install Fire Detection in Outbuildings - Holyrood	198.6
TOTAL THERMAL PLANT	9,379.8
<u>GAS TURBINES</u>	
Purchase Capital Spares - Gas Turbines	626.9
TOTAL GAS TURBINES	626.9
<u>TOOLS AND EQUIPMENT</u>	
Purchase Tools and Equipment less than \$50,000	235.2
TOTAL TOOLS AND EQUIPMENT	235.2
TOTAL GENERATION	13,123.4

PROJECT DESCRIPTION

2018

TRANSMISSION & RURAL OPERATIONS

TERMINAL STATIONS

Terminal Station In-Service Failures	1,000.0	
Upgrade Aluminium Support Structures - Holyrood	287.6	
TOTAL TERMINAL STATIONS		1,287.6

TRANSMISSION

Wood Pole Line Management Program - Various	3,532.9	
TOTAL TRANSMISSION		3,532.9

DISTRIBUTION

Provide Service Extensions - All Regions	4,520.0	
Upgrade Distribution Systems - All Regions	3,650.0	
Additions for Load Growth - Happy Valley	505.0	
TOTAL DISTRIBUTION		8,675.0

GENERATION

Overhaul Diesel Units - Various	2,852.4	
Inspect Fuel Storage Tanks - Black Tickle	818.7	
Additions for Load Growth - Makkovik and Rigolet	730.1	
Install Sub-Surface Drainage System - Paradise River	524.9	
Upgrade Ventilation - Cartwright	465.7	
Replace Human Machine Interface - St. Lewis	280.8	
TOTAL GENERATION		5,672.6

PROPERTIES

Upgrade Line Depots - Various	1,233.0	
Upgrade Office Facilities and Control Buildings - Various	1,180.6	
TOTAL PROPERTIES		2,413.6

METERING

Purchase Meters and Metering Equipment - Various	198.5	
TOTAL METERING		198.5

TOOLS AND EQUIPMENT

Replace Light Duty Mobile Equipment - Various	429.0	
Purchase Tools and Equipment less than \$50,000 - Central	257.4	
Replace Front End Loader Unit No. 9628 - Bay d'Espoir	170.2	
Purchase Tools and Equipment less than \$50,000 - Labrador	146.4	
Purchase Tools and Equipment less than \$50,000 - Northern	93.9	
TOTAL TOOLS AND EQUIPMENT		1,096.9
TOTAL TRANSMISSION AND RURAL OPERATIONS		22,877.1

PROJECT DESCRIPTION 2018

GENERAL PROPERTIES

INFORMATION SYSTEMS

SOFTWARE APPLICATIONS

Upgrade Energy Management System - Hydro Place	336.8	
Upgrade Software Applications - Hydro Place	114.7	
Refresh Security Software - Hydro Place	62.2	
TOTAL SOFTWARE APPLICATIONS		513.7

COMPUTER OPERATIONS

Replace Personal Computers - Hydro Place	493.0	
Upgrade Core IT Infrastructure - Hydro Place	352.4	
Replace Peripheral Infrastructure - Hydro Place	258.4	
TOTAL COMPUTER OPERATIONS		1,103.8
TOTAL INFORMATION SYSTEMS		1,617.5

TELECONTROL

NETWORK SERVICES

Replace Radomes - Various	360.3	
Replace Network Communications Equipment - Various	199.5	
Replace RTUs - Various	118.3	
Replace Air Conditioners - Various	74.4	
TOTAL NETWORK SERVICES		752.5
TOTAL TELECONTROL		752.5

ADMINISTRATION

Remove Safety Hazards - Various	199.4	
Purchase Office Equipment	90.0	
TOTAL ADMINISTRATION		289.4
TOTAL GENERAL PROPERTIES		2,659.4

TOTAL SINGLE YEAR PROJECTS OVER \$50,000		38,659.9
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Schedule B
Order No. P.U. 43(2017)
Multi-Year Projects over \$50,000
Issued: December 22, 2017

NEWFOUNDLAND AND LABRADOR HYDRO
2018 CAPITAL BUDGET
PROJECTS OVER \$50,000
MULTI-YEAR PROJECTS
(\$000)

Multi-year Projects Commencing in 2018

PROJECT DESCRIPTION	2018	2019	2020	2021	2022	Total
Terminal Station Refurbishment and Modernization (2018-2019)	8,170.6	18,625.1				26,795.7
Increase Fuel and Water Treatment System Capacity - Holyrood Gas Turbine	8,829.9	3,012.7				11,842.6
Turbine Hot Gas Path Level 2 Inspection and Overhaul - Holyrood Gas Turbine	6,538.8	4,607.7				11,146.5
Diesel Genset Replacements - Makkovik	604.1	4,703.3	3,592.8			8,900.2
Distribution System Upgrades (2018-2019) - Various	383.8	2,771.2				3,155.0
Replace Secondary Containment System Liner - Nain	1,639.2	1,450.4				3,089.6
Install Remote Operation of Salmon River Spillway - Bay d'Espoir	645.9	1,862.5				2,508.4
Replace Vehicles and Aerial Devices (2018-2019) - Various	1,667.2	753.7				2,420.9
Replace Transformer T1 - Buchans	249.0	2,086.1				2,335.1
Replace Automation Equipment (2018-2019) - St. Anthony Diesel Plant	307.4	1,565.9				1,873.3
Install Breaker Bypass Switch - Howley	83.1	1,440.9				1,524.0
Gas Turbine Equipment and Refurbishment - Hardwoods and Stephenville	997.9	429.3				1,427.2
Diesel Plant Engine Cooling System Upgrades - Various	638.4	671.6				1,310.0
Replace PBX Phone Systems - Various	91.7	1,150.6				1,242.3
Replace MDR 6000 Microwave Radio - Various	64.0	1,137.0				1,201.0
Replace Off Road Track Vehicles - Bishop Falls and Bay d'Espoir	213.7	986.3				1,200.0
Install Automated Meter Reading (2018-2019) - Bottom Waters	75.2	1,001.0				1,076.2
Implement Terminal Station Flood Mitigation - Springdale	186.2	787.8				974.0
Purchase Mobile DC Power Systems	270.9	695.6				966.5
Replace Battery Banks and Chargers - Various	382.1	555.8				937.9
Diesel Plant Fire Protection - Postville	505.6	336.4				842.0
Upgrade Exterior of Building - Hydro Place	260.2	405.7				665.9
Replace Teleprotection - TL261	57.6	459.8				517.4
Energy Efficiency Improvements - Various	276.2	168.9				445.1
Upgrade Cranes and Hoists - Holyrood	80.3	300.3				380.6
Install Energy Efficiency Lighting in Diesel Plants - Various	104.0	119.0	122.2			345.2
Install Recloser Remote Control (2018-2019) - English Harbour West and Barchoix	63.7	275.0				338.7
Total Multi-Year Projects over \$50,000 commencing in 2018	33,386.7	52,359.6	3,715.0	0.0	0.0	89,461.3

NEWFOUNDLAND AND LABRADOR HYDRO
2018 CAPITAL BUDGET
PROJECTS OVER \$50,000
MULTI-YEAR PROJECTS
(\$000)

Multi-year Projects Commencing in 2017

PROJECT DESCRIPTION	Expended to						Total
	2017	2018	2019	2020	2021	2022	
Terminal Station Refurbishment and Modernization - Various	10,831.3	16,550.8					27,382.1
Diesel Genset Replacements - Port Hope Simpson and Charlottetown	658.8	5,148.0					5,806.8
Refurbish Powerhouse Station Services - Bay d'Espoir	413.2	2,473.3	1,460.6				4,347.1
Replace Exciter Controls Units 1 to 6 - Bay d'Espoir	119.2	921.2	877.0	1,429.6			3,347.0
Upgrade Corner Brook Frequency Converter - Corner Brook	194.6	2,749.2					2,943.8
Water System Replacements - Bay d'Espoir and Cat Arm	265.5	2,288.3					2,553.8
Transmission Line Upgrades - TL212 and TL218	1,378.2	1,133.3					2,511.5
Replace Vehicles and Aerial Devices (2017-2018) - Various	2,001.4	398.8					2,400.2
Control Structure Refurbishments - Various	1,735.3	452.9					2,188.2
Install Automated Meter Reading (2017-2018) - Happy Valley	78.6	1,891.6					1,970.2
Construct Facilities - Various	422.0	1,034.1					1,456.1
Gas Turbine Life Extension - Stephenville	847.5	505.7					1,353.2
Replace 66 kV Station Service Feed - Holyrood	62.8	1,198.6					1,261.4
Diesel Plant Engine Auxiliary Upgrades - Various	790.6	416.3					1,206.9
Replace Substation - Holyrood	439.4	758.6					1,198.0
Distribution Upgrades (2017-2018) - Various	64.2	1,130.9					1,195.1
Upgrade Holyrood Access Road - Holyrood	579.3	583.4					1,162.7
Replace Power Transformers - Oxen Pond	297.5	850.1					1,147.6
Replace Automation Equipment - Mary's Harbour	120.3	1,021.7					1,142.0
Upgrade Ventilation in Powerhouse 1 and 2 - Bay d'Espoir	134.1	863.8					997.9
Gas Turbine Life Extension - Hardwoods	675.3	281.4					956.7
Replace Battery Banks and Chargers (2017-2018) - Various	379.3	566.2					945.5
Upgrade Telecontrol Facilities - Mary March Hill and Blue Grass Hill	91.2	665.9					757.1
Install Asset Health Monitoring System - Upper Salmon	438.0	203.4					641.4
Replace Slip Rings Units 1-6 - Bay d'Espoir	312.6	159.7					472.3
Install Recloser Remote Control - Bottom Waters	47.1	418.6					465.7
Replace Insulators - TL227	145.6	271.3					416.9
Refurbish Sump Level System for Powerhouse 2 - Bay d'Espoir	38.7	264.5					303.2
Total Multi-Year Projects over \$50,000 commencing in 2017	23,561.6	45,201.6	2,337.6	1,429.6	0.0	0.0	72,530.4

Multi-year Projects Commencing before 2017

PROJECT DESCRIPTION	2017	2018	2019	2020	2021	2022	Total
Construct 230 kV Transmission Line - Bay d'Espoir to Western Avalon	274,239.7	17,418.3					291,658.0
Upgrade Circuit Breakers - Various	17,777.8	15,408.6	15,247.3	13,026.8			61,460.5
Construct 230 kV Transmission Line - Soldiers Pond to Hardwoods	14,684.4	11,876.5					26,560.9
Replace Site Facilities - Bay d'Espoir	5,664.6	6,316.7					11,981.3
Upgrade Powerhouse Building Envelope - Holyrood	5,693.7	784.1					6,477.8
Upgrade Microsoft Office Products - Hydro Place	1,637.1	957.3					2,594.4
Cost Recovery	(759.3)	(444.0)					(1,203.3)
Total Multi-Year Projects over \$50,000 commencing before 2017	318,938.0	52,317.5	15,247.3	13,026.8	0.0	0.0	399,529.6

Schedule C
Order No. P.U. 43(2017)
2018 Capital Budget
Issued: December 22, 2017

**NEWFOUNDLAND AND LABRADOR HYDRO
2018 CAPITAL BUDGET**

Projects Over \$50,000 to be completed in 2018	\$	38,659,900
Multi-Year Projects over \$50,000 commencing in 2018		33,386,700
Multi-Year Project over \$50,000 commencing prior to 2018 (previously approved)		97,519,100
Projects under \$50,000 ¹		302,600
Allowance for Unforeseen Items		<u>1,000,000</u>
Approved 2018 Capital Budget	\$	<u><u>170,868,300</u></u>

¹ Approval of projects under \$50,000 is not required but these expenditures are part of the total 2018 Capital Budget

Newfoundland & Labrador

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