Q. **Reference: Volume I, 2019 Capital Expenditures Overview, Section H**

Please provide a copy of Hydro's annual Capital Expenditure and Carryover reports for each year from 2014 to 2018.

A. Please refer to the following attachments for Newfoundland and Labrador Hydro's annual Capital Expenditure and Carryover reports from 2014 to 2018.

- NP-NLH-023, Attachment 1: "Capital Expenditures and Carryover Report for Year Ending December 31, 2014,"March 2015;
- NP-NLH-023, Attachment 2: "Capital Expenditures and Carryover Report for Year Ending December 31, 2015," March 2016;
- NP-NLH-023, Attachment 3: "Capital Expenditures and Carryover Report for Year Ending December 31, 2016,"April 13, 2017 (rev. 1), originally filed March 1, 2017;
- NP-NLH-023, Attachment 4: "Capital Expenditures and Carryover Report for Year Ending December 31, 2017," April 1, 2018 (rev. 1), originally March 2018; and
- NP-NLH-023, Attachment 5: "Capital Expenditures and Carryover Report for Year Ending December 31, 2018," March 1, 2019.

A REPORT TO
THE BOARD OF COMMISSIONERS OF PUBLIC UTILITIES

CAPITAL EXPENDITURES AND CARRYOVER REPORT

For Year Ending December 31, 2014

March 2015

newfoundland labrador hydro
a nalcor energy company

NEWFOUNDLAND AND LABRADOR HYDRO
CAPITAL EXPENDITURES AND CARRYOVER REPORT
For Year Ending December 31, 2014

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Total Capital Project Variance
2014 Overview
($000)

Asset Type	Board Approved Budget	Total Project Expenditures and Forecast	Variance
HYDRAULIC	21,897	17,360	(4,537)
THERMAL	15,586	16,869	1,283
GAS TURBINES	4,185	3,906	(279)
TERMINAL STATIONS	19,583	18,182	(1,401)
TRANSMISSION	6,231	6,144	(87)
DISTRIBUTION	34,269	32,549	(1,720)
RURAL GENERATION	18,306	19,815	1,510
PROPERTIES	844	530	(314)
METERING	1,745	1,830	85
RURAL SYSTEMS TOOLS AND EQUIPMENT	2,984	2,644	(341)
INFORMATION SYSTEMS	3,040	3,137	98
TELECONTROL	3,138	2,446	(692)
TRANSPORTATION	4,882	4,949	67
ADMINISTRATIVE	324	282	(42)
ALLOWANCE FOR UNFORESEEN	1,580	676	(904)
SUPPLEMENTAL PROJECTS	486,517	456,235	(30,283)
PROJECTS APPROVED FOR LESS THAN $50,000	485	437	(48)
TOTAL CAPITAL BUDGET	**625,594**	**587,989**	**(37,605)**

2014 Capital Expenditures By Year ($000)

Summary	Capital Budget[1]									Actual Expenditure and Forecast								F-D	E-C
	2010	2011	2012	2013	A Carryover 2013	B Original 2014[3]	C (A+B) Revised 2014[3]	2015 and Beyond	D Total	2010	2011	2012	2013	E 2014[2]	2015 and Beyond	Carryovers to 2015	F Total	Project Variance	Annual Variance
2014 Projects						223,465.7	223,465.7	314,347.6	537,813.3				84.5	161,278.1	314,347.6	25,576.1	501,286.3	(36,527.0)	(62,187.6)
2013 Projects				23,783.5	13,633.8	39,602.3	53,236.1	2,819.7	66,205.5			137.5	9,709.7	40,127.8	2,819.7	10,030.9	62,825.6	(3,379.9)	(13,108.3)
2012 Projects			460.2	1,573.3	690.2	-	690.2	-	2,033.5			94.6	1,696.0	299.0	-	-	2,089.6	56.1	(391.2)
2011 Projects		2,670.5	2,526.1	1,070.1	1,331.2	1,268.9	2,600.1	758.5	8,294.1		1,626.9	2,377.5	2,999.1	1,779.8	758.5	798.1	10,339.9	2,045.8	(820.3)
2010 Projects	1,088.9	3,501.2	3,840.7	969.5	0.0	608.9	608.9	1,238.2	11,247.4	1,524.6	2,825.0	4,120.6	1,129.8	1,243.4	1,238	(634.5)	11,447.1	199.7	634.5
Grand Total	1,088.9	6,171.7	6,827.0	27,396.4	15,655.2	264,945.8	280,601.0	319,164.0	625,593.8	1,524.6	4,451.9	6,730.2	15,619.1	204,728.1	319,164.0	35,770.6	587,988.5	(37,605.3)	(75,872.9)

2014 Capital Budget Approved by Board Order No. P.U. 42 (2013)	97,805.3
New Project approved by Board Order No. 38 (2013)	1,263.4
New Project Approved by Board Order No. 16 (2014)[4]	109,677.0
New Project Approved by Board Order No. 23 (2014)	580.0
New Project Approved by Board Order No. 29 (2014)	7,197.8
New Project Approved by Board Order No. 32(2014)	1,452.5
New Project Approved by Board Order No. 33 (2014)	3,632.2
New Project Approved by Board Order No. 34 (2014)	636.7
New Project Approved by Board Order No. 36 (2014)	958.8
New Project Approved by Board Order No. 38 (2014)	259.5
New Project Approved by Board Order No. 45 (2014)[3]	608.9
New Project Approved by Board Order No. 46 (2014)	491.8
New Project Approved by Board Order No. 53 (2014)	2,412.6
New Project Approved by (O.C. 2014-033)	37,484.2
2014 New Projects under $50,000 Approved by Hydro	485.1
Total Approved Capital Budget Before Carryovers	264,945.8
Carryovers from 2013 to 2014	15,655.2
TOTAL APPROVED CAPITAL BUDGET	280,601.0

[1] Annual budgets previous to 2014 pertain to projects that have expenditures in 2014.

[2] Includes Insurance Proceeds relating to Sunnyside - Transformer T1 Replacement ($1.8M).

[3] As per P.U 45 (2014) the Board did not approve the $0.2M Voltage Conversion - Labrador City actual costs over budget from 2010 to 2013. Upon completion of the capital job Hydro will exclude the $0.2M from average rate base.

[4] The construction of the Labrador West Transmission was approved by OC2014-033, February 2, 2014 of which $37.5M was included in the 2014 Capital Budget. The capital expenditures associated with this project are $10,996,000 as at December 31, 2014 and are included in Work In Progress and as a result are currently excluded from average rate base. The costs to be included in rate base will be subject to review by the Board of Commissioners of Public Utilities.

2014 Capital Expenditures By Category ($000)

Hydraulic Generation Projects	Capital Budget								Actual Expenditure and Forecast										
	2011	2012	2013	Carryover 2013	Original 2014	Revised 2014	2015 and Beyond	Total	2011	2012	2013	Actual YTD 2014	Carryovers to 2015	2015 and Beyond	Total	Project Variance	Annual Variance	Notes
2014 Projects																		
Automated Fuel Monitoring System at West Salmon Spillway - BDE	-	-	-	-	193.2	193.2	-	193.2	-	-	-	0.0	-	-	0.0	(193.2)	(193.2)	1
Replace Turbine/Generator Cooling Water Flow Meters - USL	-	-	-	-	139.7	139.7	-	139.7	-	-	-	85.5	-	-	85.5	(54.2)	(54.2)	
Replace Engine on Emergency Lift System - West Salmon Spillway	-	-	-	-	67.1	67.1	-	67.1	-	-	-	61.2	-	-	61.2	(5.9)	(5.9)	
Raise Height of Earth Dam - Paradise River	-	-	-	-	98.7	98.7	-	98.7	-	-	-	158.3	-	-	158.3	59.6	59.6	
Upgrade Shoreline Protection - Cat Arm	-	-	-	-	55.3	55.3	-	55.3	-	-	-	31.5	-	-	31.5	(23.8)	(23.8)	
Replace Generator Bearing Coolers Units 4 and 5 - Bay d'Espoir	-	-	-	-	199.0	199.0	-	199.0	-	-	-	136.9	-	-	136.9	(62.1)	(62.1)	
Rewind Stator Unit 3 - Bay d'Espoir	-	-	-	-	4,343.9	4,343.9	-	4,343.9	-	-	-	2,833.4	-	-	2,833.4	(1,510.5)	(1,510.5)	2
Upgrade Burnt Dam Spillway - Bay d'Espoir	-	-	-	-	110.2	110.2	1,201.9	1,312.1	-	-	-	126.1	(15.9)	1,201.9	1,312.1	-	15.9	
Upgrade North Cut-Off Dam Access Road - Bay d'Espoir	-	-	-	-	631.7	631.7	-	631.7	-	-	-	474.1	-	-	474.1	(157.6)	(157.6)	3
Refurbish Surge Tank 3 - Bay d'Espoir	-	-	-	-	2,265.0	2,265.0	-	2,265.0	-	-	-	1,497.0	-	-	1,497.0	(768.0)	(768.0)	4
Automate Generator Deluge Systems Units 3 and 6 - Bay d'Espoir	-	-	-	-	612.0	612.0	-	612.0	-	-	-	457.9	-	-	457.9	(154.1)	(154.1)	5
Upgrade Victoria Control Structure - Bay d'Espoir	-	-	-	-	495.1	495.1	-	495.1	-	-	-	79.6	415.5	-	495.1	-	(415.5)	6
Upgrade Generator Bearings Unit 2 - Bay d'Espoir	-	-	-	-	18.9	18.9	396.0	414.9	-	-	-	9.4	9.5	396.0	414.9	-	(9.5)	
Upgrade Public Safety Around Dams and Waterways - Bay d'Espoir	-	-	-	-	352.8	352.8	-	352.8	-	-	-	246.7	-	-	246.7	(106.1)	(106.1)	7
Replace Automatic Greasing Systems Units 5 and 6 - Bay d'Espoir	-	-	-	-	233.4	233.4	-	233.4	-	-	-	166.5	-	-	166.5	(66.9)	(66.9)	
Replace Spherical By Pass Valve Assemblies Units 1 and 2 - BDE	-	-	-	-	57.5	57.5	96.3	153.8	-	-	-	12.8	44.7	96.3	153.8	-	(44.7)	
Replace Fall Arrest on Surge Tank 1 - Bay d'Espoir	-	-	-	-	142.8	142.8	-	142.8	-	-	-	114.9	-	-	114.9	(27.9)	(27.9)	
Install Handheld Pendant to Overhead Crane - Bay d'Espoir	-	-	-	-	49.9	49.9	-	49.9	-	-	-	45.0	4.9	-	49.9	-	(4.9)	
Overhaul Turbine/Generator Units - Bay d'Espoir and Hinds Lake	-	-	-	-	485.0	485.0	-	485.0	-	-	-	481.2	-	-	481.2	(3.8)	(3.8)	
Purchase Tools and Equipment Less than $50,000	-	-	-	-	87.0	87.0	-	87.0	-	-	-	82.8	-	-	82.8	(4.2)	(4.2)	
2013 Projects																		
Replace Automatic Transfer Switches - Hinds Lake	-	-	314.7	32.6	-	32.6	-	314.7	-		323.4	93.8	-	-	417.2	102.5	61.2	8
Install Automatic Fuel Monitoring System - Upper Salmon	-	-	192.7	96.0	-	96.0	-	192.7	-	1.9	94.8	(96.7)	-	-	-	(192.7)	(192.7)	9
Replace Stator Windings Units 1, 3 and 4 - Bay d'Espoir	-	-	5,663.5	3,389.0	-	3,389.0	-	5,663.5	-	8.8	2,265.7	2,132.5	-	-	4,407.0	(1,256.5)	(1,256.5)	10
Automate Generator Deluge Systems - Bay d'Espoir	-	-	532.0	55.4	-	55.4	-	532.0	-	3.9	311.6	67.7	-	-	383.2	(148.8)	12.3	11
Upgrade Units 1 to 6 By-Pass Valves - Bay d'Espoir	-	-	141.9	129.4	-	129.4	-	141.9	-	3.0	9.5	172.5	(43.1)	-	141.9	-	43.1	
Upgrade Generator Bearings - Bay d'Espoir	-	-	480.9	451.3	-	451.3	-	480.9	-	5.3	24.3	207.3	-	-	236.9	(244.0)	(244.0)	12
Upgrade Burnt Dam Spillway - Bay d'Espoir	-	-	885.8	647.7	-	647.7	-	885.8	-	15.0	223.1	635.4	12.3	-	885.8	-	(12.3)	
230 kV Transmission Line - Bay d'Espoir to Western Avalon	-	-	97.3	15.3	-	15.3	-	97.3	-	3.3	78.7	24.9	-	-	106.9	9.6	9.6	
Replace Cooling Water Pumps - Bay d'Espoir	-	-	175.4	86.9	-	86.9	-	175.4	-	2.0	86.5	61.6	-	-	150.1	(25.3)	(25.3)	
Replace Units 1 to 6 Auto Greasing Systems - Bay d'Espoir	-	-	260.1	70.2	-	70.2	-	260.1	-	-	189.9	71.9	-	-	261.8	1.7	1.7	
2011 Projects																		
Upgrade Intake Gate Controls - Bay d'Espoir	352.3	468.0	-	232.6	-	232.6	-	820.3	507.0	373.6	108.6	126.1	-	-	1,115.3	295.0	(106.5)	13
Total Hydraulic Generation Projects	352.3	468.0	8,744.3	5,206.4	10,638.2	15,844.6	1,694.2	21,897.0	507.0	416.8	3,716.1	10,597.8	427.9	1,694.2	17,359.8	(4,537.2)	(5,246.8)	

2014 Capital Expenditures By Category ($000)

Thermal Generation Projets	Capital Budget								Actual Expenditure and Forecast										
	2011	2012	2013	Carryover 2013	Original 2014	Revised 2014	2015 and Beyond	Total	2011	2012	2013	2014	Carryovers to 2015	2015 and Beyond	Total	Project Variance	Annual Variance	Notes
2014 Projects																		
Overhaul Turbine/Generator Unit 2 - Holyrood	-	-	-	-	5,147.0	5,147.0	-	5,147.0	-	-	-	5,131.6	-	-	5,131.6	(15.4)	(15.4)	
Replace Economizer Inlet Valves - Holyrood	-	-	-	-	192.0	192.0	329.1	521.1	-	-	-	133.6	58.4	329.1	521.1	-	(58.4)	
Install Cold-Reheat Condensate Drains and High Pressure Heater Trip Level Unit 3 - Holyrood	-	-	-	-	49.8	49.8	467.4	517.2	-	-	-	101.3	(51.5)	467.4	517.2	-	51.5	
Overhaul Boiler Feed Pump East Unit 3 - Holyrood	-	-	-	-	194.9	194.9	-	194.9	-	-	-	190.9	-	-	190.9	(4.0)	(4.0)	
Upgrade Underground Plant Drainage System - Holyrood	-	-	-	-	112.6	112.6	-	112.6	-	-	-	36.4	-	-	36.4	(76.2)	(76.2)	
Overhaul Cooling Water Pump East Unit 1 - Holyrood	-	-	-	-	98.4	98.4	-	98.4	-	-	-	95.6	-	-	95.6	(2.8)	(2.8)	
Overhaul Extraction Pump South Unit 1 - Holyrood	-	-	-	-	96.8	96.8	-	96.8	-	-	-	93.5	-	-	93.5	(3.3)	(3.3)	
Replace Continuous Opacity Monitors - Holyrood	-	-	-	-	49.3	49.3	-	49.3	-	-	-	48.2	-	-	48.2	(1.1)	(1.1)	
Complete Condition Assessment Phase 2 - Holyrood	-	-	-	-	1,476.8	1,476.8	-	1,476.8	-	-	-	1,412.5	-	-	1,412.5	(64.3)	(64.3)	
Upgrade Plant Elevators - Holyrood	-	-	-	-	533.2	533.2	-	533.2	-	-	-	579.9	(46.7)	-	533.2	-	46.7	
Upgrade Vibration Monitoring System - Holyrood	-	-	-	-	524.9	524.9	-	524.9	-	-	-	476.8	48.1	-	524.9	-	(48.1)	
Install Fire Protection Upgrades - Holyrood	-	-	-	-	56.6	56.6	312.5	369.1	-	-	-	312.0	(255.4)	312.5	369.1	-	255.4	14
Replace DC Distribution Panels and Breakers - Holyrood	-	-	-	-	174.2	174.2	-	174.2	-	-	-	25.6	148.6	-	174.2	-	(148.6)	15
Upgrade Waste Water Basin Building - Holyrood	-	-	-	-	136.7	136.7	-	136.7	-	-	-	36.3	-	-	36.3	(100.4)	(100.4)	16
Purchase Tools and Equipment Less than $50,000	-	-	-	-	59.2	59.2	-	59.2	-	-	-	37.7	15.1	-	52.8	(6.4)	(21.5)	
2013 Projects																		
Overhaul Extraction Pumps - Holyrood	-	-	101.5	108.7	-	108.7	-	101.5	-	-	-	97.2	-	-	97.2	(4.3)	(11.5)	
Install Variable Frequency Drives on Forced Draft Fans - Holyrood	-	-	697.6	477.8	2,659.7	3,137.5	-	3,357.3	-	13.8	206.0	2,746.8	390.7	-	3,357.3	-	(390.7)	17
Replace Condensate Polisher Annunciator Panels - Holyrood	-	-	123.5	39.5	-	39.5	-	123.5	-	0.3	20.9	36.4	-	-	57.6	(65.9)	(3.1)	
2011 Projects																		
Upgrade Hydrogen System - Holyrood	1,191.9	800.4	-	105.3	-	105.3	-	1,992.3	270.5	1,194.5	1,917.5	236.6	-	-	3,619.1	1,626.8	131.3	18
Total Thermal Generation Projects	1,191.9	800.4	922.6	731.3	11,562.1	12,293.4	1,109.0	15,586.0	270.5	1,208.6	2,144.4	11,828.9	307.3	1,109.0	16,868.7	1,282.7	(464.5)	

2014 Capital Expenditures By Category ($000)

Gas Turbine Generation Projects	Capital Budget							Actual Expenditure and Forecast								
	2012	2013	Carryover 2013	Original 2014	Revised 2014	2015 and Beyond	Total	2012	2013	2014	Carryover to 2015	2015 and Beyond	Total	Project Variance	Annual Variance	Notes
2014 Projects																
Upgrade Gas Turbine Plant Life Extension - Stephenville	-	-	-	2,995.0	2,995.0	-	2,995.0	-	-	2,715.8	-	-	2,715.8	(279.2)	(279.2)	
2013 Projects																
Upgrade Gas Turbine PLC - Happy Valley	-	61.4	36.5	1,128.6	1,165.1	-	1,190.0	2.3	22.6	430.9	734.2	-	1,190.0	-	(734.2)	19
Total Gas Turbine Generation Projects	-	61.4	36.5	4,123.6	4,160.1	-	4,185.0	2.3	22.6	3,146.7	734.2	-	3,905.8	(279.2)	(1,013.4)	

2014 Capital Expenditures By Category ($000)

Terminal Stations Projects	Capital Budget								Actual Expenditure and Forecast									
	2011	2012	2013	Carryover 2013	Original 2014	Revised 2014	2015 and Beyond	Total	2011	2012	2013	2014	Carryovers to 2015	2015 and Beyond	Total	Project Variance	Annual Variance	Notes
2014 Projects																		
Upgrade Circuit Breakers - Various Sites	-	-	-	-	3,695.4	3,695.4	1,642.5	5,337.9	-	-	-	1,571.7	2,123.7	1,642.5	5,337.9	-	(2,123.7)	20
Replace Surge Arrestors - Various Sites	-	-	-	-	181.9	181.9	-	181.9	-	-	-	61.9	-	-	61.9	(120.0)	(120.0)	21
Upgrade Power Transformers - Various Sites	-	-	-	-	1,904.4	1,904.4	-	1,904.4	-	-	-	1,726.4	-	-	1,726.4	(178.0)	(178.0)	
Replace Disconnect Switches - Various Sites	-	-	-	-	815.9	815.9	189.5	1,005.4	-	-	-	148.4	667.5	189.5	1,005.4	-	(667.5)	22
Upgrade Terminal Station Foundations - Various Sites	-	-	-	-	197.9	197.9	-	197.9	-	-	-	122.8	-	-	122.8	(75.1)	(75.1)	
Replace Optimho Relays on TL203 - Western Avalon to Sunnyside	-	-	-	-	89.1	89.1	96.9	186.0	-	-	-	18.2	70.9	96.9	186.0	-	(70.9)	
2013 Projects																		
Replace Instrument Transformers - Various Sites	-	-	593.2	352.9	552.8	905.7	2,522.0	3,668.0	-	9.6	230.7	699.0	206.7	2,522.0	3,668.0	-	(206.7)	23
Replace Insulators - Various Sites	-	-	187.1	115.0	287.9	402.9	-	475.0	-	5.1	67.0	361.3	41.6	-	475.0	-	(41.6)	
Install Online Vibration Monitoring System - Corner Brook Frequency Converter	-	-	382.8	327.6	-	327.6	-	382.8	-	4.6	50.6	255.1	-	-	310.3	(72.5)	(72.5)	
Upgrade Terminal Station - Wiltondale	-	-	697.7	553.0	1,173.3	1,726.3	-	1,871.0	-	10.7	134.0	1,707.7	-	-	1,852.4	(18.6)	(18.6)	
Replace Compressed Air System - Various Sites	-	-	303.0	253.5	2,105.9	2,359.4	-	2,408.9	-	17.2	32.3	994.4	-	-	1,043.9	(1,365.0)	(1,365.0)	24
2012 Projects																		
Replace Compressed Air Piping and Install Dew Point Monitor - Buchans	-	28.4	278.3	194.2	-	194.2	-	306.7	-	-	557.4	178.0	-	-	735.4	428.7	(16.2)	25
2011 Projects																		
Perform Grounding Upgrades - Various Sites	321.2	324.0	329.0	(61.3)	337.1	275.8	345.4	1,656.7	287.6	240.7	507.2	224.0	51.8	345.4	1,656.7	-	(51.8)	
Total Terminal Stations Projects	321.2	352.4	2,771.1	1,734.9	11,341.6	13,076.5	4,796.3	19,582.6	287.6	287.9	1,579.2	8,068.9	3,162.2	4,796.3	18,182.1	(1,400.5)	(5,007.6)	

2014 Capital Expenditures by Category ($000)

Transmission Projects	Capital Budget								Actual Expenditure and Forecast										
	2011	2012	2013	Carryover 2013	Original 2014	Revised 2014	2015 and Beyond	Total	2011	2012	2013	2014	Carryovers to 2015	2015 and Beyond	Total	Project Variance	Annual Variance	Notes
2014 Projects																		
Perform Wood Pole Line Management Program - Various Sites	-	-	-	-	2,564.20	2,564.2	-	2,564.2	-	-	-	2,496.8	-	-	2,496.8	(67.4)	(67.4)	
Refurbish Anchors and Footings TL202 and TL206 - Bay d'Espoir to Sunnyside	-	-	-	-	1,191.70	1,191.7	988.2	2,179.9	-	-	-	211.5	980.2	988.2	2,179.9	-	(980.2)	26
2011 Projects																		
Replace Guy Wires TL-215 - Doyles to Grand Bay	288.8	318.0	350.1	(33.4)	530.0	496.6	-	1,486.9	447.6	256.0	286.7	476.7	0.0	0.0	1,467.0	(19.9)	(19.9)	
Total Transmission Projects	288.8	318.0	350.1	(33.4)	4,285.9	4,252.5	988.2	6,231.0	447.6	256.0	286.7	3,185.0	980.2	988.2	6,143.7	(87.3)	(1,067.5)	

2014 Capital Expenditures By Category
($000)

Distribution Projects	Capital Budget									Actual Expenditure and Forecast										
	2010	2011	2012	2013	Carryover 2013	Original 2014	Revised 2014	2015 and Beyond	Total	2010	2011	2012	2013	2014	Carryovers to 2015	2015 and Beyond	Total	Project Variance	Annual Variance	Notes
2014 Projects																				
Replace Recloser Control Panels - Various Sites	-	-	-	-	-	111.3	111.3	84.4	195.7	-	-	-	-	85.0	26.3	84.4	195.7	-	(26.3)	
Provide Service Extensions - All Service Areas	-	-	-	-	-	6,290.0	6,290.0	-	6,290.0	-	-	-	-	5,233.8	-	-	5,233.8	(1,056.2)	(1,056.2)	27
Provide Service Extensions - All Service Areas - CIAC	-	-	-	-	-	(120.0)	(120.0)	-	(120.0)	-	-	-	-	(419.5)	-	-	(419.5)	(299.5)	(299.5)	28
Upgrade Distribution Systems - All Service Areas	-	-	-	-	-	3,422.0	3,422.0	-	3,422.0	-	-	-	-	3,661.0	-	-	3,661.0	239.0	239.0	
Upgrade Distribution Systems - All Service Areas - CIAC	-	-	-	-	-	(52.0)	(52.0)	-	(52.0)	-	-	-	-	(86.8)	-	-	(86.8)	(34.8)	(34.8)	
Upgrade Distribution Systems - Various Sites (2014/2015)	-	-	-	-	-	2,499.8	2,499.8	4,850.1	7,349.9	-	-	-	-	2,142.5	177.1	4,850.1	7,169.7	(180.2)	(357.3)	29
2013 Projects																				
Upgrade Distribution Systems - Various Sites	-	-	-	1,940.1	(61.1)	3,995.5	3,934.4	-	5,935.6	-	-	-	1,714.1	3,633.4	-	-	5,347.5	(588.1)	(301.0)	
2010 Projects																				
Voltage Conversion - Labrador City[5]	1,088.9	3,501.2	3,840.7	969.5		608.9	608.9	1238.2	11,247.4	1,524.6	2,825.0	4,120.6	1,129.8	1,243.4	(634.5)	1,238.2	11,447.1	199.7	634.5	30
Total Distribution Projects	1,088.9	3,501.2	3,840.7	2,909.6	(61.1)	16,755.5	16,694.4	6,172.7	34,268.6	1,524.6	2,825.0	4,120.6	2,843.9	15,492.8	(431.1)	6,172.7	32,548.5	(1,720.1)	(1,201.6)	

[5] As per P.U 45(2014) the Board did not approve the $0.2M Voltage Conversion - Labrador City actual costs over budget from 2010 to 2013. Upon completion of the capital job Hydro will exclude the $0.2M from average rate base.

2014 Capital Expenditures By Category ($000)

Rural Generation Projects	Capital Budget								Actual Expenditure and Forecast										
	2011	2012	2013	Carryover 2013	Original 2014	Revised 2014	2015 and Beyond	Total	2011	2012	2013	2014	Carryovers to 2015	2015 and Beyond	Total	Project Variance	Annual Variance	Notes
2014 Projects																		
Overhaul Diesel Units - Various Sites	-	-	-	-	823.5	823.5	-	823.5	-	-	-	1,242.3	-	-	1,242.3	418.8	418.8	31
Install Fire Protection System - Nain	-	-	-	-	107.1	107.1	892.2	999.3	-	-	-	40.7	66.4	892.2	999.3	-	(66.4)	
Construct Storage Facility - Postville	-	-	-	-	183.8	183.8	-	183.8	-	-	-	66.7	177.8	-	244.5	60.7	(117.1)	32
Inspect Fuel Storage Tanks - Various Sites	-	-	-	-	495.0	495.0	-	495.0	-	-	-	569.3	-	-	569.3	74.3	74.3	
Upgrade Diesel Plant Production Data Collection Equipment-Various	-	-	-	-	268.9	268.9	550.5	819.4	-	-	-	107.8	161.1	550.5	819.4	-	(161.1)	33
Upgrade Ventilation System - Ramea	-	-	-	-	263.0	263.0	-	263.0	-	-	-	180.6	-	-	180.6	(82.4)	(82.4)	
Replace Fuel Storage Tank - Ramea	-	-	-	-	234.2	234.2	-	234.2	-	-	-	184.3	-	-	184.3	(49.9)	(49.9)	
Additions To Accommodate Load Growth - Hopedale	-	-	-	-	641.2	641.2	-	641.2	-	-	-	593.3	-	-	593.3	(47.9)	(47.9)	
2013 Projects																		
Additions for Load Isolator Generation Stations - Various Sites	-	-	2,040.2	816.0	9,357.9	10,173.9	-	11,398.1	-	27.8	1196.4	6,853.5	4,310.1	-	12,387.8	989.7	(3,320.4)	34
2012 Projects																		
Perform FEED for Diesel Plant Remediation - Various Sites	-	110.4	-	-	-	0.0	-	110.4	-	43.6	69.2	-	-	-	112.8	2.4	-	
2011 Projects																		
Perform Arc Flash Remediation - Various Sites	429.5	380.3	391.0	855.8	401.8	1,257.6	413.1	2,015.7	103.5	91.7	149.8	511.3	746.3	413.1	2,015.7	-	(746.3)	35
Replace Mini Hydro Turbine - Roddickton	86.8	235.4	-	232.2	-	232.2	-	322.2	10.7	221.0	29.3	205.1	-	-	466.1	143.9	(27.1)	36
Total Rural Generation Projects	516.3	726.1	2,431.2	1,904.0	12,776.4	14,680.4	1,855.8	18,305.8	114.2	384.1	1,444.7	10,554.9	5,461.7	1,855.8	19,815.4	1,509.6	(4,125.5)	

2014 Capital Expenditures By Category ($000)

Properties Projects	Capital Budget						Actual Expenditure and Forecast								
	2013	Carryover 2013	Original 2014	Revised 2014	2015 and Beyond	Total	2013	2014	Carryovers to 2015	2015 and Beyond	Total	Project Variance	Annual Variance	Notes
2014 Projects														
Install Fall Protection Equipment - Various Sites	-	-	199.2	199.2	-	199.2	-	139.1	-	-	139.1	(60.1)	(60.1)	
Install Additional Washrooms - Various Sites	-	-	251.0	251.0	-	251.0	-	-	-	-	-	(251.0)	(251.0)	37
Legal Survey of Primary Distribution Line Right of Ways - Various Sites 2014	-	-	156.8	156.8	40.3	197.1	-	247.3	(90.6)	40.3	197.0	(0.1)	90.5	
2013 Projects														
Legal Survey of Primary Distribution Line Right of Ways - Various Sites 2013	156.2	156.2	40.0	196.2	-	196.2	-	193.6	-	-	193.6	(2.6)	(2.6)	
Total Properties Projects	156.2	156.2	647.0	803.2	40.3	843.5	-	580.0	(90.6)	40.3	529.7	(313.8)	(223.2)	

2014 Capital Expenditures By Category ($000)

Metering Projects	Capital Budget						Actual Expenditure and Forecast							
	2013	Carryover 2013	Original 2014	Revised 2014	2015 and Beyond	Total	2013	2014	Carryovers to 2015	2015 and Beyond	Total	Project Variance	Annual Variance	Notes
2014 Projects														
Purchase Meters, Equipment and Metering Tanks - Various Sites	-	-	199.0	199.0	-	199.0	-	137.6	61.4	-	199.0	-	(61.4)	
Install Automatic Meter Reading - Various Sites (2014-2015)	-	-	356.9	356.9	340.2	697.1	-	333.2	23.7	340.2	697.1	-	(23.7)	
2013 Projects														
Purchase 10 Position Meter Calibration Test Console - Hydro Place	192.5	192.5	-	192.5	-	192.5	-	190.3	-	-	190.3	(2.2)	(2.2)	
Install Automatic Meter Reading - Glenburnie and Rocky Harbour	397.9	13.8	258.8	272.6	-	656.7	537.8	205.9	-	-	743.7	87.0	(66.7)	
Total Metering Projects	590.4	206.3	814.7	1,021.0	340.2	1,745.3	537.8	867.0	85.1	340.2	1,830.1	84.8	(154.0)	

2014 Capital Expenditures By Category ($000)

Tools and Equipment	Capital Budget						Actual Expenditure and Forecast							
	2013	Carryover 2013	Original 2014	Revised 2014	2015 and Beyond	Total	2013	2014	Carryovers to 2015	2015 and Beyond	Total	Project Variance	Annual Variance	Notes
2014 Projects														
Purchase Portable Vibration Testing Equipment - Various Sites	-	-	60.6	60.6	-	60.6	-	64.4	-	-	64.4	3.8	3.8	
Replace Light Duty Mobile Equipment - Various Sites	-	-	579.1	579.1	-	579.1	-	465.3	-	-	465.3	(113.8)	(113.8)	38
Replace Excavator - St. Anthony	-	-	110.0	110.0	-	110.0	-	95.0	-	-	95.0	(15.0)	(15.0)	
Purch Track Mounted Backyard Radial Boom Derrick - Bishop Falls	-	-	158.7	158.7	-	158.7	-	163.9	-	-	163.9	5.2	5.2	
Tools and Equipment Less than $50,000	-	-	553.3	553.3	-	553.3	-	416.7	31.3	-	448.0	(105.3)	(136.6)	39
2013 Projects														
Replace Off Road Track Vehicles														
- Whitbourne, Port Saunders and Happy Valley	416.8	92.1	1,054.1	1,146.2	-	1,470.9	324.7	1,035.1	-	-	1,359.8	(111.1)	(111.1)	
Tools and Equipment Less than $50,000	51.8	51.4	-	51.4	-	51.8	0.4	46.7	-	-	47.1	(4.7)	(4.7)	
Total Tools and Equipment	468.6	143.5	2,515.8	2,659.3	-	2,984.4	325.1	2,287.1	31.3	-	2,643.5	(340.9)	(372.2)	

2014 Capital Expenditures By Category ($000)

Information Systems Projects	Capital Budget						Actual Expenditure and Forecast							
	2013	Carryover 2013	Original 2014	Revised 2014	2015 and Beyond	Total	2013	2014	Carryovers to 2015	2015 and Beyond	Total	Project Variance	Annual Variance	Notes
2014 Projects														
Perform Minor Application Enhancements - Hydro Place	-	-	138.6	138.6	-	138.6	-	142.0	-	-	142.0	3.4	3.4	
Cost Recoveries	-	-	(51.3)	(51.3)	-	(51.3)	-	(52.5)	-	-	(52.5)	(1.2)	(1.2)	
Upgrade Energy Management System - Hydro Place	-	-	187.9	187.9	-	187.9	-	184.3	-	-	184.3	(3.6)	(3.6)	
Replace Personal Computers - Various Sites	-	-	489.8	489.8	-	489.8	-	529.1	-	-	529.1	39.3	39.3	
Replace Peripheral Infrastructure - Various Sites	-	-	200.7	200.7	-	200.7	-	220.4	-	-	220.4	19.7	19.7	
Upgrade Enterprise Storage Capacity - Hydro Place	-	-	517.8	517.8	-	517.8	-	528.9	-	-	528.9	11.1	11.1	
Cost Recoveries	-	-	(191.6)	(191.6)	-	(191.6)	-	(195.7)	-	-	(195.7)	(4.1)	(4.1)	
Upgrade Server Technology Program - Hydro Place	-	-	328.0	328.0	-	328.0	-	348.3	-	-	348.3	20.3	20.3	
Cost Recoveries	-	-	(42.0)	(42.0)	-	(42.0)	-	(44.2)	-	-	(44.2)	(2.2)	(2.2)	
2013 Projects														
Upgrade Microsoft Project - Hydro Place	656.7	37.1	455.1	492.2	465.2	1,577.0	619.6	477.8	14.4	465.2	1,577.0	-	(14.4)	
Cost Recoveries	(236.4)	(13.3)	(163.8)	(177.1)	(167.5)	(567.7)	(223.1)	(172.0)	(5.1)	(167.5)	(567.7)	-	5.1	
Upgrade Business Intelligence Software - Hydro Place	576.9	331.0	-	331.0	-	576.9	245.9	353.4	-	-	599.3	22.4	22.4	
Cost Recoveries	(207.7)	(119.2)	-	(119.2)	-	(207.7)	(88.5)	(127.2)	-	-	(215.7)	(8.0)	(8.0)	
Upgrade Computer Room Air Conditioner - Hydro Place	130.0	31.7	-	31.7	-	130.0	98.3	32.9	-	-	131.2	1.2	1.2	
Cost Recoveries	(46.8)	(11.4)	-	(11.4)	-	(46.8)	(35.4)	(11.9)	-	-	(47.3)	(0.5)	(0.5)	
Total Information Systems Projects	872.7	255.9	1,869.2	2,125.1	297.7	3,039.6	616.8	2,213.6	9.3	297.7	3,137.4	97.8	88.5	

2014 Capital Expenditures By Category ($000)

Telecontrol Projects	Capital Budget						Actual Expenditure and Forecast								
	2013	Carryover 2013	Original 2014	Revised 2014	2015 and Beyond	Total	2012	2013	2014	Carryovers to 2015	2015 and Beyond	Total	Project Variance	Annual Variance	Notes
2014 Projects															
Replace Radomes - Various Sites	-	-	324.9	324.9	-	324.9	-	-	222.5	-	-	222.5	(102.4)	(102.4)	40
Purchase Tools and Equipment less than $50,000	-	-	46.4	46.4	-	46.4	-	-	45.9	-	-	45.9	(0.5)	(0.5)	
Replace Battery Banks and Chargers - Various Sites	-	-	267.0	267.0	398.0	665.0	-	-	293.5	(26.5)	398.0	665.0	-	26.5	
Replace Network Communications Equipment - Various Sites	-	-	91.0	91.0	-	91.0	-	-	100.1	-	-	100.1	9.1	9.1	
Upgrade IP SCADA Network - Various Sites	-	-	254.2	254.2	238.7	492.9	-	-	144.8	109.4	238.7	492.9	-	(109.4)	41
Upgrade Site Facilities - Various Sites	-	-	49.8	49.8	-	49.8	-	-	42.2	-	-	42.2	(7.6)	(7.6)	
Replace Telephone Systems - Various Sites	-	-	139.9	139.9	-	139.9	-	-	134.7	-	-	134.7	(5.2)	(5.2)	
Replace Wescom Scanner - Corner Brook	-	-	81.7	81.7	-	81.7	-	-	66.9	-	-	66.9	(14.8)	(14.8)	
2013 Projects															
Replace MDR 4000 Microwave Radio (West) - Various Sites	539.0	441.0	706.9	1,147.9	-	1,245.9	2.9	95.1	577.5	-	-	675.5	(570.4)	(570.4)	42
Total Telecontrol Projects	539.0	441.0	1,961.8	2,402.8	636.7	3,137.5	2.9	95.1	1,628.1	82.9	636.7	2,445.7	(691.8)	(774.7)	

2014 Capital Expenditures By Category ($000)

Transportation	Capital Budget						Actual Expenditure and Forecast								
	2013	Carryover 2013	Original 2014	Revised 2014	2015 and Beyond	Total	2013	2014	Carryovers to 2015	2015 and Beyond	Total	Project Variance	Annual Variance	Notes
2014 Projects														
Replace Vehicles and Aerial Devices (2014-2015) - Various Sites	-	-	1809.1	1,809.1	1,091.0	2,900.1	-	900.5	908.6	1,091.0	2,900.1	-	(908.6)	43
2013 Projects														
Replace Vehicles and Aerial Devices (2013-2014) - Various Sites	1302.3	609.4	679.2	1,288.6	-	1,981.5	692.9	1,356.0	-	-	2,048.9	67.4	67.4	
Total Transportation	1,302.3	609.4	2,488.3	3,097.7	1,091.0	4,881.6	692.9	2,256.5	908.6	1,091.0	4,949.0	67.4	(841.2)	

Administrative	Capital Budget						Actual Expenditure and Forecast							
	2013	Carryover 2013	Original 2014	Revised 2014	2015 and Beyond	Total	2013	2014	Carryovers to 2015	2015 and Beyond	Total	Variance	Annual Variance	Notes
2014 Projects														
Remove Safety Hazards - Various Sites	-	-	257.8	257.8	-	257.8	-	207.6	50.2	-	257.8	-	(50.2)	
Purchase Tools and Equipment Less than $50,000	-	-	65.9	65.9	-	65.9	-	24.2	-	-	24.2	(41.7)	(41.7)	
Total Administrative	-	-	323.7	323.7	-	323.7	-	231.8	50.2	-	282.0	(41.7)	(91.9)	

2014 Capital Expenditures By Category ($000)

Allowance For Unforeseen

	Capital Budget							Actual Expenditure and Forecast								
	2012	2013	Carryover 2013	Original 2014	Revised 2014	2015 and Beyond	Total	2012	2013	2014	Carryover to 2015	2015 and Beyond	Total	Project Variance	Annual Variance	Notes
2014 Projects																
Total Allowance For Unforeseen				1,000.0	1,000.0		1,000.0	-	-	-	-	-	-	(1,000.0)	(1,000.0)	
Additional Allowance for Unforeseen - Board Order No. 23 (2014)				580.0	580.0		580.0	-	-	-	-	-	-	(580.0)	(580.0)	
Replace Excitation Transformer, Unit #6 - Bay d'Espoir								-	-	71.1	-	-	71.1	71.1	71.1	
230kV Breaker (B1L17) Overhaul - Holyrood								-	-	361.3	-	-	361.3	361.3	361.3	
230kV Breaker (B1L03) Overhaul - Sunnyside								-	-	160.9	-	-	160.9	160.9	160.9	
2013 Projects																
Forced Draft Fan Upgrade - Holyrood							-	-	6.3	76.4	-	-	82.7	82.7	76.4	
Total Allowance For Unforeseen	-	-	-	1,580.0	1,580.0	-	1,580.0	-	6.3	669.7	-	-	676.0	(904.0)	(910.3)	44

Supplemental Projects

	Capital Budget							Actual Expenditure and Forecast								
	2012	2013	Carryover 2013	Original 2014	Revised 2014	2015 and Beyond	Total	2012	2013	2014	Carryover to 2015	2015 and Beyond	Total	Project Variance	Annual Variance	Notes
2014 Projects																
Blackstart Capability Upgrade - Holyrood	-	-	-	1,263.4	1,263.4	-	1,263.4	-	84.5	762.0	-	-	846.5	(416.9)	(501.4)	45
100 MW (Nominal) Combustion Turbine Addition - Holyrood	-	-	-	109,677.0	109,677.0	9,249.0	118,926.0	-	-	95,435.5	14,241.5	9,249.0	118,926.0	-	(14,241.5)	46
Labrador West Transmission Project - Construction Phase[6]	-	-	-	37,484.2	37,484.2		37,484.2	-	-	10,996.0			10,996.0	(26,488.2)	(26,488.2)	47
Transformer T1 Replacement - Sunnyside (Netted against Insurance Proceeds)[7]	-	-	-	7,197.8	7,197.8	1,226.4	8,424.2	-	-	3,236.7	2,135.1	1,226.4	6,598.2	(1,826.0)	(3,961.1)	48
Western Avalon Transformer T5 Upgrade	-	-	-	1,452.5	1,452.5	-	1,452.5	-	-	1,013.9	-	-	1,013.9	(438.6)	(438.6)	49
Transmission Lines TL201/TL203 Insulator Replacement	-	-	-	3,632.2	3,632.2	-	3,632.2	-	-	3,048.4	-	-	3,048.4	(583.8)	(583.8)	50
Excitation Transformers Replacement - Bay d'Espoir	-	-	-	636.7	636.7	360.0	996.7	-	-	381.0	255.7	360.0	996.7	-	(255.7)	51
Transformer Capacity Addition - Wabush Substation	-	-	-	958.8	958.8	-	958.8	-	-	867.6	-	-	867.6	(91.2)	(91.2)	
Replace Unit #1 Air Compressor - Holyrood	-	-	-	259.5	259.5	61.1	320.6	-	-	113.9	145.6	61.1	320.6	-	(145.6)	52
Purchase of Critical Spares	-	-	-	491.8	491.8	-	491.8	-	-	-	491.8	-	491.8	-	(491.8)	53
230 kV Transmission Line - Bay d'Espoir to Western Avalon	-	-	-	2,412.6	2,412.6	289,245.4	291,658.0	-	-	-	2,412.6	289,245.4	291,658.0	-	(2,412.6)	54
2013 Projects																
Purchase Equipotential Bonding and Grounding Equipment	-	158.3	158.3	-	158.3	-	158.3	-	-	95.4	-	-	95.4	(62.9)	(62.9)	
Increase 230 kV Transformer Capacity - Oxen Pond	0.0	3,823.6	3,670.0	15,310.4	18,980.4	0.0	19,134.0	-	153.6	14,611.3	4,369.1	-	19,134.0	-	(4,369.1)	55
2012 Projects																
Increase Generation - Mary's Harbour	321.4	1,295.0	496.0	-	496.0	-	1,616.4	51.0	1,069.4	121.0	-	-	1,241.4	(375.0)	(375.0)	56
Total Supplemental Projects Approved by PUB	321.4	5,276.9	4,324.3	180,776.9	185,101.2	300,141.9	486,517.1	51.0	1,307.5	130,682.7	24,051.4	300,141.9	456,234.5	(30,282.6)	(54,418.5)	

Projects Less than $50,000

	Capital Budget							Actual Expenditure and Forecast							
	2012	2013	Carryover 2013	Original 2014	Revised 2014	2015 and Beyond	Total	2012	2013	2014	Carryover to 2015	2015 and Beyond	Total	Variance	Annual Variance	Notes
2014 Projects																
Purchase Three-Phase Circuit Analyzer	-	-	-	42.0	42.0	-	42.0	-	-	43.2	-	-	43.2	1.2	1.2	
Replace HVY GT Air Start Compressor	-	-	-	41.5	41.5	-	41.5	-	-	30.8	-	-	30.8	(10.7)	(10.7)	
Replace Generator Unit 2073 - Port Hope Simpson	-	-	-	43.3	43.3	-	43.3	-	-	24.7	-	-	24.7	(18.6)	(18.6)	
Replace Call Pilot (Hydro Place)	-	-	-	28.5	28.5	-	28.5	-	-	31.2	-	-	31.2	2.7	2.7	
House 14 Rehabilitation - Bay d'Espoir	-	-	-	49.5	49.5	-	49.5	-	-	48.8	-	-	48.8	(0.7)	(0.7)	
High voltage Breaker Timing Sets - Bishop's Falls Terminals	-	-	-	33.0	33.0	-	33.0	-	-	33.6	-	-	33.6	0.6	0.6	
High voltage Breaker Timing Sets - Bishop's Falls Salvage Stores	-	-	-	33.0	33.0	-	33.0	-	-	33.6	-	-	33.6	0.6	0.6	
Purchase Pressure Relief Valves - Various TS	-	-	-	48.3	48.3	-	48.3	-	-	29.1	-	-	29.1	(19.2)	(19.2)	
Purchase Insulating Blanket - Stephenville Gas Turbine	-	-	-	35.0	35.0	-	35.0	-	-	35.3	-	-	35.3	0.3	0.3	
Purchase Insulating Blanket - Hardwoods Gas Turbine	-	-	-	35.0	35.0	-	35.0	-	-	32.8	-	-	32.8	(2.2)	(2.2)	
Replace Air Conditioner - Come by Chance Terminal Station	-	-	-	25.0	25.0	-	25.0	-	-	28.1	-	-	28.1	3.1	3.1	
ECC Air Conditioner Unit #9 Emergency Replacement	-	-	-	25.4	25.4	-	25.4	-	-	24.6	-	-	24.6	(0.8)	(0.8)	
BDE-Level 2 Condition Assessment	-	-	-	45.6	45.6	-	45.6	-	-	40.8	-	-	40.8	(4.8)	(4.8)	
Total Projects Less than $50,000	-	-	-	485.1	485.1	-	485.1	-	-	436.6	-	-	436.6	(48.5)	(48.5)	

[6] The construction of the Labrador West Transmission was approved by OC2014-033, February 2, 2014. The capital expenditures associated with this project are $10,996,000 as at December 31, 2014 and are included in Work In Progress and as a result are currently excluded from average rate base. The costs to be included in rate base will be subject to review by the Board of Commissioners of Public Utilities.

[7] Includes Insurance Proceeds relating to Sunnyside - Transformer T1 Replacement ($1.8M).

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The projects discussed in the following section have variances of more than 10% and $100,000 when comparing budget to the 2014 expenditure, whether it is a single year project or a multiyear project. Also discussed are projects where there is a total project variance that is greater than 10% and $100,000. The projects are ordered and numbered for explanation below based on the order and number they appear in the preceding set of tables.

The majority of projects noted were executed against a Class 3 estimate that was completed for the Capital Budget Application. A Class 3 estimate is considered to have an accuracy range of -20% to +30% based on the total project budget. There is also generally a 20% contingency applied to the projects.

Hydraulic Generation Projects

1. Automated Fuel Monitoring System at West Salmon Spillway – Bay d'Espoir (2014)

Budget: $193.2 Total: $0 Variance: ($193.2)

This project has been cancelled. The project justification was based on a positive cost benefit analysis. The contractor bids received were higher than those included in the project estimate that was used in the cost benefit analysis. Therefore, the project is no longer economically justified.

2. Rewind Stator Unit 3 – Bay d'Espoir (2014)

Budget: $4,343.9 Total: $2,833.4 Variance: ($1,510.5)

This one year project is complete. This project was to install windings purchased in the 2013-2014 Replace Stator Windings project. The project costs for internal labour and material were lower than estimated. The lower costs resulted in lower than estimated project interest cost. Variance is also attributable to contingency funds not required to be utilized.

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3. Upgrade North Cut-Off Dam Access Road – Bay d'Espoir (2014)

Budget: $631.7 Total: $474.1 Variance: ($157.6)

This project is complete. The project costs for construction labour and material were lower than estimated. The lower costs resulted in lower than estimated project interest cost. Variance also attributable to contingency funds not required to be utilized.

4. Refurbish Surge Tank – Bay d'Espoir (2014)

Budget: $2,265.0 Total: $1,497.0 Variance: ($768.0)

This one year project is complete. The project contract costs were lower than estimated. The lower costs resulted in lower than estimated project interest cost. Variance is also attributable to contingency funds not required to be utilized.

5. Automate Generator Deluge Systems Units 3 and 6 – Bay d'Espoir (2014)

Budget: $612.0 Total: $457.9 Variance: ($154.1)

This one year project is complete. Due to unforeseen changes in generation outage schedules, Hydro was unable to perform that work on Units 3 and 6 and, Units 1 and 2 were completed instead. The project contract costs were lower than estimated. The lower costs resulted in lower than estimated project interest cost. Variance is also attributable to contingency funds not required to be utilized.

6. Upgrade Victoria Control Structure – Bay d'Espoir (2014)

Budget: $495.1 Total: $79.6 Variance: ($415.5)

This is a one year project started in 2014 and carried over to 2015. Construction is rescheduled to the spring/summer of 2015. Work was ongoing at Burnt Dam Spillway during the same planned construction period, and Hydro decided not to proceed with having both water control structure out of service for upgrades at the same time. The total project forecast at completion has not changed.

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7. Upgrade Public Safety Around Dams and Waterways – Bay d'Espoir (2014)

Budget: $352.8 Total: $246.7 Variance: ($106.1)

This one year project is complete. The project material costs were lower than estimated. Variance is also attributable to contingency funds not required to be utilized.

8. Replace Automatic Transfer Switches – Hinds Lake (2013)

Budget: $314.7 Total: $417.2 Variance: $102.5

This is a one-year project that was initiated in 2013, carried over and completed in 2014. The higher than estimated costs were a result of additional travel and labor costs due to rescheduled unit outages.

9. Install Automatic Fuel Monitoring System – Upper Salmon (2013)

Budget: $192.7 Total: $0 Variance: ($192.7)

This project has been cancelled. The project justification was based on a positive cost benefit analysis. The contractor bids received were higher than those included in the project estimate that was used in the cost benefit analysis. Therefore, the project is no longer economically justified.

10. Replace Stator Windings Units 1, 3 and 4 – Bay d'Espoir (2013)

Budget: $5,663.5 Total: $4,407.0 Variance: ($1,256.5)

This is a one-year project that was carried over and completed in 2014. This project was to install the stator windings purchased in the 2012-2013 Replace Stator Windings Project and to procure stator windings for another unit. The project costs for engineering, materials and internal labor were lower than estimated. The lower costs resulted in lower than estimated project interest cost. Variance is also attributable to contingency funds not required to be utilized.

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11. Automate Generator Deluge Systems – Bay d'Espoir (2013)

Budget: $532.0 Total: $383.2 Variance: ($148.8)

This is a one-year project that was initiated in 2013, carried over and completed in 2014. The project scope was to automate the generator deluge fire protection systems on two units. Hydro completed the work on Units 4 and 7 in this project. The project costs for engineering, construction labor and material were lower than estimated. The lower costs resulted in lower than estimated project interest cost. Variance is also attributable to contingency funds not required to be utilized.

12. Upgrade Generator Bearings – Bay d'Espoir (2013)

Budget: $480.9 Total: $236.9 Variance: ($244.0)

This is a one-year project that was initiated in 2013, carried over and completed in 2014. The project engineering and contract costs were lower than estimated due to the implementation of a more cost effective solution determined during detailed engineering. An additional cost saving was realized as a result of re-babbitting of the bearings not being required.

13. Upgrade Intake Gate Controls – Bay d'Espoir (2011-2012)

Budget: $820.3 Total: $1,115.3 Variance: $295.0

This is a two-year project initiated in 2011, carried over and completed in 2014. The total project variance is primarily due to increased labour. The timing and the complexity of the work resulted in increased labor costs. The work planned for 2011 was completed; the work which was planned for 2012 could not be completed in 2013 due to operational issues with the intake gate, which had to be corrected before the planned upgrade work proceeded. This work was completed in 2014.

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Thermal Generation Projects

14. Install Fire Protection Upgrades – Holyrood (2014-2015)

Budget: $56.6 **Total: $312.0** **Variance: $255.4**

This is a two-year project initiated in 2014. The schedule was compressed and the project was substantially completed in 2014 and therefore minor work is required in 2015. The total project forecast at completion has not changed.

15. Replace DC Distribution Panels and Breakers – Holyrood (2014)

Budget: $174.2 **Total: $25.6** **Variance: ($148.6)**

This is a one-year project initiated in 2014 and carried over into 2015. Construction was delayed due to the inability to establish safe work protection during concurrent planned annual maintenance. The new equipment has been procured and will be installed during the planned outage in 2015. The total project forecast at completion has not changed.

16. Upgrade Waste Water Basin Building – Holyrood (2014)

Budget: $136.7 **Total: $36.3** **Variance: ($100.4)**

This is a one-year project completed in 2014. This project was to engage an external consultant to complete the necessary work to provide a Phase 1 engineering assessment for the refurbishment of the Waste Water Basin Building. The condition assessment and preliminary engineering were completed. Based on the initial assessment, further review of the building's future utilization is required considering Holyrood's long term plan, before more in depth engineering can continue.

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17. Install Variable Frequency Drives on Forced Draft Fans – Holyrood (2013-2014)

Budget: $3,137.5 Total: $2,746.8 Variance: ($390.7)

This is a two-year project initiated in 2013 and carried over into 2015. Technical issues during commissioning of the equipment in 2014 for Unit 3 resulted in engineering rework and a completion of Unit 2 and 3 later than originally planned. The variance from 2014 planned expenditure is due to moving the completion of Unit 1 work to 2015. The total project forecast at completion has not changed.

18. Upgrade Hydrogen System – Holyrood (2011-2012)

Budget: $1,992.3 Total: $3,619.1 Variance: $1,626.8

This is a two-year project initiated in 2011, carried over and completed in 2014. The project variance is due to an increase in costs for engineering, materials and construction. The project was initially planned to be completed in 2013, however, a forced outage of Holyrood Unit 1 in January 2013 resulted in a reduced outage window for work associated with this project, and a portion of the work was deferred to 2014. The work is now complete and the system is in service.

Gas Turbine Generation Projects

19. Upgrade Gas Turbine PLC – Happy Valley (2013-2014)

Budget: $1,165.1 Total: $430.9 Variance: ($734.2)

This is a two-year project initiated in 2013 and carried over into 2015. The variance from planned 2014 expenditure is related to a delay in material delivery. While construction in late 2014 could have then proceeded, the equipment installation was rescheduled to spring 2015 to mitigate risk to unit reliability associated with the installation of a new control systems heading into winter. Factory acceptance and delivery of the new equipment to site was completed in 2014. The forecast completion cost remains within the total project budget.

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Terminal Stations Projects

20. Upgrade Circuit Breakers – Various Sites (2014-2015)

Budget: $3,695.4 Total: $1,571.7 Variance: ($2,123.7)

This is a two-year project initiated in 2014. The variance from planned 2014 expenditure is attributed to a shift in the scheduled receipt of materials from 2014 to 2015. The delivery time for breakers at the budget estimate stage was four to six months. The delivery time for breakers in the current market conditions is nine months for gang-operated type breakers and 12 months for independent pole type breakers. The total project forecast at completion has not changed.

21. Replace Surge Arrestors – Various Sites (2014)

Budget: $181.9 Total: $61.9 Variance: ($120.0)

This is a one-year project that was completed in 2014. The scope of the project was to purchase and install surge arrestors at seven locations. Three of the planned installations were not completed due to delays in receipt of materials and outage constraints. Variance is also attributable to contingency funds not required to be utilized.

This project is part of an overall replacement program for surge arrestors which will be adjusted in future years to incorporate the installations which could not be completed in 2014.

22. Replace Disconnect Switches – Various Sites (2014-2015)

Budget: $815.9 Total: $148.4 Variance: ($667.5)

This is a two-year project initiated in 2014. The variance from 2014 planned expenditure is attributed to a shift in the scheduled receipt of materials from 2014 to 2015. The delivery time for disconnect switches at the budget estimate stage was four to six months, with expected delivery in the fall of 2014. The actual delivery time for disconnect switches in the current market conditions is seven to eight months. There were no compliant bids in the initial public tender for the supply of these disconnect

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switches, resulting in a further delay. A second public tender was a success and materials were ordered in August 2014. The total project forecast at completion has not changed.

23. Replace Instrument Transformers – Various Sites (2013-2017)

Budget: $905.7 Total: $699.0 Variance: ($206.7)

This is a five-year project initiated in 2013. The work completed in 2014 included the 2013 scope. Insulator replacements were completed in 2014 at Western Avalon, Parsons Pond, Holyrood, Buchans, Hardwoods, Deer Lake, Oxen Pond, Sunnyside, and Stony Brook terminal stations. All work planned in the multi-year project is expected to be completed over the next three years. The total project forecast at completion has not changed.

24. Replace Compressed Air System – Various Sites (2013-2014)

Budget: $2,408.9 Total: $1,043.9 Variance: ($1,365.0)

This is a two-year project that was initiated in 2013 and completed in 2014. The scope of the project included, but was not limited to, installation of back-up air dryers on air blast circuit breakers. These back-up air dryers were removed from the project scope following a change in the long term asset plan for air blast circuit breakers which are supplied by these compressed air systems. The long term asset plan is to replace the air blast breakers with SF-6 breakers; therefore, the back-up air dryers are no longer necessary. Variance is due to removal of back up air dryers and also is attributable to contingency funds not required to be utilized.

25. Replace Compressed Air Piping and Install Dew Point Monitor – Buchans (2012-2013)

Budget: $306.7 Total: $735.4 Variance: $428.7

This is a two-year project initiated in 2012, carried over and completed in 2014. The variance in the total project cost is related to several factors. The contract costs were higher than estimated. Additional construction labor and engineering were required to complete the project.

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Transmission Projects

26. Refurbish Anchors and Footings TL202 and TL206 – Bay d'Espoir to Sunnyside (2014-2015)

Budget: $1,191.7 Total: $211.5 Variance: ($980.2)

This is a two-year project initiated in 2014. Engineering was completed and materials have been received. The variance in 2014 planned expenditures is due to rescheduling the construction to 2015. Due to outage restrictions, the construction work scheduled for September 2014 was deferred until 2015. The total project forecast at completion has not changed.

Distribution Projects

27. Provide Service Extensions – All Service Areas (2014)

Budget: $6,290.0 Total: $5,233.8 Variance: ($1,056.2)

This is an annual budget created based on previous three years expenditures to provide service extensions to customers. The budget and actual expenditures in 2014 are shown by area in the table below. The variance is primarily due to fewer service extension requests in Labrador West in 2015 than in the previous three years.

	Budget ($000)	Actual ($000)	Variance ($000)
Central	1,555.0	1,652.4	97.4
Northern	1,485.0	1,710.3	225.3
Labrador	3,250.0	1,871.2	(1,378.8)
Total	**6,290.0**	**5,233.8**	**(1,056.2)**

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28. Provide Service Extensions – All Service Areas – CIAC (2014)

Budget: $120.0 Total: $419.5 Variance: $299.5

This is an annual budget created based on past CIACs to provide service extensions to customers. The budget and actual expenditures in 2014 are shown by area in the table below. The variance is primarily due to the Daniel's Harbour Fish Hatchery Line Extension in TRO Northern that was not planned for in the budget.

	Budget ($000)	Actual ($000)	Variance ($000)
Central	65.0	52.1	(12.9)
Northern	25.0	344.4	319.4
Labrador	30.0	23.0	(7.0)
Total	**120.0**	**419.5**	**299.5**

29. Upgrade Distribution Systems – Various Sites (2014-2015)

Budget: $2,499.8 Total: $2,142.5 Variance: ($357.3)

This is a two-year project that was initiated in 2014. The variance in 2014 planned expenditure is related to material delivery. Material originally budgeted for receipt in 2014 was delayed until 2015 to match material delivery timing to the year in which the material was scheduled for installation. The total project forecast at completion has not changed.

30. Voltage Conversion – Labrador City (2010-2015)

Budget: $608.9 Total: $1,243.4 Variance: $634.5

This multi-year project commenced in 2010, with additional budget approved in P.U. 45(2014) and a completion date of 2015. Variance in 2014 planned expenditure is partially due to advancement of material procurement into 2014. The total project forecast at completion has not changed.

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Rural Generation Projects

31. Overhaul Diesel Units – Various Sites (2014)

Budget: $823.5 Total: $1,242.3 Variance: $418.8

This is a one-year project to overhaul diesel units. The variance in project cost is primarily due to required unplanned overhauls of diesel units in Port Hope Simpson and L'anse-au-Loup.

32. Construct Storage Facility – Postville (2014)

Budget: $183.8 Total: $66.7 Variance: ($117.1)

This is a one-year project initiated in 2014 and carried over into 2015. The 2014 variance from planned expenditure is due to a carry-over of a portion of the construction work. The siding material was damaged beyond repair during delivery to site. New siding was ordered; however it was unable to be supplied prior to the last ferry service to Postville in 2014. The remaining work is planned for the spring of 2015.

33. Upgrade Diesel Plant Production Data Collection Equipment – Various (2014-2016)

Budget: $268.9 Total: $107.8 Variance: ($161.1)

This is a three-year project initiated in 2014. All year 1 scope was completed as planned. The variance in 2014 planned expenditure is due to materials and labour being less than estimated. The total project forecast at completion has not changed.

34. Additions for Load – Isolated Generation Stations-Various Sites (2013-2014)

Budget: $10,173.9 Total: $6,853.5 Variance: ($3,320.4)

This is a two-year project initiated in 2013, and carried over into 2015. The variance in the 2014 planned expenditure was due to rescheduling of work to allow the most critical work be completed to ensure winter readiness. The critical work was identified and completed prior to winter peak in 2014. Further, seasonal limitations on transport of equipment to site necessitated a portion of the 2014 scope be

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completed in 2015. The remaining project scope, including associated protection and control upgrades, plant ventilation upgrades, and plant automation is planned for completion in 2015.

35. Perform Arc Flash Remediation – Various Sites (2011-2015)

Budget: $1,257.6 Total: $511.3 Variance: ($746.3)

This is a five-year project initiated in 2011. The variance from 2014 planned expenditure is due to rescheduling work into 2015. A portion of the highest priority work remaining in this program was completed in 2014 and the remaining priority sites will be completed in 2015. Any residual scope will be reassessed for completion in a subsequent year. The total project forecast at completion has not changed.

36. Replace Mini Hydro Turbine – Roddickton (2011-2012)

Budget: $322.2 Total: $466.1 Variance: $143.9

This is a two-year project initiated in 2011, carried over and completed in 2014. The increase in project cost compared to budget is due to a scope change to include a generator replacement. The generator rotor shaft failed in 2010 after the project proposal was submitted for approval. A cost benefit analysis was performed to compare the feasibility of replacing the generator at additional cost under the same project, postponing work, or cancelling the current project and shutting down the plant. The results of the cost benefit analysis favored proceeding with the turbine overhaul and replacement of the generator. The project was carried over into 2014 due to the additional time required for procurement of a replacement generator.

Properties Projects

37. Install Additional Washrooms – Various Sites

Budget: $251.0 Total: $0 Variance: ($251.0)

The 2014 planned expenditure was cancelled and the multi-year program has also been cancelled. After the project was proposed and approved, the Occupational Health and Safety Branch of Service NL

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provided Hydro with a deviation from the Occupational Health and Safety Regulations. Hydro communicated plans to Occupational Health and Safety that were an acceptable alternative to the construction of additional washrooms, and these plans formed the basis for the variance.

For buildings that currently do not have any washrooms in place, Hydro will review the legislative and operational requirements and determine if such structures require washroom facilities. This review may result in a future project to install washroom facilities where no such facilities currently exist.

Tools and Equipment Projects

38. Replace Light Duty Mobile Equipment – Various Sites (2014)

Budget: $579.1 **Total: $465.3** **Variance: ($113.8)**

This project is complete. The 2014 expenditures in this project were lower than budget due to a decision to not purchase heavy equipment trailers. A Hydro line truck was involved in a serious accident while towing a piece of heavy equipment. While there were no injuries, there was a high potential for injuries. Therefore, Hydro is reassessing the practice of towing heavy equipment.

39. Tools and Equipment Less than $50,000 (2014)

Budget: $553.3 **Total: $448.0** **Variance: ($105.3)**

The variance in this project is related to the late arrival of furniture that was ordered in 2014.

Telecontrol Projects

40. Replace Radomes – Various Sites (2014)

Budget: $324.9 **Total: $222.5** **Variance: ($102.4)**

This is a one-year project that was completed in 2014. The project costs for construction were lower than the 2014 planned expenditure, primarily due to a shorter than scheduled construction period. Variance is also attributable to contingency funds not required to be utilized.

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41. Upgrade IP SCADA Network – Various Sites (2014-2015)

Budget: $254.2 Total: $144.8 Variance: ($109.4)

This is a two-year project initiated in 2014. The variance from 2014 planned expenditure is related to timing of completing detailed engineering and implementation. The materials were procured in 2014 and detailed engineering and remaining tasks, will be completed in 2015. The total project forecast at completion has not changed.

42. Replace MDR 4000 Microwave Radio (West) – Various Sites (2013-2014)

Budget: $1,245.9 Total: $675.5 Variance: ($570.4)

This is two-year project that was initiated in 2013 and completed in 2014. The project costs for materials and construction labor were lower than estimated. The savings were primarily attributed to a technology improvement that allowed Hydro to eliminate some of the components and the associated engineering. The lower costs resulted in lower than estimated project interest cost. Variance is also attributable to contingency funds not required to be utilized.

Transportation Projects

43. Replace Vehicles and Aerial Devices Hydro System (2014-2015)

Budget: $1,809.1 Total: $900.5 Variance: ($908.6)

This is a two year project initiated in 2014. The scope of this project remains unchanged. The variance from 2014 planned expenditure is related to timing of material delivery. Delivery of eight chassis planned for 2014 was delayed to 2015 due to supplier not receiving components from their supplier in time to complete delivery to Hydro. The total project forecast at completion has not changed.

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44. Allowance For Unforeseen

Budget: $1,580.0 **Total: $669.7** **Variance: $904.0**

The Allowance for Unforeseen is an annual allotment that permits Hydro to act expeditiously to deal with events affecting the electrical system which cannot wait for specific approval of the Board. Unforeseen expenditures for 2014 under this account include costs associated with refurbishment of a Forced Draft Fan Motor at Holyrood, overhauls of 230 kV breakers at Holyrood and Sunnyside and the replacement of the Excitation Transformer at Unit 6 Bay d'Espoir. Reports on these items have been filed with the Board of Commissioners of Public Utilities (the Board).

The annual budget for Allowance for Unforeseen is $1,000,000. Hydro applied for and the Board approved a supplementary amount of $580,000 to be added to the balance in the Allowance For Unforeseen (P.U. 23(2014)).

Supplemental Projects

45. Blackstart Capability Upgrade – Holyrood (2013-2014)

Budget: $1,263.4 **Total: $846.5** **Variance: ($416.9)**

This is a one-year project that was initiated in 2013, carried over and completed in 2014. During project execution the site layout was adjusted, resulting in the elimination of significant civil excavation work and contract costs. The lower project costs resulted in lower than estimated interest cost. Variance is also attributable to contingency funds not required to be utilized.

46. 100 MW (Nominal) Combustion Turbine Addition – Holyrood (2014-2015)

Budget: $109,677.0 **Total: $95,435.5** **Variance: ($14,241.5)**

This is a two-year project initiated in 2014. The variance from 2014 planned expenditure is mainly attributed to the scheduled completion for the final combustion turbine milestones pushed from December 2014 into 2015. In addition, the costs for project management and construction labour were less than estimated. The total project forecast at completion has not changed.

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Hydro submits regular reports on this project to the Board.

47. Labrador West Transmission Project – Construction Phase

Budget: $37,484.2 Total: $10,996.0 Variance: ($26,488.2)

In 2014, the Provincial Government approved the construction of the third transmission line in Labrador to help supply power for planned new developments in Labrador West, such as the Kami Iron Ore Project, and improve reliability for all customers in the region.

In September 2014, work on the line was temporarily suspended until completion of Alderon's financing plan which resulted in 2014 expenditures being lower than budgeted. All project costs incurred to date are covered by the security Alderon has already provided. Construction will proceed once additional funding is secured.

48. Transformer T1 Replacement – Sunnyside (2014-2015)

Budget: $7,197.8 Total: $3,236.7 Variance: ($3,961.1)

This is a two-year project initiated in 2014. The variance in 2014 planned expenditure is primarily a result of lower than estimated material and construction contract pricing and no contingency funds being utilized in 2014. Variance is also attributable to the deferral of the initial portion of the purchase of the new 230 kV breaker B1T1 to 2015 and lower than planned project management and engineering costs. Hydro also received insurance proceeds related to events at Sunnyside terminal station of which $1,826 was applied against the project costs.

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49. Western Avalon Transformer T5 Upgrade (2014)

Budget: $1,452.5 Total: $1,013.9 Variance: ($438.6)

This is a one-year project initiated and completed in 2014. The variance from planned expenditure is primarily due to lower than estimated material and construction contract pricing and no contingency funds being utilized, as well as some savings in lower than planned project management and engineering costs.

50. Transmission Lines TL201/TL203 Insulator Replacement (2014)

Budget: $3,632.2 Total: $3,048.4 Variance: ($583.8)

This is a one-year project that was completed in 2014. The variance from 2014 planned expenditure is due to lower construction costs than estimated. Variance is also attributable to contingency funds not required to be utilized.

51. Excitation Transformers Replacement – Bay d'Espoir (2014-2015)

Budget: $636.7 Total: $381.0 Variance: ($255.7)

This is a two-year project initiated in 2014. The variance from 2014 planned expenditure is related to timing of arrival of materials. Unit 7 transformer was replaced. Remaining transformers arrived too late in the outage season to be placed in service as outages would have had to extend outside planned outage time. The transformers were maintained on site in the event of a failure. The remaining installation work will be completed in 2015. The total project forecast at completion has not changed.

52. Replace Unit #1 Air Compressor – Holyrood

Budget: $259.5 Total: $113.9 Variance: ($145.6)

This is a two-year project initiated in 2014. The variance from 2014 planned expenditure is due to the late arrival of the compressor in 2014. The install commenced before year end with final commissioning in 2015. The total project forecast at completion has not changed.

NEWFOUNDLAND AND LABRADOR HYDRO
2014 VARIANCE EXPLANATIONS
FOR THE YEAR ENDING DECEMBER 31, 2014
(Greater than $100,000 and 10% Variance from Budget)
($000)

53. Purchase of Critical Spares – Holyrood (2014)

Budget: $491.8 Total: $0 Variance: ($491.8)

This project is for the purchase of critical spare motors for the generating units at Holyrood. Approval was received from the Board in November 2014. Variance is due to motors not received in 2014. Delays in manufacturing that developed after order placement have delayed delivery of motors to Holyrood. Motors are expected to be delivered in February and March 2015 (P.U. 46(2014)).

54. 230 kV Transmission Line – Bay d'Espoir to Western Avalon (2014-2018)

Budget: $2,412.6 Total: $0 Variance: ($2,412.6)

This is a multi-year project approved in 2014 and will be completed in 2018. Approval for this project was received in P.U. 53(2014) on December 12, 2014. The variance to the 2014 planned expenditure is due to no work being completed in 2014 as compared to plan. Work previously planned to be completed in 2014 will now be completed in 2015.

55. 230 kV Transformer Capacity – Oxen Pond Terminal Station (2013-2014)

Budget: $18,980.4 Total: $14,611.3 Variance: ($4,369.1)

This is a two-year project initiated in 2013 and carried over into 2015. The project scope includes: replacement of two transformers and associated 66 kV breakers and disconnect switches at Oxen Pond Terminal Station; replacement of one transformer and associated disconnect switch at Hardwoods Terminal Station; relocation of Transmission Line TL218 and associated 230 kV equipment at Oxen Pond; and installation of a 230 kV bus tie breaker at Oxen Pond.

In order to ensure winter readiness (2014-2015), the project work was re-planned to prioritize the completion of the two new transformers at Oxen Pond in 2014. These two new transformers were successfully installed in 2014. The variance from 2014 planned expenditure is due to moving the remaining work to be completed into 2015.

NEWFOUNDLAND AND LABRADOR HYDRO
2014 VARIANCE EXPLANATIONS
FOR THE YEAR ENDING DECEMBER 31, 2014
(Greater than $100,000 and 10% Variance from Budget)
($000)

56. Increase Generation – Mary's Harbour (2012-2013)

Budget: $1,616.4 **Total: $1,241.4** **Variance: ($375.0)**

This is a two-year project initiated in 2012 and was carried over and completed in 2014. The project costs for contracts and materials were lower than estimated. The lower costs resulted in lower than estimated project interest cost. Variance is also attributable to contingency funds not required to be utilized.

NEWFOUNDLAND AND LABRADOR HYDRO
2014 VARIANCE EXPLANATIONS
FOR THE YEAR ENDING DECEMBER 31, 2014
(Greater than $100,000 and 10% Variance from Budget)
($000)

Capital Budgets/Expenditures 2004-2014 ($000)

Year	Budget	Actual Expenditures	Variance	Percentage Variance
2004	31,435	27,984	3,451	11.0%
2005	47,760	33,952	13,808	28.9%
2006	49,024	41,217	7,807	15.9%
2007	43,304	35,669	7,635	17.6%
2008	53,579	46,246	7,333	13.7%
2009	61,544	54,152	7,392	12.0%
2010	63,297	55,553	7,744	12.2%
2011	67,454	63,116	4,338	6.4%
2012	93,840	77,252	16,588	17.7%
2013	116,373	84,755	31,618	27.2%
2014	280,601	204,728	75,873	27.0%

The 2014 variance in actual expenditures compared to budget is primarily attributable to:

- $26,488 associated with work that was planned to be completed in 2014 on the Labrador West Transmission Line[1] however was not completed due to a temporary suspension of the work in September. Work is suspended until Alderon completes the financing plan for the Kami mine.
- $35,770 associated with work that was planned for completion in 2014 but is now carried into 2015. Key drivers of the $35,770:
    - $14,241 for the new Combustion Turbine at Holyrood;
    - $4,369 for the Oxen Pond Transformer Capacity project;
    - $4,310 for the Additions for Load at Isolated Generating Stations;
    - $2,412 for the new Transmission Line from Bay d'Espoir to Western Avalon;
    - $2,135 for Sunnyside Transformer project; and

[1] The construction of the Labrador West Transmission was approved by OC2014-033, February 2, 2014. The capital expenditures associated with this project are $10,996,000 as at December 31, 2014 and are included in Work In Progress and as a result are currently excluded from average rate base. The costs to be included in rate base will be subject to review by the Board of Commissioners of Public Utilities.

NEWFOUNDLAND AND LABRADOR HYDRO
2014 VARIANCE EXPLANATIONS
FOR THE YEAR ENDING DECEMBER 31, 2014
(Greater than $100,000 and 10% Variance from Budget)
($000)

  - $2,123 for Upgrade Circuit Breakers.

- $1,826 received from insurance proceeds associated with January 2014 events at Sunnyside terminal station.
- An additional driver largely related to favorable contract pricing as well as lower than estimated labour and materials on a number of projects.

2014 Carryover Report
For the Year Ending December 31, 2014
($000)

Project Name	PUB Approved Budget 2014	Revised Budget 2014	Total Actual Expenditures 2014	Carryover Amount	Original Completion Year
Replace Spherical By Pass Valve Assemblies - Bay d'Espoir	129.4	129.4	172.5	(43.1)	2014
Upgrade Burnt Dam Spillway Structure - Bay d'Espoir	647.7	647.7	635.4	12.3	2014
Upgrade Victoria Control Structure - Bay d'Espoir	495.1	495.1	79.6	415.5	2014
Purchase Critical Spares - Holyrood	491.8	491.8	0.0	491.8	2014
Install Variable Frequency Drives on Forced Draft Fans - Holyrood	2,659.7	3,137.5	2,746.8	390.7	2014
Upgrade Plant Elevators - Holyrood	533.2	533.2	579.9	(46.7)	2014
Upgrade Vibration Monitoring System - Holyrood	524.9	524.9	476.8	48.1	2014
Replace DC Distribution Panels and Breakers - Holyrood	174.2	174.2	25.6	148.6	2014
Remove Safety Hazards - Various Sites	257.8	257.8	207.6	50.2	2014
Replace Insulators - Various Sites	287.9	402.9	361.3	41.6	2014
230 kV Transformer Capacity - Oxen Pond Terminal Station	15,310.4	18,980.4	14,611.3	4,369.1	2014
Construct Storage Building - Postville	183.8	244.5	66.7	177.8	2014
Tools and Equipment Less than $50,000	553.3	37.2	5.9	31.3	2014
Upgrade Gas Turbine PLC - Happy Valley	1,128.6	1,165.1	430.9	734.2	2014
Purchase Tools and Equipment Less than $50,000	59.2	15.1	0.0	15.1	2014
Additions for Load Isolator Generation Stations - Various Sites	9,357.6	11,163.6	6,853.5	4,310.1	2014
Purchase Meters, Equipment & Metering Tanks	199.0	199.0	137.6	61.4	2014
Labrador City - Voltage Conversion	0.0	608.9	1,243.4	(634.5)	2014
Install Automatic Meter Reading - English Harbour West and Barachoix	356.9	356.9	333.2	23.7	2015
Replace Battery Banks and Chargers - Various Sites	267.0	267.0	293.5	(26.5)	2015
Upgrade IP SCADA Network - Various Sites	254.2	254.2	144.8	109.4	2015
Upgrade Burnt Dam Spillway - Bay d'Espoir	110.2	110.2	126.1	(15.9)	2015
Upgrade Generator Bearings Unit 2 - Bay d'Espoir	18.9	18.9	9.4	9.5	2015
Replace Spherical By Pass Valve Assemblies Units 1 and 2 - Bay d'Espoir	57.5	57.5	12.8	44.7	2015

2014 Carryover Report
For the Year Ending December 31, 2014
($000)

Project Name	PUB Approved Budget 2014	Revised Budget 2014	Total Actual Expenditures 2014	Carryover Amount	Original Completion Year
Install Handheld Pendant to Overhead Crane - Bay d'Espoir	49.9	49.9	45.0	4.9	2015
Excitation Transformers Replacement - Bay d'Espoir	636.7	636.7	381.0	255.7	2015
Replace Economizer Inlet Valves - Holyrood	192.0	192.0	133.6	58.4	2015
Install Cold-Reheat Condensate Drains and High Pressure Heater Trip Level Unit 3 - Holyrood	49.8	49.8	101.3	(51.5)	2015
Replace Unit #1 Air Compressor - Holyrood	259.5	259.5	113.9	145.6	2015
Install Fire Protection Upgrades - Holyrood	56.6	56.6	312.0	(255.4)	2015
100 MW (Nominal) Combustion Turbine Addition - Holyrood	109,677.0	109,677.0	95,435.5	14,241.5	2015
Perform Grounding Upgrades - Various Sites	337.1	275.8	224.0	51.8	2015
Upgrade Circuit Breakers - Various Sites	3,695.4	3,695.4	1,571.7	2,123.7	2015
Replace Disconnect Switches - Various Sites	815.9	815.9	148.4	667.5	2015
Replace Optimho Relays on TL203 - Western Avalon to Sunnyside	89.1	89.1	18.2	70.9	2015
Transformer T1 Replacement - Sunnyside	7,197.8	7,197.8	5,062.7	2,135.1	2015
Perform Arc Flash Remediation - Various Sites	401.8	1,257.6	511.3	746.3	2015
Install Fire Protection System - Nain	107.1	107.1	40.7	66.4	2015
Replace Vehicles and Aerial Devices Hydro System (2014 - 2015)	1,809.1	1,809.1	900.5	908.6	2015
Refurbish Anchors and Footings TL202 and TL206 - Bay d'Espoir to Sunnyside	1,191.7	1,191.7	211.5	980.2	2015
Replace Recloser Control Panels - Various Sites	111.3	111.3	85.0	26.3	2015
Legal Survey of Primary Distribution Line Right of Ways - Various Sites (2014 - 2015)	156.8	156.8	247.4	(90.6)	2015
Upgrade Microsoft Project - Hydro Place	455.1	492.2	477.8	14.4	2015
Cost Recoveries	(163.8)	(177.1)	(172.0)	(5.1)	2015
Upgrade Distribution Systems - Various Sites (2014/2015)	370.2	370.2	193.1	177.1	2015
Upgrade Diesel Plant Production Data Collection Equipment-Various	268.9	268.9	107.8	161.1	2016
Replace Instrument Transformers - Various Sites	552.8	905.7	699.0	206.7	2017
230 kV Transmission Line, Bay d'Espoir to Western Avalon	2,412.6	2,412.6	0.0	2,412.6	2018
Total Carryover amount				35,770.6	

NEWFOUNDLAND AND LABRADOR HYDRO
2014 REMOVE SAFETY HAZARDS
FOR THE YEAR ENDING DECEMBER 31, 2014
($000)

Total Approved Budget: **$257,800**
Total Expenditure: **$207,565**

Board Order P.U. 38(2010)

As part of Board Order No. P.U. 38(2010) 2011 Capital Budget, the following was included: "Because of the nature of this project the Board would expect to see an explanation in Hydro's annual report on capital expenditures as to each project that was undertaken, setting out the safety hazard that was identified, the location, the steps taken to address the issue and the amount of the expenditure." Please see the following table for projects undertaken in 2014:

Safety Hazards

Project Title/Location	Expenditure	Safety Hazard Identified	Project Scope
Provide Safe Means of Access to Repair Needles – Cat Arm	$27.3	The platform supports are necessary to perform maintenance on the needle, turbine runner, and other components. With the broken beams in the support structure it is not safe to install a platform. This hinders maintenance activities for equipment in that area. This work is necessary to avoid any unwanted maintenance delay and to perform the maintenance work safely. Please refer to SWOP# 201401270.	Fabrication and installation of a platform at Cat Arm Unit#2 below the needles
Install Emergency Egress to Waste Water Treatment Plant – Holyrood	$85.4	A National Building Code assessment was completed and it was determined without an emergency egress, it failed to meet code. The installation of a new emergency exit from the second floor on the east side of the WWTP, is an important safety improvement with sufficient justification to warrant prompt completion. Project was carried over to 2015 due to contractor delays with material fabrication.	Fabrication of new emergency stairwell and door.

NEWFOUNDLAND AND LABRADOR HYDRO
2014 REMOVE SAFETY HAZARDS
FOR THE YEAR ENDING DECEMBER 31, 2014
($000)

Safety Hazards

Project Title/Location	Expenditure		Safety Hazard Identified	Project Scope
Install Tote Storage Platform -Holyrood	$52.2		The bulk tanks are refilled through portable 1000L totes placed into position using a forklift. The totes used to transport cortrol and ammonia was changed and the old design was no longer available. This newly designed transportation tote could no longer be safely placed on the bulk storage tank. Clearances with existing piping and orientation of valves prevented the tote from being properly supported. There are four SWOPs associated with the issue: 2014000491, 2013005537, 2013002295, 2012003321. Project was carried over to 2015 due to contractor delays with material fabrication.	Fabrication of a new tote storage platform for cortrol and ammonia totes
Install Ramps to Steel Towers - #85 - #95	$42.7		There are a total of 27 ramps of which 12 ramps have been identified as a safety hazard due to the steel being stacked approximately 3-4ft high and the rotting timbers can result in the steel pieces tipping and falling. Please refer to SWOP# 2013002420.	Replacement of wooden timbers with new.

A REPORT TO
THE BOARD OF COMMISSIONERS OF PUBLIC UTILITIES

CAPITAL EXPENDITURES AND CARRYOVER REPORT

For Year Ending December 31, 2015

March 2016

newfoundland labrador hydro
a nalcor energy company

NEWFOUNDLAND AND LABRADOR HYDRO
CAPITAL EXPENDITURES AND CARRYOVER REPORT
For Year Ending December 31, 2015

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Total Capital Project Variance
2015 Overview
($000)

Asset Type	Board Approved Budget	Total Project Expenditures and Forecast	Variance
HYDRAULIC	14,243.1	13,558.6	(684.5)
THERMAL	9,953.5	10,740.1	786.6
GAS TURBINES	6,855.0	6,905.9	50.9
TERMINAL STATIONS	42,910.1	43,223.2	313.1
TRANSMISSION	5,010.5	5,238.4	227.9
DISTRIBUTION	31,384.6	29,862.3	(1,522.3)
RURAL GENERATION	25,574.3	23,121.4	(2,452.9)
PROPERTIES	3,312.8	3,230.4	(82.4)
METERING	2,054.0	2,010.4	(43.6)
RURAL SYSTEMS TOOLS AND EQUIPMENT	2,069.3	1,871.5	(197.8)
INFORMATION SYSTEMS	3,391.6	3,519.0	127.4
TELECONTROL	1,794.2	1,813.1	18.9
TRANSPORTATION	5,502.5	5,419.0	(83.5)
ADMINISTRATIVE	1,549.6	1,372.7	(176.9)
ALLOWANCE FOR UNFORESEEN	1,250.0	945.1	(304.9)
SUPPLEMENTAL PROJECTS	773,585.1	462,469.7	(311,115.4)
PROJECTS APPROVED FOR LESS THAN $50,000	554.5	493.2	(61.3)
TOTAL CAPITAL BUDGET	**930,994.7**	**615,794.0**	**(315,200.7)**

2015 Capital Expenditures By Year ($000)

Summary	Capital Budget[1]										Actual Expenditure and Forecast											
	A					B	C	D (B+C)	E	F (A+C+E)	G					H	I	J	K (G+H+I+J)	K-F	H-D
	2010	2011	2012	2013	2014	Carryover 2015	Original 2015[3]	Revised 2015[3]	2016 and Beyond	Total	2010	2011	2012	2013	2014[2]	2015	2016 and Beyond	Carryovers to 2016	Total	Project Variance	Annual Variance
2015 Projects							65,471.2	65,471.2	29,309.7	94,780.9						55,850.2	29,269.4	4,792.1	89,911.7	(4,869.2)	(9,621.0)
2014 Projects					173,298.2	25,576.1	207,102.1	232,678.2	399,524.0	779,924.3					119,176.6	55,028.4	289,475.7	3,324.3	467,005.0	(312,919.3)	(177,649.8)
2013 Projects				8,851.1	29,588.6	10,030.9	836.1	10,867.0	1,983.5	41,259.3			76.6	2,505.4	26,816.5	12,157.1	1,983.5	183.1	43,722.2	2,462.9	1,290.1
2012 Projects			110.4	-	-	-	-	-	-	110.4			43.6	69.2	-	-	-	-	112.8	2.4	-
2011 Projects		750.7	704.3	720.0	738.9	798.1	758.5	1,556.6	-	3,672.4		391.1	332.4	657.0	735.3	1,228.8	-	-	3,344.6	(327.8)	(327.8)
2010 Projects	1,088.9	3,501.2	3,840.7	969.5	608.9	(634.5)	1,238.2	603.7	-	11,247.4	1,524.6	2,825.0	4,120.6	1,129.8	1,243.4	854.3	-	-	11,697.7	450.3	250.6
Grand Total	1,088.9	4,251.9	4,655.4	10,540.6	204,234.6	35,770.6	275,406.1	311,176.7	430,817.2	930,994.7	1,524.6	3,216.1	4,573.2	4,361.4	147,971.8	125,118.8	320,728.6	8,299.5	615,794.0	(315,200.7)	(186,057.9)

2015 Capital Budget Approved by Board Order No. P.U. 50(2014)	76,832.9
New Project Approved by Board Order No. 16(2014)	9,248.8
New Project Approved by Board Order No. 29(2014)	1,226.4
New Project Approved by Board Order No. 34(2014)	360.0
New Project Approved by Board Order No. 38(2014)	61.1
New Project Approved by Board Order No. 45(2014)[3]	1,238.2
New Project Approved by Board Order No. 53(2014)	18,964.7
New Project Approved by (O.C. 2014-033)[4]	163,145.3
New Project Approved by Board Order No. 24(2015)	1,536.3
New Project Approved by Board Order No. 27(2015)	327.9
New Project Approved by Board Order No. 29(2015)	1,249.3
New Project Approved by Board Order No. 31(2015)	500.1
New Project Approved by Board Order No. 34(2015)	250.0
2015 New Projects under $50,000 Approved by Hydro	465.1
Total Approved Capital Budget Before Carryovers	275,406.1
Carryovers from 2014 to 2015	35,770.6
TOTAL APPROVED CAPITAL BUDGET	311,176.7

[1] Annual budgets previous to 2015 pertain to projects that have expenditures in 2015.

[2] Includes Insurance Proceeds relating to Sunnyside - Transformer T1 Replacement ($1.8M).

[3] As per Board Order No. P.U. 45(2014) the Board did not approve the $0.2M Voltage Conversion - Labrador City actual costs over budget from 2010 to 2013. Hydro has excluded the $0.2M from average rate base.

[4] The construction of the Labrador West Transmission was approved by OC2014-033, February 2, 2014 of which $163.1M was included in the 2015 Capital Budget. The capital expenditures associated with this project are $11.6M as at December 31, 2015 and are included in Work In Progress and as a result are currently excluded from average rate base. The costs to be included in rate base will be subject to review by the Board of Commissioners of Public Utilities.

2015 Capital Expenditures By Category ($000)

Hydraulic Generation Projects	Capital Budget								Actual Expenditure and Forecast										
	A			B	C	D (B+C)	E	F (A+C+E)	G			H	I	J	K (G+H+I+J)	K-F	H-D	
	2012	2013	2014	Carryover 2014	Original 2015	Revised 2015	2016 and Beyond	Total	2012	2013	2014	2015	2016 and Beyond	Carryovers to 2016	Total	Project Variance	Annual Variance	Notes
2015 Projects																		
Refurbish Unit Relay Protection - Paradise River	-	-	-	-	8.7	8.7	79.7	88.4	-	-	-	9.0	79.7	(0.3)	88.4	-	0.3	
Refurbish Generation Unit - Snook's Arm	-	-	-	-	352.9	352.9	-	352.9	-	-	-	315.0	-	-	315.0	(37.9)	(37.9)	
Replace Station Service Breakers - Cat Arm	-	-	-	-	644.9	644.9	363.4	1,008.3	-	-	-	646.1	363.4	(1.2)	1,008.3	-	1.2	
Refurbish Access Road - Cat Arm	-	-	-	-	990.0	990.0	-	990.0	-	-	-	939.8	-	-	939.8	(50.2)	(50.2)	
Replace ABB Exciter Unit 2 - Cat Arm	-	-	-	-	845.9	845.9	-	845.9	-	-	-	680.8	-	-	680.8	(165.1)	(165.1)	1
Replace Interior Coating on Surge Tank 3 - Bay d'Espoir	-	-	-	-	1,629.3	1,629.3	-	1,629.3	-	-	-	1,262.7	-	-	1,262.7	(366.6)	(366.6)	2
Rehabilitate Salmon River Spillway - Bay d'Espoir	-	-	-	-	745.6	745.6	556.8	1,302.4	-	-	-	522.9	556.8	222.7	1,302.4	-	(222.7)	3
Upgrade Generator Bearings Units 1 and 3 - Bay d'Espoir	-	-	-	-	14.7	14.7	633.3	648.0	-	-	-	8.1	633.3	6.6	648.0	-	(6.6)	
Automate Generator Deluge Systems - Bay d'Espoir	-	-	-	-	645.2	645.2	-	645.2	-	-	-	567.9	-	-	567.9	(77.3)	(77.3)	
Replace Pump House and Associated Equipment - Bay d'Espoir	-	-	-	-	22.7	22.7	522.5	545.2	-	-	-	137.0	522.5	(114.3)	545.2	-	114.3	4
Upgrade Public Safety Around Dams and Waterways - Various Sites	-	-	-	-	483.9	483.9	-	483.9	-	-	-	468.7	-	-	468.7	(15.2)	(15.2)	
Install Hydrometeorological Stations - Various Sites	-	-	-	-	377.9	377.9	-	377.9	-	-	-	372.2	-	-	372.2	(5.7)	(5.7)	
Upgrade Equipment Doors - Various Sites	-	-	-	-	348.5	348.5	-	348.5	-	-	-	285.4	-	63.1	348.5	-	(63.1)	
Refurbish Intakes - Bay d'Espoir	-	-	-	-	72.6	72.6	262.3	334.9	-	-	-	26.4	262.3	46.2	334.9	-	(46.2)	
Replace Automatic Greasing Systems Units 2 and 4 - Bay d'Espoir	-	-	-	-	254.4	254.4	-	254.4	-	-	-	231.5	-	-	231.5	(22.9)	(22.9)	
Install Infrared View Ports - Various Sites	-	-	-	-	83.7	83.7	113.1	196.8	-	-	-	54.7	113.1	29.0	196.8	-	(29.0)	
Replace Generator Bearing Coolers - Bay d'Espoir	-	-	-	-	153.8	153.8	-	153.8	-	-	-	132.2	-	-	132.2	(21.6)	(21.6)	
Overhaul Turbine/Generator Units - Bay d'Espoir and Paradise River	-	-	-	-	304.4	304.4	-	304.4	-	-	-	325.8	-	-	325.8	21.4	21.4	
Purchase Tools and Equipment Less than $50,000	-	-	-	-	108.6	108.6	-	108.6	-	-	-	75.2	-	-	75.2	(33.4)	(33.4)	
2014 Projects																		
Upgrade Burnt Dam Spillway - Bay d'Espoir	-	-	110.2	(15.9)	1,201.9	1,186.0	-	1,312.1	-	-	126.1	640.2	-	545.8	1,312.1	-	(545.8)	5
Upgrade Victoria Control Structure - Bay d'Espoir	-	-	495.1	415.5	-	415.5	-	495.1	-	-	79.6	235.0	-	180.5	495.1	-	(180.5)	6
Upgrade Generator Bearings Unit 2 - Bay d'Espoir	-	-	18.9	9.5	396.0	405.5	-	414.9	-	-	9.4	252.8	-	-	262.2	(152.7)	(152.7)	7
Replace Spherical By Pass Valve Assemblies Units 1 and 2 - Bay d'Espoir	-	-	57.5	44.7	96.3	141.0	-	153.8	-	-	12.8	169.5	-	53.5	235.8	82.0	28.5	
Install Handheld Pendant to Overhead Crane - Bay d'Espoir	-	-	49.9	4.9	170.8	175.7	-	220.7	-	-	45.0	19.3	-	156.4	220.7	-	(156.4)	8
2013 Projects																		
Upgrade Units 1 to 6 By-Pass Valves - Bay d'Espoir	-	141.9	-	(43.1)	-	(43.1)	-	141.9	3.0	9.5	172.5	35.5	-	-	220.5	78.6	78.6	
Upgrade Burnt Dam Spillway - Bay d'Espoir	-	885.8	-	12.3	-	12.3	-	885.8	15.0	223.1	635.4	94.4	-	-	967.9	82.1	82.1	
Total Hydraulic Generation Projects	-	1,027.7	731.6	427.9	9,952.7	10,380.6	2,531.1	14,243.1	18.0	232.6	1,080.8	8,508.1	2,531.1	1,188.0	13,558.6	(684.5)	(1,872.5)	

2015 Capital Expenditures By Category ($000)

Thermal Generation Projects	Capital Budget								Actual Expenditure and Forecast									
	A			B	C	D (B+C)	E	F (A+C+E)	G			H	I	J	K (G+H+I+J)	K-F	H-D	
	2012	2013	2014	Carryover 2014	Original 2015	Revised 2015	2016 and Beyond	Total	2012	2013	2014	2015	2016 and Beyond	Carryovers to 2016	Total	Project Variance	Annual Variance	Notes
2015 Projects																		
Overhaul Turbine Valves Unit 1 - Holyrood	-	-	-	-	1,577.5	1,577.5	-	1,577.5	-	-	-	1,707.6	-	-	1,707.6	130.1	130.1	
Overhaul Boiler Feed Pump East Unit 1 - Holyrood	-	-	-	-	196.3	196.3	-	196.3	-	-	-	215.2	-	-	215.2	18.9	18.9	
Replace DC Distribution Panels and Breakers - Holyrood	-	-	-	-	127.9	127.9	-	127.9	-	-	-	131.5	-	-	131.5	3.6	3.6	
Upgrade Powerhouse Roofing - Holyrood	-	-	-	-	1,047.8	1,047.8	-	1,047.8	-	-	-	802.9	-	244.9	1,047.8	-	(244.9)	9
Upgrade Quarry Brook Dam Equipment - Holyrood	-	-	-	-	498.7	498.7	-	498.7	-	-	-	490.9	-	-	490.9	(7.8)	(7.8)	
Upgrade Fire Protection (Main Warehouse) - Holyrood	-	-	-	-	46.2	46.2	197.6	243.8	-	-	-	76.4	197.6	(30.2)	243.8	-	30.2	
Overhaul Extraction Pumps - Holyrood	-	-	-	-	189.6	189.6	-	189.6	-	-	-	192.5	-	-	192.5	2.9	2.9	
Purchase Tools and Equipment Less than $50,000	-	-	-	-	15.7	15.7	-	15.7	-	-	-	15.5	-	-	15.5	(0.2)	(0.2)	
2014 Projects																		
Replace Economizer Inlet Valves - Holyrood	-	-	192.0	58.4	329.1	387.5	-	521.1	-	-	133.6	409.1	-	-	542.7	21.6	21.6	
Install Cold-Reheat Condensate Drains and High Pressure Heater Trip Level Unit 3 - Holyrood	-	-	49.8	(51.5)	467.4	415.9	-	517.2	-	-	101.3	453.9	-	-	555.2	38.0	38.0	
Upgrade Plant Elevators - Holyrood	-	-	533.2	(46.7)	-	(46.7)	-	533.2	-	-	579.9	309.3	-	-	889.2	356.0	356.0	10
Upgrade Vibration Monitoring System - Holyrood	-	-	524.9	48.1	-	48.1	-	524.9	-	-	476.8	31.7	-	-	508.5	(16.4)	(16.4)	
Install Fire Protection Upgrades - Holyrood	-	-	56.6	(255.4)	312.5	57.1	-	369.1	-	-	312.0	20.6	-	-	332.6	(36.5)	(36.5)	
Replace DC Distribution Panels and Breakers - Holyrood	-	-	174.2	148.6	-	148.6	-	174.2	-	-	25.6	159.7	-	-	185.3	11.1	11.1	
Purchase Tools and Equipment Less than $50,000	-	-	59.2	15.1	-	15.1	-	59.2	-	-	37.7	11.8	-	-	49.5	(9.7)	(3.3)	
2013 Projects																		
Install Variable Frequency Drives on Forced Draft Fans - Holyrood	-	697.6	2,659.7	390.7	-	390.7	-	3,357.3	13.8	206.0	2,746.8	665.7	-	-	3,632.3	275.0	275.0	11
Total Thermal Generation Projects	-	697.6	4,249.6	307.3	4,808.7	5,116.0	197.6	9,953.5	13.8	206.0	4,413.7	5,694.3	197.6	214.7	10,740.1	786.6	578.3	

2015 Capital Expenditures By Category ($000)

Gas Turbine Generation Projects	Capital Budget								Actual Expenditure and Forecast									
	A			B	C	D (B+C)	E	F (A+C+E)	G			H	I	J	K (G+H+I+J)	K-F	H-D	
	2012	2013	2014	Carryover 2014	Original 2015	Revised 2015	2016 and Beyond	Total	2012	2013	2014	2015	2016 and Beyond	Carryover to 2016	Total	Project Variance	Annual Variance	Notes
2015 Projects																		
Upgrade Gas Turbine Plant Life Extension - Stephenville	-	-	-	-	2,655.2	2,655.2	2,525.4	5,180.6	-	-	-	2,613.6	2,525.4	41.6	5,180.6	-	(41.6)	
Replace Alternator Shaft - Happy Valley	-	-	-	-	484.4	484.4	-	484.4	-	-	-	131.1	-	320.0	451.1	(33.3)	(353.3)	12
2013 Projects																		
Upgrade Gas Turbine PLC - Happy Valley	-	61.4	1,128.6	734.2	-	734.2	-	1,190.0	2.3	22.6	430.9	818.4	-	-	1,274.2	84.2	84.2	
Total Gas Turbine Generation Projects	-	61.4	1,128.6	734.2	3,139.6	3,873.8	2,525.4	6,855.0	2.3	22.6	430.9	3,563.1	2,525.4	361.6	6,905.9	50.9	(310.7)	

2015 Capital Expenditures By Category ($000)

Terminal Stations Projects	Capital Budget									Actual Expenditure and Forecast										
	A				B	C	D (B+C)	E	F (A+C+E)	G				H	I	J	K (G+H+I+J)	K-F	H-D	
	2011	2012	2013	2014	Carryover 2014	Original 2015	Revised 2015	2016 and Beyond	Total	2011	2012	2013	2014	2015	2016 and Beyond	Carryovers to 2016	Total	Project Variance	Annual Variance	Notes
2015 Projects																				
Upgrade Circuit Breakers - Various Sites (2015-2016)	-	-	-	-	-	6,189.1	6,189.1	6,873.8	13,062.9	-	-	-	-	7,570.4	6,873.8	(1,381.3)	13,062.9	-	1,381.3	13
Replace Surge Arrestors - Various Sites	-	-	-	-	-	198.1	198.1	-	198.1	-	-	-	-	172.2	-	-	172.2	(25.9)	(25.9)	
Install Transformer On line Gas Monitoring - Various Sites	-	-	-	-	-	700.5	700.5	975.7	1,676.2	-	-	-	-	786.5	975.7	(86.0)	1,676.2	-	86.0	
Upgrade Power Transformers - Various Sites	-	-	-	-	-	4,440.4	4,440.4	7,002.3	11,442.7	-	-	-	-	2,357.3	7,002.3	2,083.1	11,442.7	-	(2,083.1)	14
Replace Disconnect Switches - Various Sites (2015-2016)	-	-	-	-	-	963.7	963.7	642.9	1,606.6	-	-	-	-	563.1	642.9	400.6	1,606.6	-	(400.6)	15
Design and Install Fire Protection in 230 kV Station - Various Sites	-	-	-	-	-	67.6	67.6	424.3	491.9	-	-	-	-	74.9	424.3	(7.3)	491.9	-	7.3	
Perform Site Work for Mobile Substation - Barachoix	-	-	-	-	-	489.3	489.3	-	489.3	-	-	-	-	516.5	-	-	516.5	27.2	27.2	
Upgrade Terminal Station Protection and Control - Various Sites	-	-	-	-	-	172.7	172.7	307.2	479.9	-	-	-	-	162.5	307.2	10.2	479.9	-	(10.2)	
Upgrade Terminal Station Foundations - Various Sites	-	-	-	-	-	302.3	302.3	-	302.3	-	-	-	-	313.1	-	-	313.1	10.8	10.8	
Upgrade Control Wiring Phase 1 to Terminal Station 1 - Bay d'Espoir	-	-	-	-	-	301.0	301.0	-	301.0	-	-	-	-	336.3	-	-	336.3	35.3	35.3	
Install Support Structures C2 Capacitor Bank - Hardwoods	-	-	-	-	-	199.3	199.3	-	199.3	-	-	-	-	58.0	-	26.4	84.4	(114.9)	(141.3)	16
Replace Station Lighting - Bay d'Espoir	-	-	-	-	-	16.7	16.7	160.3	177.0	-	-	-	-	20.0	160.3	(3.3)	177.0	-	3.3	
Upgrade Transformer Differential Protection - Grandy Brook	-	-	-	-	-	154.0	154.0	-	154.0	-	-	-	-	75.0	-	-	75.0	(79.0)	(79.0)	
2014 Projects																				
Upgrade Circuit Breakers - Various Sites	-	-	-	3,695.4	2,123.7	1,642.5	3,766.2	-	5,337.9	-	-	-	1,571.7	4,167.5	-	-	5,739.2	401.3	401.3	17
Replace Disconnect Switches - Various Sites	-	-	-	815.9	667.5	189.5	857.0	-	1,005.4	-	-	-	148.4	939.7	-	-	1,088.1	82.7	82.7	
Replace Optimho Relays on TL203 - Western Avalon to Sunnyside	-	-	-	89.1	70.9	96.9	167.8	-	186.0	-	-	-	18.2	200.7	-	-	218.9	32.9	32.9	
2013 Projects																				
Replace Instrument Transformers - Various Sites	-	-	593.2	552.8	206.7	538.4	745.1	1,983.5	3,667.9	-	9.6	230.7	699.0	755.5	1,983.5	(10.4)	3,667.9	-	10.4	
Replace Insulators - Various Sites	-	-	187.1	287.9	41.6	-	41.6	-	475.0	-	5.1	67.0	361.3	68.0	-	-	501.4	26.4	26.4	
2011 Projects																				
Perform Grounding Upgrades - Various Sites	321.2	324.0	329.0	337.1	51.8	345.4	397.2	-	1,656.7	287.6	240.7	507.2	224.0	313.5	-	-	1,573.0	(83.7)	(83.7)	
Total Terminal Stations Projects	321.2	324.0	1,109.3	5,778.2	3,162.2	17,007.4	20,169.6	18,370.0	42,910.1	287.6	255.4	804.9	3,022.6	19,450.7	18,370.0	1,032.0	43,223.2	313.1	(718.9)	

2015 Capital Expenditures by Category ($000)

Transmission Projects	Capital Budget						Actual Expenditure and Forecast								
	A	B	C	D (B+C)	E	F (A+C+E)	G	H	I	J	K (G+H+I+J)	K-F	H-D	
	Original 2014	Carryover 2014	Original 2015	Revised 2015	2016 and Beyond	Total	2014	2015	2016 and Beyond	Carryovers to 2016	Total	Project Variance	Annual Variance	Notes
2015 Projects														
Perform Wood Pole Line Management Program - Various Sites	-	-	2,830.6	2,830.6	-	2,830.6	-	3,058.5	-	-	3,058.5	227.9	227.9	
2014 Projects														
Refurbish Anchors and Footings TL202 and TL206														
- Bay d'Espoir to Sunnyside	1,191.7	980.2	988.2	1,968.4	-	2,179.9	211.5	28.2	1,940.0	0.2	2,179.9	-	(1,940.2)	18
Total Transmission Projects	1,191.7	980.2	3,818.8	4,799.0	-	5,010.5	211.5	3,086.7	1,940.0	0.2	5,238.4	227.9	(1,712.3)	

2015 Capital Expenditures By Category ($000)

Distribution Projects	Capital Budget										Actual Expenditure and Forecast											
	A					B	C	D (B+C)	E	F (A+C+E)	G					H	I	J	K (G+H+I+J)	K-F	H-D	
	2010	2011	2012	2013	2014	Carryover 2014	Original 2015	Revised 2015	2016 and Beyond	Total	2010	2011	2012	2013	2014	2015	2016 and Beyond	Carryovers to 2016	Total	Project Variance	Annual Variance	Notes
2015 Projects																						
Construct Second Distribution Feeder - Nain	-	-	-	-	-	-	1,050.3	1,050.3	-	1,050.3	-	-	-	-	-	1,139.4	-	-	1,139.4	89.1	89.1	
Relocate Voltage Regulator - Hawkes Bay	-	-	-	-	-	-	166.4	166.4	-	166.4	-	-	-	-	-	116.6	-	-	116.6	(49.8)	(49.8)	
Provide Service Extensions - All Service Areas	-	-	-	-	-	-	6,328.0	6,328.0	-	6,328.0	-	-	-	-	-	4,797.0	-	-	4,797.0	(1,531.0)	(1,531.0)	19
Provide Service Extensions - All Service Areas - CIAC	-	-	-	-	-	-	(248.0)	(248.0)	-	(248.0)	-	-	-	-	-	(214.7)	-	-	(214.7)	33.3	33.3	
Upgrade Distribution Systems - All Service Areas	-	-	-	-	-	-	3,402.0	3,402.0	-	3,402.0	-	-	-	-	-	2,985.7	-	-	2,985.7	(416.3)	(416.3)	20
Upgrade Distribution Systems - All Service Areas - CIAC	-	-	-	-	-	-	(62.0)	(62.0)	-	(62.0)	-	-	-	-	-	0.8	-	-	0.8	62.8	62.8	
Upgrade Distribution Systems - Various Sites (2015/2016)	-	-	-	-	-	-	1,136.1	1,136.1	818.8	1,954.9	-	-	-	-	-	1,379.1	818.8	(243.0)	1,954.9	-	243.0	21
2014 Projects																						
Replace Recloser Control Panels - Various Sites	-	-	-	-	111.3	26.3	84.4	110.7	-	195.7	-	-	-	-	85.0	147.7	-	-	232.7	37.0	37.0	
Upgrade Distribution Systems - Various Sites (2014/2015)	-	-	-	-	2,499.8	177.1	4,850.1	5,027.2	-	7,349.9	-	-	-	-	2,142.5	5,009.7	-	-	7,152.2	(197.7)	(17.5)	
2010 Projects																						
Voltage Conversion - Labrador City[5]	1,088.9	3,501.2	3,840.7	969.5	608.9	-634.5	1238.2	603.7	-	11,247.4	1,524.6	2,825.0	4,120.6	1,129.8	1,243.4	854.3	-	-	11,697.7	450.3	250.6	22
Total Distribution Projects	1,088.9	3,501.2	3,840.7	969.5	3,220.0	(431.1)	17,945.5	17,514.4	818.8	31,384.6	1,524.6	2,825.0	4,120.6	1,129.8	3,470.9	16,215.6	818.8	(243.0)	29,862.3	(1,522.3)	(1,298.8)	

[3] As per Board Order No. P.U. 45(2014) the Board did not approve the $0.2M Voltage Conversion - Labrador City actual costs over budget from 2010 to 2013. Hydro has excluded the $0.2M from average rate base.

2015 Capital Expenditures By Category ($000)

Rural Generation Projects	Capital Budget									Actual Expenditure and Forecast									
	A				B	C	D (B+C)	E	F (A+C+E)	G				H	I	J	K (G+H+I+J)	K-F	H-D	
	2011	2012	2013	2014	Carryover 2014	Original 2015	Revised 2015	2016 and Beyond	Total	2011	2012	2013	2014	2015	2016 and Beyond	Carryovers to 2016	Total	Project Variance	Annual Variance	Notes
2015 Projects																				
Overhaul Diesel Units - Various Sites	-	-	-	-	-	1,199.2	1,199.2	-	1,199.2	-	-	-	-	958.4	-	240.8	1,199.2	-	(240.8)	23
Install Disconnect Switches for Mobile Generators - Various Sites	-	-	-	-	-	10.0	10.0	189.3	199.3	-	-	-	-	7.8	189.3	2.2	199.3	-	(2.2)	
Inspect Fuel Storage Tanks - Various Sites	-	-	-	-	-	1,761.1	1,761.1	-	1,761.1	-	-	-	-	769.3	-	-	769.3	(991.8)	(991.8)	24
Increase Fuel Storage - Rigolet	-	-	-	-	-	1,666.8	1,666.8	-	1,666.8	-	-	-	-	837.1	-	-	837.1	(829.7)	(829.7)	25
Upgrade Ventilation Systems - Various Sites	-	-	-	-	-	175.9	175.9	317.3	493.2	-	-	-	-	245.6	317.3	(69.7)	493.2	-	69.7	
Upgrade Building Exterior - Makkovik	-	-	-	-	-	309.5	309.5	-	309.5	-	-	-	-	229.8	-	-	229.8	(79.7)	(79.7)	
Increase Generation Capacity - Makkovik	-	-	-	-	-	272.6	272.6	-	272.6	-	-	-	-	221.3	-	-	221.3	(51.3)	(51.3)	
Replace Unit 2038 - Mary's Harbour	-	-	-	-	-	103.5	103.5	1,241.5	1,345.0	-	-	-	-	101.7	1,241.5	1.8	1,345.0	-	(1.8)	
Replace Unit 254 - Paradise River	-	-	-	-	-	66.8	66.8	429.3	496.1	-	-	-	-	80.5	429.3	(13.7)	496.1	-	13.7	
Replace Programmable Logic Controllers - Various Sites	-	-	-	-	-	366.9	366.9	591.1	958.0	-	-	-	-	397.2	591.1	(30.3)	958.0	-	30.3	
Install Fire Protection - L'Anse au Loup	-	-	-	-	-	220.6	220.6	1,126.2	1,346.8	-	-	-	-	96.4	1,126.2	124.2	1,346.8	-	(124.2)	26
2014 Projects																				
Install Fire Protection System - Nain	-	-	-	107.1	66.4	892.2	958.6	-	999.3	-	-	-	40.7	33.1	-	-	73.8	(925.5)	(925.5)	27
Construct Storage Facility - Postville	-	-	-	183.8	177.8	-	177.8	-	183.8	-	-	-	66.7	164.2	-	-	230.9	47.1	(13.6)	
Upgrade Diesel Plant Production Data Collection Equipment - Various Sites	-	-	-	268.9	161.1	269.8	430.9	280.7	819.4	-	-	-	107.8	57.8	280.7	3.1	449.4	(370.0)	(373.1)	28
2013 Projects																				
Additions for Load Isolator Generation Stations - Various Sites	-	-	2,040.2	9,357.9	4,310.1	-	4,310.1	-	11,398.1	-	27.8	1196.4	6,853.5	3,916.4	-	393.7	12,387.8	989.7	(393.7)	
2012 Projects																				
Perform FEED for Diesel Plant Remediation - Various Sites	-	110.4	-	-	-	-	-	-	110.4	-	43.6	69.2	-	-	-	-	112.8	2.4	-	
2011 Projects																				
Perform Arc Flash Remediation - Various Sites	429.5	380.3	391.0	401.8	746.3	413.1	1,159.4	-	2,015.7	103.5	91.7	149.8	511.3	915.3	-	-	1,771.6	(244.1)	(244.1)	29
Total Rural Generation Projects	429.5	490.7	2,431.2	10,319.5	5,461.7	7,728.0	13,189.7	4,175.4	25,574.3	103.5	163.1	1,415.4	7,580.0	9,031.9	4,175.4	652.1	23,121.4	(2,452.9)	(4,157.8)	

2015 Capital Expenditures By Category ($000)

Properties Projects	Capital Budget						Actual Expenditure and Forecast							
	A	B	C	D (B+C)	E	F (A+C+E)	G	H	I	J	K (G+H+I+J)	K-F	H-D	
	2014	Carryover 2014	Original 2015	Revised 2015	2016 and Beyond	Total	2014	2015	2016 and Beyond	Carryovers to 2016	Total	Project Variance	Annual Variance	Notes
2015 Projects														
Replace Accommodations and Septic System - Ebbegunbaeg	-	-	489.4	489.4	1,061.4	1,550.8	-	94.2	1,061.4	395.2	1,550.8	-	(395.2)	30
Upgrade Line Depots - Various Sites	-	-	953.3	953.3	-	953.3	-	877.0	-	-	877.0	(76.3)	(76.3)	
Reshingle Roof - Stephenville	-	-	76.8	76.8	-	76.8	-	74.9	-	-	74.9	(1.9)	(1.9)	
Install Fall Protection Equipment - Various Sites	-	-	198.9	198.9	-	198.9	-	180.7	-	-	180.7	(18.2)	(18.2)	
Upgrade HVAC System - Port Saunders	-	-	137.0	137.0	-	137.0	-	150.2	-	-	150.2	13.2	13.2	
Legal Survey of Primary Distribution Line Right of Ways - Various Sites 2015	-	-	158.6	158.6	40.3	198.9	-	200.0	-	-	200.0	1.1	41.4	
2014 Projects														
Legal Survey of Primary Distribution Line Right of Ways - Various Sites 2014	156.8	(90.6)	40.3	(50.3)	-	197.1	247.3	(50.5)	-	-	196.8	(0.3)	(0.2)	
Total Properties Projects	156.8	(90.6)	2,054.3	1,963.7	1,101.7	3,312.8	247.3	1,526.5	1,061.4	395.2	3,230.4	(82.4)	(437.2)	

2015 Capital Expenditures By Category ($000)

Metering Projects	Capital Budget						Actual Expenditure and Forecast							
	A	B	C	D (B+C)	E	F (A+C+E)	G	H	I	J	K (G+H+I+J)	K-F	H-D	
	2014	Carryover 2014	Original 2015	Revised 2015	2016 and Beyond	Total	2014	2015	2016 and Beyond	Carryovers to 2016	Total	Project Variance	Annual Variance	Notes
2015 Projects														
Purchase Meters, Equipment and Metering Tanks - Various Sites	-	-	196.2	196.2	-	196.2	-	235.0	-	-	235.0	38.8	38.8	
Install Automatic Meter Reading - Various Sites (2015-2016)	-	-	559.9	559.9	401.8	961.7	-	90.6	401.8	469.3	961.7	-	(469.3)	31
2014 Projects														
Purchase Meters, Equipment and Metering Tanks - Various Sites	199.0	61.4	-	61.4	-	199.0	137.6	12.3	-	-	149.9	(49.1)	(49.1)	
Install Automatic Meter Reading - Various Sites (2014-2015)	356.9	23.7	340.2	363.9	-	697.1	333.2	330.6	-	-	663.8	(33.3)	(33.3)	
Total Metering Projects	555.9	85.1	1,096.3	1,181.4	401.8	2,054.0	470.8	668.5	401.8	469.3	2,010.4	(43.6)	(512.9)	

2015 Capital Expenditures By Category ($000)

Tools and Equipment	Capital Budget						Actual Expenditure and Forecast							
	A	B	C	D (B+C)	E	F (A+C+E)	G	H	I	J	K (G+H+I+J)	K-F	H-D	
	2014	Carryover 2014	Original 2015	Revised 2015	2016 and Beyond	Total	2014	2015	2016 and Beyond	Carryovers to 2016	Total	Project Variance	Annual Variance	Notes
2015 Projects														
Replace Light Duty Mobile Equipment - Various Sites	-	-	494.4	494.4	-	494.4	-	423.1	-	-	423.1	(71.3)	(71.3)	
Replace Off Road Track Vehicles - Unit 7861, Stephenville (2015-2016)	-	-	1.1	1.1	397.8	398.9	-	176.8	397.8	(175.7)	398.9	-	175.7	32
Tools and Equipment Less than $50,000	-	-	622.7	622.7	-	622.7	-	563.1	-	35.8	598.9	(23.8)	(59.6)	
2014 Projects														
Tools and Equipment Less than $50,000	553.3	31.3	-	31.3	-	553.3	416.7	33.9	-	-	450.6	(102.7)	2.6	33
Total Tools and Equipment	553.3	31.3	1,118.2	1,149.5	397.8	2,069.3	416.7	1,196.9	397.8	(139.9)	1,871.5	(197.8)	47.4	

2015 Capital Expenditures By Category ($000)

Information Systems Projects	Capital Budget							Actual Expenditure and Forecast								
	A		B	C	D (B+C)	E	F (A+C+E)	G		H	I	J	K (G+H+I+J)	K-F	H-D	
	2013	2014	Carryover 2014	Original 2015	Revised 2015	2016 and Beyond	Total	2013	2014	2015	2016 and Beyond	Carryovers to 2016	Total	Project Variance	Annual Variance	Notes
2015 Projects																
Perform Minor Application Enhancements - Hydro Place	-	-	-	329.5	329.5	-	329.5	-	-	482.1	-	-	482.1	152.6	152.6	34
Cost Recoveries	-	-	-	(141.6)	(141.6)	-	(141.6)	-	-	(205.9)	-	-	(205.9)	(64.3)	(64.3)	
Upgrade Energy Management System - Hydro Place	-	-	-	194.9	194.9	-	194.9	-	-	185.1	-	-	185.1	(9.8)	(9.8)	
Upgrade Lotus Notes - Hydro Place	-	-	-	635.4	635.4	-	635.4	-	-	559.2	-	-	559.2	(76.2)	(76.2)	
Cost Recoveries	-	-	-	(273.1)	(273.1)	-	(273.1)	-	-	(240.4)	-	-	(240.4)	32.7	32.7	
Replace Customer Care System - Hydro Place	-	-	-	134.9	134.9	-	134.9	-	-	141.0	-	-	141.0	6.1	6.1	
Replace Peripheral Infrastructure - Various Sites	-	-	-	200.5	200.5	-	200.5	-	-	201.7	-	-	201.7	1.2	1.2	
Upgrade Enterprise Storage Capacity - Hydro Place	-	-	-	621.3	621.3	-	621.3	-	-	627.7	-	-	627.7	6.4	6.4	
Cost Recoveries	-	-	-	(267.0)	(267.0)	-	(267.0)	-	-	(269.9)	-	-	(269.9)	(2.9)	(2.9)	
Replace Personal Computers - Various Sites	-	-	-	573.3	573.3	-	573.3	-	-	570.5	-	-	570.5	(2.8)	(2.8)	
Upgrade Server Technology Program - Hydro Place	-	-	-	601.3	601.3	-	601.3	-	-	639.8	-	-	639.8	38.5	38.5	
Cost Recoveries	-	-	-	(227.1)	(227.1)	-	(227.1)	-	-	(234.1)	-	-	(234.1)	(7.0)	(7.0)	
2013 Projects																
Upgrade Microsoft Project - Hydro Place	656.7	455.1	14.4	465.2	479.6	-	1,577.0	619.6	477.8	562.3	-	-	1,659.7	82.7	82.7	
Cost Recoveries	(236.4)	(163.8)	(5.1)	(167.5)	(172.6)	-	(567.7)	(223.1)	(172.0)	(202.4)	-	-	(597.5)	(29.8)	(29.8)	
Total Information Systems Projects	420.3	291.3	9.3	2,680.0	2,689.3	-	3,391.6	396.5	305.8	2,816.7	-	-	3,519.0	127.4	127.4	

2015 Capital Expenditures By Category ($000)

Telecontrol Projects	Capital Budget						Actual Expenditure and Forecast							
	A	B	C	D (B+C)	E	F (A+C+E)	G	H	I	J	K (G+H+I+J)	K-F	H-D	
	2014	Carryover 2014	Original 2015	Revised 2015	2016 and Beyond	Total	2014	2015	2016 and Beyond	Carryovers to 2016	Total	Project Variance	Annual Variance	Notes
2015 Projects														
Purchase Tools and Equipment less than $50,000	-	-	45.6	45.6	-	45.6	-	49.6	-	-	49.6	4.0	4.0	
Replace Network Communications Equipment - Various Sites	-	-	169.5	169.5	-	169.5	-	170.2	-	-	170.2	0.7	0.7	
Upgrade Site Facilities - Various Sites	-	-	48.3	48.3	-	48.3	-	51.7	-	-	51.7	3.4	3.4	
Replace Telephone Systems - Various Sites	-	-	132.7	132.7	-	132.7	-	145.5	-	-	145.5	12.8	12.8	
Replace WIFI Access Points - Various Sites	-	-	126.3	126.3	-	126.3	-	137.8	-	-	137.8	11.5	11.5	
Replace GDC Metroplex - Various Sites	-	-	69.2	69.2	-	69.2	-	38.7	-	30.5	69.2	-	(30.5)	
Replace DTI Phone Turrets Energy Control Center - Hydro Place	-	-	44.7	44.7	-	44.7	-	29.8	-	-	29.8	(14.9)	(14.9)	
2014 Projects														
Replace Battery Banks and Chargers - Various Sites	267.0	(26.5)	398.0	371.5	-	665.0	293.5	275.4	-	-	568.9	(96.1)	(96.1)	
Upgrade IP SCADA Network - Various Sites	254.2	109.4	238.7	348.1	-	492.9	144.8	445.6	-	-	590.4	97.5	97.5	
Total Telecontrol Projects	521.2	82.9	1,273.0	1,355.9	-	1,794.2	438.3	1,344.3	-	30.5	1,813.1	18.9	(11.6)	

2015 Capital Expenditures By Category ($000)

Transportation	Capital Budget						Actual Expenditure and Forecast							
	A	B	C	D (B+C)	E	F (A+C+E)	G	H	I	J	K (G+H+I+J)	K-F	H-D	
	2014	Carryover 2014	Original 2015	Revised 2015	2016 and Beyond	Total	2014	2015	2016 and Beyond	Carryovers to 2016	Total	Project Variance	Annual Variance	Notes
2015 Projects														
Replace Vehicles and Aerial Devices - Hydro System (2015-2016)	-	-	2377.1	2,377.1	225.3	2,602.4	-	1,734.9	225.3	642.2	2,602.4	-	(642.2)	35
2014 Projects														
Replace Vehicles and Aerial Devices - Various Sites (2014-2015)	1809.1	908.6	1,091.0	1,999.6	-	2,900.1	900.5	1,916.1	-	-	2,816.6	(83.5)	(83.5)	
Total Transportation	1,809.1	908.6	3,468.1	4,376.7	225.3	5,502.5	900.5	3,651.0	225.3	642.2	5,419.0	(83.5)	(725.7)	

Administrative	Capital Budget						Actual Expenditure and Forecast							
	2014	Carryover 2014	Original 2015	Revised 2015	2016 and Beyond	Total	2014	2015	2016 and Beyond	Carryovers to 2016	Total	Variance	Annual Variance	Notes
2015 Projects														
Remove Safety Hazards - Various Sites - 2015	-	-	194.9	194.9	-	194.9	-	176.9	-	-	176.9	(18.0)	(18.0)	
Replace Roof - Hydro Place	-	-	671.9	671.9	-	671.9	-	623.2	-	-	623.2	(48.7)	(48.7)	
Replace Cooling Tower and Auxiliaries - Hydro Place	-	-	45.7	45.7	311.3	357.0	-	52.5	311.3	(6.8)	357.0	-	6.8	
Purchase Tools and Equipment less than $50,000	-	-	68.0	68.0	-	68.0	-	18.6	-	-	18.6	(49.4)	(49.4)	
2014 Projects														
Remove Safety Hazards - Various Sites - 2014	257.8	50.2	-	50.2	-	257.8	207.6	(10.6)	-	-	197.0	(60.8)	(60.8)	
Total Administrative	257.8	50.2	980.5	1,030.7	311.3	1,549.6	207.6	860.6	311.3	(6.8)	1,372.7	(176.9)	(170.1)	

2015 Capital Expenditures By Category ($000)

Allowance For Unforeseen

	Capital Budget							Actual Expenditure and Forecast								
	A		B	C	D (B+C)	E	F (A+C+E)	G		H	I	J	K (G+H+I+J)	K-F	H-D	
	2013	2014	Carryover 2014	Original 2015	Revised 2015	2016 and Beyond	Total	2013	2014	2015	2016 and Beyond	Carryover to 2016	Total	Project Variance	Annual Variance	Notes
2015 Projects																
Contingency Fund	-	-	-	1,000.0	1,000.0	-	1,000.0	-	-	-	-	-	-	(1,000.0)	(1,000.0)	
Additional Allowance for Unforeseen - Board Order No. P.U. 34(2015)	-	-	-	250.0	250.0	-	250.0	-	-	-	-	-	-	(250.0)	(250.0)	
Unit Service Transformer for Unit 3 - Holyrood Thermal Generating Station								-	-	75.8	-	-	75.8	75.8	75.8	
Perform Upgrades - Western Avalon Transformer T5 Tap Changer								-	-	869.3	-	-	869.3	869.3	869.3	
Total Allowance For Unforeseen	-	-	-	1,250.0	1,250.0	-	1,250.0	-	-	945.1	-	-	945.1	(304.9)	(304.9)	36

Supplemental Projects

	Capital Budget							Actual Expenditure and Forecast								
	2013	2014	Carryover 2014	Original 2015	Revised 2015	2016 and Beyond	Total	2013	2014	2015	2016 and Beyond	Carryover to 2016	Total	Project Variance	Annual Variance	Notes
2015 Projects																
Purchase Critical Spares Generation Stations	-	-	-	1,536.3	1,536.3	-	1,536.3	-	-	495.2	-	1,041.1	1,536.3	-	(1,041.1)	37
Replace Rectifier Transformers - Holyrood Units 1 and 2	-	-	-	327.9	327.9	428.3	756.2	-	-	32.0	428.3	295.9	756.2	-	(295.9)	38
Hardwoods Gas Turbine Engine Refurbishment	-	-	-	1,249.3	1,249.3	-	1,249.3	-	-	1,252.1	-	-	1,252.1	2.8	2.8	
Internal Assessment and Repair of Transformer VBN T1	-	-	-	500.1	500.1	-	500.1	-	-	321.7	-	178.4	500.1	-	(178.4)	39
2014 Projects																
100 MW (Nominal) Combustion Turbine Addition - Holyrood	-	109,677.0	14,241.5	9,248.8	23,490.3	-	118,925.8	-	95,435.5	33,061.3	-	-	128,496.8	9,571.0	9,571.0	40
Labrador West Transmission Project - Construction Phase[6]	-	37,484.2	-	163,145.3	163,145.3	128,962.6	329,592.1	-	10,996.0	628.0	-	-	11,624.0	(317,968.1)	(162,517.3)	41
Transformer T1 Replacement - Sunnyside[7]	-	7,197.8	2,135.1	1,226.4	3,361.5	-	8,424.2	-	3,236.7	1,549.7	-	-	4,786.4	(3,637.8)	(1,811.8)	42
Excitation Transformers Replacement - Bay d'Espoir	-	636.7	255.7	360.0	615.7	-	996.7	-	381.0	659.6	-	-	1,040.6	43.9	43.9	
Replace Unit #1 Air Compressor - Holyrood	-	259.5	145.6	61.1	206.7	-	320.6	-	113.9	205.5	-	-	319.4	(1.2)	(1.2)	
Purchase of Critical Spares	-	491.8	491.8	-	491.8	-	491.8	-	-	491.8	-	-	491.8	-	-	
230 kV Transmission Line - Bay d'Espoir to Western Avalon	-	2,412.6	2,412.6	18,964.7	21,377.3	270,280.7	291,658.0	-	-	2,018.2	287,255.0	2,384.8	291,658.0	-	(19,359.1)	43
2013 Projects																
Increase 230 kV Transformer Capacity - Oxen Pond	3,823.6	15,310.4	4,369.1	-	4,369.1	-	19,134.0	153.6	14,611.3	5,443.3	-	(200.2)	20,008.0	874.0	1,074.2	44
Total Supplemental Projects Approved by PUB	3,823.6	173,470.0	24,051.4	196,619.9	220,671.3	399,671.6	773,585.1	153.6	124,774.4	46,158.4	287,683.3	3,700.0	462,469.7	(311,115.4)	(174,512.9)	

Projects Less than $50,000

	Capital Budget							Actual Expenditure and Forecast								
	2013	2014	Carryover 2014	Original 2015	Revised 2015	2016 and Beyond	Total	2013	2014	2015	2016 and Beyond	Carryover to 2016	Total	Variance	Annual Variance	Notes
2015 Projects																
Replace Pumps on Mobile Transformer P235 - Bishop's Falls	-	-	-	30.4	30.4	-	30.4	-	-	30.2	-	-	30.2	(0.2)	(0.2)	
Replace Generator Unit # 580 - William's Harbour	-	-	-	9.8	9.8	-	9.8	-	-	10.0	-	-	10.0	0.2	0.2	
Purchase Pick-Up - Holyrood Gas Turbine	-	-	-	36.7	36.7	-	36.7	-	-	27.2	-	-	27.2	(9.5)	(9.5)	
Replace 125VDC Battery Bank - Paradise River Hydro Plant	-	-	-	45.9	45.9	-	45.9	-	-	29.1	-	-	29.1	(16.8)	(16.8)	
Elevator Fire Alarm Tie-in - Holyrood	-	-	-	41.7	41.7	-	41.7	-	-	46.0	-	-	46.0	4.3	4.3	
Replace Unit 7 Carbon Seal - Bay d'Espoir	-	-	-	49.2	49.2	-	49.2	-	-	46.6	-	-	46.6	(2.6)	(2.6)	
Replace Unit 7 Turbine Base Plate - Bay d'Espoir	-	-	-	49.4	49.4	-	49.4	-	-	46.4	-	-	46.4	(3.0)	(3.0)	
Spare Turbine Bearing Refurbishment Unit 1-6 - Bay d'Espoir	-	-	-	47.4	47.4	-	47.4	-	-	37.2	-	-	37.2	(10.2)	(10.2)	
Replace Unit 1 Turbine Guide Gearing - Bay d'Espoir	-	-	-	40.3	40.3	-	40.3	-	-	49.5	-	-	49.5	9.2	9.2	
Replace Valve Breaker B12L42 - Holyrood TS	-	-	-	34.0	34.0	-	34.0	-	-	-	-	-	-	(34.0)	(34.0)	
Purchase Portable Generating Unit - Oxen Pond TS	-	-	-	28.0	28.0	-	28.0	-	-	28.0	-	-	28.0	-	-	
Replace Horizontal Fuel Tanks - St. Anthony Diesel Plant	-	-	-	48.8	48.8	-	48.8	-	-	50.1	-	-	50.1	1.3	1.3	
Thrust Bearing Refurbishment Units 1 - 6, Bay d'Espoir	-	-	-	2.5	2.5	41.2	43.7	-	-	0.1	41.2	2.4	43.7	-	(2.4)	
Replace Interupter Bottom Brook Breaker B3L50	-	-	-	1.0	1.0	48.2	49.2	-	-	-	48.2	1.0	49.2	-	(1.0)	
Total Projects Less than $50,000	-	-	-	465.1	465.1	89.4	554.5	-	-	400.4	89.4	3.4	493.2	(61.3)	(64.7)	

[6] The construction of the Labrador West Transmission was approved by OC2014-033, February 2, 2014. The capital expenditures associated with this project are $11.6M as at December 31, 2015 and are included in Work In Progress and as a result are currently excluded from average rate base. The costs to be included in rate base will be subject to review by the Board of Commissioners of Public Utilities.

[7] Includes Insurance Proceeds relating to Sunnyside - Transformer T1 Replacement ($1.8M).

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($000)

The projects discussed in the following section have variances of more than 10% and $100,000 when comparing budget to the 2015 expenditure, whether it is a single year project or a multiyear project. Also discussed are projects where there is a total project variance that is greater than 10% and $100,000. The projects are ordered and numbered for explanation below based on the order and number they appear in the preceding set of tables.

The majority of projects noted were executed against a Class 3 estimate that was completed for the Capital Budget Application. A Class 3 estimate is considered to have an accuracy range of -20% to +30% based on the total project budget. There is also generally a 20% contingency applied to the projects.

Hydraulic Generation Projects

1. Replace ABB Exciter Unit 2 - Cat Arm (2015)

Budget: $845.9 **Total: $680.8** **Variance: ($165.1)**

This project is complete. The project costs for exciter manufacturing were lower than estimated. The variance is also attributable to contingency funds not being required.

2. Replace Interior Coating on Surge Tank 3 - Bay d'Espoir (2015)

Budget: $1,629.3 **Total: $1,262.7** **Variance: ($366.6)**

This project is complete. The approved budget included a structural inspection as well as anticipated repairs resulting from the findings of the inspection report. The inspection report determined that structural repairs and associated costs were not required. The variance is also attributable to the contingency funds not being required.

3. Rehabilitate Salmon River Spillway - Bay d'Espoir (2015-2016)

Budget: $745.6 **Total: $522.9** **Variance: ($222.7)**

This is a two-year project that commenced in 2015. A portion of the scope has been rescheduled from 2015 to 2016. There is no change to the total project budget, scope or completion date. The installation of the gate drive brakes was rescheduled from 2015 to 2016 due to a vendor supply issue. The gate

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heater replacement was rescheduled from 2015 to 2016 to allow for re-planning of the work to lower the safety risk during construction.

4. Replace Pump House and Associated Equipment - Bay d'Espoir (2015-2016)

Budget: $22.7 Total: $137.0 Variance: $114.3

This is a two-year project that commenced in 2015. The original project schedule included engineering design from November 2015 to February 2016. The annual variance is due to the fact that engineering work was advanced and largely completed in 2015. There is no change to the overall project scope, budget or completion date.

5. Upgrade Burnt Dam Spillway - Bay d'Espoir (2014-2015)

Budget: $1,186.0 Total: $640.2 Variance: ($545.8)

This project is partially complete with the remaining scope carried into for 2016. The engineering and procurement of the diesel generator units took longer than estimated in order to ensure best available control technology in compliance with Air Pollution Control Regulations. Electrical upgrades to the Burnt Dam structure and replacement of the stop-log seals were completed later in 2015 than originally scheduled. In order to avoid congestion at site and ensure safe execution of the remaining work, the upgrades to the emergency backup hydraulic system and the mechanical gate inspection were rescheduled for 2016. The total project budget is presently being re-forecasted, and any resultant material change will be discussed with the Board.

6. Upgrade Victoria Control Structure - Bay d'Espoir (2014-2015)

Budget: $415.5 Total: $235.0 Variance: ($180.5)

This is a two-year project that commenced in 2014. The project is partially complete with the remaining scope carried into for 2016. Electrical scope and civil assessment portions of this project were completed in 2015. Due to ongoing work at Burnt Dam in 2015, the start of work at Victoria Control Structure was delayed, so as not to have both Burnt Dam and Victoria systems out of service concurrently. The late

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($000)

start resulted in the mechanical scope being rescheduled to 2016. The total project budget is presently being re-forecasted, and any resultant material change will be discussed with the Board.

7. Upgrade Generator Bearings Unit 2 - Bay d'Espoir (2014)

Budget: $414.9 Total: $262.2 Variance: ($152.7)

This project is complete. The original project scope included modification of the guide bearing segments and modifications to the bearing oil pot covers in order to reduce generator bearing oil leakage. Upon reviewing the impacts of the modification to the bearing guide, as completed on Unit 2 in 2014 (a separate project), it was decided to only replace bearing oil pot covers and not modify the generator guide bearing segments for remaining generating units, as this achieved the desired project intent. The variance is also attributable to the contingency funds not being required.

8. Install Handheld Pendant to Overhead Crane - Bay d'Espoir (2014-2015)

Budget: $175.7 Total: $19.3 Variance: ($156.4)

This is a two-year project that commenced in 2014. The engineering and procurement for this project are complete and construction is rescheduled for 2016. This is a carryover but not a change to the total project budget or scope. During acceptance testing of the replacement parts, it was determined that additional parts were required which were not available until late December 2015. The cost of the additional parts was the responsibility of the vendor and thus did not impact the project cost.

Thermal Generation Projects

9. Upgrade Powerhouse Roofing - Holyrood (2015)

Budget: $1,047.8 Total: $802.9 Variance: ($244.9)

This was a single year project scheduled for completion in 2015. This project is partially complete with the remaining scope rescheduled for 2016. There is no change to the total project budget or scope. Due to weather delays that exceeded the estimated weather allowance originally included in the project plan, a portion of the roofing work was rescheduled to 2016.

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($000)

10. Upgrade Plant Elevators - Holyrood (2014)

Budget: $533.2 **Total: $889.2** **Variance: $356.0**

This project is complete. The overall project costs included labour associated with working in a confined space. This cost was not included in the original estimate as it was not identified as a confined space. Additionally, prior to a return of service, a provincial inspector required additional upgrades that were not included in the original budget.

11. Install Variable Frequency Drives on Forced Draft Fans - Holyrood

Budget: $390.7 **Total: $665.7** **Variance: $275.0**

This project is complete. This was a two year project that was originally planned to be completed in 2014 but was carried over into 2015. The project was completed within 10% of the total approved budget. The annual variance is attributable to engineering rework required to address issues identified during commissioning.

Gas Turbine Generation Projects

12. Replace Alternator Shaft - Happy Valley (2015)

Budget: $484.4 **Total: $131.1** **Variance: ($353.3)**

This was a single year project scheduled for completion in 2015. The project engineering and procurement are complete and construction has been rescheduled for 2016. There is no change to the project total budget or scope. Upon delivery of the long lead equipment in the fall of 2015 it was decided, from a winter readiness perspective, that it would be more prudent to complete this work in the spring of 2016. The unit's availability through the winter was not impacted by this carry over.

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Terminal Stations Projects

13. Upgrade Circuit Breakers - Various Sites (2015-2016)

Budget: $6,189.1 **Total: $7,570.4** **Variance: $1,381.3**

This is a two year project that commenced in 2015 and is a portion of an ongoing program to replace circuit breakers. Some breaker procurement was advanced from 2016 to 2015 to allow implementation flexibility and to enhance early 2016 work implementation to meet winter readiness timelines. The project is expected to be completed on budget.

14. Upgrade Power Transformers - Various Sites (2015-2016)

Budget: $4,440.4 **Total: $2,357.3** **Variance: ($2,083.1)**

This is a two year project that commenced in 2015. The variance from the planned 2015 expenditures is primarily attributable to Cat Arm and Bay d'Espoir Generating Stations transformer orders being placed later than planned.

15. Replace Disconnect Switches - Various Sites (2015-2016)

Budget: $963.7 **Total: $563.1** **Variance: ($400.6)**

This is a two year project that commenced in 2015. There is no change to the overall project scope, budget, or completion date. The detailed project planning completed in early 2015 resulted in more of the procurement being scheduled in 2015 and a greater portion of the construction scheduled for 2016. This resulted in a net negative variance in 2015 actual expenditure against the original planned expenditure, but no impact on overall project budget.

16. Install Support Structures C2 Capacitor Bank - Hardwoods (2015)

Budget: $199.3 **Total: $58.0** **Variance: ($141.3)**

This was a single year project scheduled for completion in 2015. The project engineering and procurement are complete and construction has been rescheduled for 2016. A less costly design to address the original issue is anticipated to result in an overall budget reduction. The deferral of the

NEWFOUNDLAND AND LABRADOR HYDRO
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($000)

construction work to 2016 was based on winter readiness planning and a review of impacts on system capacity and reliability; the work was rescheduled to coordinate with the replacement of a disconnect switch (another project), thereby further reducing costs.

17. Upgrade Circuit Breakers - Various Sites (2014-2015)

Budget: $3,766.2 Total: $4,167.5 Variance: $401.3

This project is complete and the overall project variance was within 10% of approved budget. The variance from the annual planned 2015 expenditure is attributable to increased engineering and field work associated with breaker controls.

Transmission Projects

18. Refurbish Anchors and Footings TL202 and TL206 - Bay d'Espoir to Sunnyside (2014)

Budget: $1,968.4 Total: $28.2 Variance: ($1,940.2)

This project commenced in 2014. The engineering is complete and during project planning, it was decided to align construction with execution of the new transmission line between Bay d'Espoir and Western Avalon Terminal Stations, which is along the same corridor. The new line was approved by the Board under Order No. P. U. 53(2014) on December 12, 2014. The alignment of this project with the construction of the transmission line will result in overall cost savings to the project as well as a reduced environmental impact.

Distribution Projects

19. Provide Service Extensions - All Service Areas (2015)

Budget: $6,328.0 Total: $4,797.0 Variance: ($1,531.0)

This is a one year project with budget based on previous years expenditures to provide service extensions to customers. The budget and actual expenditures in 2015 are shown by area in table below. The annual variance is primarily due to less than expected service extensions in Labrador than in

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(Greater than $100,000 and 10% Variance from Budget)
($000)

previous years due to the economic climate in Labrador, resulting in fewer customer requests requiring extensions. The service extension numbers in Labrador are customer driven.

	Budget ($000)	Actual ($000)	Variance ($000)
Central	1,710.0	1,869.7	159.7
Northern	1,570.0	1,661.5	91.5
Labrador	3,048.0	1,265.8	(1,782.2)
Total	6,328.0	4,797.0	(1,531.0)

20. Upgrade Distribution Systems - All Service Areas (2015)

Budget: $3,402.0 Total: $2,985.7 Variance: ($416.3)

This is a one year project with budget based on previous years expenditures to provide distribution upgrades to customers. The budget and actual expenditures in 2015 are shown by area in table below. The variance is primarily due to less than expected distribution upgrades in Northern than in the previous years.

	Budget ($000)	Actual ($000)	Variance ($000)
Central	1,735.0	1,900.0	165.0
Northern	1,217.0	735.7	(481.3)
Labrador	450.0	350.0	(100.0)
Total	3,402.0	2,985.7	(416.3)

21. Upgrade Distribution Systems - Various Sites (2015-2016)

Budget: $1,136.1 Total: $1,379.1 Variance: $243.0

This is a multiyear project that began in 2015. There is no overall change to the project budget or completion date. The annual variance is attributable to work on the Farewell Head distribution system which included the replacement of additional cross arms and hardware to facilitate insulator replacement on Fogo Island. The cost of the additional cross arms was absorbed through the project contingency. As well, for the Bottom Waters system upgrade, a portion of the engineering design was advanced from 2016 to 2015.

NEWFOUNDLAND AND LABRADOR HYDRO
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($000)

22. Voltage Conversion - Labrador City (2010)

Budget: $603.7 **Total: $854.3** **Variance: $250.6**

This multi-year project is complete and the overall project variance was within 10% of approved budget. Annual variance is due to higher than planned execution costs.

Rural Generation Projects

23. Overhaul Diesel Units - Various Sites (2015)

Budget: $1,199.2 **Total: $958.4** **Variance: ($240.8)**

This is a one year project to overhaul diesel units that are being carried over into 2016. The variance in project cost is mostly due to the late delivery of material.

24. Inspect Fuel Storage Tanks - Various Sites (2015)

Budget: $1,761.1 **Total: $769.3** **Variance: ($991.8)**

This one-year project is complete. Resultant work from inspections was less than expected at Hardwoods Gas Turbine, McCallum and Port Hope Simpson Diesel Plants. In addition, the project contract prices were lower than estimated. One tank in L'Anse au Loup was inspected and condemned by the inspector. Following consultation with the Board, it was agreed to replace the tank under this project using available budget as any attempt to repair the tank would have exceeded the cost to replace.

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($000)

25. Increase Fuel Storage - Rigolet (2015)

Budget: $1,666.8 **Total: $837.1** **Variance: ($829.7)**

This one-year project is complete. The contract and corresponding on-site supervision costs were significantly lower than estimated. The variance is also attributable to the contingency funds not being required.

26. Install Fire Protection - L'Anse au Loup (2015-2016)

Budget: $220.6 **Total: $96.4** **Variance: ($124.2)**

This is a two year project that commenced in 2015. The annual variance is attributed to rescheduling a portion of the engineering design and procurement activity into 2016 Q1.

27. Install Fire Protection System - Nain (2014)

Budget: $999.3 **Total: $73.8** **Variance: ($925.5)**

This is a multi-year project that commenced in 2014. Early in 2015, project spending was suspended when it was determined that the approved budget was inadequate to complete the planned scope of work. A revised project proposal was submitted as part of the 2016 Capital Budget Application and subsequently approved. This project will now be executed as part of the 2016 budget.

28. Upgrade Diesel Plant Production Data Collection Equipment - Various Sites (2014-2016)

Budget: $430.9 **Total: $57.8** **Variance: ($373.1)**

This is a three-year project that commenced in 2014. There is no change to the overall scope or completion date. The variance from the planned 2015 expenditure is primarily related to an overestimation of engineering and construction costs. It is anticipated that the project will be completed in 2016 under budget.

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($000)

29. Perform Arc Flash Remediation - Various Sites (2011-2015)

Budget: $2,015.7 Total: $1,771.6 Variance: ($244.1)

This was a five year project initiated in 2011 to perform arc flash hazard remediation. The planned work is complete and the project is closed. The variance is primarily attributable to the contingency funds not being required.

Properties Projects

30. Replace Accommodations and Septic System - Ebbegunbaeg (2015-2016)

Budget: $489.4 Total: $94.2 Variance: ($395.2)

This is a two year project that commenced in 2015. There is no change to the total project budget, scope or completion date. Due to the requirement for an environmental assessment and flood study, the bridge installation and road upgrades planned for 2015 were rescheduled to 2016.

Metering Projects

31. Install Automatic Meter Reading - Various Sites (2015-2016)

Budget: $559.9 Total: $90.6 Variance: ($469.3)

This is a two year project that commenced in 2015. There is no change to the total project budget, scope or completion date. The procurement of the new meters was originally planned to be received in December 2015. Delivery is now expected in 2016 Q1 with no risk to overall project completion.

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($000)

Tools and Equipment Projects

32. Replace Off Road Track Vehicles - Unit 7861 - Stephenville (2015-2016)

Budget: $1.1 Total: $176.8 Variance: $175.7

This is a two-year project, with two years required due to the timing of delivery post ordering. The variance in the 2015 planned expenditure is primarily due to early arrival of the equipment.

33. Tools and Equipment Less than $50,000 (2014)

Budget: $555.3 Total: $450.6 Variance: ($102.7)

The overall project variance is primarily due to the cancellation of the replacement of a material ramp until the completion of a condition assessment.

Information Systems Projects

34. Perform Minor Application Enhancements - Hydro Place (2015)

Budget: $329.5 Total: $482.1 Variance: $152.6

This is a one-year project that was completed in 2015. The variance was primarily for additional minor enhancements that were not anticipated.

Transportation Projects

35. Replace Vehicles and Aerial Devices - Hydro System (2015-2016)

Budget: $2,377.1 Total: $1,734.9 Variance: ($642.2)

This is a two-year project initiated in 2015. The variance from 2015 planned expenditure is related to timing of material delivery. Various chassis manufacturers were delayed in supplying chassis to the up fitters, including five chassis and six van conversions.

NEWFOUNDLAND AND LABRADOR HYDRO
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FOR THE YEAR ENDING DECEMBER 31, 2015
(Greater than $100,000 and 10% Variance from Budget)
($000)

36. Allowance For Unforeseen

Budget: $1,250.0 Total: $945.1 Variance: ($304.9)

The Allowance for Unforeseen is an annual allotment that permits Hydro to act expeditiously to deal with events affecting the electrical system which cannot wait for specific approval of the Board. Unforeseen expenditures for 2015 under this account include costs associated with the Inspection and Repair of Unit Service Transformer (UST-3) for Unit 3 at Holyrood Thermal Generating Station and Performing Upgrades to the Western Avalon Terminal Station Transformer T5 Tap Changer. Reports on these items have been filed with the Board of Commissioners of Public Utilities (the Board).

The annual budget for Allowance for Unforeseen is $1,000,000. Hydro applied for and the Board approved a supplementary amount of $250,000 to be added to the balance in the Allowance for Unforeseen (P.U. 34(2015)).

Supplemental Projects

37. Purchase Critical Spares - Generation Stations (2015)

Budget: $1,563.3 Total: $495.2 Variance: ($1,041.1)

A number of the critical spares included in this project have lead times in excess of nine months. Orders for materials were placed upon Board approval, and therefore, materials will be received in 2016. While no additional funding is required to complete the project, the project will not be completed until 2016.

38. Replace Excitation Transformers - Holyrood Units 1 and 2 (2015)

Budget: $327.9 Total: $32.0 Variance: ($295.9)

This is a supplemental project approved by the Board in 2015 Q4. There is no overall change to the total project budget, scope or completion date. The transformers were originally planned to be received in 2015 Q4 but were actually received in 2016 Q1.

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(Greater than $100,000 and 10% Variance from Budget)
($000)

39. Internal Assessment and Repair of Transformer VBN T1 (2015)

Budget: $500.1 Total: $321.7 Variance: ($178.4)

This is a supplemental project approved by the Board in 2015 Q4. This project was initiated and substantially completed in 2015. The scope included a major internal inspection and an allowance for repairs; however substantial repairs were not required. The project carried into 2016 for final testing and project completion. It is anticipated that the project will close under budget.

40. 100 MW (Nominal) Combustion Turbine Addition - Holyrood (2014)

Budget: $23,490.3 Total: $33,061.3 Variance: $9,571.0

This was a two year project initiated in 2014 and is now complete. The overall project variance was within 10% of approved budget. The variance from the planned 2015 expenditure was mainly attributed to the higher than budgeted cost for the building. The main contributors to the higher than budgeted cost for the building were generally as follows:

1. Building construction progress was impacted for safety considerations associated with constructing the building in parallel with and around other work fronts. Also, there were many interruptions of heavy lifts and other aerial work due to high winds and inclement weather.

2. As the priority was to get the CT into operation, a phased approach to building construction was implemented to accommodate priority work fronts. This significantly extended the construction phase of the building.

3. Increased building complexity due to interface with the turbine generator. In particular, the Heating Ventilation Air Conditioning (HVAC) system is complex due to the nature of the equipment that is being housed in the building. Also, the fire protection system is complex due to the nature of the equipment that is being protected and integrated with the HVAC system. Fire protection system design is in full compliance with FM Global standards.

NEWFOUNDLAND AND LABRADOR HYDRO
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FOR THE YEAR ENDING DECEMBER 31, 2015
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($000)

41. Labrador West Transmission Project - Construction Phase (2014)

Budget: $163,145.3 Total: $628.0 Variance: ($162,517.3)

In 2014, the Provincial Government approved the construction of the third transmission line in Labrador to help supply power for planned new developments in Labrador West, such as the Kami Iron Ore Project, and improve reliability for all customers in the region. In September 2014, work on the line was temporarily suspended until completion of Alderon's financing plan which resulted in 2015 expenditures being lower than budgeted. All project costs incurred to date, including the 2015 Interest During Constriction costs, are covered by the security Alderon has already provided. Construction will proceed should additional funding be secured.

42. Transformer T1 Replacement - Sunnyside (2014-2015)

Budget: $8,424.2 Total: $4,786.4 Variance: ($3,637.8)

This project is complete. The variance from 2015 planned expenditure is attributed to a cost recovery from insurance proceeds and lower than estimated materials and installation costs. The variance is also attributable to the contingency funds not being required.

43. 230 kV Transmission Line - Bay d'Espoir to Western Avalon (2014-2018)

Budget: $21,377.3 Total: $2,018.2 Variance: ($19,359.1)

The original budget for 2015 was $21.4M. The revised 2015 expenditure for TL267 as submitted to the Board in the 2016 Capital Budget Application on August 1 was $4.4M. As of the end of 2015, the actual expenditure was $2.018M. The noted differences were in the areas of Project Management and Engineering, where efficiencies have been realized by expanding upon the work already completed for similar designs. The work plan to this point is on schedule, with only engineering possible at this time given that the project has not been released from Environmental Assessment. The unused funds will be carried over to 2016 for the continuation and completion of engineering and the start of construction, given the relatively early stage of the project.

NEWFOUNDLAND AND LABRADOR HYDRO
2015 VARIANCE EXPLANATIONS
FOR THE YEAR ENDING DECEMBER 31, 2015
(Greater than $100,000 and 10% Variance from Budget)
($000)

44. Increase 230 kV Transformer Capacity - Oxen Pond (2013-2014)

Budget: $4,369.1 **Total: $5,443.3** **Variance: $1,074.2**

This is a multiyear project that commenced in 2013, was substantially completed in 2014 and 2015, and has been carried into 2016 to complete project deficiencies. The approved project scope included work at both Oxen Pond and Hardwoods Terminal Stations. The overall project variance at completion will be within 10% of approved budget. The annual variance from the 2015 planned expenditures is attributed to higher than anticipated contract costs associated with additional purchase and processing of transformer oil to achieve required quality, and overall higher contract pricing.

NEWFOUNDLAND AND LABRADOR HYDRO
2015 VARIANCE EXPLANATIONS
FOR THE YEAR ENDING DECEMBER 31, 2015
(Greater than $100,000 and 10% Variance from Budget)
($000)

Captial Budgets/Expenditures 2006-2015

Year	Budget	Actual Expenditures	Variance	Percentage Variance
2006	49,024	41,217	7,807	15.9%
2007	43,304	35,669	7,635	17.6%
2008	53,579	46,246	7,333	13.7%
2009	61,544	54,152	7,392	12.0%
2010	63,297	55,553	7,744	12.2%
2011	67,454	63,116	4,338	6.4%
2012	93,840	77,252	16,588	17.7%
2013	116,373	84,755	31,618	27.2%
2014	280,601	204,728	75,873	27.0%
2015	311,177	125,119	186,058	59.8%

The 2015 variance in actual expenditures compared to budget is primarily attributable to:

- $163.0M associated with work that was planned to be completed in 2015 on the Labrador West Transmission Line[1] however was not completed due to a temporary suspension of the work in September 2014. Work is suspended until completion of Alderon's financing plan for the Kami mine.
- $19.4M variance is related to the original 2015 budget for 230 kV Transmission Line - Bay d'Espoir to Western Avalon (TL267) project. This budget was revised in early 2015 to $4.4M, and the actual expenditure in 2015 was $2.0M.

[1] The construction of the Labrador West Transmission was approved by OC2014-033, February 2, 2014. The capital expenditures associated with this project are $11,624,000 as at December 31, 2015 and are included in Work In Progress and as a result are currently excluded from average rate base. The costs to be included in rate base will be subject to review by the Board.

2015 Carryover Report
For the Year Ending December 31, 2015
($000)

Project Name	PUB Approved Budget 2015	Revised Budget 2015	Total Actual Expenditures 2015	Carryover Amount	Original Completion Year
Replace GDC Metroplex - Various Sites	69.2	69.2	38.7	30.5	2015
Upgrade Burnt Dam Spillway - Bay d'Espoir	1,186.0	1,186.0	640.2	545.8	2015
Upgrade Victoria Control Structure - Bay d'Espoir	415.5	415.5	235.0	180.5	2015
Replace Spherical By Pass Valve Assemblies Units 1 and 2 - Bay d'Espoir	141.0	223.0	169.5	53.5	2015
Install Handheld Pendant to Overhead Crane - Bay d'Espoir	175.7	175.7	19.3	156.4	2015
Upgrade Equipment Doors - Various Sites	348.5	348.5	285.4	63.1	2015
Purchase of Critical Spares - Generation Stations	1,536.3	1,536.3	495.2	1,041.1	2015
Upgrade Powerhouse Roofing - Holyrood	1,047.8	1,047.8	802.9	244.9	2015
Increase 230kV Transformer Capacity - Oxen Pond	4,369.1	5,243.1	5,443.3	(200.2)	2015
Install Support Structures C2 Capacitor Bank - Hardwoods	199.3	84.4	58.0	26.4	2015
Internal Assessment and Repair of Transformer VBN T1	500.1	500.1	321.7	178.4	2015
Overhaul Diesel Units - Various Sites	1,199.2	1,199.2	958.4	240.8	2015
Additions for Load Isolator Generation Stations - Various Sites	4,310.1	4,310.1	3,916.4	393.7	2014
Tools and Equipment Less than $50,000	622.7	622.7	0.0	35.8	2015
Replace Alternator Shaft - Happy Valley	484.4	451.1	131.1	320.0	2015
Install Automatic Meter Reading - Various Sites (2015-2016)	559.9	559.9	90.6	469.3	2016
Refurbish Unit Relay Protection - Paradise River	8.7	8.7	9.0	(0.3)	2016
Replace Station Service Breakers - Cat Arm	644.9	644.9	646.1	(1.2)	2016
Rehabilitate Salmon River Spillway - Bay d'Espoir	745.6	745.6	522.9	222.7	2016
Upgrade Generator Bearings Units 1 and 3 - Bay d'Espoir	14.7	14.7	8.1	6.6	2016
Replace Pump House and Associated Equipment - Bay d'Espoir	22.7	22.7	137.0	(114.3)	2016
Refurbish Intakes - Bay d'Espoir	72.6	72.6	26.4	46.2	2016
Install Infrared View Ports - Various Sites	83.7	83.7	54.7	29.0	2016
Replace Accommodations and Septic System - Ebbegunbaeg	489.4	489.4	94.2	395.2	2016

2015 Carryover Report
For the Year Ending December 31, 2015
($000)

Project Name	PUB Approved Budget 2015	Revised Budget 2015	Total Actual Expenditures 2015	Carryover Amount	Original Completion Year
Thrust Bearing Refurbishment Units 1 - 6, Bay d'Espoir	2.5	2.5	0.1	2.4	2016
Replace Rectifier Transformers - Holyrood Units 1 and 2	327.9	327.9	32.0	295.9	2016
Upgrade Fire Protection (Main Warehouse) - Holyrood	46.2	46.2	76.4	(30.2)	2016
Replace Instrument Transformers - Various Sites	745.1	745.1	755.5	(10.4)	2017
Upgrade Circuit Breakers - Various Sites (2015-2016)	6,189.1	6,189.1	7,570.4	(1,381.3)	2016
Install Transformer On line Gas Monitoring - Various Sites	700.5	700.5	786.5	(86.0)	2016
Upgrade Power Transformers - Various Sites	4,440.4	4,440.4	2,357.3	2,083.1	2016
Replace Disconnect Switches - Various Sites (2015-2016)	963.7	963.7	563.1	400.6	2016
Design and Install Fire Protection in 230 kV Station - Various Sites	67.6	67.6	74.9	(7.3)	2016
Upgrade Terminal Station Protection and Control - Various Sites	172.7	172.7	162.5	10.2	2016
Replace Station Lighting - Bay d'Espoir	16.7	16.7	20.0	(3.3)	2016
Replace Interupter Bottom Brook Breaker B3L50	1.0	1.0	0.0	1.0	2016
Upgrade Gas Turbine Plant Life Extension - Stephenville	2,655.2	2,655.2	2,613.6	41.6	2016
Upgrade Diesel Plant Production Data Collection Equipment-Various	430.9	60.9	57.8	3.1	2016
Install Disconnect Switches for Mobile Generators - Various Sites	10.0	10.0	7.8	2.2	2016
Replace Vehicles and Aerial Devices Hydro System (2015-2016)	2,377.1	2,377.1	1,734.9	642.2	2016
Replace Off Road Track Vehicles - Unit 7861, Stephenville (2015-2016)	1.1	1.1	176.8	(175.7)	2016
Refurbish Anchors and Footings TL202 and TL206 - Bay d'Espoir to Sunnyside	1,968.4	28.4	28.2	0.2	2017
Construct 230kV Transmission Line - Bay d'Espoir to Western Avalon	21,377.3	4,403.0	2,018.2	2,384.8	2018
Upgrade Distribution Systems - Various Sites (2015/2016)	1,136.1	1,136.1	1,379.1	(243.0)	2016
Upgrade Ventilation Systems - Various Sites	175.9	175.9	245.6	(69.7)	2016
Replace Unit 2038 - Mary's Harbour	103.5	103.5	101.7	1.8	2016
Replace Unit 254 - Paradise River	66.8	66.8	80.5	(13.7)	2016
Replace Programmable Logic Controllers - Various Sites	366.9	366.9	397.2	(30.3)	2017
Install Fire Protection - L'Anse au Loup	220.6	220.6	96.4	124.2	2016
Replace Cooling Tower and Auxiliaries - Hydro Place	45.7	45.7	52.5	(6.8)	2016
Total Carryover Amount				8,299.5	

NEWFOUNDLAND AND LABRADOR HYDRO
2015 REMOVE SAFETY HAZARDS
FOR THE YEAR ENDING DECEMBER 31, 2015
($000)

Total Approved Budget: **$194,900**
Total Expenditure: **$176,891**

Board Order P.U. 38(2010)

As part of Board Order No. P.U. 38(2010) 2011 Capital Budget, the following was included: "Because of the nature of this project the Board would expect to see an explanation in Hydro's annual report on capital expenditures as to each project that was undertaken, setting out the safety hazard that was identified, the location, the steps taken to address the issue and the amount of the expenditure." Please see the following table for projects undertaken in 2014:

Safety Hazards

Project Title/Location	Expenditure	Safety Hazard Identified	Project Scope
Resurface deteriorated concrete floor to remove safety hazards	$34.9	The concrete floor of the Wastewater Treatment Plant (WWTP) dyke is in rough shape with the majority of the concrete surface eroded. This poses a safety issue. When a chemical spill occurs it is difficult to do a proper clean up. The chemical residue will become lodged in the cracked and peeling concrete surface leaving behind hazardous waste in the dyke. The deteriorating surface no longer has any chemical resistant coating remaining, therefore the problem will continue to progress. This has also created a tripping hazard when working in the WWTP dyke. The concrete floor in the Chemical Storage Building poses similar safety risks. The rough uneven surface interferes with the proper clean-up of a spill due to hazardous chemicals becoming lodge in the cracked concrete. If spills cannot be cleaned up properly, hazardous waste is left behind posing a safety risk to those entering the storage facility. The concrete sealer is deteriorating and sections are pealing from the floor creating a slipping and tripping hazard from the dislodged sections.	Resurfacing of the concrete floors in the WWTP dyke and the chemical storage building.

NEWFOUNDLAND AND LABRADOR HYDRO
2015 REMOVE SAFETY HAZARDS
FOR THE YEAR ENDING DECEMBER 31, 2015
($000)

Safety Hazards

Project Title/Location	Expenditure	Safety Hazard Identified	Project Scope
Install safe walkway on Oil Tank #1 roof	$142.0	Testing concluded that the roof plate for Tank #1 was under the minimal required thickness. An evaluation of the fuel oil storage tanks, associated pipelines and dyked drainage system was carried out at Holyrood by SGE Acres Limited. The study concluded that large areas of the Tank #1 roof plate were below the minimum required thickness of 0.09 inches; based on samples that were taken for testing. There is a risk of a worker falling through the roof plate into a large batch of bunker C oil which can result in death.	Construction of a walkway on the heavy fuel oil Tank #1 roof to allow safe access for operation of the east and west fuel oil suction heater valves.

Capital Expenditures and Carryover Report
For the Year Ended December 31, 2016

A Report to the Board of Commissioners of Public Utilities

newfoundland labrador hydro
a nalcor energy company

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1.0 Capital Budget Overview

During 2016, Hydro invested $205 million to execute capital projects to contribute to the provision of safe, reliable and least-cost electricity to the people of the province. This included $59 million expended for the construction of a new transmission line between Bay d'Espoir and Western Avalon Terminal Stations. This project was released from environmental assessment in June of 2016. Significant engineering, procurement and construction activities were completed in 2016 and will continue in 2017. A significant portion of the overall capital investment included sustaining capital to replace boiler tubes for Units 1 and 2 and to overhaul the turbine and generator for Unit 3 at Holyrood Thermal Generating Station. There were also significant investments in power transformers and circuit breakers.

Table 1

Total Capital Project Variance
2016 Overview
($000)

Asset Type	Board Approved Budget	Total Project Expenditures and Forecast	Variance
HYDRAULIC	28,981	28,312	(669)
THERMAL	17,094	19,500	2,406
GAS TURBINES	6,125	6,656	531
TERMINAL STATIONS	122,691	125,064	2,373
TRANSMISSION	326,871	327,155	284
DISTRIBUTION	19,464	19,210	(255)
RURAL GENERATION	34,197	34,589	392
PROPERTIES	4,553	4,193	(360)
METERING	2,119	2,588	468
RURAL SYSTEMS TOOLS AND EQUIPMENT	2,159	1,762	(396)
INFORMATION SYSTEMS	4,433	4,363	(69)
TELECONTROL	5,583	5,683	100
TRANSPORTATION	5,135	5,069	(66)
ADMINISTRATIVE	1,633	1,382	(251)
ALLOWANCE FOR UNFORESEEN	3,000	13,667	10,667
SUPPLEMENTAL PROJECTS	361,387	42,500	(318,888)
PROJECTS APPROVED FOR LESS THAN $50,000	362	333	(29)
TOTAL CAPITAL BUDGET	**945,787**	**642,024**	**(303,764)**

2.0 Capital Expenditures by Year

The following tables provide a summary of Hydro's Capital Expenditures by Year for the period 2012-2017.

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Table 2

2016 Capital Expenditures By Year
($000)

Summary	Capital Budget[1]									Actual Expenditure and Forecast									
	A				B	C	D (B+C)	E	F (A+C+E)	G				H	I	J	K (G+H+I+J)	K-F	H-D
	2012	2013	2014	2015	Carryover 2016	Original 2016	Revised 2016	2017 and Beyond	Total	2012	2013	2014	2015	2016	2017 and Beyond	Carryovers to 2017	Total	Project Variance	Annual Variance
2016 Projects						106,199.7	106,199.7	120,950.2	227,149.9					105,800.6	120,950.2	9,556.0	236,306.8	9,156.9	(399.1)
2015 Projects				28,736.9	4,792.1	29,024.3	33,816.4	245.1	58,006.3				23,772.8	34,334.5	245.1	1,118.2	59,470.6	1,464.3	518.1
2014 Projects			38,677.3	169,315.5	3,324.3	205,566.0	208,890.3	212,872.3	626,431.1			11,578.8	3,796.2	62,032.2	205,115.0	27,270.5	309,792.7	(316,638.4)	(146,858.1)
2013 Projects		6,457.0	25,221.1	538.4	183.1	1,511.7	1,694.8	471.9	34,200.1	37.4	1,580.7	22,163.8	10,115.2	1,773.7	471.9	311.0	36,453.7	2,253.6	78.9
Grand Total	-	6,457.0	63,898.4	198,590.8	8,299.5	342,301.7	350,601.2	334,539.5	945,787.4	37.4	1,580.7	33,742.6	37,684.2	203,941.0	326,782.2	38,255.7	642,023.8	(303,763.6)	(146,660.2)

2016 Capital Budget Approved by Board Order No. P.U. 33(2015)	183,082.8
New Project Approved by (O.C. 2014-033)[2]	128,962.6
New Project Approved by Board Order No. P.U. 27(2015)	428.3
New Project Approved by Board Order No. P.U. 8(2016)	1,000.0
New Project Approved by Board Order No. P.U. 17 & P.U. 23 (2016)	4,700.0
New Project Approved by Board Order No. 19 (2016)	11,800.0
New Project Approved by Board Order No. 20 (2016)	717.0
New Project Approved by Board Order No. 22 (2016)	3,047.1
New Project Approved by Board Order No. 28 (2016)	1,977.3
New Project Approved by Board Order No. 37 (2016)	490.0
New Project Approved by Board Order No. 40 (2016)	4,738.3
New Project Approved by Board Order No. 48 (2016)	1,000.0
2016 New Projects under $50,000 Approved by Hydro	358.3
Total Approved Capital Budget Before Carryovers	342,301.7
Carryovers from 2015 to 2016	8,299.5
TOTAL APPROVED CAPITAL BUDGET	350,601.2

[1] Annual budgets previous to 2016 pertain to projects that have expenditures in 2016.

[2] The construction of the Labrador West Transmission was approved by OC2014-033, February 2, 2014. The capital expenditures associated with this project are included in Work In Progress and as a result are currently excluded from average rate base. The costs to be included in rate base will be subject to review by the Board of Commissioners of Public Utilities.

3.0 Capital Expenditures by Category

The following tables provide Hydro's Capital Expenditures by category including: Hydraulic Generation, Thermal Generation, Gas Turbine Generation, Terminal Stations, Transmission, Distribution, Rural Generation, Properties, Metering, Tools and Equipment, Information Systems, and Telecontrol Projects.

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Table 3

2016 Capital Expenditures By Category
($000)

Hydraulic Generation Projects	Capital Budget							Actual Expenditure and Forecast								
	A		B	C	D (B+C)	E	F (A+C+E)	G		H	I	J	K (G+H+I+J)	K–F	H–D	
	2014	2015	Carryover 2015	Original 2016	Revised 2016	2017 and Beyond	Total	2014	2015	2016	2017 and Beyond	Carryovers to 2017	Total	Project Variance	Annual Variance	Notes
2016 Projects																
Install Hydrometeorological Equipment – Various Sites	-	-	-	314.1	314.1	-	314.1	-	-	4.3	-	309.8	314.1	-	(309.8)	1
Perform Condition Assessment of Control Structures – Hinds Lake	-	-	-	323.4	323.4	-	323.4	-	-	351.1	-	-	351.1	27.7	27.7	
Replace Generator Cooling Water Piping – Hinds Lake	-	-	-	181.7	181.7	-	181.7	-	-	278.4	-	-	278.4	96.7	96.7	
Replace Control Room/Communications Room Air Conditioning – Hinds Lake	-	-	-	41.3	41.3	53.0	94.3	-	-	31.0	53.0	10.3	94.3	-	(10.3)	
Refurbish Station Water System – Upper Salmon	-	-	-	96.6	96.6	197.6	294.2	-	-	38.3	197.6	58.3	294.2	-	(58.3)	
Upgrade Work – Cat Arm	-	-	-	558.3	558.3	1,353.0	1,911.3	-	-	240.4	1,353.0	317.9	1,911.3	-	(317.9)	2
Rehabilitate Shoreline Protection – Cat Arm	-	-	-	112.2	112.2	1,030.7	1,142.9	-	-	104.7	1,030.7	7.5	1,142.9	-	(7.5)	
Replace Site Facilities – Bay d'Espoir	-	-	-	928.3	928.3	11,053.0	11,981.3	-	-	270.4	11,053.0	657.9	11,981.3	-	(657.9)	3
Replace Interior and Exterior Protective Coating on Surge Tank 2 – Bay d'Espoir	-	-	-	2,959.6	2,959.6	-	2,959.6	-	-	2,735.7	-	-	2,735.7	(223.9)	(223.9)	
Upgrade Public Safety Around Dams and Waterways – Bay d'Espoir	-	-	-	477.6	477.6	-	477.6	-	-	334.7	-	-	334.7	(142.9)	(142.9)	4
Replace PH1 Station Service Transformer – Bay d'Espoir	-	-	-	46.7	46.7	354.5	401.2	-	-	45.0	354.5	1.7	401.2	-	(1.7)	
Replace Monitoring Vibration System Unit 7 – Bay d'Espoir	-	-	-	366.0	366.0	-	366.0	-	-	272.1	-	-	272.1	(93.9)	(93.9)	
Replace Spherical By-Pass Valves Units 1 and 2 – Bay d'Espoir	-	-	-	183.6	183.6	167.9	351.5	-	-	154.8	167.9	28.8	351.5	-	(28.8)	
Assess Vent Chambers Units 1 to 6 – Bay d'Espoir	-	-	-	85.7	85.7	-	85.7	-	-	85.7	-	-	85.7	-	-	
Overhaul Turbine/Generator Units #6 and #7 – Bay d'Espoir	-	-	-	1,345.6	1,345.6	-	1,345.6	-	-	544.5	-	56.2	600.7	(744.9)	(801.1)	5
Purchase Tools and Equipment Less than $ 50,000	-	-	-	96.1	96.1	-	96.1	-	-	90.8	-	-	90.8	(5.3)	(5.3)	
2015 Projects																
Refurbish Unit Relay Protection – Paradise River	-	8.7	(0.3)	79.7	79.4	-	88.4	-	9.0	129.1	-	-	138.1	49.7	49.7	
Replace Station Service Breakers – Cat Arm	-	644.9	(1.2)	363.4	362.2	-	1,008.3	-	646.1	185.9	-	176.3	1,008.3	-	(176.3)	6
Rehabilitate Salmon River Spillway – Bay d'Espoir	-	745.6	222.7	556.8	779.5	-	1,302.4	-	522.9	871.1	-	-	1,394.0	91.6	91.6	
Upgrade Generator Bearings Units 1 and 3 – Bay d'Espoir	-	14.7	6.6	633.3	639.9	-	648.0	-	8.1	277.1	-	-	285.2	(362.8)	(362.8)	7
Replace Pump House and Associated Equipment – Bay d'Espoir	-	22.7	(114.3)	522.5	408.2	-	545.2	-	137.0	128.6	-	279.6	545.2	-	(279.6)	8
Upgrade Equipment Doors – Various Sites	-	348.5	63.1	0.0	63.1	-	348.5	-	285.4	115.4	-	46.7	447.5	99.0	52.3	
Refurbish Intakes – Bay d'Espoir	-	72.6	46.2	262.3	308.5	-	334.9	-	26.4	262.2	-	-	288.6	(46.3)	(46.3)	
Install Infrared View Ports – Various Sites	-	83.7	29.0	113.1	142.1	-	196.8	-	54.7	151.3	-	-	206.0	9.2	9.2	
2014 Projects																
Upgrade Burnt Dam Spillway – Bay d'Espoir	110.2	1,201.9	545.8	-	545.8	-	1,312.1	126.1	640.2	740.2	-	-	1,506.5	194.4	194.4	9
Upgrade Victoria Control Structure – Bay d'Espoir	495.1	-	180.5	-	180.5	-	495.1	79.6	235.0	446.9	-	-	761.5	266.4	266.4	10
Replace Spherical By Pass Valve Assemblies Units 1 and 2 – Bay d'Espoir	57.5	96.3	53.5	-	53.5	-	153.8	12.8	169.5	77.2	-	-	259.5	105.7	23.7	11
Install Handheld Pendant to Overhead Crane – Bay d'Espoir	49.9	170.8	156.4	-	156.4	-	220.7	45.0	19.3	166.8	-	-	231.1	10.4	10.4	
Total Hydraulic Generation Projects	712.7	3,410.4	1,188.0	10,647.9	11,835.9	14,209.7	28,980.7	263.5	2,753.6	9,133.7	14,209.7	1,951.0	28,311.5	(669.2)	(2,702.2)	

Table 4

2016 Capital Expenditures By Category
($000)

Thermal Generation Projects	Capital Budget						Actual Expenditure and Forecast							
	A	B	C	D (B+C)	E	F (A+C+E)	G	H	I	J	K (G+H+I+J)	K-F	H-D	
	2015	Carryover 2015	Original 2016	Revised 2016	2017 and Beyond	Total	2015	2016	2017 and Beyond	Carryovers to 2017	Total	Project Variance	Annual Variance	Notes
2016 Projects														
Upgrade Powerhouse Building Envelope - Holyrood	-	-	2,723.8	2,723.8	3,754.0	6,477.8	-	2,239.9	3,754.0	483.9	6,477.8	-	(483.9)	12
Overhaul Steam Turbine Generator Unit 3 - Holyrood	-	-	5,868.6	5,868.6	-	5,868.6	-	8,147.9	-	-	8,147.9	2,279.3	2,279.3	13
Rewind Rotor and Install Flux Probe Unit 3 - Holyrood	-	-	2,755.5	2,755.5	-	2,755.5	-	2,879.8	-	-	2,879.8	124.3	124.3	
Study of Space Heating and Boiler Startup Assistance - Holyrood	-	-	148.7	148.7	-	148.7	-	154.0	-	-	154.0	5.3	5.3	
Overhaul Pumps - Holyrood	-	-	536.2	536.2	-	536.2	-	532.4	-	-	532.4	(3.8)	(3.8)	
Purchase Tools and Equipment Less than $ 50,000	-	-	15.8	15.8	-	15.8	-	13.7	-	-	13.7	(2.1)	(2.1)	
2015 Projects														
Upgrade Powerhouse Roofing - Holyrood	1,047.8	244.9	-	244.9	-	1,047.8	802.9	218.8	-	-	1,021.7	(26.1)	(26.1)	
Upgrade Fire Protection (Main Warehouse) - Holyrood	46.2	(30.2)	197.6	167.4	-	243.8	76.4	196.1	-	-	272.5	28.7	28.7	
Total Thermal Generation Projects	1,094.0	214.7	12,246.2	12,460.9	3,754.0	17,094.2	879.3	14,382.6	3,754.0	483.9	19,499.8	2,405.6	1,921.7	

Table 5

2016 Capital Expenditures By Category
($000)

Gas Turbine Generation Projects	Capital Budget						Actual Expenditure and Forecast							
	A	B	C	D (B+C)	E	F (A+C+E)	G	H	I	J	K (G+H+I+J)	K-F	H-D	
	2015	Carryover 2015	Original 2016	Revised 2016	2017 and Beyond	Total	2015	2016	2017 and Beyond	Carryover to 2017	Total	Project Variance	Annual Variance	Notes
2016 Projects														
Replace Fuel Piping - Hardwoods and Stephenville	-	-	44.8	44.8	267.0	311.8	-	11.6	267.0	33.2	311.8	-	(33.2)	
Install Transfer Switches for Diesel Automation - Happy Valley	-	-	148.4	148.4	-	148.4	-	147.7	-	-	147.7	(0.7)	(0.7)	
2015 Projects														
Upgrade Gas Turbine Plant Life Extension - Stephenville	2,655.2	41.6	2,525.4	2,567.0	-	5,180.6	2,613.6	3,107.4	-	-	5,721.0	540.4	540.4	14
Replace Alternator Shaft - Happy Valley	484.4	320.0	-	320.0	-	484.4	131.1	344.1	-	-	475.2	(9.2)	24.1	
Total Gas Turbine Generation Projects	3,139.6	361.6	2,718.6	3,080.2	267.0	6,125.2	2,744.7	3,610.8	267.0	33.2	6,655.7	530.5	530.6	

Table 6

2016 Capital Expenditures By Category
($000)

Terminal Stations Projects	Capital Budget								Actual Expenditure and Forecast										
	A			B	C	D (B+C)	E	F (A+C+E)	G				H	I	J	K (G+H+I+J)	K-F	H-D	
	2013	2014	2015	Carryover 2015	Original 2016	Revised 2016	2017 and Beyond	Total	2012	2013	2014	2015	2016	2017 and Beyond	Carryovers to 2017	Total	Project Variance	Annual Variance	Notes
2016 Projects																			
Upgrade Circuit Breakers - Various Sites (2016-2020)	-	-	-	-	6,969.1	6,969.1	54,491.3	61,460.4	-	-	-	-	5,599.5	54,491.3	1,369.6	61,460.4	-	(1,369.6)	15
Replace Surge Arrestors - Various Sites	-	-	-	-	144.4	144.4	53.0	197.4	-	-	-	-	175.1	53.0	(30.7)	197.4	-	30.7	
Replace Protective Relays - Various Sites	-	-	-	-	700.6	700.6	1,156.4	1,857.0	-	-	-	-	1,425.8	1,156.4	(725.2)	1,857.0	-	725.2	16
Replace Disconnect Switches - Various Sites (2016-2017)	-	-	-	-	646.9	646.9	1,320.9	1,967.8	-	-	-	-	131.7	1,320.9	515.2	1,967.8	-	(515.2)	17
Upgrade Digital Fault Recorders - Various Sites	-	-	-	-	197.9	197.9	304.6	502.5	-	-	-	-	221.2	304.6	(23.3)	502.5	-	23.3	
Upgrade Roof - Indian River	-	-	-	-	48.3	48.3	-	48.3	-	-	-	-	46.0	-	-	46.0	(2.3)	(2.3)	
Upgrade Aluminum Support Structure - Holyrood	-	-	-	-	401.1	401.1	-	401.1	-	-	-	-	186.1	-	-	186.1	(215.0)	(215.0)	18
Upgrade Terminal Station Equipment Foundations - Various Sites	-	-	-	-	319.9	319.9	-	319.9	-	-	-	-	300.2	-	-	300.2	(19.7)	(19.7)	
Upgrade Data Alarm Systems - Various Sites	-	-	-	-	74.4	74.4	234.1	308.5	-	-	-	-	49.7	234.1	24.7	308.5	-	(24.7)	
Install Breaker Failure Protection - Various Sites	-	-	-	-	65.7	65.7	211.3	277.0	-	-	-	-	81.8	211.3	(16.1)	277.0	-	16.1	
Install Fire Protection in 230 kV Stations - Bay d'Espoir	-	-	-	-	200.0	200.0	566.0	766.0	-	-	-	-	91.4	566.0	108.6	766.0	-	(108.6)	19
Install Spare Transformer - Happy Valley	-	-	-	-	2,040.9	2,040.9	-	2,040.9	-	-	-	-	2,026.8	-	-	2,026.8	(14.1)	(14.1)	
Upgrade Terminal Station for Mobile Substation - Cow Head	-	-	-	-	40.0	40.0	444.7	484.7	-	-	-	-	27.5	444.7	12.5	484.7	-	(12.5)	
Replace Air Receivers and Compressors - St. Anthony	-	-	-	-	120.7	120.7	-	120.7	-	-	-	-	215.4	-	-	215.4	94.7	94.7	
2015 Projects																			
Upgrade Circuit Breakers - Various Sites (2015-2016)	-	-	6,189.1	(1,381.3)	6,873.8	5,492.5	-	13,062.9	-	-	-	7,570.4	6,022.4	-	-	13,592.8	529.9	529.9	
Install Transformer On line Gas Monitoring - Various Sites	-	-	700.5	(86.0)	975.7	889.7	-	1,676.2	-	-	-	786.5	1,065.6	-	-	1,852.1	175.9	175.9	20
Upgrade Power Transformers - Various Sites	-	-	4,440.4	2,083.1	7,002.3	9,085.4	-	11,442.7	-	-	-	2,357.3	9,472.8	-	-	11,830.1	387.4	387.4	
Replace Disconnect Switches - Various Sites (2015-2016)	-	-	963.7	400.6	642.9	1,043.5	-	1,606.6	-	-	-	563.1	946.3	-	-	1,509.4	(97.2)	(97.2)	
Design and Install Fire Protection in 230 kV Station - Various Sites	-	-	67.6	(7.3)	424.3	417.0	-	491.9	-	-	-	74.9	458.7	-	-	533.6	41.7	41.7	
Upgrade Terminal Station Protection and Control - Various Sites	-	-	172.7	10.2	307.2	317.4	-	479.9	-	-	-	162.5	734.9	-	-	897.4	417.5	417.5	21
Install Support Structures C2 Capacitor Bank - Hardwoods	-	-	199.3	26.4	-	26.4	-	199.3	-	-	-	58.0	21.7	-	-	79.7	(119.6)	(4.7)	22
Replace Station Lighting - Bay d'Espoir	-	-	16.7	(3.3)	160.3	157.0	-	177.0	-	-	-	20.0	178.4	-	-	198.4	21.4	21.4	
2013 Projects																			
Replace Instrument Transformers - Various Sites	593.2	552.8	538.4	(10.4)	1,511.7	1,501.3	471.9	3,668.0	9.6	230.7	699.0	755.5	1,190.3	471.9	311.0	3,668.0	-	(311.0)	23
Increase 230 kV Transformer Capacity - Oxen Pond	3,823.6	15,310.4	-	(200.2)	-	(200.2)	-	19,134.0	-	153.6	14,611.3	5,443.3	98.3	-	-	20,306.5	1,172.5	298.5	24
Total Terminal Stations Projects	4,416.8	15,863.2	13,288.4	831.8	29,868.1	30,699.9	59,254.2	122,690.7	9.6	384.3	15,310.3	17,791.5	30,767.6	59,254.2	1,546.3	125,063.8	2,373.1	67.7	

Table 7

2016 Capital Expenditures by Category
($000)

Transmission Projects	Capital Budget							Actual Expenditure and Forecast						K-F	H-D	
	A		B	C	D	E	F (A+C+E)	G		H	I	J	K(G+H+I+J)			
	2014	2015	Carryover 2015	Original 2016	Revised 2016	2017 and Beyond	Total	2014	2015	2016	2017 and Beyond	Carryovers to 2017	Total	Project Variance	Annual Variance	Notes
2016 Projects																
Construct 230 kV Transmission Line - Soldiers Pond to Hardwoods	-	-	-	3,699.0	3,699.0	22,861.9	26,560.9	-	-	3,501.6	22,861.9	197.4	26,560.9	-	(197.4)	
Replace Insulators - TL203	-	-	-	1,985.6	1,985.6	-	1,985.6	-	-	2,008.2	-	-	2,008.2	22.6	22.6	
Replace Aircraft Markers at Grand Lake Crossing - TL228	-	-	-	589.6	589.6	978.3	1,567.9	-	-	61.8	978.3	527.8	1,567.9	-	(527.8)	25
Perform Wood Pole Line Management Program - Various Sites	-	-	-	2,919.0	2,919.0	-	2,919.0	-	-	3,180.1	-	-	3,180.1	261.1	261.1	
2014 Projects																
Refurbish Anchors and Footings TL202 and TL206 - Bay d'Espoir to Sunnyside	211.5	28.4	0.2	1,038.4	1,038.6	901.6	2,179.9	211.5	28.2	19.9	901.6	1,018.7	2,179.9	-	(1,018.7)	26
230 kV Transmission Line - Bay d'Espoir to Western Avalon	-	4,403.0	2,384.8	75,284.3	77,669.1	211,970.7	291,658.0	-	2,018.2	59,317.8	204,213.4	26,108.6	291,658.0	-	(18,351.3)	27
Total Transmission Projects	211.5	4,431.4	2,385.0	85,515.9	87,900.9	236,712.5	326,871.3	211.5	2,046.4	68,089.4	228,955.2	27,852.5	327,155.0	283.7	(19,811.5)	

Table 8

2016 Capital Expenditures By Category
($000)

Distribution Projects	Capital Budget						Actual Expenditure and Forecast							
	A	B	C	D (B+C)		F (A+C+E)	G	H	I	J	K (G+H+I+J)	K-F	H-D	
	2015	Carryover 2015	Original 2016	Revised 2016	2017 and Beyond	Total	2015	2016	2017 and Beyond	Carryovers to 2017	Total	Project Variance	Annual Variance	Notes
2016 Projects														
Provide Service Extensions - All Service Areas	-	-	5,350.0	5,350.0	-	5,350.0	-	6,021.5	-	-	6,021.5	671.5	671.5	28
Provide Service Extensions - All Service Areas - CIAC	-	-	(200.0)	(200.0)	-	(200.0)	-	(833.1)	-	-	(833.1)	(633.1)	(633.1)	29
Upgrade Distribution Systems - All Service Areas	-	-	3,990.0	3,990.0	-	3,990.0	-	3,357.4	-	-	3,357.4	(632.6)	(632.6)	30
Upgrade Distribution Systems - All Service Areas - CIAC	-	-	(100.0)	(100.0)	-	(100.0)	-	(153.7)	-	-	(153.7)	(53.7)	(53.7)	
Upgrade Distribution Systems - Various Sites (2016/2017)	-	-	285.6	285.6	6,350.3	6,635.9	-	361.8	6,350.3	(76.2)	6,635.9	-	76.2	
Construct Overhead Distribution Line - Pilley's Island to Long Island	-	-	1,239.9	1,239.9	-	1,239.9	-	1,509.0	-	-	1,509.0	269.1	269.1	31
Additions for Load Growth - Happy Valley	-	-	593.7	593.7	-	593.7	-	582.6	-	-	582.6	(11.1)	(11.1)	
2015 Projects														
Upgrade Distribution Systems - Various Sites (2015-2016)	1,136.1	(243.0)	818.8	575.8	-	1,954.9	1,379.1	710.8	-	-	2,089.9	135.0	135.0	32
Total Distribution Projects	1,136.1	(243.0)	11,978.0	11,735.0	6,350.3	19,464.4	1,379.1	11,556.3	6,350.3	(76.2)	19,209.5	(254.9)	(178.7)	

Table 9

2016 Capital Expenditures By Category
($000)

Rural Generation Projects	Capital Budget								Actual Expenditure and Forecast										
	A			B	C	D	E	(A+C+E)	G				H	I	J	(G+H+I+J)	K-F	H-D	
	2013	2014	2015	Carryover 2015	Original 2016	Revised 2016	2017 and Beyond	Total	2012	2013	2014	2015	2016	2017 and Beyond	Carryovers to 2017	Total	Project Variance	Annual Variance	Notes
2016 Projects																			
Overhaul Diesel Units - Various Sites	-	-	-	-	2,078.4	2,078.4	-	2,078.4	-	-	-	-	2,526.4	-	-	2,526.4	448.0	448.0	33
Upgrade Human Machine Interface - Various Sites	-	-	-	-	114.0	114.0	320.0	434.0	-	-	-	-	125.3	320.0	(11.3)	434.0	-	11.3	
Install Variable Frequency Drives - Grey River	-	-	-	-	46.9	46.9	123.0	169.9	-	-	-	-	49.7	123.0	(2.8)	169.9	-	2.8	
Inspect Fuel Storage Tanks - Various Sites	-	-	-	-	1,326.9	1,326.9	-	1,326.9	-	-	-	-	1,024.5	-	-	1,024.5	(302.4)	(302.4)	34
Replace Diesel Unit - Charlottetown	-	-	-	-	1,384.9	1,384.9	46.1	1,431.0	-	-	-	-	1,442.2	46.1	-	1,488.3	57.3	57.3	
Install Fire Protection Systems - Cartwright and Nain	-	-	-	-	3,030.7	3,030.7	1,376.4	4,407.1	-	-	-	-	782.8	1,376.4	1,557.1	3,716.3	(690.8)	(2,247.9)	35
Upgrade Transformer Systems - Postville and Cartwright	-	-	-	-	465.2	465.2	-	465.2	-	-	-	-	296.0	-	169.2	465.2	-	(169.2)	36
Additions for Load Growth - Various Sites	-	-	-	-	883.4	883.4	4,746.0	5,629.4	-	-	-	-	190.4	4,746.0	693.0	5,629.4	-	(693.0)	37
2015 Projects																			
Overhaul Diesel Units - Various Sites	-	-	1,199.2	240.8	-	240.8	-	1,199.2	-	-	-	958.4	249.6	-	-	1,208.0	8.8	8.8	
Install Disconnect Switches for Mobile Generators - Various Sites	-	-	10.0	2.2	189.3	191.5	-	199.3	-	-	-	7.8	287.5	-	-	295.3	96.0	96.0	
Upgrade Ventilation Systems - Various Sites	-	-	175.9	(69.7)	317.3	247.6	-	493.2	-	-	-	245.6	290.3	-	-	535.9	42.7	42.7	
Replace Unit 2038 - Mary's Harbour	-	-	103.5	1.8	1,241.5	1,243.3	-	1,345.0	-	-	-	101.7	1,059.3	-	-	1,161.0	(184.0)	(184.0)	38
Replace Unit 254 - Paradise River	-	-	66.8	(13.7)	429.3	415.6	-	496.1	-	-	-	80.5	434.0	-	-	514.5	18.4	18.4	
Replace Programmable Logic Controllers - Various Sites	-	-	366.9	(30.3)	346.0	315.7	245.1	958.0	-	-	-	397.2	345.5	245.1	(29.8)	958.0	-	29.8	
Install Fire Protection - L'Anse au Loup	-	-	220.6	124.2	1,126.2	1,250.4	-	1,346.8	-	-	-	96.4	1,067.3	-	-	1,163.7	(183.1)	(183.1)	39
2014 Projects																			
Upgrade Diesel Plant Production Data Collection Equipment-Various	-	268.9	269.8	3.1	280.7	283.8	-	819.4	-	-	107.8	57.8	510.6	-	143.2	819.4	-	226.8	40
2013 Projects																			
Additions for Load Isolator Generation Stations - Various Sites	2,040.2	9,357.9	-	393.7	-	393.7	-	11,398.1	27.8	1,196.4	6,853.5	3,916.4	485.1	-	-	12,479.2	1,081.1	91.4	
Total Rural Generation Projects	2,040.2	9,626.8	2,412.7	652.1	13,260.7	13,912.8	6,856.6	34,197.0	27.8	1,196.4	6,961.3	5,861.8	11,166.5	6,856.6	2,518.6	34,589.0	392.0	(2,746.3)	

Table 10

2016 Capital Expenditures By Category ($000)

Properties Projects	Capital Budget						Actual Expenditure and Forecast							
	A	B	C	D	E	F (A+C+E)	G	H	I	J	K (G+H+I+J)	K-F	H-D	
	2015	Carryover 2015	Original 2016	Revised 2016	2017 and Beyond	Total	2015	2016	2017 and Beyond	Carryovers to 2017	Total	Project Variance	Annual Variance	Notes
2016 Projects														
Upgrade Warehouse Lighting - Bishop's Falls	-	-	15.2	15.2	180.4	195.6	-	28.1	180.4	(12.9)	195.6	-	12.9	
Upgrade Line Depots - Various Sites	-	-	861.4	861.4	-	861.4	-	955.5	-	-	955.5	94.1	94.1	
Upgrade Office Facilities and Control Buildings - Various Sites	-	-	1,134.0	1,134.0	-	1,134.0	-	675.0	-	-	675.0	(459.0)	(459.0)	41
Replace Roof on Service Building - Bishop's Falls	-	-	612.8	612.8	-	612.8	-	327.8	-	285.0	612.8	-	(285.0)	42
Install Fall Protection Equipment - Various Sites	-	-	198.8	198.8	-	198.8	-	203.6	-	-	203.6	4.8	4.8	
2015 Projects														
Replace Accommodations and Septic System - Ebbegunbaeg	489.4	395.2	1,061.4	1,456.6	-	1,550.8	94.2	811.2	-	645.4	1,550.8	-	(645.4)	43
Total Properties Projects	489.4	395.2	3,883.6	4,278.8	180.4	4,553.4	94.2	3,001.2	180.4	917.5	4,193.3	(360.1)	(1,277.6)	

Table 11

2016 Capital Expenditures By Category
($000)

Metering Projects	Capital Budget						Actual Expenditure and Forecast							
	A	B	C	D	E	F (A+C+E)	G	H	I	J	K (G+H+I+J)	K-F	H-D	
	2015	Carryover 2015	Original 2016	Revised 2016	2017 and Beyond	Total	2015	2016	2017 and Beyond	Carryovers to 2017	Total	Project Variance	Annual Variance	Notes
2016 Projects														
Install Automated Meter Reading - Labrador West	-	-	433.8	433.8	533.4	967.2	-	130.4	533.4	303.4	967.2	-	(303.4)	44
Purchase Meters, Equipment and Metering Tanks - Various Sites	-	-	190.4	190.4	-	190.4	-	155.6	-	-	155.6	(34.8)	(34.8)	
2015 Projects														
Install Automatic Meter Reading - Various Sites (2015-2016)	559.9	469.3	401.8	871.1	-	961.7	90.6	1,374.1	-	-	1,464.7	503.0	503.0	45
Total Metering Projects	559.9	469.3	1,026.0	1,495.3	533.4	2,119.3	90.6	1,660.1	533.4	303.4	2,587.5	468.2	164.8	

Table 12

2016 Capital Expenditures By Category
($000)

Tools and Equipment	Capital Budget						Actual Expenditure and Forecast							
	A	B	C	D	E	F (A+C+E)	G	H	I	J	K (G+H+I+J)	K-F	H-D	
	2015	Carryover 2015	Original 2016	Revised 2016	2017 and Beyond	Total	2015	2016	2017 and Beyond	Carryovers to 2017	Total	Project Variance	Annual Variance	Notes
2016 Projects														
Replace Light Duty Mobile Equipment - Various Sites	-	-	348.0	348.0	-	348.0	-	351.4	-	-	351.4	3.4	3.4	
Purchase Excavator - Bay d'Espoir	-	-	312.0	312.0	-	312.0	-	187.0	-	35.0	222.0	(90.0)	(125.0)	46
Tools and Equipment Less than $ 50,000	-	-	477.0	477.0	-	477.0	-	418.5	-	-	418.5	(58.5)	(58.5)	
2015 Projects														
Replace Off Road Track Vehicles - Unit 7861, Stephenville (2015 - 2016)	1.1	(175.7)	397.8	222.1	-	398.9	176.8	-	-	-	176.8	(222.1)	(222.1)	47
Tools and Equipment Less than $ 50,000	622.7	35.8	-	35.8	-	622.7	563.1	30.4	-	-	593.5	(29.2)	(5.4)	
Total Tools and Equipment	623.8	(139.9)	1,534.8	1,394.9	-	2,158.6	739.9	987.3	-	35.0	1,762.2	(396.4)	(407.6)	

Table 13

2016 Capital Expenditures By Category
($000)

Information Systems Projects	Capital Budget						Actual Expenditure and Forecast					Variance		
	A	B	C	D	E	F (A+C+E)	G	H	I	J	K (G+H+I+J)	K-F	H-D	
		Carryover	Original	Revised	2017 and				2017 and	Carryovers		Project	Annual	
	2015	2015	2016	2016	Beyond	Total	2015	2016	Beyond	to 2017	Total	Variance	Variance	Notes
2016 Projects														
Perform Minor Application Enhancements - Hydro Place	-	-	346.7	346.7	-	346.7	-	360.5	-	-	360.5	13.8	13.8	
Cost Recoveries	-	-	(148.8)	(148.8)	-	(148.8)	-	(154.6)	-	-	(154.6)	(5.8)	(5.8)	
Implement Industrial Billing Software - Hydro Place	-	-	443.1	443.1	-	443.1	-	169.5	-	273.6	443.1	-	(273.6)	48
Upgrade Microsoft Project - Hydro Place	-	-	683.7	683.7	1,910.7	2,594.4	-	656.9	1,910.7	26.8	2,594.4	-	(26.8)	
Cost Recoveries	-	-	(317.1)	(317.1)	(886.2)	(1,203.3)	-	(304.8)	(886.2)	(12.3)	(1,203.3)	-	12.3	
Upgrade Sharepoint/Document Repository - Hydro Place	-	-	267.6	267.6	-	267.6	-	260.3	-	-	260.3	(7.3)	(7.3)	
Cost Recoveries	-	-	(124.1)	(124.1)	-	(124.1)	-	(120.8)	-	-	(120.8)	3.3	3.3	
Upgrade Energy Management System - Hydro Place	-	-	246.2	246.2	-	246.2	-	256.5	-	-	256.5	10.3	10.3	
Refresh Security Software - Hydro Place	-	-	230.4	230.4	-	230.4	-	230.5	-	-	230.5	0.1	0.1	
Cost Recoveries	-	-	(106.9)	(106.9)	-	(106.9)	-	(107.0)	-	-	(107.0)	(0.1)	(0.1)	
Replace Peripheral Infrastructure - Various Sites	-	-	611.3	611.3	-	611.3	-	507.3	-	-	507.3	(104.0)	(104.0)	49
Cost Recoveries	-	-	(186.8)	(186.8)	-	(186.8)	-	(154.7)	-	-	(154.7)	32.1	32.1	
Upgrade Enterprise Storage Capacity - Hydro Place	-	-	628.8	628.8	-	628.8	-	464.5	-	164.3	628.8	-	(164.3)	50
Cost Recoveries	-	-	(291.6)	(291.6)	-	(291.6)	-	(215.5)	-	(76.1)	(291.6)	-	76.1	
Replace Personal Computers - Various Sites	-	-	861.7	861.7	-	861.7	-	850.0	-	-	850.0	(11.7)	(11.7)	
Upgrade Server Technology Program - Hydro Place	-	-	492.5	492.5	-	492.5	-	451.1	-	41.4	492.5	-	(41.4)	
Cost Recoveries	-	-	(228.5)	(228.5)	-	(228.5)	-	(209.3)	-	(19.2)	(228.5)	-	19.2	
Total Information Systems Projects	-	-	3,408.2	3,408.2	1,024.5	4,432.7	-	2,940.4	1,024.5	398.5	4,363.4	(69.3)	(467.8)	

Table 14

2016 Capital Expenditures By Category
($000)

Telecontrol Projects	Capital Budget						Actual Expenditure and Forecast							
	A	B	C	D	E	F (A+C+E)	G	H	I	J	K (G+H+I+J)	K-F	H-D	
	2015	Carryover 2015	Original 2016	Revised 2016	2017 and Beyond	Total	2015	2016	2017 and Beyond	Carryovers to 2017	Total	Project Variance	Annual Variance	Notes
2016 Projects														
Purchase Tools and Equipment less than $50,000	-	-	45.6	45.6	-	45.6	-	51.9	-	-	51.9	6.3	6.3	
Replace Battery Banks and Chargers - Various Sites	-	-	425.0	425.0	456.6	881.6	-	365.7	456.6	59.3	881.6	-	(59.3)	
Replace MDR 4000 Microwave Radio East - Various Sites	-	-	77.4	77.4	1,093.1	1,170.5	-	113.4	1,093.1	(36.0)	1,170.5	-	36.0	
Replace UPS Systems - Hydro Place	-	-	889.8	889.8	-	889.8	-	928.6	-	(38.8)	889.8	-	38.8	
Replace Network Communication Equipment - Various Sites	-	-	186.4	186.4	-	186.4	-	183.0	-	-	183.0	(3.4)	(3.4)	
Upgrade Site Facilities - Various Sites	-	-	49.5	49.5	-	49.5	-	56.1	-	-	56.1	6.6	6.6	
Replace Radomes - Various Sites	-	-	235.2	235.2	-	235.2	-	230.1	-	-	230.1	(5.1)	(5.1)	
Replace Air Conditioners - Various Sites	-	-	39.9	39.9	152.0	191.9	-	51.2	152.0	(11.3)	191.9	-	11.3	
Replace Video Conferencing Bridge - Hydro Place	-	-	182.6	182.6	-	182.6	-	213.8	-	-	213.8	31.2	31.2	
Upgrade Access Roads to Microwave Sites - Various Sites	-	-	141.1	141.1	-	141.1	-	161.3	-	-	161.3	20.2	20.2	
Upgrade Remote Terminal Units - Various Sites	-	-	89.6	89.6	-	89.6	-	106.2	-	-	106.2	16.6	16.6	
Replace Wescom Transceivers - Various Sites	-	-	49.3	49.3	-	49.3	-	55.2	-	-	55.2	5.9	5.9	
Replace Powerline Carrier - Various Sites	-	-	73.4	73.4	763.4	836.8	-	77.4	763.4	(4.0)	836.8	-	4.0	
Upgrade Telecontrol Facilities - Sandy Brook Hill	-	-	101.6	101.6	462.4	564.0	-	81.7	462.4	19.9	564.0	-	(19.9)	
2015 Projects														
Replace GDC Metroplex - Various Sites	69.2	30.5	-	30.5	-	69.2	38.7	51.7	-	-	90.4	21.2	21.2	
Total Telecontrol Projects	69.2	30.5	2,586.4	2,616.9	2,927.5	5,583.1	38.7	2,727.3	2,927.5	(10.9)	5,682.6	99.5	110.4	

Table 15

2016 Capital Expenditures By Category
($000)

Transportation	Capital Budget						Actual Expenditure and Forecast								
	A	B	C	D	E	F (A+C+E)	G	H	I	J	K (G+H+I+J)	K-F	H-D	
	2015	Carryover 2015	Original 2016	Revised 2016	2017 and Beyond	Total	2015	2016	2017 and Beyond	Carryovers to 2017	Total	Project Variance	Annual Variance	Notes
2016 Projects														
Replace Vehicles and Aerial Devices - Various Sites (2016-2017)	-	-	1,443.3	1,443.3	534.2	1,977.5	-	1,032.7	534.2	410.6	1,977.5	-	(410.6)	51
Purchase Vehicles and Aerial Devices - Various Sites	-	-	382.5	382.5	172.7	555.2	-	470.4	172.7	(87.9)	555.2	-	87.9	
2015 Projects														
Replace Vehicles and Aerial Devices Hydro System (2015-2016)	2,377.1	642.2	225.3	867.5	-	2,602.4	1,734.9	801.8	-	-	2,536.7	(65.7)	(65.7)	
Total Transportation	2,377.1	642.2	2,051.1	2,693.3	706.9	5,135.1	1,734.9	2,304.9	706.9	322.7	5,069.4	(65.7)	(388.4)	

Administrative	Capital Budget						Actual Expenditure and Forecast							
	2015	Carryover 2015	Original 2016	Revised 2016	2017 and Beyond	Total	2015	2016	2017 and Beyond	Carryovers to 2017	Total	Variance	Annual Variance	Notes
2016 Projects														
Remove Safety Hazards - Various Sites - 2015	-	-	199.3	199.3	-	199.3	-	175.4	-	-	175.4	(23.9)	(23.9)	
Replace Roof - Hydro Place	-	-	639.5	639.5	-	639.5	-	576.2	-	-	576.2	(63.3)	(63.3)	
Replace Air Conditioning Units 8 and 14 - Hydro Place	-	-	34.6	34.6	229.5	264.1	-	31.0	229.5	3.6	264.1	-	(3.6)	
Purchase Tools and Equipment less than $50,000	-	-	172.6	172.6	-	172.6	-	55.1	-	-	55.1	(117.5)	(117.5)	52
2015 Projects														
Replace Cooling Tower and Auxiliaries - Hydro Place	45.7	(6.8)	311.3	304.5	-	357.0	52.5	258.5	-	-	311.0	(46.0)	(46.0)	
Total Administrative	45.7	(6.8)	1,357.3	1,350.5	229.5	1,632.5	52.5	1,096.2	229.5	3.6	1,381.8	(250.7)	(254.3)	

Table 16

2016 Capital Expenditures By Category
($000)

Allowance For Unforeseen	Capital Budget							Actual Expenditure and Forecast								
	A		B	C	D	E	F (A+C+E)	G		H	I	J	K (G+H+I+J)	K-F	H-D	
	2014	2015	Carryover 2015	Original 2016	Revised 2016	2017 and Beyond	Total	2014	2015	2016	2017 and Beyond	Carryover to 2017	Total	Project Variance	Annual Variance	Notes
2016 Projects																
Contingency Fund	-	-	-	1,000.0	1,000.0	-	1,000.0	-	-	-	-	-	0.0	(1,000.0)	(1,000.0)	
Perform Upgrades - Western Avalon Transformer T5 Tap Changer	-	-	-	-	-	-	-	-	-	474.0	-	-	474.0	474.0	474.0	
Boiler Tube Replacement - Holyrood Generating Station Unit 2	-	-	-	-	-	-	-	-	-	1,565.6	-	-	1,565.6	1,565.6	1,565.6	
Boiler Tube Replacement - Holyrood Generating Station Unit 1	-	-	-	-	-	-	-	-	-	928.3	-	-	928.3	928.3	928.3	
Transmission Line TL 259 Rerouting - Sally's Cove	-	-	-	-	-	-	-	-	-	1,387.2	-	-	1,387.2	1,387.2	1,387.2	
Penstock #1 Weld Refurbishment - Bay d'Espoir				-	-	-	-	-	-	6,589.2	-	-	6,589.2	6,589.2	6,589.2	
Access Road Rehabilitations - Bay d'Espoir				-	-	-	-	-	-	2,722.6	-	-	2,722.6	2,722.6	2,722.6	
Contingency Top Up - P.U.8 (2016)	-	-	-	1,000.0	1,000.0	-	1,000.0	-	-	-	-	-	-	(1,000.0)	(1,000.0)	
Contingency Top Up -P.U.48 (2016)	-	-	-	1,000.0	1,000.0	-	1,000.0	-	-	-	-	-	-	(1,000.0)	(1,000.0)	
Total Allowance For Unforeseen	-	-	-	3,000.0	3,000.0	-	3,000.0	-	-	13,666.9	-	-	13,666.9	10,666.9	10,666.9	53

Supplemental Projects	Capital Budget							Actual Expenditure and Forecast								
	2014	2015	Carryover 2015	Original 2016	Revised 2016	2017 and Beyond	Total	2014	2015	2016	2017 and Beyond	Carryover to 2017	Total	Project Variance	Annual Variance	Notes
2016 Projects																
Upgrade Units 1 and 2 Lower Reheaters	-	-	-	11,800.0	11,800.0	-	11,800.0	-	-	11,734.4	-	-	11,734.4	(65.6)	(65.6)	
Purchase of 12 MW Diesel Generation - Holyrood	-	-	-	4,700.0	4,700.0	[. . .]	4,700.0	-	-	3,784.0	[. . .]	916.0	4,700.0	-	(916.0)	62
TL 227 Distribution Line Sally's Cove L1	-	-	-	717.0	717.0	1,533.0	2,250.0	-	-	186.3	1,533.0	530.7	2,250.0	-	(530.7)	54
Refurbish Gas Generator Engines - Hardwoods and Stephenville	-	-	-	3,047.1	3,047.1	-	3,047.1	-	-	2,538.7	-	508.4	3,047.1	-	(508.4)	55
Unit 4 Turbine Primary Seal Clearance - Bay d'Espoir	-	-	-	1,977.3	1,977.3	-	1,977.3	-	-	1,517.9	-	-	1,517.9	(459.4)	(459.4)	56
CT - Combustion Inspection and Overhaul - Holyrood	-	-	-	4,738.3	4,738.3	-	4,738.3	-	-	3,967.2	-	-	3,967.2	(771.1)	(771.1)	57
Purchase Wabush Terminal Station	-	-	-	490.0	490.0	-	490.0	-	-	464.1	-	-	464.1	(25.9)	(25.9)	
2015 Projects																
Purchase Critical Spares Generation Stations	-	1,536.3	1,041.1	-	1,041.1	-	1,536.3	-	495.2	731.2	-	-	1,226.4	(309.9)	(309.9)	58
Replace Rectifier Transfomers - Holyrood Units 1 and 2	-	327.9	295.9	428.3	724.2	-	756.2	-	32.0	838.4	-	-	870.4	114.2	114.2	59
Transformer VBN T1 Major Internal Assessment	-	500.1	178.4	-	178.4	-	500.1	-	321.7	23.8	-	-	345.5	(154.6)	(154.6)	60
2014 Projects																
Labrador West Transmission Project - Construction Phase[1]	37,484.2	163,145.3	-	128,962.6	128,962.6	-	329,592.1	10,996.0	628.0	752.8	-	-	12,376.8	(317,215.3)	(128,209.8)	61
Total Supplemental Projects Approved by PUB	37,484.2	165,509.6	1,515.4	156,860.6	158,376.0	1,533.0	361,387.4	10,996.0	1,476.9	26,538.8	1,533.0	1,955.1	42,499.8	(318,887.6)	(131,837.2)	

Projects Less than $50,000	Capital Budget							Actual Expenditure and Forecast								
	2014	2015	Carryover 2015	Original 2016	Revised 2016	2017 and Beyond	Total	2014	2015	2016	2017 and Beyond	Carryover to 2017	Total	Project Variance	Annual Variance	Notes
2016 Projects																
Hardwoods Station Service Artificial Neutral	-	-	-	42.1	42.1	-	42.1	-	-	42.2	-	-	42.2	0.1	0.1	
Tank 1 External Inspection and Condition Assessment - Holyrood	-	-	-	39.8	39.8	-	39.8	-	-	24.4	-	-	24.4	(15.4)	(15.4)	
Exciter Refurbishment - Corner Brook Frequency Converter (CBFC)	-	-	-	49.0	49.0	-	49.0	-	-	46.9	-	-	46.9	(2.1)	(2.1)	
HWD Snow Door Overhaul	-	-	-	46.7	46.7	-	46.7	-	-	48.4	-	-	48.4	1.7	1.7	
Replace Radiator Unit 2029 Makkovik	-	-	-	49.0	49.0	-	49.0	-	-	27.5	-	21.5	49.0	-	(21.5)	
St. Anthony, Mary's Harbour, Port Hope Simpson - Lighting Replacement	-	-	-	42.3	42.3	-	42.3	-	-	40.4	-	-	40.4	(1.9)	(1.9)	
2015 Projects																
Thrust Bearing Refurbishment Units 1 - 6, Bay d'Espoir	-	2.5	2.4	41.2	43.6	-	43.7	-	0.1	32.7	-	-	32.8	(10.9)	(10.9)	
Replace Interrupter Bottom Brook Breaker B3L50	-	1.0	1.0	48.2	49.2	-	49.2	-	-	48.5	-	-	48.5	(0.7)	(0.7)	
Total Projects Less than $50,000	-	3.5	3.4	358.3	361.7	-	361.8	-	0.1	311.0	-	21.5	332.6	(29.2)	(50.7)	

[1] The construction of the Labrador West Transmission was approved by OC2014-033, February 2, 2014. The capital expenditures associated with this project are included in Work In Progress and as a result are currently excluded from average rate base. The costs to be included in rate base will be subject to review by the Board of Commissioners of Public Utilities.

4.0 Variance Explanations (Greater than $100,000 and 10% Variance from Budget)

The projects discussed in the following section have 2016 variances of more than 10% and $100,000 when comparing the approved budget to the 2016 expenditures, whether it is a single year project or a multiyear project. Also discussed are projects where there is a total project variance greater than 10% and $100,000. The projects are ordered and numbered based upon the order and number they appear in the preceding set of tables.

4.1 Hydraulic Generation Projects

1. Install Hydrometeorological Equipment - Various Sites (2016)

Budget: $314.1 Total: $4.3 Variance: ($309.8)

This is a one year project that has been carried over into 2017 for further evaluation of the technology prior to construction. In 2015, prior to this project, a snow water equivalent sensor was loaned to Hydro and installed at Victoria Hydrometeorological Station. The 2016 project was to purchase the loaner and an additional three snow water equivalent sensors for other sites. The data collected from the loaner sensor in the spring of 2016 was not accurate, so the project was put on hold. The sensor supplier believes the problem to be a calibration error. Hydro has requested to keep the loaner for an additional year with recalibration. If the recalibration gives acceptable results in spring of 2017, then the project will proceed.

2. Upgrade Work – Cat Arm (2016)

Budget: $558.3 Total: $240.4 Variance: ($317.9)

This is a two year project that commenced in 2016. Procurement of the deflector servo motor was originally scheduled for late 2016 and will now be procured in early 2017 with no effect on the overall execution schedule. The budget, scope and schedule remain unchanged.

3. Replace Site Facilities – Bay d'Espoir (2016)

Budget: $928.3 Total: $270.4 Variance: ($657.9)

This is a three year project that commenced in 2016. The less than forecasted spend in the first year was due to lower than expected design consultant cost. The project remains on schedule with no change to the overall budget, scope or completion date.

4. Upgrade Public Safety Around Dams and Waterways - Bay d'Espoir (2016)

Budget: $477.6 Total: $334.7 Variance: ($142.9)

This was a one year project that is part of an ongoing program to upgrade public safety around dams and waterways. The 2016 work was cut short due to Hurricane Matthew's impact on crew availability, and therefore the project was closed in 2016. Remaining scope will be completed in 2017 as part of the next Public Safety Around Dams Project. The scope of work that has been moved into 2017 is within the contingency for the 2017 project. The variance is also attributable to the 2016 contingency funds not being required.

5. Overhaul Turbine/Generator Units #6 and #7 – Bay d'Espoir (2016)

Budget: $1,345.6 Total: $544.5 Variance: ($801.1)

This was a one year project and due to unresolved contract terms with the original equipment manufacturer, and schedule conflicts with other on-going work, it was decided to limit part of the rotor scope that was included in the whole project. The rotor scope was to address unacceptable vibration levels and was limited to design only, with construction deferred until 2017. The generator bearing was replaced during the outage and resulted in a significant improvement to the operating vibration levels. Based on this improved performance, it was decided to cancel the remaining rotor scope instead of deferring it to 2017 in order to provide a timeframe to assess the long term performance of the generator with the new bearing. Approximately $60,000 of the project funds was carried into 2017 to allow time for the old generator bearing to be refurbished and returned as a capital critical spare.

6. Replace Station Service Breakers – Cat Arm (2015)

Budget: $362.2 Total: $185.9 Variance: ($176.3)

This is a two year project that commenced in 2015 and was carried over to 2017. The primary scope of this project, accounting for approximately 65% of the project budget, was the replacement of the breakers, which was completed in 2015. The programmable logic controller upgrade was scheduled for 2016 during the planned outage to Cat Arm Units 1 and 2. That planned outage was compressed as a result of the need for emergency refurbishment of Penstock 1 in Bay d'Espoir. The risk of completing this project in a compressed 2016 outage was weighed against the risk of carrying the project over to 2017 and it was determined that moving the project to 2017 would be the least risk option.

7. Upgrade Generator Bearings Units 1 and 3 – Bay d'Espoir (2015)

Budget: $648.0 Total: $285.2 Variance: ($362.8)

This is a two year project that commenced in 2015 and is now complete. The original project scope included bearing modifications to reduce generator bearing oil leakage. Upon reviewing the impacts of bearing modifications that were completed on Unit 2 in 2014 (a separate project), it was decided to reduce the scope to only what was necessary and the desired project intent was still achieved.

8. Replace Pump House and Associated Equipment – Bay d'Espoir (2015)

Budget: $408.2 Total: $128.6 Variance: ($279.6)

This is a two year project that commenced in 2015 and is being carried over into 2017/2018. Engineering work commenced, and the construction was tendered but not awarded in early 2016, since tendered prices were significantly higher than the budget. The project was carried over to realign on scope and determine if any savings could be realized in pairing this project with the construction of the Replace Site Facilities Project in Bay d'Espoir. The site facilities construction project is planned to commence in 2017 with completion in fall of 2018. The schedule for the Replace Pump House and Associated Equipment project has been modified to align with the construction schedule for the Replace Site Facilities Project.

9. Upgrade Burnt Dam Spillway – Bay d'Espoir (2014)

Budget: $1,312.1 Total: $1,506.5 Variance: $194.4

This project is complete. This was a two year project that commenced in 2014 with partial scope carried over to 2016. Additional funds were required to complete 2016 construction due to higher than expected engineering and operations support costs. The higher costs were attributed to the lack of suitable accommodations close to site resulting in longer travel time, extended construction schedules, and additional vehicle and helicopter cost. The material supply cost for the new diesel generator sets was also higher than the original estimate.

10. Upgrade Victoria Control Structure - Bay d'Espoir (2014)

Budget: $495.1 Total: $761.5 Variance: $266.4

This project is complete. This was a two year project that commenced in 2014 with partial scope carried over to 2016. Additional funds were required to complete 2016 construction due to higher than expected contractor and operations support costs. The higher costs were attributed to the lack of suitable accommodation close to site resulting in longer travel time, extended construction schedules, and additional vehicle and helicopter cost.

11. Replace Spherical By Pass Valve Assemblies Units 1 and 2 – Bay d'Espoir (2014)

Budget: $153.8 Total: $259.5 Variance: $105.7

This project is complete. The cost of the replacement by-pass valves and actuator, and the amount of construction labour required, was higher than originally budgeted.

4.2 Thermal Generation Projects

12. Upgrade Powerhouse Building Envelope - Holyrood (2016)

Budget: $2,723.8 Total: $2,239.9 Variance: ($483.9)

This is a three year project that commenced in 2016. A portion of the planned construction in 2016 has been deferred to 2017. The delay was a result of the need to tender the construction work a second time (after the first tender call was unsuccessful due to bidders

not meeting the safety requirements), as well as greater than expected weather delays. There is no change to the overall budget, scope or completion date for this project.

13. Overhaul Steam Turbine Generator Unit 3 - Holyrood (2016)

Budget: $5,868.6 Total: $8,147.9 Variance: $2,279.3

This is a one year project. The variance is due to several factors. Internal labor costs were higher than estimated due to the removal and reinstallation of the synchronous condenser skid. The contractor experienced difficulty in dismantling the unit due to the fact that the last major overhaul was 9 years ago, resulting in additional labour hours and broken parts. Finally, findings during the inspection and discovery phase of the overhaul resulted in more repairs and parts replaced than estimated.

4.3 Gas Turbine Generation Projects

14. Upgrade Gas Turbine Plant Life Extension - Stephenville (2015)

Budget: $5,180.6 Total: $5,721.0 Variance: $540.4

This is a two year project that commenced in 2015 and is complete. The total project variance is attributed to higher than expected publicly tendered prices for the fire protection upgrades, and the requirement of more extensive refurbishment of the exhaust stacks than expected. The extent of the stack refurbishment could only be accurately determined once the unit was disassembled for the work.

4.4 Terminal Stations Projects

15. Upgrade Circuit Breakers - Various Sites (2016-2020)

Budget: $6,969.1 Total: $5,599.5 Variance: ($1,369.6)

This is a five year project that commenced in 2016 and is a part of an ongoing program to replace circuit breakers in terminal stations. Some breaker procurement and engineering work was advanced from 2016 to 2015 (against the Upgrade Circuit Breakers - Various Sites (2015-2016) Project) to allow implementation flexibility in 2016 and to ensure successful completion of breaker installations for winter readiness timelines. The overall project is

currently expected to be completed on budget. An overall reforecast of the project will be undertaken at the end of 2017

16. Replace Protective Relays – Various Sites (2016)

Budget: $700.6 Total: $1,425.8 Variance: $725.2

This is a two year project that commenced in 2016. During the design phase of the project, Hydro's design standard for protection relays was revised to address lessons learned from system events experienced since 2014. The updated standard significantly impacted the overall design for all protection relays. This increased the engineering design effort on the project and resulted in increased procurement and construction costs due to the requirement for additional components to adhere to the new standard.

17. Replace Disconnect Switches - Various Sites (2016-2017)

Budget: $646.9 Total: $131.7 Variance: ($515.2)

This is a two-year project that commenced in 2016. The variance in the first year expenditure is attributable to a delay in receipt of materials. The new disconnect switches were originally expected to be delivered in Q4 of 2016, but are delayed until Q1 of 2017. This delay in materials delivery does not impact the construction schedule. The original budget included an allowance in 2016 for any unforeseen construction for early failures, but this was not required. There is no change to the overall project scope, budget or completion date.

18. Upgrade Aluminum Support Structure – Holyrood (2016)

Budget: $401.1 Total: $186.1 Variance: ($215.0)

This was a single year project completed in 2016. This project was executed in parallel with a separate project to Upgrade Terminal Station Equipment Foundations. This allowed Hydro to realize efficiencies and cost savings for engineering, procurement and construction.

19. Install Fire Protection in 230 kV Stations – Bay d'Espoir (2016)

Budget:	$200.0	Total:	$91.4	Variance:	($108.6)

This is a two year project that commenced in 2016. During detailed project planning, it was determined that the procurement of materials could wait until 2017 without impacting the construction schedule. There is no change to the overall project scope, budget or schedule.

20. Install Transformer On line Gas Monitoring – Various Sites (2015)

Budget:	$1,676.2	Total:	$1,852.1	Variance:	$175.9

This was a two-year project that commenced in 2015 and was completed in 2016. The overall project variance was within 10.5% of approved budget. The variance is attributed to higher than anticipated engineering efforts to integrate the new technology to existing transformers, as well as telecommunications upgrades to support the new equipment.

21. Upgrade Terminal Station Protection and Control – Various Sites (2015)

Budget:	$479.9	Total:	$897.4	Variance:	$417.5

This is a two year project that commenced in 2015 and was completed in 2016. During the design phase of the project, Hydro's design standard for breaker failure protection was revised. The changes to the standard were made to address lessons learned from system events experienced since 2014. The updated standard significantly impacted the overall design for breaker failure protection. This increased the engineering design effort on this project and resulted in increased procurement and construction costs due to the requirement for additional components to adhere to the new standard.

22. Install Support Structures C2 Capacitor Bank - Hardwoods (2015)

Budget:	$199.3	Total:	$79.7	Variance:	($119.6)

This was a one year project that commenced in 2015 and was carried over and completed in 2016. During detailed engineering, a less expensive design was identified, resulting in savings for materials and construction.

23. Replace Instrument Transformers – Various Sites (2013)

Budget: $1,501.3 Total: $1,190.3 Variance: ($311.0)

This is a five-year project that commenced in 2013. The variance in 2016 expenditure is attributed to a small portion of the 2016 scope being rescheduled for 2017, due to the inability to secure the necessary equipment outages to perform the work. The remaining work on the project is expected to be completed in 2017 with no change to the overall project scope, budget or schedule.

24. Increase 230 kV Transformer Capacity – Oxen Pond (2013)

Budget: ($200.2) Total: $98.3 Variance: $298.5

This was a two year project that commenced in 2013 and was substantially completed through 2014 and 2015. It was carried over into 2016 for completion of project. The identified items were completed at a cost of $98.3k and the project was completed at an overall cost of 6.1% over the approved budget.

4.5 Transmission Projects

25. Replace Aircraft Markers at Grand Lake Crossing – TL228 (2016)

Budget: $589.6 Total: $61.8 Variance: ($527.8)

This is a two-year project that commenced in 2016 to replace four aircraft marker systems that are located on four 230 kV transmission crossing tower structures that span over a section of Grand Lake at Glover's Island. The variance in the first year expenditure is attributed to the materials procurement being deferred to Q1 of 2017. There is no change to the overall project scope, budget and completion date.

26. Refurbish Anchors and Footings TL202 and TL206 – Bay d'Espoir to Sunnyside (2014)

Budget: $1,038.6 Total: $19.9 Variance: ($1,018.7)

This project commenced in 2014. During project planning, it was decided to align construction with execution of the new transmission line between Bay d'Espoir and Western Avalon Terminal Stations, which is along the same corridor. The new line was approved by the Board under Order No. P. U. 53(2014) on December 12, 2014. The alignment of this

project with the construction of the new transmission line will result in overall cost savings to the project as well as a reduced environmental impact. Access roads for the new transmission line were originally anticipated to be completed in the fall of 2016; however, they will not be ready until 2017. For this reason, all construction work for this project will take place in 2017 instead of being spread across 2016 and 2017 as previously planned.

27. 230 kV Transmission Line – Bay d'Espoir to Western Avalon (2015)

Budget: $77,669.1 Total: $59,317.8 Variance: ($18,351.3)

The approved capital budget for 2016 (including 2015 carryover) was $77.7M. As of the end of 2016, the actual expenditure was $59.3M. As per the TL267 Monthly Status Update Report submitted to the PUB this project has undergone schedule and cash flow changes. The anticipated in service date has been accelerated from May 2018 to October 2017 with no change to the overall project budget.

4.6 Distribution Projects

28. Provide Service Extensions - All Service Areas (2016)

Budget: $5,350.0 Total: $6,021.5 Variance: $671.5

This is an annual budget that is based on data from past experience to provide service extensions to customers. The variance is primarily due to the Duley Lake Cottage Development, which had 26 customers request connections in 2016, at a cost of approximately $750k.

29. Provide Service Extensions - All Service Areas - CIAC (2016)

Budget: ($200.0) Total: ($833.1) Variance: ($633.1)

This is an annual budget that is based on past Contributions in Aid of Construction (CIAC) to provide service extensions to customers. The variance is primarily due to the Duley Lake Cottage area line extension and Hampden Tap – LCP Repeater site. As per Board Order P.U.16(2016), the Board approved $13,900 per customer for Duley Lake, and as of December 31, 2016, 26 customers have requested connections and provided their funding, resulting in contributions of approximately $350k. The installation of the Hampden Tap – LCP Repeater

site, executed by Hydro, carried a CIAC from the Muskrat Falls project of approximately $350k.

30. Upgrade Distribution Systems - All Service Areas (2016)

Budget: $3,990.0 Total: $3,357.4 Variance: ($632.6)

This is a one year project to provide distribution upgrades to customers, with a budget based on 2015 expenditures. The budget and actual expenditures in 2016 are shown by area in the table below. The variance is primarily due to less than expected distribution upgrade requests across all areas.

Table 17

	Budget ($000)	Actual ($000)	Variance ($000)
Central	1,910.0	1,702.3	(207.7)
Northern	1,150.0	937.1	(212.9)
Labrador	930.0	718.0	(212.0)
Total	3,990.0	3,357.4	(632.6)

31. Construct Overhead Distribution Line – Pilley's Island to Long Island (2016)

Budget: $1,239.9 Total: $1,509.0 Variance: $269.1

This was a one year project completed in 2016. During the budget stage, Hydro determined the least cost alternative to provide reliable power to Long Island was construction of an overhead distribution line. This was based on standard requirements for navigable waters, including a 24 m wire clearance over the water. After this project had been submitted for approval in the 2016 Capital Budget Application, the Canadian Coast Guard increased their wire clearance requirement to a minimum of 40 m to allow for their largest ice breaking vessel to safely pass underneath. This extra 16 m of clearance resulted in a change in the overhead design, and the project estimate increased to approximately $3.6 M dollars. The evaluation of project alternatives was revisited and an updated cost benefit analysis concluded that the least cost option was to replace the original submarine cables with new cables. The supply and installation of two submarine cables was completed.

32. Upgrade Distribution Systems – Various Sites (2015-2016)

Budget: $575.8 Total: $710.8 Variance: $135.0

This was a two year project that commenced in 2015 and is complete. The variance in the annual expenditure is attributable to work on the Bottom Waters distribution system that was planned to be performed under de-energized conditions but was carried out under energized conditions, to manage customer impact. This resulted in higher construction costs. The total project expenditure was within 7% of the approved budget.

4.7 Rural Generation Projects

33. Overhaul Diesel Units - Various Sites (2016)

Budget: $2,078.4 Total: $2,526.4 Variance: $448.0

This was a one year project completed in 2016. The project is part of an ongoing program to overhaul diesel engines at diesel generating plants to sustain reliability of the generating equipment. Project estimates are based on the projected number of engines that will reach the criteria for overhaul (20,000 hours of operation), and typical extent of refurbishment. The project variance is attributable to more extensive refurbishment than typically required for some of the engines, which was unknown until the engines were disassembled for the overhauls. Additionally, the higher United States dollar exchange rate resulted in an increase in material costs.

34. Inspect Fuel Storage Tanks - Various Sites (2016)

Budget: $1,326.9 Total: $1,024.5 Variance: ($302.4)

This was a one year project completed in 2016. The project is part of an ongoing program to inspect fuel storage tanks for diesel plants. After a detailed review and prioritization of the sites to be inspected in 2016, an update was made to the schedule as provided for in the Capital Budget Application for this project. Nain tank inspections were deferred to 2018, and Rigolet tank inspections were advanced to 2016. This change resulted in significant savings for contracted work in 2016. Additionally, after an external inspection, tanks in St. Brendan's were discovered to be leaking. As detailed in the 2016 Capital Budget Application, "Hydro

may inspect a higher priority tank should conditions change and defer a lower priority tank." The St. Brendan's tank, having failed, was replaced as it became a higher priority, given that fuel leakage was occurring. Other tanks inspected in 2016 did not require significant refurbishment, contributing to the project underspend.

35. Install Fire Protection Systems – Cartwright and Nain (2016)

Budget: $3,030.7 Total: $782.8 Variance: ($2,247.9)

This is a two year project that commenced in 2016. Design is complete and procurement is in progress. Most of the procurement and construction activity planned to be completed in late 2016 will now be completed in the first quarter of 2017. This schedule change was made to balance the overall capital work plan and to reduce the project schedule and delivery risks. There is no change to the overall project scope, budget or completion date.

36. Upgrade Transformer Systems – Postville and Cartwright (2016)

Budget: $465.2 Total: $296.0 Variance: ($169.2)

This was a one year project that has been carried over into 2017. The project is to replace transformers at Postville and Cartwright. The work at Postville was completed in 2016. The transformers purchased for Cartwright were determined to have incorrect secondary voltages and have been returned to the manufacturer for rewind. Construction is rescheduled for early 2017, ahead of the anticipated load growth (i.e. the transformers will be installed prior to start-up of the fish plant). There is no change to the overall project scope or budget.

37. Additions For Load Growth – Various Sites (2016)

Budget: $883.4 Total: $190.4 Variance: ($693.0)

This is a multi-year project that commenced in 2016. The annual variance in 2016 expenditure is attributable to delay in material purchases from Q4 2016 to Q1 2017. There is no change to the overall project scope, budget or completion date.

38. Replace Unit 2038 – Mary's Harbour (2015)

Budget: $1,345.0 Total: $1,161.0 Variance: ($184.0)

This was a two year project that commenced in 2015 and was completed as planned. A portion of the project contingency was not required.

39. Install Fire Protection – L'anse Au Loup (2015)

Budget: $1,346.8 Total: $1,163.7 Variance: ($183.1)

This was a two-year project that commenced in 2015 and was completed as planned. A portion of the project contingency was not required.

40. Upgrade Diesel Plant Production Data Collection Equipment - Various (2014)

Budget: $283.8 Total: $510.6 Variance: $226.8

This is a three year project that commenced in 2014. At commencement of the detailed engineering in year three for the sites that are included in year three of the project, it was determined that the design and construction would be more complex than the sites completed in the first two years of the project, which attributes to additional cost of the project for additional engineering, construction labour and materials. This prompted a review of the overall project scope and justification. From this review, it was determined that the diesel plant production data is not critical for three of the diesel plants that are connected to the Island Interconnected System (St. Anthony, Hawkes Bay, and Little Bay Islands), since these plants are not prime power. The diesel plant production data collection equipment work for these plants was subsequently removed from the project scope, mitigating the impact of cost overrun. The work is complete for all isolated diesel plants, with the exception of the construction for L'Anse au Loup, which has been carried into 2017. The project is expected to be completed in 2017 within 10% of the total project budget.

4.8 Properties Projects

41. Upgrade Office Facilities and Control Buildings – Various Sites (2016)

Budget: $1,134.0 Total: $675.0 Variance: ($459.0)

This was a one year project completed as planned in 2016. Publicly tendered prices for the construction at all three sites were lower than estimated.

42. Replace Roof on Service Building – Bishop's Falls (2016)

Budget: $612.8 Total: $327.8 Variance: ($285.0)

This was a one year project scheduled for completion in 2016, and carried over into 2017. Engineering and procurement are complete with construction partially completed in 2016. Due to factors including contractor resource issues, unforeseen design issues, and frequent inclement weather, the full roof replacement could not be completed before winter conditions set in. The building is weather tight and remaining roof work will be completed in the spring of 2017, when conditions allow. There is no change to the overall project scope or budget.

43. Replace Accommodations and Septic System - Ebbegunbaeg (2015)

Budget: $1,456.6 Total: $811.2 Variance: ($645.4)

This is a two year project that commenced in 2015 and is being carried over to 2017. The project scope includes installation of new accommodations and septic system, installation of a bridge at Noel Paul Brook, and access road upgrades. The bridge and road upgrades were completed as planned. The manufacturer was unable to deliver the new accommodations in accordance with the planned schedule. Delivery has been deferred to the spring of 2017 and construction will be completed in the summer of 2017. There is no change to the overall project scope or budget.

4.9 Metering Projects

44. Install Automatic Meter Reading – Labrador West (2016)

Budget: $433.8 Total: $130.4 Variance: ($303.4)

This is a two-year project that commenced in 2016. Engineering is complete and materials with long lead times have been ordered. The original budget estimate included receipt of materials in Q4 2016, but materials will be received in Q1 2017. There is no change to the overall project budget or completion date.

45. Install Automatic Meter Reading – Various Sites (2015-2016)

Budget: $961.7 Total: $1,464.7 Variance: $503.0

This is a two year project completed in 2016. The two primary drivers of the cost variance were higher than estimated equipment costs and higher than expected meter installation costs. Equipment costs were higher than budgeted due to a higher cost of the United States Dollar exchange rate, and estimates that were based on equipment costs of an earlier, less sophisticated generation of the equipment. Higher installation costs were incurred due to: greater than anticipated number of failed meter bases related to corrosive (salty) environmental conditions; low residential densities; long distances between communities; and the requirement for a dedicated line crew to ensure prompt restoration of service. An updated project cost estimate and updated assumptions for project benefits were used to re-evaluate the project. The updated cost-benefit analysis confirmed that the project remains the least cost alternative versus the status quo.

4.10 Tools and Equipment Projects

46. Purchase Excavator – Bay d'Espoir (2016)

Budget: $312.0 Total: $187.0 Variance: ($125.0)

The cost of the excavator was less than the original budget as it was a new product line for the supplier and a lower cost than historical similar purchases. The mulcher head attachment procurement was delayed to ensure the compatibility with the unit. The project will be completed by March 2017.

47. Replace Off Road Track Vehicles – Unit 7861, Stephenville (2015-2016)

Budget: $398.9 Total: $176.8 Variance: ($222.1)

This was budgeted as a two year project with the actual purchase completed in 2015 due to early availability and at a reduced cost.

4.11 Information Systems Projects

48. Implement Industrial Billing Software - Hydro Place (2016)

Budget: $443.1 Total: $169.5 Variance: ($273.6)

Vendor resources, when required, were unavailable resulting in a delay in commencement of the project and a carryover to 2017.

49. Replace Peripheral Infrastructure - Various Sites (2016)

Budget: $611.3 Total: $507.3 Variance: ($104.0)

An evaluation of the number of required printers indicated that some that were removed from service did not require replacement, thereby reducing the number of printers acquired.

50. Upgrade Enterprise Storage Capacity – Hydro Place (2016)

Budget: $628.8 Total: $464.5 Variance: ($164.3)

Resources were not available to work on the upgrade due to demands of other projects, causing a delay in execution; however, the Project is scheduled for completion in Q1 2017.

4.12 Transportation Projects

51. Replace Vehicles and Aerial Devices - Various Sites (2016-2017)

Budget: $1,443.3 Total: $1,032.7 Variance: ($410.6)

This is a two year project. There was a limitation on vehicle availability; however, the vehicles will be delivered in 2017.

4.13 Administrative

52. Purchase Tools and Equipment less than $50,000 (2016)

Budget: $172.6 Total: $55.1 Variance: ($117.5)

The overall project variance is primarily due to overall cost savings to the project due to items such as reduction in the estimated requirements for office equipment, and lower than estimated costs for some equipment.

4.14 Allowance for Unforeseen Items

53. Allowance for Unforeseen Items

Budget: $3,000.0 Total: $13,666.9 Variance: $10,666.9

The Allowance for Unforeseen is an annual allotment that permits Hydro to act expeditiously to deal with events affecting the electrical system which cannot wait for specific approval of the Board. Unforeseen expenditures for 2016 under this account include costs associated with Performing Upgrades to the Western Avalon Terminal Station Transformer T5 Tap Changer, Holyrood Units 1 and 2 – Boiler Re-Heat Tubes, Sally's Cove Transmission Line Reroutes, Bay d'Espoir-Penstock 1 and Access Roads Refurbishments. Reports on these items have been filed with the Board of Commissioners of Public Utilities.

4.15 Supplemental Projects

54. TL 227 Distribution Line Sally's Cove L1 (2016)

Budget: $717.0 Total: $186.3 Variance: ($530.7)

This is a two year supplemental project that commenced in 2016. In early 2016, a coastal landslide occurred south of Sally's Cove on the Northern Peninsula. This project is required to re-route a section of transmission line TL227 and distribution line L1 away from the high-risk zone surrounding the landslide. The variance in the first year expenditure is attributed to a delay in material delivery that was scheduled for November 2016, but was not received until early 2017. This late delivery of materials does not impact the construction schedule. There is no change to the overall project scope, budget or completion date.

55. Refurbish Gas Generator Engines – Hardwoods and Stephenville (2016)

Budget: $3,047.1 Total: $2,538.7 Variance: ($508.4)

This is a supplemental project approved in 2016 and carried into 2017. The engine for Hardwoods Gas Turbine was refurbished and successfully returned to service. The engine for the Stephenville Gas Turbine was refurbished and reinstalled, but experienced vibration issues during commissioning. The project is carried over into 2017 to assess and resolve the vibration issues.

56. Unit 4 Turbine Primary Seal Clearance – Bay d'Espoir (2016)

Budget: $1,977.3 Total: $1,517.9 Variance: ($459.4)

This project is complete. This was a supplementary project approved and executed in 2016. The contract cost to complete the refurbishment of the turbine seal (concrete grouting and seal machining) of the turbine was less than original estimate. The variance is also attributed to the contingency funds not being required.

57. CT – Combustion Inspection and Overhaul - Holyrood (2016)

Budget: $4,738.3 Total: $3,967.2 Variance: ($771.1)

This is a supplemental project approved and completed in 2016. The variance from the planned expenditure is primarily attributed to the fact that the contingency was not required.

58. Purchase Critical Spares Generation Stations (2015)

Budget: $1,536.3 Total: $1,226.4 Variance: ($309.9)

This is a supplemental project approved in 2015 for procurement in 2016. The variance was due to material costs being lower than budgeted and the contingency not being required.

59. Replace Rectifier Transformers – Holyrood Units 1 and 2 (2015)

Budget: $756.2 Total: $870.4 Variance: $114.2

This is a two-year project that commenced in 2015 and is complete. The project variance is due to higher than anticipated remediation costs required for the proper disposal of the removed rectifying transformers for Units 1 and 2.

60. Transformer VBN T1 Major Internal Assessment (2015)

Budget: $500.1 Total: $345.5 Variance: ($154.6)

This is a supplemental project that was substantially completed in 2015, with final testing in 2016. The project is now complete. The scope included a major internal assessment of a transformer. The budget included an allowance for refurbishment, but the level of refurbishment estimated was not required.

61. Labrador West Transmission Project – Construction Phase (2014)

Budget: $329,592.1 Total: $12,376.8 Variance: ($317,215.3)

In 2014, the provincial Government approved the construction of the third transmission line in Labrador to help supply power for planned new development in Labrador West, such as the Kami Iron Ore Project, and improved reliability for all customers in the region. In September 2014, work on the line was temporarily suspended until completion of Alderson's financing plan which resulted in overall expenditures being lover than budgeted. All project costs to date, including the 2016 Interest During Construction costs, are covered by the security Alderon has already provided. Construction will proceed should additional funding be secured.

62. Purchase of 12 MW Diesel Generation - Holyrood

Budget: $4,700.0 Total: $3,784.0 Variance: ($916.0)

This supplemental capital project was initially envisioned as a one year project. Once approved, the purchase of the 6 diesel engines was completed in 2016. The remaining scope to make the new infrastructure permanent, including the environmental modeling and

changes to the exhaust stacks, could not be completed in the available time frame and was carried over to 2017. There is no change to the original budget.

4.16 Units 1 and 2 Boilers Lower Re-heater Boiler Tube Replacement and Reliability Improvements, Holyrood Thermal Generating Station

This supplemental project was approved and completed in 2016, with the actual expenditure within 1% of the approved project budget. The project scope included replacement of boiler lower re-heater tubes and a number of other reliability improvements. Item 10 of the reliability improvements (Section 3.3.2. of the supplementary application) was stated as:

> "While Hydro has not currently identified additional equipment for immediate replacement, it is possible an additional component may require replacement during the annual outages. Hydro proposes that any item, material in dollar value, that meets capitalization criteria, is required to be replaced to mitigate an unplanned outage in the coming winter season, and that can be replaced within this project's contingency, would be replaced and communicated to the Board via the year end Capital Expenditures Variance report."

The Board of Commissioners of Public Utilities approved this project with Board Order No. P.U. 19(2016) and ordered that: "Hydro shall report on the contingency expenditures associated with additional component replacements arising from this project, setting out in detail the work which was done, the associated costs and the justification, as a part of its year-end capital expenditures variance report."

Hydro identified and completed four items under these criteria, as summarized in Table 18.

Table 18

Item	Description	Cost ($,000)	Scope of Work and Justification
1	Boiler Floor Tube Refurbishment Unit 3	47.3	This work was based on an ultrasonic thickness inspection that was carried out that found pitting in the tubing, and tubing approaching minimum wall thickness. Welding refurbishment was completed to bring these tubes to an acceptable level.
2	Thermal Performance Study on Unit 3	210.9	This work included a review of Holyrood de-rate assessment analysis to identify any derating that should be applied to the power boilers, after the 2016 annual outages and the planned tube replacements were made. Tube samples were taken and specialized non-destructive examination were completed to confirm or deny the theoretical analysis, which induced the de-rate on Unit 3. The results of this work ensured that the de-rate of Unit 3 could be lifted. This would allow Hydro to operate reliably as planned to the end of service in 2021.
3	Steam Coil Air Heaters (SCAH) (Units 1 & 2)	124.4	This work was based on a condition identified during the unit outages. The SCAH were replaced because they were determined to be fouled and damaged beyond repair. Replacement was necessary prior to unit start-up.
4	Corrosion Mapping for 9 Air Receivers	73.0	During replacement of the #2 air compressor (an approved reliability scope item for this project), it was determined that a level 2 condition assessment of the nine associated air receivers (storage tanks) was required. This assessment was completed to ensure the long term reliability of the compressed air system.
TOTAL		455.6	

5.0 Capital Budget Verses Actual Expenditures 2007 – 2016

Table 19 provides a summary of Hydro's Capital Budget Variances for the years 2007-2016.

Table 19

Capital Budgets/Expenditures 2007-2016

Year	Budget	Actual Expenditures	Variance	Percentage Variance
2007	43,304	35,669	7,635	17.6%
2008	53,579	46,246	7,333	13.7%
2009	61,544	54,152	7,392	12.0%
2010	63,297	55,553	7,744	12.2%
2011	67,454	63,116	4,338	6.4%
2012	93,840	77,252	16,588	17.7%
2013	116,373	84,755	31,618	27.2%
2014	280,601	204,728	75,873	27.0%
2015	311,177	125,119	186,058	59.8%
2016	350,601	203,941	146,660	41.8%

The 2016 variance in actual expenditures compared to budget, an underspend of $145.9M, is attributable to two major projects, the 230 kV transmission line from Bay d'Espoir to Western Avalon (TL 267 – Variance #27), and the 230 kV line from Churchill Falls to Wabush (Labrador West Transmission Line – Variance #61). TL 267 includes a project underspend of $18.4M in relation to the original 2016 budget. The Labrador West Transmission Line work is suspended until completion of Alderson's financing plan for the Kami mine. Therefore, $129.0M associated with work that was planned to be completed in 2016 on the Labrador West Transmission Line was not completed due to a temporary suspension of the work in September 2014. These two projects account for approximately $147M.

6.0 Carryover Report

Table 20 provides a summary listing of the carryovers from 2010-2017.

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Table 20

2016 Carryover Report
For the Year Ending December 31, 2016
($000)

Project Name	PUB Approved Budget 2016	Revised Budget 2016	Total Actual Expenditures 2016	Carryover Amount	Original Completion Year
Replace Pump House and Associated Equipment - Bay d'Espoir	522.5	408.2	128.6	279.6	2016
Upgrade Equipment Doors - Various Sites	0.0	162.1	115.4	46.7	2015
Replace UPS Systems - Hydro Place	889.8	889.8	928.6	(38.8)	2016
Install Hydrometeorological Equipment - Various Sites	314.1	314.1	4.3	309.8	2016
Overhaul Turbine/Generator Units #6 and #7 - Bay d'Espoir	1,213.5	466.4	410.2	56.2	2016
Refurbish Gas Generator Engines - Hardwoods and Stephenville	0.0	3,047.1	2,538.7	508.4	2016
Purchase Excavator - Bay d'Espoir	312.0	222.0	187.0	35.0	2016
Replace Roof on Service Building – Bishop's Falls	612.8	612.8	327.8	285.0	2016
Replace Radiator Unit 2029 Makkovik	0.0	49.0	27.5	21.5	2016
Upgrade Transformer Systems - Postville and Cartwright	465.2	465.2	296.0	169.2	2016
Implement Industrial Billing Software - Hydro Place	443.1	443.1	169.5	273.6	2016
Upgrade Enterprise Storage Capacity - Hydro Place	628.8	628.8	464.5	164.3	2016
Cost Recoveries	(291.6)	(291.6)	(215.5)	(76.1)	2016
Upgrade Server Technology Program - Hydro Place	492.5	492.5	451.1	41.4	2016
Cost Recoveries	(228.5)	(228.5)	(209.3)	(19.2)	2016
Replace Station Service Breakers - Cat Arm	363.4	362.2	185.9	176.3	2016
Replace Accommodations and Septic System - Ebbegunbaeg	1,061.4	1,456.6	811.2	645.4	2016
Upgrade Diesel Plant Production Data Collection Equipment-Various	280.7	653.8	510.6	143.2	2016
Purchase of 12 MW Diesel Generation - Holyrood	0.0	4,700.0	3,784.0	916.0	2016
Install Automated Meter Reading - Labrador West	433.8	433.8	130.4	303.4	2017
Replace Battery Banks and Chargers - Various Sites	425.0	425.0	365.7	59.3	2017
Replace MDR 4000 Microwave Radio East - Various Sites	77.4	77.4	113.4	(36.0)	2017
Replace Air Conditioners - Various Sites	39.9	39.9	51.2	(11.3)	2017
Replace Powerline Carrier - Various Sites	73.4	73.4	77.4	(4.0)	2017
Upgrade Telecontrol Facilities - Sandy Brook Hill	101.6	101.6	81.7	19.9	2017
Replace Control Room/Communications Room Air Conditioning – Hinds Lake	41.3	41.3	31.0	10.3	2017
Refurbish Station Water System – Upper Salmon	96.6	96.6	38.3	58.3	2017
Upgrade Work – Cat Arm	558.3	558.3	240.4	317.9	2017
Rehabilitate Shoreline Protection – Cat Arm	112.2	112.2	104.7	7.5	2017
Replace PH1 Station Service Transformer – Bay d'Espoir	46.7	46.7	45.0	1.7	2017
Replace Spherical By-Pass Valves Units 1 and 2 – Bay d'Espoir	183.6	183.6	154.8	28.8	2017
[					}
Replace Instrument Transformers – Various Sites	1,511.7	1,501.3	1,190.3	311.0	2017
Replace Surge Arrestors – Various Sites	144.4	144.4	175.1	(30.7)	2017

Replace Protective Relays – Various Sites	700.6	700.6	1,425.8	(725.2)	2017
Replace Disconnect Switches – Various Sites (2016-2017)	646.9	646.9	131.7	515.2	2017
Upgrade Digital Fault Recorders – Various Sites	197.9	197.9	221.2	(23.3)	2017
Upgrade Data Alarm Systems – Various Sites	74.4	74.4	49.7	24.7	2017
Install Breaker Failure Protection – Various Sites	65.7	65.7	81.8	(16.1)	2017
Install Fire Protection in 230 kV Stations – Bay d'Espoir	200.0	200.0	91.4	108.6	2017
Upgrade Warehouse Lighting – Bishop's Falls	15.2	15.2	28.1	(12.9)	2017
Replace Fuel Piping – Hardwoods and Stephenville	44.8	44.8	11.6	33.2	2017
Upgrade Human Machine Interface – Various Sites	114.0	114.0	125.3	(11.3)	2017
Install Variable Frequency Drives – Grey River	46.9	46.9	49.7	(2.8)	2017
Replace Vehicles and Aerial Devices – Hydro System (2016-2017)	1,443.3	1,443.3	1,032.7	410.6	2017
Purchase Vehicles and Aerial Devices – Various Sites	382.5	382.5	470.4	(87.9)	2017
Refurbish Anchors and Footings TL202 and TL206 – Bay d'Espoir to Sunnyside	1,038.4	1,038.6	19.9	1,018.7	2017
Replace Aircraft Markers at Grand Lake Crossing – TL228	589.6	589.6	61.8	527.8	2017
Upgrade Distribution Systems – Various Sites (2016-2017)	285.6	285.6	361.8	(76.2)	2017
Additions for Load Growth – Various Sites	883.4	883.4	190.4	693.0	2017
Install Fire Protection Systems – Cartwright and Nain	3,030.7	2,339.9	782.8	1,557.1	2017
Replace Programmable Logic Controllers – Various Sites	346.0	315.7	345.5	(29.8)	2017
TL 227 Distribution Line Sally's Cove L1	0.0	717.0	186.3	530.7	2017
Upgrade Terminal Station for Mobile Substation – Cow Head	40.0	40.0	27.5	12.5	2017
Replace Air Conditioning Units 8 and 14 – Hydro Place	34.6	34.6	31.0	3.6	2017
Replace Site Facilities – Bay d'Espoir	928.3	928.3	270.4	657.9	2018
Upgrade Powerhouse Building Envelope – Holyrood	2,723.8	2,723.8	2,239.9	483.9	2018
230 kV Transmission Line – Bay d'Espoir to Western Avalon	75,284.3	85,426.4	59,317.8	26,108.6	2018
Construct 230 kV Transmission Line – Soldiers Pond to Hardwoods	3,699.0	3,699.0	3,501.6	197.4	2018
Upgrade Microsoft Project – Hydro Place	366.6	366.6	352.1	14.5	2018
Upgrade Circuit Breakers – Various Sites (2016-2020)	6,969.1	6,969.1	5,599.5	1,369.6	2020
				38,255.7	

7.0 Safety Hazards

In Board Order No. P.U. 38(2010) 2011 Capital Budget, the Board directed Hydro to include an explanation in Hydro's annual. Please see the following Table 21 for projects undertaken in 2016.

Total Approved Budget: **$199,300**
Total Expenditure: **$175,378**

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Table 21

Safety Hazards			
Project Title/Location	**Expenditure**	**Safety Hazard Identified**	**Project Scope**
Holyrood Unit 3 – Upgrade Continuous Blowdown Throttling Valve	$57.1	Prior to this improvement, the piping and manual throttling valve configuration for the boiler blowdown tank for Holyrood Unit 3 did not allow quick egress in the event that a failure occurred, resulting in emitted steam. If a release occurred, steam would have quickly filled the area, creating a visibility hazard and making egress more difficult. In addition to this concern, the valve location required an operator to extend beyond the range of safe ergonomics to operate the valve. As this throttling valve is required to be continuously adjusted while the boiler is online, the ability to operate the valve in a safe location, using proper ergonomics is required.	To address the hazard, an upgrade to the Unit 3 continuous blowdown tank throttling valve was completed. The manually operated valve was upgraded to an actuated throttling valve, which allows the operator to adjust it while outside the valve location. This removes the plant operator from any potential safety or ergonomic hazards, eliminating the need for a plant operator to enter an unsafe location while the boiler is online. The valve was equipped with a digital controller that adjusts the position of the throttling valve; this allows the operator to verify the valve is operating correctly.

Safety Hazards			
Project Title/Location	**Expenditure**	**Safety Hazard Identified**	**Project Scope**
Holyrood Unit 3 – Upgrade Main Steam Seat Drain Valves	$25.3	Prior to this improvement, a plant operator had to descend a ladder to operate a main steam valve which is located above the seat drain valves. The existing piping and valve configuration did not allow quick egress in the event that a failure occurred, resulting in emitted steam. If a release occurred, steam would quickly fill the area, creating a visibility hazard and making egress more difficult.	To address this hazard, an upgrade to the two Unit 3 main steam stop valves was completed. The existing y-pattern main steam valves were replaced with t-pattern valves complete with handle extensions. This allows operation from the plant floor

			level and eliminates the need for a plant operator to enter a hazardous location.
Holyrood – Install Chemical Shower & Eye Wash Station Water Heaters	$93.0	Prior to this improvement, equipment did not include any form of heating for the domestic water used by the critical emergency showers and eye wash stations at the Holyrood Thermal Generating Station. Emergency showers and eye wash stations are required safety equipment and have a defined required performance, as outlined in ANSI Z358.1-2014. Emergency showers must provide tepid water, between 16°C and 38°C, with a minimum flow of 20 gallons per minute for the required decontamination time. The chemical showers currently meet flow requirements but provided water at 4°C to 12°C, depending on the seasonal temperature of Quarry Brook, the water source. Based on the treatment requirements of the chemical exposures, the minimum required shower time is 20 minutes creating a safety hazard due to the exposure time at potentially cold temperatures.	To address this hazard, water heaters and automatic mixing valves were installed for critical emergency showers and eye wash stations at the Holyrood Thermal Generating Station.

Capital Expenditures and Carryover Report
For the Year Ended December 31, 2017

March 1, 2018

Revised: April 2, 2018

A Report to the Board of Commissioners of Public Utilities

newfoundland labrador hydro
a nalcor energy company

Table of Contents

1.0 Capital Expenditure Overview

During 2017, Hydro invested $341M to execute capital projects to contribute to the provision of safe, reliable, and least-cost electricity to the people of the province. A significant portion of the expenditure is in new transmission infrastructure, including $213.7M expended for the construction of a new transmission line between Bay d'Espoir and Western Avalon Terminal Stations (TL 267), which went to service on December 6, 2017, and $11M on the construction of a new line between Soldiers Pond Terminal Station and Hardwoods Terminal Station (TL 266), with expenditure of the remaining 50% of the cost of TL 266 planned for 2018. Both projects remain within their approved budgets. Sustaining capital for Terminal Station infrastructure totaled $21.5M, including $8.9M in the *Upgrade Circuit Breakers Project*. Expenditures to maintain the Hydraulic Generation equipment and infrastructure across the province totaled $13M, and $16.5M was expended to maintain the Thermal Generation equipment and infrastructure at Holyrood. The distribution system also required $13.6M for service extensions and distribution system upgrades. This report includes details about the capital expenditures and reportable variances for 2017, and projects carryovers to 2018.

2.0 Capital Expenditures and Variance Summary

Table 1 provides a summary of Hydro's Capital Expenditures by Year for the period 2012-2017 for all capital projects that were active in 2017, and Table 2 provides a breakdown of the summary by asset type.

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Table 1: 2017 Capital Expenditures by Year ($000)

Summary	A				B	C	D (B+C)	E	F (A+C+E)	Actual Expenditure and Forecast G				H	I	J	K (G+H+I+J)	K-F	H-D
	2013	2014	2015	2016	Carryover 2017	Original 2017	Revised 2017	2018 and Beyond	Total	2013	2014	2015	2016	2017	2018 and Beyond	Carryovers to 2018	Total	Project Variance	Annual Variance
2017 Projects						86,449.2	86,449.2	49,339.8	135,789.0					69,782.3	48,756.4	10,529.1	129,067.8	(6,721.2)	(16,666.9)
2016 Projects				40,698.9	9,556.0	64,281.4	73,837.4	56,668.9	161,649.2				29,674.5	54,017.6	63,173.3	12,954.0	159,819.4	(1,829.8)	(19,819.8)
2015 Projects			1,872.4	2,293.3	1,118.2	245.1	1,363.3	-	4,410.8			1,559.9	1,586.6	1,791.4	-	305.1	5,243.0	832.2	428.1
2014 Projects		37,964.6	167,846.5	205,566.0	27,270.5	150,797.3	178,067.8	62,075.0	624,249.4		11,315.3	2,732.2	60,601.1	214,438.5	17,418.3	1,069.8	307,575.2	(316,674.2)	36,370.7
2013 Projects	593.2	552.8	538.4	1,511.7	311.0	471.9	782.9	-	3,668.0	240.3	699.0	755.5	1,190.3	711.0	-	31.9	3,628.0	(40.0)	(71.9)
Grand Total	**593.2**	**38,517.4**	**170,257.3**	**250,069.9**	**38,255.7**	**302,244.9**	**340,500.6**	**168,083.7**	**929,766.4**	**240.3**	**12,014.3**	**5,047.6**	**93,052.5**	**340,740.8**	**129,348.0**	**24,889.9**	**605,333.4**	**(324,433.0)**	**240.2**

2017 Capital Budget Approved by Board Order No. P.U. 4[1]	271,265.6
New Project Approved by Board Order No. 20 (2016)	1,533.0
New Project Approved by Board Order No. 5 (2017)	3,045.0
New Project Approved by Board Order No. 7 (2017)	3,168.9
New Project Approved by Board Order No. 10 (2017)	1,349.2
New Project Approved by Board Order No. 11 (2017)	2,585.2
New Project Approved by Board Order No. 13 (2017)	11,425.2
New Project Approved by Board Order No. 20 (2017)	2,610.0
New Project Approved by Board Order No. 21 (2017)	3,714.8
New Project Approved by Board Order No. 15 (2017)	500.0
New Project Approved by Board Order No. 27 (2017)	540.0
2017 New Projects under $50,000 Approved by Hydro	508.0
Total Approved Capital Budget Before Carryovers	302,244.9
Carryover Projects 2016 to 2017	38,255.7
Total Approved Capital Budget	**340,500.6**

[1] Annual budgets previous to 2017 pertain to projects that have expenditures in 2017.

Table 2: Total Capital Variance Summary ($000) by Asset Type

Asset Type	Board Approved Budget	Total Project Expenditures and Forecast	Variance
Hydraulic	36,468	35,921	(547)
Thermal	14,273	15,687	1,414
Gas Turbines	2,807	1,884	(923)
Terminal Stations	107,460	106,933	(527)
Transmission	327,299	328,048	749
Distribution	16,726	16,287	(439)
Rural Generation	25,824	23,523	(2,301)
Properties	7,666	6,903	(763)
Metering	3,333	3,817	484
Rural Systems Tools and Equipment	1,139	907	(232)
Information Systems	3,264	3,224	(40)
Telecontrol	6,649	6,337	(312)
Transportation	4,933	4,854	(79)
Administrative	1,470	996	(474)
Allowance for Unforeseen	2,040	5,646	3,606
Supplemental Projects	367,815	43,792	(324,023)
Projects Approved for less than $50,000	601	574	(27)
Total Capital Budget	**929,766**	**605,333**	**(324,434)**

3.0 Capital Expenditures by Category

The following tables provide Hydro's Capital Expenditures by category including: Hydraulic Generation, Thermal Generation, Gas Turbine Generation, Terminal Stations, Transmission, Distribution, Rural Generation, Properties, Metering, Tools and Equipment, Information Systems, Telecontrol projects, Transportation, Administration, Allowance for Unforeseen Items, Supplemental Capital projects, and projects less than $50,000.

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Table 3: 2017 Capital Expenditures – Hydraulic Generation ($000)

Hydraulic Generation Projects	Capital Budget							Actual Expenditure and Forecast								
	A		B	C	D (B+C)	E	F (A+C+E)	G		H	I	J	K (G+H+I)	K-F	H-D	
	2015	2016	Carryover 2016	2017	Revised 2017	2018 and Beyond	Total	2015	2016	2017	2018 and Beyond	Carryovers to 2018	Total	Project Variance	Annual Variance	Notes
2017 Projects																
Install Asset Health Monitoring System - Upper Salmon	-	-	-	438.0	438.0	203.4	641.4	-	-	214.9	203.4	223.1	641.4	(0.0)	(223.1)	1
Refurbish Main Generator Breaker - Upper Salmon	-	-	-	271.1	271.1	-	271.1	-	-	123.2	-	147.9	271.1	0.0	(147.9)	2
Water System Replacements - Bay d'Espoir and Cat Arm	-	-	-	265.5	265.5	2,288.3	2,553.8	-	-	176.7	2,288.3	88.8	2,553.8	(0.0)	(88.8)	
Refurbish Powerhouse Station Services - Bay d'Espoir	-	-	-	413.2	413.2	3,933.9	4,347.1	-	-	43.0	3,933.9	370.2	4,347.1	0.0	(370.2)	3
Replace Exciter Controls Units 1 to 6 - Bay d'Espoir	-	-	-	119.2	119.2	3,227.8	3,347.0	-	-	182.7	3,227.8	(63.5)	3,347.0	0.0	63.5	
Upgrade Ventilation in Powerhouse 1 and 2 - Bay d'Espoir	-	-	-	134.1	134.1	863.8	997.9	-	-	111.8	863.8	22.3	997.9	(0.0)	(22.3)	
Upgrade Public Safety Around Dams and Waterways - Bay d'Espoir	-	-	-	489.0	489.0	-	489.0	-	-	355.5	-	-	355.5	(133.5)	(133.5)	4
Purchase Capital Spares - Hydraulic	-	-	-	487.4	487.4	-	487.4	-	-	325.2	-	362.2	687.4	200.0	(162.2)	5
Replace Slip Rings Units 1-6 - Bay d'Espoir	-	-	-	312.6	312.6	159.7	472.3	-	-	102.4	159.7	210.2	472.3	0.0	(210.2)	6
Refubish Sump Level System for Powerhouse 2 - Bay d'Espoir	-	-	-	38.7	38.7	264.5	303.2	-	-	10.6	264.5	28.1	303.2	0.0	(28.1)	
Install Wind Monitoring Station North Salmon Dam SD-2 - Bay d'Espoir	-	-	-	165.5	165.5	-	165.5	-	-	52.3	-	113.2	165.5	0.0	(113.2)	7
Replace Floor Annunciator Panels - Bay d'Espoir	-	-	-	46.8	46.8	-	46.8	-	-	45.5	-	-	45.5	(1.3)	(1.3)	
Control Structure Refurbishments	-	-	-	1,735.3	1,735.3	452.9	2,188.2	-	-	991.4	452.9	743.9	2,188.2	(0.0)	(743.9)	8
Overhaul Turbine/Generators - Cat Arm	-	-	-	305.4	305.4	-	305.4	-	-	334.1	-	-	334.1	28.7	28.7	
Purchase Tools and Equipment Less than $ 50,000	-	-	-	113.4	113.4	-	113.4	-	-	112.0	-	-	112.0	(1.4)	(1.4)	
2016 Projects																
Install Hydrometeorological Equipment - Various Sites	-	314.1	309.8	0.0	309.8	-	314.1	-	4.3	179.0	-	-	183.3	(130.8)	(130.8)	9
Replace Control Room/Communications Room Air Conditioning - Hinds Lake	-	41.3	10.3	53.0	63.3	-	94.3	-	31.0	65.4	-	-	96.4	2.1	2.1	
Refurbish Station Water System - Upper Salmon	-	96.6	58.3	197.6	255.9	-	294.2	-	38.3	161.0	-	94.9	294.2	(0.0)	(94.9)	
Upgrade Work - Cat Arm	-	558.3	317.9	1,353.0	1,670.9	-	1,911.3	-	240.4	760.6	-	910.3	1,911.3	(0.0)	(910.3)	10
Rehabilitate Shoreline Protection - Cat Arm	-	112.2	7.5	1,030.7	1,038.2	-	1,142.9	-	104.7	61.0	-	977.2	1,142.9	(0.0)	(977.2)	11
Replace Site Facilities - Bay d'Espoir	-	928.3	657.9	4,736.3	5,394.2	6,316.7	11,981.3	-	270.4	2,231.6	6,316.7	3,162.6	11,981.3	0.0	(3,162.6)	12
Replace PH1 Station Service Transformer - Bay d'Espoir	-	46.7	1.7	354.5	356.2	-	401.2	-	45.0	488.1	-	-	533.1	131.9	131.9	13
Replace Spherical By-Pass Valves Units 1 and 2 - Bay d'Espoir	-	183.6	28.8	167.9	196.7	-	351.5	-	154.8	51.8	-	144.9	351.5	0.0	(144.9)	14
Overhaul Turbine/Generator Units #6 and #7 - Bay d'Espoir	-	1,345.6	56.2	0.0	56.2	-	1,345.6	-	544.5	65.3	-	-	609.8	(735.8)	9.1	15
2015 Projects																
Replace Station Service Breakers - Cat Arm	644.9	363.4	176.3	0.0	176.3	-	1,008.3	646.1	185.9	204.8	-	-	1,036.8	28.5	28.5	
Replace Pump House and Associated Equipment - Bay d'Espoir	22.7	522.5	279.6	0.0	279.6	-	545.2	137.0	128.6	26.0	-	253.6	545.2	(0.0)	(253.6)	16
Upgrade Equipment Doors - Various Sites	348.5	-	46.7	0.0	46.7	-	348.5	285.4	115.4	11.9	-	-	412.7	64.2	(34.8)	
Total Hydraulic Generation Projects	**1,016.1**	**4,512.6**	**1,951.0**	**13,228.2**	**15,179.2**	**17,711.0**	**36,467.9**	**1,068.5**	**1,863.3**	**7,488.0**	**17,711.0**	**7,789.9**	**35,920.7**	**(547.2)**	**(7,691.2)**	

Table 4: 2017 Capital Expenditures – Thermal Generation ($000)

Thermal Generation Projects	Capital Budget						Actual Expenditure and Forecast							
	A	B	C	D (B+C)	E	F (A+C+E)	G	H	J	J	K (G+H+I+J)	K-F	H-D	
		Carryover	Original	Revised	2018 and				2018 and	Carryovers		Project	Annual	
	2016	2016	2017	2017	Beyond	Total	2016	2017	Beyond	to 2018	Total	Variance	Variance	Notes
2017 Projects														
Overhaul Turbine Valves Unit 2 - Holyrood	-	-	2,302.1	2,302.1	-	2,302.1	-	2,496.6	-	-	2,496.6	194.5	194.5	
Purchase Capital Spares Holyrood	-	-	321.5	321.5	-	321.5	-	338.3	-	-	338.3	16.8	16.8	
Condition Assessment and Miscellaneous Upgrades - Holyrood	-	-	2,437.3	2,437.3	-	2,437.3	-	3,058.1	-	-	3,058.1	620.8	620.8	17
Upgrade Holyrood Access Road - Holyrood	-	-	579.3	579.3	583.4	1,162.7	-	825.7	-	-	825.7	(337.0)	246.4	18
Upgrade Underground Plant Drainage System - Holyrood	-	-	923.1	923.1	-	923.1	-	1,825.2	-	(10.7)	1,814.5	891.4	902.1	19
Overhaul Pumps - Holyrood	-	-	633.0	633.0	-	633.0	-	661.3	-	-	661.3	28.3	28.3	
Purchase Tools and Equipment Less than $ 50,000	-	-	16.1	16.1	-	16.1	-	15.0	-	-	15.0	(1.1)	(1.1)	
2016 Projects														
Upgrade Powerhouse Building Envelope - Holyrood	2,723.8	483.9	2,969.9	3,453.8	784.1	6,477.8	2,239.9	2,378.2	784.1	1,075.6	6,477.8	(0.0)	(1,075.6)	20
Total Thermal Generation Projects	**2,723.8**	**483.9**	**10,182.3**	**10,666.2**	**1,367.5**	**14,273.6**	**2,239.9**	**11,598.5**	**784.1**	**1,064.9**	**15,687.4**	**1,413.8**	**932.3**	

Table 5: 2017 Capital Expenditures – Gas Turbine Generation ($000)

Gas Turbine Generation Projects	Capital Budget						Actual Expenditure and Forecast							
	A	B	C	D (B+C)	E	F (A+C+E)	G	H	I	J	K (G+H+I+J)	K-F	H-D	
	2016	Carryover 2016	Original 2017	Revised 2017	2018 and Beyond	Total	2016	2017	2018 and Beyond	Carryover to 2018	Total	Project Variance	Annual Variance	Notes
2017 Projects														
Gas Turbine Life Extension - Stephenville	-	-	847.5	847.5	505.7	1,353.2	-	342.2	505.7	24.1	872.0	(481.2)	(505.3)	21
Gas Turbine Life Extension - Hardwoods	-	-	675.3	675.3	281.4	956.7	-	273.6	281.4	28.3	583.3	(373.4)	(401.7)	22
Purchase Capital Spares - Gas Turbines	-	-	185.0	185.0	-	185.0	-	161.2	-	-	161.2	(23.8)	(23.8)	
2016 Projects														
Replace Fuel Piping - Hardwoods and Stephenville	44.8	33.2	267.0	300.2	-	311.8	11.6	256.3	-	-	267.9	(43.9)	(43.9)	
Total Gas Turbine Generation Projects	**44.8**	**33.2**	**1,974.8**	**2,008.0**	**787.1**	**2,806.7**	**11.6**	**1,033.3**	**787.1**	**52.4**	**1,884.4**	**(922.3)**	**(974.7)**	

Table 6: 2017 Capital Expenditures – Terminal Stations ($000)

Terminal Stations Projects	Capital Budget									Actual Expenditure and Forecast										
	A				B	C	D (B+C)	E	F (A+C+E)	G				H	I	J	K (G+H+I+J)	K-F	H-D	
	2013	2014	2015	2016	Carryover 2016	Original 2017	Revised 2017	2018 and Beyond	Total	2013	2014	2015	2016	2017	2018 and Beyond	Carryovers to 2018	Total	Project Variance	Annual Variance	Notes
2017 Projects																				
Upgrade Corner Brook Frequency Converter - Corner Brook	-	-	-	-	-	194.6	194.6	2,749.2	2,943.8	-	-	-	-	42.2	2,749.2	152.4	2,943.8	0.0	(152.4)	23
Replace 66 kV Station Service Feed - Holyrood	-	-	-	-	-	62.8	62.8	1,198.6	1,261.4	-	-	-	-	80.7	1,198.6	(17.9)	1,261.4	0.0	17.9	
Replace Substation - Holyrood	-	-	-	-	-	439.4	439.4	758.6	1,198.0	-	-	-	-	115.4	758.6	324.0	1,198.0	(0.0)	(324.0)	24
Replace Power Transformers - Oxen Pond	-	-	-	-	-	297.5	297.5	850.1	1,147.6	-	-	-	-	109.1	850.1	188.4	1,147.6	0.0	(188.4)	25
In-Service Failures - Various Sites	-	-	-	-	-	1,000.0	1,000.0	-	1,000.0	-	-	-	-	1,437.2	-	-	1,437.2	437.2	437.2	26
Purchase Capital Spares - Terminal Stations	-	-	-	-	-	495.8	495.8	-	495.8	-	-	-	-	397.8	-	-	397.8	(98.0)	(98.0)	
Upgrade Aluminum Support Structures - Holyrood	-	-	-	-	-	352.9	352.9	-	352.9	-	-	-	-	190.8	-	-	190.8	(162.1)	(162.1)	27
Purchase Backup Diesel For Station Service - Grand Falls and Buchans	-	-	-	-	-	188.9	188.9	-	188.9	-	-	-	-	149.3	-	-	149.3	(39.6)	(39.6)	
Terminal Station Refurbishment and Modernization - Various Sites	-	-	-	-	-	10,831.3	10,831.3	16,550.8	27,382.1	-	-	-	-	5,852.1	16,550.8	3,138.3	25,541.2	(1,840.9)	(4,979.2)	28
2016 Projects																				
Upgrade Circuit Breakers - Various Sites (2016-2020)	-	-	-	6,969.1	1,369.6	10,808.7	12,178.3	43,682.7	61,460.5	-	-	-	5,599.5	8,877.8	43,682.7	3,300.5	61,460.5	(0.0)	(3,300.5)	29
Replace Surge Arrestors - Various Sites	-	-	-	144.4	(30.7)	53.0	22.3	-	197.4	-	-	-	175.1	-	-	-	175.1	(22.3)	(22.3)	
Replace Protective Relays - Various Sites	-	-	-	700.6	(725.2)	1,156.4	431.2	-	1,857.0	-	-	-	1,425.8	1,134.5	-	267.5	2,827.8	970.8	703.3	30
Replace Disconnect Switches - Various Sites (2016-2017)	-	-	-	646.9	515.2	1,320.9	1,836.1	-	1,967.8	-	-	-	131.7	1,064.9	-	771.2	1,967.8	(0.0)	(771.2)	31
Upgrade Digital Fault Recorders - Various Sites	-	-	-	197.9	(23.3)	304.6	281.3	-	502.5	-	-	-	221.2	328.8	-	-	550.0	47.5	47.5	
Upgrade Data Alarm Systems - Various Sites	-	-	-	74.4	24.7	234.1	258.8	-	308.5	-	-	-	49.7	116.0	-	142.8	308.5	0.0	(142.8)	32
Install Breaker Failure Protection - Various Sites	-	-	-	65.7	(16.1)	211.3	195.2	-	277.0	-	-	-	81.8	382.4	-	22.2	486.4	209.4	187.2	33
Install Fire Protection in 230 kV Stations - Bay d'Espoir	-	-	-	200.0	108.6	566.0	674.6	-	766.0	-	-	-	91.4	100.7	-	681.7	873.8	107.8	(573.9)	34
Upgrade Terminal Station for Mobile Substation - Cow Head	-	-	-	40.0	12.5	444.7	457.2	-	484.7	-	-	-	27.5	359.9	-	-	387.4	(97.3)	(97.3)	
2013 Projects																				
Replace Instrument Transformers - Various Sites	593.2	552.8	538.4	1,511.7	311.0	471.9	782.9	-	3,668.0	240.3	699.0	755.5	1,190.3	711.0	-	31.9	3,628.0	(40.0)	(71.9)	
Total Terminal Stations Projects	**593.2**	**552.8**	**538.4**	**10,550.7**	**1,546.3**	**29,434.8**	**30,981.1**	**65,790.0**	**107,459.9**	**240.3**	**699.0**	**755.5**	**8,994.0**	**21,450.7**	**65,790.0**	**9,003.0**	**106,932.5**	**(527.4)**	**(9,530.4)**	

Table 7: 2017 Capital Expenditures – Transmission ($000)

Transmission Projects	Capital Budget								Actual Expenditure and Forecast									
	A			B	C	D	E	F (A+C+E)	G			H	I	J	K(G+H+I+J)	K-F	H-D	
	2014	2015	2016	Carryover 2016	Original 2017	Revised 2017	2018 and Beyond	Total	2014	2015	2016	2017	2018 and Beyond	Carryovers to 2018	Total	Project Variance	Annual Variance	Notes
2017 Projects																		
Transmission Line Upgrades - TL212 and TL218	-	-	-	-	1,378.2	1,378.2	1,133.3	2,511.5	-	-	-	287.1	1,133.3	1,091.1	2,511.5	0.0	(1,091.1)	35
Replace Insulators - TL227	-	-	-	-	145.6	145.6	271.3	416.9	-	-	-	16.7	271.3	128.9	416.9	(0.0)	(128.9)	36
Wood Pole Line Management Program - Various Sites	-	-	-	-	2,404.1	2,404.1	-	2,404.1	-	-	-	3,234.6	-	-	3,234.6	830.5	830.5	37
2016 Projects																		
Construct 230 kV Transmission Line - Soldiers Pond to Hardwoods	-	-	3,699.0	197.4	17,489.8	17,687.2	5,372.1	26,560.9	-	-	3,501.6	11,210.6	11,876.5	(27.8)	26,560.9	(0.0)	(6,476.6)	38
Replace Aircraft Markers at Grand Lake Crossing - TL228	-	-	589.6	527.8	978.3	1,506.1	-	1,567.9	-	-	61.8	1,424.6	-	-	1,486.4	(81.5)	(81.5)	
2014 Projects																		
Refurbish Anchors and Footings TL202 and TL206 - Bay d'Espoir to Sunnyside	211.5	28.4	1,038.4	1,018.7	901.6	1,920.3	-	2,179.9	211.5	28.2	19.9	90.5	-	1,829.8	2,179.9	0.0	(1,829.8)	39
230 kV Transmission Line - Bay d'Espoir to Western Avalon	-	4,403.0	75,284.3	26,108.6	149,895.7	176,004.3	62,075.0	291,658.0	-	2,018.2	59,317.8	213,663.7	17,418.3	(760.0)	291,658.0	(0.0)	37,659.4	40
Total Transmission Projects	**211.5**	**4,431.4**	**80,611.3**	**27,852.5**	**173,193.3**	**201,045.8**	**68,851.7**	**327,299.2**	**211.5**	**2,046.4**	**62,901.1**	**229,927.8**	**30,699.4**	**2,262.0**	**328,048.2**	**749.0**	**28,882.0**	

Table 8: 2017 Capital Expenditures – Distribution ($000)

Distribution Projects	Capital Budget						Actual Expenditure and Forecast							
	A	B	C	D (B+C)	E	F (A+C+E)	G	H	I	J	K (G+H+I+J)	K-F	H-D	
	2016	Carryover 2016	Original 2017	Revised 2017	2018 and Beyond	Total	2016	2017	2018 and Beyond	Carryovers to 2018	Total	Project Variance	Annual Variance	Notes
2017 Projects														
Provide Service Extensions - All Service Areas	-	-	4,530.0	4,530.0	-	4,530.0	-	4,545.6	-	-	4,545.6	15.6	15.6	
Provide Service Extensions - All Service Areas - CIAC	-	-	(200.0)	(200.0)	-	(200.0)	-	(323.6)	-	-	(323.6)	(123.6)	(123.6)	41
Upgrade Distribution Systems - All Service Areas	-	-	3,910.0	3,910.0	-	3,910.0	-	3,745.0	-	-	3,745.0	(165.0)	(165.0)	
Upgrade Distribution Systems - All Service Areas - CIAC	-	-	(100.0)	(100.0)	-	(100.0)	-	(165.8)	-	-	(165.8)	(65.8)	(65.8)	
Distribution Upgrades - Various Sites (2017-2018)	-	-	64.2	64.2	1,130.9	1,195.1	-	78.7	1,130.9	(14.5)	1,195.1	0.0	14.5	
Install Recloser Remote Control - Bottom Waters	-	-	47.1	47.1	418.6	465.7	-	63.9	418.6	(16.8)	465.7	(0.0)	16.8	
Install Demand Metering - Various Sites	-	-	89.7	89.7	-	89.7	-	73.4	-	-	73.4	(16.3)	(16.3)	
Replace Recloser - Wabush	-	-	199.2	199.2	-	199.2	-	116.0	-	-	116.0	(83.2)	(83.2)	
2016 Projects														
Upgrade Distribution Systems - Various Sites (2016/2017)	285.6	(76.2)	6,350.3	6,274.1	-	6,635.9	361.8	5,363.1	-	911.0	6,635.9	0.0	(911.0)	42
Total Distribution Projects	**285.6**	**(76.2)**	**14,890.5**	**14,814.3**	**1,549.5**	**16,725.6**	**361.8**	**13,496.4**	**1,549.5**	**879.7**	**16,287.4**	**(438.2)**	**(1,317.9)**	

Table 9: 2017 Capital Expenditures – Rural Generation ($000)

Rural Generation Projects	Capital Budget								Actual Expenditure and Forecast									
	A			B	C	D	E	F (A+C+E)	G			H	I	J	K (G+H+I+J)	K-F	H-D	
	2014	2015	2016	Carryover 2016	Original 2017	Revised 2017	2018 and Beyond	Total	2014	2015	2016	2017	2018 and Beyond	Carryovers to 2018	Total	Project Variance	Annual Variance	Notes
2017 Projects																		
Overhaul Diesel Engines - Various Sites	-	-	-	-	2,095.9	2,095.9	-	2,095.9	-	-	-	1,619.8	-	-	1,619.8	(476.1)	(476.1)	43
Diesel Plant Engine Auxiliary Upgrades - Various Sites	-	-	-	-	790.6	790.6	416.3	1,206.9	-	-	-	644.7	416.3	145.9	1,206.9	0.0	(145.9)	44
Inspect Fuel Storage Tanks - Various Sites	-	-	-	-	1,058.8	1,058.8	-	1,058.8	-	-	-	717.3	-	-	717.3	(341.5)	(341.5)	45
Replace Automation Equipment - Mary's Harbour	-	-	-	-	120.3	120.3	1,021.7	1,142.0	-	-	-	87.4	1,021.7	32.9	1,142.0	(0.0)	(32.9)	
Replace Fuel Tank 22E - St. Anthony	-	-	-	-	199.8	199.8	-	199.8	-	-	-	139.0	-	-	139.0	(60.8)	(60.8)	
Diesel Genset Replacements - Port Hope Simpson and Charlottetown	-	-	-	-	658.8	658.8	5,148.0	5,806.8	-	-	-	213.6	5,148.0	445.2	5,806.8	0.0	(445.2)	46
2016 Projects																		
Upgrade Human Machine Interface - Various Sites	-	-	114.0	(11.3)	320.0	308.7	-	434.0	-	-	125.3	235.7	-	73.0	434.0	(0.0)	(73.0)	
Install Variable Frequency Drives - Grey River	-	-	46.9	(2.8)	123.0	120.2	-	169.9	-	-	49.7	207.8	-	-	257.5	87.6	87.6	
Install Fire Protection Systems - Cartwright and Nain	-	-	3,030.7	1,557.1	1,376.4	2,933.5	-	4,407.1	-	-	782.8	2,869.3	-	-	3,652.1	(755.0)	(64.2)	47
Upgrade Transformer Systems - Postville and Cartwright	-	-	465.2	169.2	-	169.2	-	465.2	-	-	296.0	169.2	-	-	465.2	(0.0)	(0.0)	
Additions for Load Growth - Various Sites	-	-	883.4	693.0	4,746.0	5,439.0	-	5,629.4	-	-	190.4	4,402.1	-	-	4,592.5	(1,036.9)	(1,036.9)	48
Replace Diesel Units - Charlottetown			1,384.9	-	46.1	46.1	-	1,431.0	-	-	1,442.2	-	-	-	1,442.2	11.2	(46.1)	
2015 Projects																		
Replace Programmable Logic Controllers - Various Sites	-	366.9	346.0	(29.8)	245.1	215.3	-	958.0	-	397.2	345.5	410.5	-	51.5	1,204.7	246.7	195.2	49
2014 Projects																		
Upgrade Diesel Plant Production Data Collection Equipment-Various	268.9	269.8	280.7	143.2	-	143	-	819.4	107.8	57.8	510.6	166.5	-	-	842.7	23.3	23.3	
Total Rural Generation Projects	**268.9**	**636.7**	**6,551.8**	**2,518.6**	**11,780.8**	**14,299.4**	**6,586.0**	**25,824.2**	**107.8**	**455.0**	**3,742.5**	**11,882.8**	**6,586.0**	**748.5**	**23,522.6**	**(2,301.6)**	**(2,416.6)**	

Table 10: 2017 Capital Expenditures – Properties ($000)

Properties Projects	Capital Budget							Actual Expenditure and Forecast								
	A		B	C	D	E	F (A+C+E)	G		H	I	J	K (G+H+I+J)	K-F	H-D	
	2015	2016	Carryover 2016	Original 2017	Revised 2017	2018 and Beyond	Total	2015	2016	2017	2018 and Beyond	Carryovers to 2018	Total	Project Variance	Annual Variance	Notes
2017 Projects																
Upgrade Office Facilities & Control Buildings - Various Sites	-	-	-	2,197.3	2,197.3	-	2,197.3	-	-	1,815.2	-	-	1,815.2	(382.1)	(382.1)	50
Line Depot Condition Assessment and Refurbishment Program - Various Sites	-	-	-	1,458.8	1,458.8	-	1,458.8	-	-	689.4	-	-	689.4	(769.4)	(769.4)	51
Construct New Facilities - Various Sites	-	-	-	422.0	422.0	1,034.1	1,456.1	-	-	237.8	1,034.1	184.2	1,456.1	(0.0)	(184.2)	52
Install Fall Protection Equipment - Various Sites	-	-	-	194.7	194.7	-	194.7	-	-	161.3	-	-	161.3	(33.4)	(33.4)	
2016 Projects																
Upgrade Warehouse Lighting - Bishop's Falls	-	15.2	(12.9)	180.4	167.5	-	195.6	-	28.1	93.6	-	-	121.7	(73.9)	(73.9)	
Replace Roof on Service Building - Bishop's Falls	-	612.8	285.0	-	285.0	-	612.8	-	327.8	288.5	-	-	616.3	3.5	3.5	
2015 Projects																
Replace Accommodations and Septic System - Ebbegunbaeg	489.4	1,061.4	645.4	-	645.4	-	1,550.8	94.2	811.2	1,138.1	-	-	2,043.5	492.7	492.7	53
Total Properties Projects	**489.4**	**1,689.4**	**917.5**	**4,453.2**	**5,370.7**	**1,034.1**	**7,666.1**	**94.2**	**1,167.1**	**4,423.9**	**1,034.1**	**184.2**	**6,903.5**	**(762.6)**	**(946.8)**	

Table 11: 2017 Capital Expenditures – Metering ($000)

Metering Projects	Capital Budget						Actual Expenditure and Forecast							
	A	B	C	D	E	F (A+C+E)	G	H	I	J	K (G+H+I+J)	K-F	H-D	
	2016	Carryover 2016	Original 2017	Revised 2017	2018 and Beyond	Total	2016	2017	2018 and Beyond	Carryovers To 2018	Total	Project Variance	Annual Variance	Notes
2017 Projects														
Install Automated Meter Reading - Happy Valley (2017-2018)	-	-	78.6	78.6	1,891.6	1,970.2	-	183.8	1,891.6	(105.2)	1,970.2	0.0	105.2	54
Purchase Meters and Metering Equipment - Various Sites	-	-	198.8	198.8	-	198.8	-	273.9	-	-	273.9	75.1	75.1	
Purchase New Meter Calibration Test Console - Hydro Place	-	-	196.9	196.9	-	196.9	-	0.1	-	212.7	212.8	15.9	(196.8)	55
2016 Projects														
Install Automated Meter Reading - Labrador West	433.8	303.4	533.4	836.8	-	967.2	130.4	1,232.8	-	(3.2)	1,360.0	392.8	396.0	56
Total Metering Projects	**433.8**	**303.4**	**1,007.7**	**1,311.1**	**1,891.6**	**3,333.1**	**130.4**	**1,690.6**	**1,891.6**	**104.3**	**3,816.9**	**483.8**	**379.5**	

Table 12: 2017 Capital Expenditures – Tools and Equipment ($000)

Tools and Equipment	Capital Budget						Actual Expenditure and Forecast							
	A	B	C	D	E	F (A+C+E)	G	H	I	J	K (G+H+I+J)	K-F	H-D	
		Carryover	Original	Revised	2018 and				2018 and	Carryovers		Project	Annual	
	2016	2016	2017	2017	Beyond	Total	2016	2017	Beyond	to 2018	Total	Variance	Variance	Notes
2017 Projects														
Replace Light Duty Mobile Equipment - Various Sites	-	-	270.9	270.9	-	270.9	-	179.8	-	-	179.8	(91)	(91.1)	
Purchase Front End Loader with Backhoe - Wabush	-	-	133.2	133.2	-	133.2	-	132.8	-	-	132.8	(0)	(0.4)	
Tools and Equipment Less than $ 50,000	-	-	423.0	423.0	-	423.0	-	371.0	-	-	371.0	(52)	(52.0)	
2016 Projects														
Purchase Excavator - Bay d'Espoir	312.0	35.0	-	35.0	-	312.0	187.0	36.5	-	-	223.5	(88.5)	1.5	
Total Tools and Equipment	**312.0**	**35.0**	**827.1**	**862.1**	**-**	**1,139.1**	**187.0**	**720.1**	**-**	**-**	**907.1**	**(232.0)**	**(142.0)**	

Table 13: 2017 Capital Expenditures – Information Systems ($000)

Information Systems Projects	Capital Budget						Actual Expenditure and Forecast							
	A	B	C	D	E	F (A+C+E)	G	H	I	J	K (G+H+I+J)	K-F	H-D	
	2016	Carryover 2016	Original 2017	Revised 2017	2018 and Beyond	Total	2016	2017	2018 and Beyond	Carryovers to 2018	Total	Project Variance	Annual Variance	Notes
2017 Projects														
Upgrade Energy Management System - Hydro Place	-	-	427.0	427.0	-	427.0	-	433.4	-	-	433.4	6.4	6.4	
Replace Personal Computers - Hydro Place	-	-	401.4	401.4	-	401.4	-	394.4	-	-	394.4	(7.0)	(7.0)	
2016 Projects														
Implement Industrial Billing Software - Hydro Place	443.1	273.6	-	273.6	-	443.1	169.5	245.6	-	-	415.1	(28.0)	(28.0)	
Upgrade Microsoft Project - Hydro Place	683.7	26.8	953.4	980.2	957.3	2,594.4	656.9	960.0	957.3	20.2	2,594.4	(0.0)	(20.2)	
Cost Recoveries	(317.1)	(12.3)	(442.2)	(454.5)	(444.0)	(1,203.3)	(304.8)	(445.5)	(444.0)	(9.0)	(1,203.3)	0.0	9.0	
Upgrade Enterprise Storage Capacity - Hydro Place	628.8	164.3	-	164.3	-	628.8	464.5	97.8	-	-	562.3	(66.5)	(66.5)	
Cost Recoveries	(291.6)	(76.1)	-	(76.1)	-	(291.6)	(215.5)	(45.4)	-	-	(260.9)	30.7	30.7	
Upgrade Server Technology Program - Hydro Place	492.5	41.4	-	41.4	-	492.5	451.1	86.3	-	-	537.4	44.9	44.9	
Cost Recoveries	(228.5)	(19.2)	-	(19.2)	-	(228.5)	(209.3)	(39.1)	-	-	(248.4)	(19.9)	(19.9)	
Total Information Systems Projects	**1,410.9**	**398.5**	**1,339.6**	**1,738.1**	**513.3**	**3,263.8**	**1,012.4**	**1,687.4**	**513.3**	**11.2**	**3,224.3**	**(39.5)**	**(50.7)**	

Table 14: 2017 Capital Expenditures – Telecontrol ($000)

Telecontrol Projects	Capital Budget						Actual Expenditure and Forecast							
	A	B	C	D	E	F (A+C+E)	G	H	I	J	K (G+H+I+J)	K-F	H-D	
	2016	Carryover 2016	Original 2017	Revised 2017	2018 and Beyond	Total	2016	2017	2018 and Beyond	Carryovers to 2018	Total	Project Variance	Annual Variance	Notes
2017 Projects														
Purchase Tools and Equipment less than $50,000	-	-	45.2	45.2	-	45.2	-	48.7	-	-	48.7	3.5	3.5	
Replace Battery Banks and Chargers - Various Sites (2017-2018)	-	-	379.3	379.3	566.2	945.5	-	217.6	566.2	(4.3)	779.5	(166.0)	(161.7)	57
Replace Network Communications Equipment - Various Sites	-	-	199.3	199.3	-	199.3	-	228.6	-	-	228.6	29.3	29.3	
Upgrade Site Facilities	-	-	49.0	49.0	-	49.0	-	49.9	-	-	49.9	0.9	0.9	
Upgrade Access Roads to Microwave Sites - Various Sites	-	-	118.4	118.4	-	118.4	-	121.1	-	-	121.1	2.7	2.7	
Upgrade Telecontrol Facilities - Mary March Hill and Blue Grass Hill	-	-	91.2	91.2	665.9	757.1	-	123.3	665.9	(32.1)	757.1	(0.0)	32.1	
2016 Projects														
Replace Battery Banks and Chargers - Various Sites	425.0	59.3	456.6	515.9	-	881.6	365.7	279.6	-	-	645.3	(236.3)	(236.3)	58
Replace MDR 4000 Microwave Radio East - Various Sites	77.4	(36.0)	1,093.1	1,057.1	-	1,170.5	113.4	1,041.0	-	-	1,154.4	(16.1)	(16.1)	
Replace UPS Systems - Hydro Place	889.8	(38.8)	-	-38.8	-	889.8	928.6	49.9	-	-	978.5	88.7	88.7	
Replace Air Conditioners - Various Sites	39.9	(11.3)	152.0	140.7	-	191.9	51.2	145.1	-	-	196.3	4.4	4.4	
Replace Powerline Carrier - Various Sites	73.4	(4.0)	763.4	759.4	-	836.8	77.4	684.7	-	-	762.1	(74.7)	(74.7)	
Upgrade Telecontrol Facilities - Sandy Brook Hill	101.6	19.9	462.4	482.3	-	564.0	81.7	533.5	-	-	615.2	51.2	51.2	
Total Telecontrol Projects	**1,607.1**	**(10.9)**	**3,809.9**	**3,799.0**	**1,232.1**	**6,649.1**	**1,618.0**	**3,523.2**	**1,232.1**	**(36.4)**	**6,336.9**	**(312.2)**	**(275.8)**	

Table 15: 2017 Capital Expenditures – Transportation and Administration

Transportation	Capital Budget						Actual Expenditure and Forecast							
	A	B	C	D	E	F (A+C+E)	G	H	J	J	K (G+H+I+J)	K-F	H-D	
		Carryover	Original	Revised	2018 and					Carryovers		Project	Annual	
	2016	2016	2017	2017	Beyond	Total	2016	2017	Beyond	to 2018	Total	Variance	Variance	Notes
2017 Projects														
Replace Vehicles and Aerial Devices - Various Sites (2017-2018)	-	-	2,001.4	2,001.4	398.8	2,400.2	-	1,275.8	398.8	725.6	2,400.2	0.0	(725.6)	59
2016 Projects														
Replace Vehicles and Aerial Devices - Various Sites (2016-2017)	1,443.3	410.6	534.2	944.8	-	1,977.5	1,032.7	815.5	-	-	1,848.2	(129.3)	(129.3)	60
Purchase Vehicles and Aerial Devices - Various Sites	382.5	(87.9)	172.7	84.8	-	555.2	470.4	135.3	-	-	605.7	50.5	50.5	
Total Transportation	**1,825.8**	**322.7**	**2,708.3**	**3,031.0**	**398.8**	**4,932.9**	**1,503.1**	**2,226.6**	**398.8**	**725.6**	**4,854.1**	**(78.8)**	**(804.4)**	

Administrative	Capital Budget						Actual Expenditure and Forecast							
		Carryover	Original	Revised	2018 and					Carryovers		Project	Annual	
	2016	2016	2017	2017	Beyond	Total	2016	2017	Beyond	to 2018	Total	Variance	Variance	Notes
2017 Projects														
Remove Safety Hazards - Various Sites	-	-	198.6	198.6	-	198.6	-	185.9	-	-	185.9	(12.7)	(12.7)	
Replace Roof - Hydro Place	-	-	923.4	923.4	-	923.4	-	503.5	-	-	503.5	(419.9)	(419.9)	61
Purchase Tools and Equipment less than $50,000	-	-	83.6	83.6	-	83.6	-	42.0	-	-	42.0	(41.6)	(41.6)	
2016 Projects														
Replace Air Conditioning Units 8 and 14 - Hydro Place	34.6	3.6	229.5	233.1	-	264.1	31.0	213.6	-	19.5	264.1	(0.0)	(19.5)	
Total Administrative	**34.6**	**3.6**	**1,435.1**	**1,438.7**	**-**	**1,469.7**	**31.0**	**945.0**	**-**	**19.5**	**995.5**	**(474.2)**	**(493.7)**	

Table 16: 2017 Capital Expenditures – Allowance for Unforeseen Items, Supplemental Capital Projects, and Projects less than $50,000

Allowance For Unforeseen	Capital Budget								Actual Expenditure and Forecast								
	A			B	C	D	E	F (A+C+E)	G			H	I	J	K (G+H+I+J)	K-F	H-D	
	2014	2015	2016	Carryover 2016	Original 2017	Revised 2017	2018 and Beyond	Total	2014	2015	2016	2017	2018 and Beyond	Carryover to 2018	Total	Project Variance	Annual Variance	Notes
2017 Projects																		
Contingency Fund	-	-	-	-	1,000.0	1,000.0	-	1,000.0	-	-	-	-	-	-	-	(1,000.0)	(1,000.0)	
Transmission Line Emergency Refurbishments	-	-	-	-	-	-	-	-	-	-	-	506.2	-	-	506.2	506.2	506.2	
Holyrood Unit 2 Fire Damage Rehabilitation	-	-	-	-	-	-	-	-	-	-	-	540.8	-	-	540.8	540.8	540.8	
Allowance for Unforeseen Top Up P.U. No. 15 (2017)	-	-	-	-	500.0	500.0	-	500.0				-	-	-	-	(500.0)	(500.0)	
Contingency Top Up	-	-	-	-	540.0	540.0	-	540.0				-	-	-	-	(540.0)	(540.0)	
Emergency Repairs Penstock #1 - Bay d'Espoir	-	-	-	-	-	-	-	-				4,598.8	-	-	4,598.8	4,598.8	4,598.8	
Total Allowance For Unforeseen	**-**	**-**	**-**	**-**	**2,040.0**	**2,040.0**	**-**	**2,040**	**-**	**-**	**-**	**5,645.8**	**-**	**-**	**5,645.8**	**3,605.8**	**3,605.8**	**62**

Supplemental Projects	Capital Budget								Actual Expenditure and Forecast								
	2014	2015	2016	Carryover 2016	Original 2017	Revised 2017	2018 and Beyond	Total	2014	2015	2016	2017	2018 and Beyond	Carryover to 2018	Total	Project Variance	Annual Variance	Notes
2017 Projects																		
Additions for Load Growth - Bottom Waters	-	-	-	-	3,045.0	3,045.0	-	3,045.0	-	-	-	3,024.8	-	-	3,024.8	(20.2)	(20.2)	
Acquisition of two 230 kV Transmission Lines - Labrador West	-	-	-	-	3,168.9	3,168.9	-	3,168.9	-	-	-	2,913.1	-	-	2,913.1	(255.8)	(255.8)	
Unit 3 Turbine Rehabilitation - Bay d'Espoir	-	-	-	-	2,361.5	2,361.5	-	2,361.5	-	-	-	1,905.4	-	-	1,905.4	(456.1)	(456.1)	63
Exciter Controls Replacement - Holyrood	-	-	-	-	1,349.2	1,349.2	-	1,349.2	-	-	-	1,339.9	-	-	1,339.9	(9.3)	(9.3)	
Terminal Station Upgrades - Wabush	-	-	-	-	2,585.2	2,585.2	327.3	2,912.5	-	-	-	940.7	327.3	1,644.5	2,912.5	(0.0)	(1,644.5)	64
Penstock #2 Refurbishment - Bay d'Espoir	-	-	-	-	9,063.7	9,063.7	-	9,063.7	-	-	-	3,586.3	-	-	3,586.3	(5,477.4)	(5,477.4)	65
Reliability Improvements - Holyrood	-	-	-	-	2,610.0	2,610.0	-	2,610.0	-	-	-	3,586.6	-	16.7	3,603.3	993.3	976.6	66
Repair and Advanced Overhaul of the Happy Valley Gas Turbine	-	-	-	-	3,714.8	3,714.8	-	3,714.8	-	-	-	2,049.3	-	-	2,049.3	(1,665.5)	(1,665.5)	67
2016 Projects																		
Purchase of 12 MW Diesel Generation - Holyrood	-	-	4,700.0	916.0	-	916.0	-	4,700.0	-	-	3,784.0	497.1	-	418.9	4,700.0	(0.0)	(418.9)	68
TL 227 Distribution Line Sally's Cove L1	-	-	717.0	530.7	1,533.0	2,063.7	-	2,250.0	-	-	186.3	1,708.2	-	-	1,894.5	(355.5)	(355.5)	69
Refurbish Gas Generator Engines - Hardwoods and Stephenville	-	-	3,047.1	508.4	-	508.4	-	3,047.1	-	-	2,538.7	429.6	-	-	2,968.3	(78.8)	(78.8)	
2014 Projects																		
Labrador West Transmission Project - Construction Phase[1]	37,484.2	163,145.3	128,962.6	-	-	-	-	329,592.1	10,996.0	628.0	752.8	517.8	-	-	12,894.6	(316,697.5)	517.8	70
Total Supplemental Projects Approved by PUB	**37,484.2**	**163,145.3**	**137,426.7**	**1,955.1**	**29,431**	**31,386.4**	**327.3**	**367,814.8**	**10,996.0**	**628.0**	**7,261.8**	**22,498.8**	**327.3**	**2,080.1**	**43,792.0**	**(324,022.8)**	**(8,887.6)**	

Projects Less than $50,000	Capital Budget								Actual Expenditure and Forecast								
	2014	2015	2016	Carryover 2016	Original 2017	Revised 2017	2018 and Beyond	Total	2014	2015	2016	2017	2018 and Beyond	Carryover to 2018	Total	Project Variance	Annual Variance	Notes
2017 Projects																		
Three Phase Construction - Bishop's Falls	-	-	-	-	49.6	49.6	-	49.6	-	-	-	43.2	-	-	43.2	(6.4)	(6.4)	
Tools Procurement - Hardwoods and Stephenville Gas Turbine	-	-	-	-	47.2	47.2	-	47.2	-	-	-	35.5	-	-	35.5	(11.7)	(11.7)	
Replace Powerhouse #2 Lighting - Bay d'Espoir	-	-	-	-	48.0	48.0	-	48.0	-	-	-	46.1	-	-	46.1	(1.9)	(1.9)	
Replace Powerhouse Lighting - Paradise River	-	-	-	-	43.9	43.9	-	43.9	-	-	-	36.2	-	-	36.2	(7.7)	(7.7)	
Domestic Waterline Replacement - Holyrood	-	-	-	-	49.6	49.6	-	49.6	-	-	-	56.9	-	-	56.9	7.3	7.3	
Stage 1 Pumphouse Siding Replacement - Holyrood	-	-	-	-	49.9	49.9	-	49.9	-	-	-	51.9	-	-	51.9	2.0	2.0	
Line Replacement and New Valve - Holyrood	-	-	-	-	49.9	49.9	-	49.9	-	-	-	50.3	-	-	50.3	0.4	0.4	
Construct Smoking Shelter and Security Fence - Hydro Place	-	-	-	-	20.4	20.4	-	20.4	-	-	-	13.8	-	-	13.8	(6.6)	(6.6)	
Replace Generator Bearing Coolers - Upper Salmon	-	-	-	-	48.7	48.7	-	48.7	-	-	-	46.2	-	-	46.2	(2.5)	(2.5)	
Purchase 10 Aclara KV2C and Meters	-	-	-	-	49.9	49.9	-	49.9	-	-	-	40.1	-	-	40.1	(9.8)	(9.8)	
Replace Tracks for V7601 Groomer - Bay d'Espoir	-	-	-	-	1.0	1.0	43.7	44.7	-	-	-	-	43.7	1.0	44.7	-	(1.0)	
PA System Repairs - Holyrood	-	-	-	-	49.9	49.9	-	49.9				54.1	-	-	54.1	4.2	4.2	
2016 Projects																		
Replace Radiator Unit 2029 Makkovik	-	-	49.0	21.5	-	21.5	-	49.0	-	-	27.5	27.6	-	-	55.1	6.1	6.1	
Total Projects Less than $50,000	**-**	**-**	**49.0**	**21.5**	**508.0**	**529.5**	**43.7**	**600.7**	**-**	**-**	**27.5**	**501.8**	**43.7**	**1.0**	**574.0**	**(26.7)**	**(27.7)**	

[1] The construction of the Labrador West Transmission was approved by OC2014-033, February 2, 2014. The capital expenditures associated with this project are included in Work In Progress and as a result are currently excluded from average rate base. The costs to be included in rate base will be subject to review by the Board of Commissioners of Public Utilities.

4.0 Variance Explanations (Greater than $100,000 and 10% Variance from Budget)

The projects discussed in the following section have 2017 variances (project total or annual as indicated) of more than 10% and $100,000 when comparing the approved budget to the 2017 expenditures, whether it is a single year project or a multiyear project. The projects are ordered and numbered based upon the order and number they appear in the preceding set of tables.

4.1 Hydraulic Generation Projects

1. ***Install Asset Health Monitoring System – Upper Salmon***

Annual Variance ($000)

Budget: 438.0 Expenditures: 214.9 Variance: (223.1)

This is a two-year project (2017-2018) that commenced in 2017. The 2017 construction activities were estimated based on construction executed by a contractor. Hydro was able to leverage an opportunity to execute the activities using internal operations and maintenance resources, resulting in a first year expenditure less than budgeted. The planned scope of work for 2017 is complete. The project remains on schedule with no change to the overall budget, scope or completion date.

2. ***Refurbish Main Generator Breaker – Upper Salmon***

Annual Variance ($000)

Budget: 271.1 Expenditures: 123.2 Variance: (147.9)

This is a one-year project that commenced in 2017 and carried over to 2018. The variance in 2017 expenditure is attributed to rescheduling the construction activity from 2017 to 2018. The rescheduling of the work was necessary when the generation unit outage was advanced from the planned outage in October 2017 to a new outage window in August 2017 due to a change in the overall generation outage schedule. The work on the unit breaker can only be completed during a generating unit outage

and the parts required for the work were not available for the advanced outage date. There is no change to the overall project scope or budget.

3. ***<u>Refurbish Powerhouse Station Services – Bay d'Espoir</u>***

Annual Variance ($000)

Budget: 413.2 Expenditures: 43.0 Variance (370.2)

This is a three-year project (2017-2019) that commenced in 2017. Engineering commenced in late 2017 and the project schedule is expected to recover in 2018. There is no change to the overall project scope, budget or completion date.

4. ***<u>Upgrade Public Safety around Dams and Waterways – Bay d'Espoir</u>***

Project Variance ($000)

Budget: 489.0 Expenditures: 355.5 Variance: (133.5)

This was a one-year project (2017) that is part of an ongoing program to U*pgrade Public Safety around Dams and Waterways*. The construction activity for this project was planned for construction by internal operations and maintenance resources. A portion of the 2017 construction was incomplete due to operations and maintenance resources being re-deployed to address higher priority work including emergency work associated with leakage on Bay d'Espoir Penstock 1. As this is an ongoing program, the 2017 project was closed and the incomplete scope will be completed in 2018 as part of the next *Upgrade Public Safety around Dams and Waterways Project*.

5. ***<u>Purchase Capital Spares – Hydraulic</u>***

Annual Variance ($000)

Budget: 487.4 Expenditures: 325.2 Variance: (162.2)

Project Variance ($000)

Budget: 487.4 Expenditures & Forecast: 687.4 Variance: 200.0

This is a one-year project that commenced in 2017 and carried over to 2018. Some of the capital spares components that were ordered in 2017 did not arrive by year end. Spare excitation transformers for Hinds Lake and Bay d'Espoir Unit 7 arrived in January 2018 following weather delays during transportation. Spare exciter slip rings for Hinds Lake are being procured from the original equipment manufacturer with a longer lead time than originally anticipated. The slip rings have been ordered with an expected delivery in May 2018.

In 2017, Hydro experienced failures of generator bearing coolers in Hinds Lake, and determined that spare coolers were required in the event of additional failures in the 2017-2018 winter season. A spare set of coolers were ordered under this project and received in 2017.

The annual variance in 2017 expenditure is attributed to the delay in delivery from 2017 to 2018 of the transformers and slip rings, partially off-set by the procurement of coolers for Hinds Lake. The forecasted variance in total project expenditure is attributed to the addition of the Hinds Lake coolers to the project scope.

6. ***<u>Replace Slip Rings Units 1-6 – Bay d'Espoir</u>***

Annual Variance ($000)

Budget: 312.6 Expenditures: 102.4 Variance: (210.2)

This is a two-year project (2017-2018) that commenced in 2017. The original project cash flow assumed that the procurement cost to acquire the slip rings would be incurred in 2017. As the slip rings are in inventory, the new slip rings will be sourced from inventory when required in 2018, at which time the cost will be assigned to the capital project. There is no change to the overall project scope, budget or schedule.

7. ***<u>Install Wind Monitoring Station North Salmon Dam SD-2 – Bay d'Espoir</u>***

Annual Variance ($000)

Budget: 165.5 Expenditures: 52.3 Variance: (113.2)

This is a one-year project that commenced in 2017 and carried over to 2018. This work was planned for construction by internal operations and maintenance resources late in 2017, following the resource intense outage maintenance season. The work was then delayed due to operations and maintenance resources being re-deployed to address higher priority work including emergency work associated with leakage on Bay d'Espoir Penstock 1. The work has been rescheduled for completion in early 2018 when internal resources are expected to be available. All materials have been procured and are located at North Salmon. There is no change to overall project scope or budget.

8. ***<u>Control Structure Refurbishments</u>***

Annual Variance ($000)

Budget: 1,735.3 Expenditures: 991.4 Variance: (743.9)

This is a two-year project that commenced in 2017. The assignment of critical supplemental capital projects to the project team resulted in adjustments being

required in engineering design and material procurement originally planned for 2017. The project schedule is expected to recover in 2018. There is no change to the overall project scope, budget or completion date.

9. ***<u>Install Hydrometeorological Equipment – Various Sites</u>***

Project Variance ($000)

Budget: 314.1 Expenditures: 183.3 Variance: (130.8)

This is a one-year project that commenced in 2016, and was carried over and completed in 2017. The variance in overall project expenditures is attributed to lower than estimated construction costs.

10. ***<u>Upgrade Work – Cat Arm</u>***

Annual Variance ($000)

Budget: 1,670.9 Expenditures: 760.6 Variance: (910.3)

This is a two-year project (2016-2017) that commenced in 2016 and carried over to 2018. The carryover is attributed to a delay in procurement of deflector servomotors and a delay in the construction for the spherical controls upgrades. The deflector servomotors were planned to be ordered from the original equipment manufacturer. Prior to placing the order, Hydro tested the original equipment manufacturer's design and deemed it to be unsatisfactory; a new design is required. A new servomotor has been designed and manufactured and is ready for installation in 2018. The spherical valve controls upgrade was scheduled for construction in the fall of 2017. Due to contractor material delivery issues for the valve controls upgrade, the risk of starting installation of the spherical valve controls without the necessary materials on site was assessed and determined to be too high. The work has been rescheduled to 2018. There is no change to overall project scope or budget.

11. ***<u>Rehabilitate Shoreline Protection – Cat Arm</u>***

Annual Variance ($000)

Budget: 1,038.2 Expenditures: 61.0 Variance: (977.2)

This is a two-year project (2016-2017) that commenced in 2016 and carried over to 2018. Failures in the mountain slope in the area sent large boulders directly into the proposed shoreline construction site. A consultant was engaged to develop a plan to mitigate the safety risk of further rock fall during construction. Hydro is evaluating the safety risk and the impact that it may have on the project, and has therefore carried the project over to 2018 to allow for time to complete this evaluation. The project cost and schedule is also being assessed in light of the requirement for safety risk mitigation.

12. ***<u>Replace Site Facilities – Bay d'Espoir</u>***

Annual Variance ($000)

Budget: 5,394.2 Expenditures: 2,231.6 Variance: (3,162.6)

This is a three-year project (2016-2018) that commenced in 2016. The variance in 2017 expenditure can be attributed to the late delivery of structural steel, which delayed portions of the schedule by over a month, delaying some steel installation and subsequent construction tasks into 2018. The contractor has committed extra resources in the first quarter of 2018 to recover the schedule. There is no change to the overall project budget, scope or completion date.

13. ***<u>Replace PH1 Station Service Transformer – Bay d'Espoir</u>***

Project Variance ($000)

Budget: 401.2 Expenditures: 533.1 Variance: 131.9

This was a two-year project (2016-2017) that commenced in 2016 and was completed in 2017. The variance in overall project expenditures is attributed to the publically tendered construction cost being higher than originally estimated.

14. ***<u>Replace Spherical By-Pass Valves Units 1 and 2 – Bay d'Espoir</u>***

Annual Variance ($000)

Budget: 196.7 Expenditures: 51.8 Variance: (144.9)

This is a two-year project (2016-2017) that commenced in 2016 and carried over to 2018. Project construction requires an outage of Bay d'Espoir Penstock 1, and, when this project was proposed in the *2016 Capital Budget Application*, was planned to coincide with the project to refurbish Surge Tank 1, which, at the time, was also planned for 2017, and which also requires an outage to Penstock 1. Given that the execution plan for Surge Tank 1 was changed to 2018, construction for the spherical valve by-pass valves has therefore been rescheduled to 2018 for execution in conjunction with the *2018 Surge Tank 1 Project*. There is no change to the overall project budget or scope.

15. ***<u>Overhaul Turbine/Generator Units #6 and #7 – Bay d'Espoir</u>***

Project Variance ($000)

Budget: 1,345.6 Expenditures: 609.8 Variance: (735.8)

This was a one-year project (2016) and due to unresolved contract terms with the original equipment manufacturer, and schedule conflicts with other on-going work, it was decided to limit part of the rotor scope for Unit 7 that was included in the whole project. The Unit 7 rotor scope was to address unacceptable vibration levels and was

limited to design only, with construction deferred until 2017. The generator bearing was replaced during the outage and resulted in a significant improvement to the operating vibration levels. Based on this improved performance, it was decided to cancel the remaining rotor scope instead of deferring it to 2017 in order to provide a timeframe to assess the long term performance of the generator with the new bearing. Throughout 2017 Unit 7 has had acceptable vibration levels. Approximately $60,000 of the project funds was carried from 2016 to 2017 to allow time for the old generator bearing to be refurbished and returned as a capital critical spare. This work was completed in 2017, and this project is now closed.

16. <u>Replace Pump House and Associated Equipment – Bay d'Espoir</u>

Annual Variance ($000)

Budget: 279.6 Expenditures: 26.0 Variance: (253.6)

This is a two-year project (2015-2016) that commenced in 2015 and is a carryover to 2017/2018. The total carryover budget was assigned to 2017 resulting in the variance in 2017.

The overall project cost for this project remains a concern. Engineering work commenced in 2016, and the construction was tendered but not awarded in 2016, since tendered prices were significantly higher than the budget. The project was carried over to reassess the execution and determine if any savings could be realized in pairing this project with the construction of the *Replace Site Facilities Project* in Bay d'Espoir. It was determined in 2017 that significant savings could not be realized. Furthermore, following Hurricane Matthew in October 2016, Hydro completed a flood study of this area in 2017, and those results may further increase the project scope and cost. Hydro is evaluating next steps for this project prior to proceeding.

4.2 Thermal Generation Projects

17. ***<u>Condition Assessment and Miscellaneous Upgrades – Holyrood</u>***

Project Variance ($000)

Budget: 2,437.3 Expenditures: 3,058.1 Variance: 620.8

This was a one-year project completed in 2017. The variance in expenditure is attributed to the requirement for additional work identified during the discovery phase of the project. The extent of testing required to accurately track degradation of the high energy piping due to flow accelerated corrosion was more than originally anticipated. In addition, the number of expansion joints requiring replacement increased for Units 1 and 2, due to the identification of additional leaks.

During the condition assessment of the boiler feedwater piping, it was determined that some piping components required immediate replacement prior to returning to service. This scope was completed as part of this project. In 2018, this type of replacement due to failure will be covered in the Thermal In-service Failures project.

18. ***<u>Upgrade Holyrood Access Road – Holyrood</u>***

Project Variance ($000)

Budget: 1,162.7 Expenditures: 825.7 Variance: (337.0)

This was a two-year project (2017-2018) that commenced in 2017 and was completed in 2017. Hydro tendered the construction work with optional pricing to complete all of the construction in the first year. The optional pricing was favorable and Hydro proceeded to complete the project in 2017. The variance in project expenditures is attributed to lower than estimated contract pricing as well as savings associated with completing the project in a single year.

19. ***<u>Upgrade Underground Plant Drainage System – Holyrood</u>***

Annual Variance ($000)

Budget: 923.1 Expenditures: 1,825.2 Variance: 902.1

Project Variance ($000)

Budget: 923.1 Expenditures and Forecast: 1,814.5 Variance: 891.4

This is a one-year project that commenced in 2017 and carried over to 2018. The project is substantially complete and in service. It was determined during construction that one section of piping planned to be replaced during a generating unit outage in 2017 could only be completed during a total plant outage. This portion of the project construction has been rescheduled to the next available total plant outage in 2018.

The variance in annual expenditures, and forecasted variance in total project expenditures, is attributed to the requirement to replace more piping that originally estimated (due to further deterioration of the piping from the time of the budget proposal), higher than expected contract tender prices, and the requirement for asbestos removal, which was not included in the original estimate.

20. ***<u>Upgrade Powerhouse Building Envelope – Holyrood</u>***

Annual Variance ($000)

Budget: 3,453.8 Expenditures: 2,378.2 Variance: (1,075.6)

This is a three-year project (2016-2018) that commenced in 2016. As part of a construction safety risk review, it was determined that the roof and siding work in the vicinity of the unit transformers could only be safely completed during a total plant outage, and not concurrently. Priority was placed on completing the roofing in 2017 and the siding installation was rescheduled to the total plant outage in 2018. There is no change to the overall project scope, budget or completion date.

4.3 Gas Turbine Generation Projects

21. ***<u>Gas Turbine Life Extension – Stephenville</u>***

Annual Variance ($000)

Budget: 847.5 Expenditures: 342.2 Variance: (505.3)

Project Variance ($000)

Budget: 1,353.2 Expenditures & Forecast: 872.0 Variance: (481.2)

This is a two-year project (2017-2018) that commenced in 2017. The variance in 2017 expenditures, and forecast variance in total project expenditures, is attributed to the removal of a portion of the project scope. As a result of the uncertainty around the longer term requirements of the Hardwoods and Stephenville gas turbines, Hydro continues to assess any proposed capital expenditures for these units. As a result of a comprehensive review of the project scope prior to project execution, Hydro removed from the scope the installation of closed circuit television cameras, and planned instrumentation upgrades were revised to include only those requiring immediate replacement, based on function testing and evaluation results. Project scope pertaining to the replacement of lube oil and fuel filters will be reviewed in 2018. There is no change to the overall project schedule.

22. ***<u>Gas Turbine Life Extension – Hardwoods</u>***

Annual Variance ($000)

Budget: 675.3 Expenditures: 273.6 Variance: (401.7)

Project Variance ($000)

Budget: 956.7 Expenditures & Forecast: 583.3 Variance: (373.4)

This is a two-year project (2017-2018) that commenced in 2017. The variance in 2017 expenditures, and forecast variance in total project expenditures, is attributed to the removal of a portion of the project scope. As a result of the uncertainty around the

longer term requirements of the Hardwoods and Stephenville gas turbines, Hydro continues to assess any proposed capital expenditures for these units. As a result of a comprehensive review of the project scope prior to project execution, Hydro removed from the scope the installation of closed circuit television cameras, and planned instrumentation upgrades were revised to include only those requiring immediate replacement, based on function testing and evaluation results. Project scope pertaining to the replacement of lube oil and fuel filters will be reviewed in 2018. There is no change to the overall project schedule.

4.4 Terminal Stations Projects

23. ***<u>Upgrade Corner Brook Frequency Converter – Corner Brook</u>***

Annual Variance ($000)

Budget: 194.6 Expenditures: 42.2 Variance: (152.4)

This is a two-year project (2017-2018) that commenced in 2017 and was placed on hold to confirm alignment with the customer. Activity in 2017 was limited to the level of engineering required for successful execution in 2018, should the project proceed. There is no change to the overall project scope, budget, or schedule.

24. ***<u>Replace Substation – Holyrood</u>***

Annual Variance ($000)

Budget: 439.4 Expenditures: 115.4 Variance: (324.0)

This is a two-year project (2017-2018) that commenced in 2017. The variance in 2017 expenditure is attributed to the rescheduling of civil construction to 2018. It was identified during planning that it would be more effective to execute the civil work in conjunction with the electrical work. There is no change to the overall project scope, budget or completion date.

25. ***Replace Power Transformers – Oxen Pond***

Annual Variance ($000)

Budget: 297.5 Expenditures: 109.1 Variance: (188.4)

This is a two-year project (2017-2018) that commenced in 2017. The variance in 2017 expenditures is attributed to a rescheduling of some of the engineering and procurement activity from 2017 to early 2018. This delay is not expected to impact the project construction schedule. There is no change to the overall project scope, budget or completion date.

26. ***Terminal Station In-Service Failures – Various Sites***

Project Variance ($000)

Budget: 1,000.0 Expenditures: 1,437.2 Variance: 437.2

This was a one-year project completed in 2017. The 2017 project variance is attributed to the actual number of failures incurred. A detailed list of work executed under this project is found in Section 8.0 of this report.

27. ***Upgrade Aluminum Support Structures – Holyrood***

Project Variance ($000)

Budget: 352.9 Expenditures: 190.8 Variance: (162.1)

This was a one-year project completed in 2017. The variance in project expenditures is attributed to cost savings measures determined during project planning and engineering. Existing temporary support structures were able to be used during construction of the permanent support structures, eliminating the need to fabricate additional temporary support structures. The project was executed in parallel with the *Terminal Station Refurbishment and Modernization Project*, allowing Hydro to realize efficiencies for engineering, procurement and construction effort.

28. ***<u>Terminal Station Refurbishment and Modernization – Various Sites</u>***

Annual Variance ($000)

Budget: 10,831.3 Expenditures: 5,852.1 Variance: (4,979.2)

This is a two-year project (2017-2018) that commenced in 2017 and includes a number of consolidated program-type terminal station projects. The variance in 2017 expenditure is primarily associated with the capital programs for power transformers, instrument transformers, disconnect switches and grounding systems, and is primarily attributed to the cancellation or rescheduling of various project scope items due to new condition information, changing priorities for system reliability, and balancing of the overall work plan. Items removed from the project scope due to newly acquired condition assessment information indicating that the work was not immediately required include: St. Anthony Airport transformer T1 bushing replacement, and Buchans transformer T1 leak repair. Items rescheduled to 2018 due to reassessment and modification of priority level include: procurement of Holyrood transformer T3 coolers, replacement of Bay d'Espoir transformer T1 radiators, Stony Brook transformer T2 tap changer overhaul, Holyrood transformer T6 oil refurbishment, procurement of various disconnect switches and instrument transformers, and engineering for grounding upgrades.

29. ***<u>Upgrade Circuit Breakers – Various Sites (2016-2020)</u>***

Annual Variance ($000)

Budget: 12,178.3 Expenditures: 8,877.8 Variance: (3,300.5)

This is a five-year project (2016-2020) that commenced in 2016. The variance in 2017 expenditures is attributed to changes in the timing of several breaker upgrades reflecting changes in priorities since the plan was established and requirements to balance the overall work plan. A significant year of activity in terminal stations for other critical projects, including the terminal station work related to the construction of the new transmission line from Western Avalon to Bay d'Espoir (TL 267),

contributed to the rescheduling of scope for this project to future years. Breakers deferred to future years include two at Bay d'Espoir (B3B4 and B2B3) and one at Massey Drive (B1L28). There are no changes to the overall project scope, budget or completion date.

30. ***<u>Replace Protective Relays – Various Sites</u>***

Annual Variance ($000)

Budget: 431.2 Expenditures: 1,134.5 Variance: 703.3

Project Variance ($000)

Budget: 1,857.0 Expenditures & Forecast: 2,827.8 Variance: 970.8

This is a two-year project (2016-2017) that commenced in 2016 and carried over to 2018 for a portion of the work.

The carryover is attributed to changes in the timing of protective relay replacements at Holyrood and Bay d'Espoir reflecting changes in priorities since the plan was established and requirements to balance the overall work plan. A significant year of activity in terminal stations for other critical projects, including the terminal station aspects of the construction of the new transmission line from Western Avalon to Bay d'Espoir (TL 267), contributed to the rescheduling of scope for this project to future years. Work deferred to 2018 includes protective relay upgrades for Bay d'Espoir Transformer T6 and Generating Unit G6, line protection upgrade for Holyrood 39L, and protection upgrade for Holyrood Transformer T5.

The variance in 2017 expenditures, and forecast variance in total project expenditure, is attributed to higher than estimated engineering, procurement and construction cost. During the design phase of the project, Hydro's design standard for protective relays was revised. The changes to the standard were made to address lessons learned from system events. The updated standard significantly impacted the

overall design for these protection systems. This increased the engineering design effort on this project and resulted in increased procurement and construction costs due to the requirement for additional components to adhere to the new standard.

31. ***<u>Replace Disconnect Switches – Various Sites (2016-2017)</u>***

Annual Variance ($000)

Budget: 1,836.1 Expenditures: 1,064.9 Variance: (771.2)

This is a two-year project (2016-2017) that commenced in 2016 and carried over to 2018. The installation and commissioning for four of sixteen disconnect switches was carried over for completion in 2018. Due to a review of workload for internal construction resources and the demands on internal resources, the construction work for two disconnect switches in Bay d'Espoir (B1B2-1 and B3B4-1) and one disconnect switch in Sunnyside (B1L02-2/L02G) was scheduled to 2018. A significant year of activity in terminal stations for other critical projects, including the construction of the new transmission line from Western Avalon to Bay d'Espoir (TL 267), contributed to the rescheduling of this scope. A fourth disconnect switch in Churchill Falls (L13G) could not be completed in 2017 due to operational issues with the Happy Valley Gas Turbine, and this work has also been rescheduled to 2018. The variance in 2017 expenditure is attributed to rescheduling of the construction activity for those four disconnect switches. There is no change to the overall project scope or budget.

32. ***<u>Upgrade Data Alarm Systems – Various Sites</u>***

Annual Variance ($000)

Budget: 258.8 Expenditures: 116.0 Variance: (142.8)

This is a two-year project (2016-2017) that commenced in 2016 and carried over to 2018. The variance in 2017 expenditure is attributed to rescheduling some of the construction activity from 2017 to 2018. Due to a review of workload for internal

construction resources and the demands on protection and control resources, the construction work for most of the data alarm system upgrade activity was rescheduled to 2018. A significant year of activity in terminal stations for other critical projects, including the construction of the new transmission line from Western Avalon to Bay d'Espoir (TL 267), contributed to the rescheduling of scope for this project. There is no change to the overall project scope or budget.

33. ***<u>Install Breaker Failure Protection – Various Sites</u>***

Annual Variance ($000)

Budget: 195.2 Expenditures: 382.4 Variance: 187.2

Project Variance ($000)

Budget: 277.0 Expenditures & Forecast: 486.4 Variance: 209.4

This is a two-year project (2016-2017) that commenced in 2016 and carried over to 2018. Due to a review of workload for internal construction resources and the demands on protection and control resources, some of the construction work for the breaker failure protection installations has been rescheduled to 2018. A significant year of activity in terminal stations for other critical projects, including the construction of the new transmission line from Western Avalon to Bay d'Espoir (TL 267), contributed to the rescheduling of scope for this project to 2018.
The variance in 2017 expenditures, and forecast variance in total project expenditure, is attributed to higher than estimated engineering, procurement and construction cost. During the design phase of the project, Hydro's design standard for breaker failure protection was revised. The changes to the standard were made to address lessons learned from system events. The updated standard significantly impacted the overall design for breaker failure protection. This increased the engineering design effort on this project and resulted in increased procurement and construction costs due to the requirement for additional components to adhere to the new standard.

34. ***<u>Install Fire Protection in 230 kV Stations – Bay d'Espoir</u>***

Annual Variance ($000)

Budget: 674.6 Expenditures: 100.7 Variance: (573.9)

Project Variance ($000)

Budget: 766.0 Expenditures & Forecast: 873.8 Variance: 107.8

This is a two-year project (2016-2017) that commenced in 2016 and carried over to 2018. The carryover and the variance in 2017 expenditures are attributed to a rescheduling of the construction into 2018. This project is to construct a new fire protection system to protect the Bay d'Espoir Terminal Station 2 Control Building. That building was modified in 2017 as part of the separate project to construct a transmission line from Bay d'Espoir to Western Avalon (TL 267). Modifications included a building extension and new ventilation equipment, which impact the design of the fire protection system. It was therefore logical to delay the fire protection engineering and construction until the building modifications were complete. The building modifications were completed in 2017 and the fire protection project is on track for construction in 2018. The forecasted variance in overall project expenditures is attributed to the fire protection system design changes to incorporate protection of the extension to the building.

4.5 Transmission Projects

35. ***<u>Transmission Line Upgrades – TL 212 and TL 218</u>***

Annual Variance ($000)

Budget: 1,378.2 Expenditures: 287.1 Variance: (1,091.1)

This is a two-year project (2017-2018) that commenced in 2017. The variance in 2017 expenditures is attributed to the rescheduling of procurement and construction activities from 2017 to 2018. For TL 212, the work included working within a water body. Once the design was completed and work plans were developed the necessary

environmental permits to backfill the water body around the structure were unable to be obtained in 2017. The permits have been obtained to complete work in 2018. An unanticipated lead time on the delivery of insulator for TL 218 has necessitated rescheduling construction to 2018. There is no change to the overall project scope or budget.

36. ***Replace Insulators – TL 227***

Annual Variance ($000)

Budget: 145.6 Expenditures: 16.7 Variance: (128.9)

This is a two-year project (2017-2018) that commenced in 2017. The variance in 2017 expenditures is attributed to longer than estimated lead time for the insulators, resulting in procurement costs to be incurred in 2018 versus 2017. The longer delivery time does not impact project construction schedules. There is no change to the overall project scope, schedule or budget.

37. ***Wood Pole Line Management Program – Various Sites***

Project Variance ($000)

Budget: 2,404.1 Expenditures: 3,234.6 Variance: 830.5

This was a one-year project completed in 2017. The variance in expenditures is partially attributed to an unforeseen quantity of refurbishment work required on L1301 (TL 240) and TL 232. Critically damaged cross arms and a critical pole were identified during helicopter patrols on L1301, and these items were refurbished when the line was de-energized in November. On TL 232, an unforeseen number of critically deteriorated cross braces were identified and replaced.

38. ***Construct 230 kV Transmission Line – Soldiers Pond to Hardwoods***

Annual Variance ($000)

Budget: 17,687.2 Expenditures: 11,210.6 Variance: (6,476.6)

This is a three-year project (2016-2018) to that commenced in 2016. The variance in 2017 expenditures is attributed to the deferral of some of the work on TL 266 from Soldiers Pond to Hardwoods, to 2018. A portion of the project construction was executed in 2017, including the two kilometer link to Soldiers Pond Terminal Station. The remainder of the work was rescheduled to 2018 in order to allow the contractor to be re-deployed in 2017 to the TL 267 construction effort to reduce risk of schedule slippage on TL 267. The in-service date of TL 266 changed from October 2017 to August 2018. There is no change to the overall project scope or budget.

39. ***Refurbish Anchors and Footings TL 202 and TL 206 - Bay d'Espoir to Sunnyside***

Annual Variance ($000)

Budget: 1,920.3 Expenditures: 90.5 Variance: (1,829.8)

This is a two-year project (2014-2015) that commenced in 2014 and has been carried over again to 2018. Initially carried over to be executed during the construction of TL 267, taking advantage of the access required for TL 267, the project was carried over again to take place after TL 267 was constructed and in service, which now improves the ability to obtain outages while maintaining system reliability, to enable safer anchor replacement during planned outages to TL 202 and TL 206 versus replacing them while the lines are energized. There is no change to the overall project scope or budget.

40. ***<u>230 kV Transmission Line – Bay d'Espoir to Western Avalon (TL 267)</u>***

Annual Variance ($000)

Budget: 176,004.3 Expenditures: 213,663.7 Variance: 37,659.4

This is a five-year project (2014-2018) that commenced in 2014. The variance in 2017 expenditure is attributed to the redistribution of funds from 2018 back to 2017 in the fall of 2017 to take into account the accelerated in-service date and to better reflect when they would be expended, as most work was to be completed in 2017. The contingency funds were utilized in 2017. There is no change to the overall project budget, and the project was energized ahead of schedule. Project close-out will occur in 2018, as planned.

4.6 Distribution Projects

41. ***<u>Provide Service Extensions – All Service Areas – CIAC</u>***

Project Variance ($000)

Budget: (200.0) Expenditures: (323.6) Variance: (123.6)

This is an annual project that tracks the Contributions in Aid of Construction received against the project executed under "*Provide Service Extensions – All Service Areas*". Contributions in Aid of Construction are based on a calculated formula, are highly variable, and depend on the customer requests for electrical service. In 2017 the CIAC amount included $50,000 received for Smokey Mountain Lodge, a project that is planned and approved for 2018, which contributed to a higher than anticipated recovery of CIAC funds in 2017.

42. ***Upgrade Distribution Systems – Various Sites (2016-2017)***

Annual Variance ($000)

Budget: 6,274.1 Expenditures: 5,363.1 Variance: (911.0)

This is a two-year project (2016-2017) that commenced in 2016 and carried over to 2018. Most of the project scope for this project was completed in 2017. This carryover was necessary as the final decision to proceed with work on the existing underground distribution system in Bay d'Espoir was delayed until August 2017, resulting in the materials delivery dates of underground materials moving into 2018. There is no change to the overall project scope or budget.

4.7 Rural Generation Projects

43. ***Overhaul Diesel Engines – Various Sites***

Project Variance ($000)

Budget: 2,095.9 Expenditures: 1,619.8 Variance: (476.1)

This was a one-year project completed in 2017. The project is part of an ongoing program to overhaul diesel engines to sustain reliability of diesel generating plants. Project estimates are based on the projected number of engines that will reach the criteria for overhaul (20,000 hours of operation), and typical extent of refurbishment. The project variance is attributable to less refurbishment than typically required for some of the engines, which was unknown until the engines were disassembled for the overhauls.

44. ***Diesel Plant Engine Auxiliary Upgrades – Various Sites***

Annual Variance ($000)

Budget: 790.6 Expenditures: 644.7 Variance: (145.9)

This is a two-year project (2017-2018) that commenced in 2017. The variance in 2017 expenditures is attributed to a portion of the construction planned for 2017 being

rescheduled to 2018. Construction for McCallum is complete. Significant progress was made in 2017 on construction for Ramea and Francois, but was put on hold to allow construction resources to respond to operational issues at other diesel plants. Recovery of the construction schedule is expected in 2018. There is no change to the overall project scope, budget or completion date.

45. ***Inspect Fuel Storage Tanks – Various Sites***

Project Variance ($000)

Budget: 1,058.8	Expenditures: 717.3	Variance: (341.5)

This was a one-year project completed in 2017. The variance in project expenditures is attributed to requiring less than estimated costs for the engineering and construction contract, as well as unutilized project contingency.

46. ***Diesel Genset Replacements – Port Hope Simpson and Charlottetown***

Annual Variance ($000)

Budget: 658.8	Expenditures: 213.6	Variance: (445.2)

This is a two-year project (2017-2018) that commenced in 2017. The variance in 2017 expenditures is attributed to the electrical, protection and control engineering being delayed from late 2017 to early 2018. The replacement gensets have been ordered and the delay in engineering is not expected to impact the construction schedule. There is no change to the overall project scope, budget or completion date.

47. ***Install Fire Protection Systems – Cartwright and Nain***

Project Variance ($000)

Budget: 4,407.1	Expenditures: 3,652.1	Variance: (755.0)

This was a two-year project (2016-2017) that commenced in 2016 and was completed in 2017. The variance in total project expenditures is attributed to lower than estimated material and installation costs and unutilized project contingency.

48. ***<u>Additions for Load Growth – L'Anse au Loup and Postville</u>***

Project Variance ($000)

Budget: 5,629.4 Expenditures: 4,592.5 Variance: (1,036.9)

This was a two-year project (2016-2017) that commenced in 2016 and was completed in 2017. The variance in total project expenditures is attributed to lower than estimated engineering, procurement and construction costs and unutilized project contingency.

49. ***<u>Replace Programmable Logic Controllers – Various Sites</u>***

Annual Variance ($000)

Budget: 215.3 Expenditures: 410.5 Variance: 195.2

Project Variance ($000)

Budget: 958.0 Expenditures & Forecast: 1,204.7 Variance: 246.7

This is a three-year project (2015-2017) that commenced in 2015 and carried over to 2018. The carryover to 2018 expenditure is attributed to rescheduling the construction activity for Ramea. Replacement of the programmable logic controller at Ramea requires an extended outage to the wind turbines owned by Frontier Energy. Following a review of the construction schedule with Frontier Energy, it was decided to reschedule the work to a non-peak production period in 2018.

Following a review of the existing control systems at St. Anthony Diesel Plant, the replacement of the programmable logic controller for this location was removed from the project scope. It was determined that the existing control systems are significantly different than the other diesel sites and would require substantially more effort to convert. Upgrade of the controls for St. Anthony are included in the scope of a separate 2018-2019 project "*Replace Automation Equipment (2018-2019) – St. Anthony Diesel Plant*", as part of Hydro's *2018 Capital Budget Application.*

The variance in 2017 project expenditures, and the forecasted variance in total project expenditures, is attributed to more engineering and construction effort required compared to the original estimates.

4.8 Properties Projects

50. ***<u>Upgrade Office Facilities and Control Buildings – Various Sites</u>***

Project Variance ($000)

Budget: 2,197.3 Expenditures: 1,815.2 Variance: (382.1)

This was a one-year project completed in 2017. The variance in project expenditures is attributed to unutilized project contingency.

51. ***<u>Line Depot Condition Assessment and Refurbishment Program – Various Sites</u>***

Project Variance ($000)

Budget: 1,458.8 Expenditures: 689.4 Variance: (769.4)

This was a one-year project completed in 2017. The variance in project expenditures is attributed to lower than estimated publicly tendered contract prices for construction.

52. ***<u>Construct New Facilities – Various Sites</u>***

Annual Variance ($000)

Budget: 422.0 Expenditures: 237.8 Variance: (184.2)

This is a two-year project that commenced in 2017. The variance in 2017 expenditures is attributed to a cost savings through the utilization of internal operations and maintenance resources rather than contractors for construction of the Charlottetown storage building. There is no change to the overall project scope, budget or completion date.

53. ***<u>Replace Accommodations and Septic System – Ebbegunbaeg</u>***

Project Variance ($000)

Budget: 1,550.8 Expenditures: 2,043.5 Variance: 492.7

This was a two-year project (2015-2016) that commenced in 2015, carried over to 2017 and was completed in 2017. The variance in project expenditures is attributed to higher than estimated costs for the procurement and installation of the accommodations building, the bridge at Noel Paul's Brook, and access road upgrades, as well as unanticipated upgrades required for the provision of electrical service to the new accommodations. In addition, some of the road upgrades required re-work following road washouts associated with Hurricane Matthew.

4.9 Metering Projects

54. ***<u>Install Automated Meter Reading – Happy Valley (2017-2018)</u>***

Annual Variance ($000)

Budget: 78.6 Expenditures: 183.8 Variance: 105.2

This is a two-year project (2017-2018) that commenced in 2017. The variance in 2017 expenditure is attributed to the advancement of a portion of the construction activity from 2018 into 2017. As a work efficiency opportunity, the installation of automatic meter reading equipment at the Happy Valley Terminal Station was advanced and completed in conjunction with similar work that was being executed for a separate project in the same terminal station. There is no change to the overall project scope, budget or completion date.

55. ***<u>Purchase New Meter Calibration Test Console – Hydro Place</u>***

Annual Variance ($000)

Budget: 196.9 Expenditures: 0.1 Variance: (196.8)

This is a one-year project that commenced in 2017 and carried over to 2018. This carryover is attributed to the calibration test console having a lead time of thirteen

months. The test console has been ordered and is expected to arrive in April 2018. There is no change to the project scope or budget.

56. ***Install Automated Meter Reading – Labrador West***

Annual Variance ($000)

Budget: 836.8 Expenditures: 1,232.8 Variance: 396.0

Project Variance ($000)

Budget: 967.2 Expenditures & Forecast: 1,360.0 Variance: 392.8

This is a two-year project (2016-2017) that commenced in 2016 and carried over into 2018. The new meters have been procured and installed and a portion of the terminal station equipment has been installed. During construction planning, it was determined that additional components were required for the terminal station. These components were ordered and received in 2017, and are scheduled to be installed in early 2018.

The variance in 2017 expenditures, and the forecast variance in total project expenditure, is attributed to the requirement for additional terminal station equipment as well as higher than estimated unit pricing for the new automatic meter readers. An updated project cost estimate and updated assumptions for project benefits were used to reevaluate the project. The updated cost-benefit analysis confirmed that the project remains the least cost alternative versus the status quo.

4.10 Information Systems Projects

There are no reportable variances under Information Systems Projects.

4.11 Tools and Equipment Projects

There are no reportable variances under Tools and Equipment Projects.

4.12 Telecontrol Projects

57. ***<u>Replace Battery Banks and Chargers – Various Sites (2017-2018)</u>***

Annual Variance ($000)

Budget: 379.3 Expenditures: 217.6 Variance: (161.7)

Project Variance ($000)

Budget: 945.5 Expenditures & Forecast: 779.5 Variance: (166.0)

This is a two-year project (2017-2018) that commenced in 2017. The variance in 2017 expenditures, and the forecasted variance in total project expenditures, are attributed to lower than estimated construction and procurement costs. There is no change to the overall project scope or completion date.

58. ***<u>Replace Battery Banks and Chargers – Various Sites</u>***

Project Variance ($000)

Budget: 881.6 Expenditures: 645.3 Variance: (236.3)

This was a two-year project (2016-2017) that commenced in 2016 and was completed in 2017. The variance in total project expenditures is attributed to lower than estimated construction and procurement costs and unutilized project contingency.

4.12 Transportation Projects

59. ***<u>Replace Vehicles and Aerial Devices – Various Sites (2017-2018)</u>***

Annual Variance ($000)

Budget: 2,001.4 Expenditures: 1,275.8 Variance: (725.6)

This is a two-year project (2017-2018) that commenced in 2017. The annual variance in expenditure is attributed to a delivery delay of seven chassis' and booms for crew cab boom trucks ordered for the coast of Labrador Diesel Plants. The original delivery

was scheduled for December 2017 with a new forecasted delivery of late March 2018.

60. ***<u>Replace Vehicles and Aerial Devices – Various Sites (2016-2017)</u>***

Annual Variance ($000)

Budget: 944.8 Expenditures: 815.5 Variance: (129.3)

This is a two year project (2016-2017) that commenced in 2016. The variance in expenditure is attributed to the procurement of an off the lot material handling boom truck, suitable for the purpose for which it was purchased, resulting in a savings of $60,000. Hydro also implemented a specification change by utilizing slide in caps and 3/4 ton double cab pickups versus purchasing 4X4 vans for Protection and Control and Terminal Station Electricians. This change in specification reduced the cost by a total of $70,000 for the purchase of 4 vehicles and caps versus vans.

4.13 Administrative

61. ***<u>Replace Roof – Hydro Place</u>***

Project Variance ($000)

Budget: 923.4 Expenditures: 503.5 Variance: (419.9)

This was a one-year project completed in 2017. The variance in project expenditures is attributed to publicly tendered contractor pricing being less than estimated, and the project contingency not being required. There was no change to the overall project scope.

4.14 Allowance for Unforeseen Items

62. ***<u>Allowance for Unforeseen Items</u>***

Project Variance ($000)

Budget: 2,040 Expenditures: 5,645.8 Variance: 3,605.8

The Allowance for Unforeseen is an annual allotment that permits Hydro to act expeditiously to deal with events affecting the electrical system that cannot wait for specific approval of the Board. Unforeseen expenditures for 2017 under this account include costs associated with emergency structure replacement for Transmission Lines TL 212 and TL 201, Holyrood Unit 2 fire damage refurbishment, and Bay d'Espoir Penstock 1 reinforcement. Two top-up applications were approved by the Board, adding an additional $500,000 and $540,000 respectively. Reports on these items have been filed with the Board.

4.15 Supplemental Projects

63. ***<u>Unit 3 Turbine Rehabilitation – Bay d'Espoir</u>***

Project Variance ($000)

Budget : 2,361.5 Expenditures : 1,905.4 Variance : (456.1)

This was a one-year supplemental project approved and completed in 2017. The variance in project expenditure is attributed to lower than estimated construction contract costs.

64. ***<u>Terminal Station Upgrades – Wabush</u>***

Annual Variance ($000)

Budget : 2,585.2 Expenditures: 940.7 Variance: (1,644.5)

This is a two-year supplemental project (2017-2018) approved in 2017. The 2017 variance is attributed to the rescheduling of a portion of the work to 2018. The scope of this project includes major inspections and replacement of resistive rings on

Synchronous Condensers SC-1 and SC-2. The work was completed on SC-1 but the resistive rings for SC-2 failed the manufacturer's quality control tests and a new set of resistive rings had to be manufactured. The new rings arrived in October 2017, too late in the year to secure the required three-week outage for installation. This work was therefore rescheduled to 2018. The project scope also included the replacement of one 46 kV circuit breaker. The engineering activity was delayed and installation of the breaker has been rescheduled to 2018. There is no change to the overall project scope, budget or completion date.

65. <u>Penstock #2 Refurbishment – Bay d'Espoir</u>

Project Variance ($000)

Budget: 9,063.7 Expenditures: 3,586.3 Variance: (5,477.4)

This was a one-year supplemental project approved and completed in 2017. The variance in project expenditure is attributed to lower than estimated quantity of weld refurbishment. The budget estimate allowed for 920 meters of weld repair, a similar magnitude as was required for refurbishment of Penstock #1 on a previous project. The actual extent of weld refurbishment required could only be determined during the detailed inspection work that was part of this project. Detailed inspection determined that 440 meters of welds required refurbishment.

66. <u>Reliability Improvements – Holyrood</u>

Annual Variance ($000)

Budget: 2,610.0 Expenditures: 3,586.6 Variance: 976.6

Project Variance ($000)

Budget: 2,610.0 Expenditures & Forecast: 3,603.3 Variance: 993.3

This is a one-year supplemental project approved in 2017 and carried over to 2018. The project work is complete with the exception of the replacement of a section of

condenser cooling water piping for Unit 1. This is a large, specially designed section of piping with long delivery time. It was necessary to reschedule this work due to a change in the generation outage schedule, advancing the planned outage for Unit 1 to earlier in 2017, and prior to delivery of the replacement piping. The material is now on site and will be installed during the Unit 1 outage in 2018.

The variance in project expenditure is attributed to five new capital scope items identified during the discovery and execution phases of the project, as summarized in Section 9, Table 21, Items 2 to 6.

67. ***<u>Repair and Advanced Overhaul of the Happy Valley Gas Turbine</u>***

Project Variance ($000)

Budget: 3,714.8 Expenditures: 2,049.3 Variance: (1,665.5)

This was a one-year supplemental project approved and completed in 2017. The variance in project expenditure is attributed to lower than estimated refurbishment costs to overhaul the gas turbine engine. The extent of engine refurbishment could not have been known at the project proposal stage and the initial project budget was based upon a worst case estimate provided by the original equipment manufacturer. Refurbishment scope was fully defined following disassembly and inspection at the repair facility and was less than expected.

68. ***<u>Purchase of 12 MW Diesel Generation – Holyrood</u>***

Annual Variance ($000)

Budget: 916.0 Expenditures: 497.1 Variance: (418.9)

This is a two-year supplemental project 2016-2017) approved in 2016 and carried over to 2018. The carryover and variance in 2017 expenditures is attributed to the change in delivery times of stacks and silencers that are necessary to meet environmental requirements to early 2018. There is no change to the overall project scope or budget.

69. ***<u>Reroute TL 227 and Distribution Line Sally's Cove L1</u>***

Project Variance ($000)

Budget: 2,250.0 Expenditures: 1,894.5 Variance: (355.5)

This is a two-year supplemental project (2016-2017) approved in 2016 and completed in 2017. The variance is attributable to favourable contract construction costs.

70. ***<u>Labrador West Transmission Project – Construction Phase</u>***[1]

Annual Variance ($000)

Budget: - Expenditures: 517.8 Variance: 517.8

Project Variance ($000)

Budget: 329,592.1 Expenditures & Forecast: 12,894.6 Variance: (316,697.5)

In 2014, the provincial Government approved the construction of the third transmission line in Labrador to help supply power for planned new development in Labrador West, such as the *Kami Iron Ore Project*, and improve reliability for all customers in the region. In September 2014, work on the line was temporarily suspended until completion of Alderon's financing plan, which resulted in overall expenditures on the project being lower than budgeted.

In September 2017, Hydro executed a settlement agreement with The Kami Mine Limited Partnership in relation to the outstanding balance. Project costs up to September 2017 were included in the work in progress account, but excluded from average rate base, were $12.4M. Settlement proceeds of $9.5M were received, and the remaining $3.4M was expensed as a loss.

[1] The construction of the Labrador West Transmission was approved by OC2014-033, February 2, 2014. The capital expenditures associated with this project are included in Work In Progress and as a result are currently excluded from average rate base. The costs to be included in rate base will be subject to review by the Board of Commissioners of Public Utilities.

5.0 Capital Budget versus Actual Expenditures 2007 – 2017

Table 17 provides a summary of Hydro's Capital Budget Variances for the years 2007-2017.

Table 17 Capital Budgets/Expenditures 2007-2017

Year	Budget ($000)	Actual Expenditures ($000)	Variance ($000)	Variance (%)
2008	53,579	46,246	7,333	13.7
2009	61,544	54,152	7,392	12.0
2010	63,297	55,553	7,744	12.2
2011	67,454	63,116	4,338	6.4
2012	93,840	77,252	16,588	17.7
2013	116,373	84,755	31,618	27.2
2014	280,601	204,728	75,873	27.0
2015	311,177	125,119	186,058	59.8
2016	350,601	203,941	146,660	41.8
2017	340,501	340,741	240	0.1

The variance in actual expenditures compared to budget in Hydro's overall capital program for 2017 was only 0.1%. It should be noted, however, that TL 267 necessitated moving $38M back from the planned 2018 expenditure, causing an annual overspend for this project alone due to the acceleration of the project from a proposed in-service date of May 2018 to December 2017. The TL 267 project caused some other projects to be carried over to 2018.

The largest contributors of the total annual underspend in 2017 for the other projects were:

- Variance 12 – *Replace Site Facilities – Bay d'Espoir* (-$3.2M)
- Variance 28 – *Terminal Station Refurbishment and Modernization* (-$5.0M)
- Variance 29 – *Upgrade Circuit Breakers* (-$3.3M)
- Variance 38 – *Construction of 230 kV Transmission Line Soldiers Pond to Hardwoods* (-$6.5M)
- Variance 65 – *Penstock 2 Refurbishment – Bay d'Espoir* (-$5.5M)

These 5 projects contributed to $23.5M underspend in 2017, with details regarding each project provided above.

6.0 Carryover Report

Table 18 provides a summary listing of the carryovers from 2010-2017.

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Table 18: 2017 Carryover Report for the Year Ending December 31, 2017 ($000)

Project Name	PUB Approved Budget 2017	Revised Budget 2017	Total Actual Expenditures 2017	Carryover Amount	Original Completion Year
Install Automated Meter Reading - Labrador West	533.4	1,229.6	1,232.8	(3.2)	2017
Refurbish Station Water System - Upper Salmon	197.6	255.9	161.0	94.9	2017
Refurbish Main Generator Breaker - Upper Salmon	271.1	271.1	123.2	147.9	2017
Upgrade Work - Cat Arm	1,353.0	1,670.9	760.6	910.3	2017
Rehabilitate Shoreline Protection - Cat Arm	1,030.7	1,038.2	61.0	977.2	2017
Replace Pump House and Associated Equipment - Bay d'Espoir	-	279.6	26.0	253.6	2017
Replace Spherical By-Pass Valves Units 1 and 2 - Bay d'Espoir	167.9	196.7	51.8	144.9	2017
Purchase Capital Spares - Hydraulic	487.4	687.4	325.2	362.2	2017
Install Wind Monitoring Station North Salmon Dam SD-2 - Bay d'Espoir	165.5	165.5	52.3	113.2	2017
Purchase of 12MW Diesel Generation - Holyrood	-	916.0	497.1	418.9	2017
Refurbish and Replace Critical Systems and Equipment - Holyrood	2,610.0	3,603.3	3,586.6	16.7	2017
Upgrade Underground Plant Drainage System - Holyrood	923.1	1,814.5	1,825.2	(10.7)	2017
Purchase New Meter Calibration Test Console	196.9	212.8	0.1	212.7	2017
Replace Instrument Transformers - Various Sites	471.9	742.9	711.0	31.9	2017
Replace Protective Relays - Various Sites	1,156.4	1,402.0	1,134.5	267.5	2017
Replace Disconnect Switches - Various Sites (2016-2017)	1,320.9	1,836.1	1,064.9	771.2	2017
Upgrade Data Alarm Systems - Stony Brook	234.1	258.8	116.0	142.8	2017
Install Breaker Failure Protection - Various Sites	211.3	404.6	382.4	22.2	2017
Install Fire Protection in 230 kV Stations - Bay d'Espoir	566.0	782.4	100.7	681.7	2017
Upgrade Human Machine Interface - Various Sites	320.0	308.7	235.7	73.0	2017
Refurbish Anchors and Footings TL202 and TL206 - Bay d'Espoir to Sunnyside	901.6	1,920.3	90.5	1,829.8	2017
Upgrade Distribution Systems - Various Sites (2016/2017)	6,350.3	6,274.1	5,363.1	911.0	2017
Replace Programmable Logic Controllers - Various Sites	245.1	462.0	410.5	51.5	2017
Replace Air Conditioning Units 8 and 14 - Hydro Place	229.5	233.1	213.6	19.5	2017
Install Automated Meter Reading - Happy Valley (2017-2018)	78.6	78.6	183.8	(105.2)	2018
Replace Battery Banks and Chargers - Various Sites (2017-2018)	379.3	213.3	217.6	(4.3)	2018
Upgrade Telecontrol Facilities - Mary March Hill and Blue Gras Hill	91.2	91.2	123.3	(32.1)	2018
Replace Tracks for V7601 Groomer - Bay d'Espoir	1.0	1.0	-	1.0	2018
Install Asset Health Monitoring System - Upper Salmon	438.0	438.0	214.9	223.1	2018
Water System Replacements - Bay d'Espoir and Cat Arm	265.5	265.5	176.7	88.8	2018
Replace Site Facilities - Bay d'Espoir	4,736.3	5,394.2	2,231.6	3,162.6	2018
Upgrade Ventilation in Powerhouse 1 and 2 - Bay d'Espoir	134.1	134.1	111.8	22.3	2018
Replace Slip Rings Units 1-6 - Bay d'Espoir	312.6	312.6	102.4	210.2	2018
Refurbish Sump Level System for Powerhouse 2 - Bay d'Espoir	38.7	38.7	10.6	28.1	2018
Control Structure Refurbishments	1,735.3	1,735.3	991.4	743.9	2018
Upgrade Powerhouse Building Envelop - Holyrood	2,969.9	3,453.8	2,378.2	1,075.6	2018
Upgrade Corner Brook Frequency Converter - Corner Brook	194.6	194.6	42.2	152.4	2018
Replace 66 kV Station Service Feed - Holyrood	62.8	62.8	80.7	(17.9)	2018
Replace Substation - Holyrood	439.4	439.4	115.4	324.0	2018
Replace Power Transformers - Oxen Pond	297.5	297.5	109.1	188.4	2018
Gas Turbine Life Extension - Stephenville	847.5	366.3	342.2	24.1	2018
Gas Turbine Life Extension - Hardwoods	675.3	301.9	273.6	28.3	2018
Diesel Plant Engine Auxiliary Upgrades - Various Sites	790.6	790.6	644.7	145.9	2018
Replace Vehicles and Aerial Devices - Various Sites (2017-2018)	2,001.4	2,001.4	1,275.8	725.6	2018
Construct 230kV Transmission Line - Bay D'Espoir to Western Avalon	149,895.7	212,903.7	213,663.7	(760.0)	2018
Construct 230 kV Transmission Line - Soldiers Pond to Hardwoods	17,489.8	11,182.8	11,210.6	(27.8)	2018
Transmission Line Upgrades - TL212 and TL218	1,378.2	1,378.2	287.1	1,091.1	2018
Replace Insulators - TL227	145.6	145.6	16.7	128.9	2018
Distribution Upgrades - Various Sites (2017-2018)	64.2	64.2	78.7	(14.5)	2018
Install Recloser Remote Control - Bottom Waters	47.1	47.1	63.9	(16.8)	2018
Terminal Station Upgrades - Wabush	2,585.2	2,585.2	940.7	1,644.5	2018
Replace Automation Equipment - Mary's Harbour	120.3	120.3	87.4	32.9	2018
Upgrade Microsoft Project - Hydro Place	953.4	980.2	960.1	20.1	2018
Cost Recoveries	(442.2)	(454.5)	(445.5)	(9.0)	2018
Refurbish Powerhouse Station Services - Bay d'Espoir	413.2	413.2	43.0	370.2	2019
Replace Exciter Controls Units 1 to 6 - Bay d'Espoir	119.2	119.2	182.7	(63.5)	2020
Upgrade Circuit Breakers - Various Sites (2016-2020)	10,808.7	12,178.3	8,877.8	3,300.5	2020
Terminal Station Modernization and Upgrade Program	10,831.3	8,508.5	5,852.1	3,138.3	2018
Construct New Facilities	422.0	422.0	237.8	184.2	2018
Diesel Genset Replacements - Charlottetown and Port Hope Simpson	658.8	658.8	213.6	445.2	2018
	231,923.8	**294,830.1**	**270,422.2**	**24,889.8**	

7.0 Safety Hazards

In Board Order No. P.U. 38(2010) of the *2011 Capital Budget Application*, the Board directed Hydro to include an explanation in Hydro's annual report on capital expenditures as to each project that was undertaken for the *Remove Safety Hazards Project*, setting out the safety hazard that was identified, the location, the steps taken to address the issue and the amount of the expenditure. Please see Table 19 for projects undertaken in 2017.

Total Approved Budget: **$198,600**

Total Expenditure: **$185,910**

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Table 19: Safety Hazards

Project Title and Location	Expenditure ($000)	Safety Hazard Identified	Project Scope
Construct Vestibule and Stairwell Approach Walkways *Holyrood Thermal Generating Station*	$119.6	Two hazards were identified at the Holyrood Thermal Generating Station. The first was related to a vacuum effect created by the plant on the laboratory entranceway creating a hazard to personnel either opening or closing the doors. This vacuum effect is also a hazard during emergency evacuation issues when trying to open the doors or a pinch point if a door shut abruptly on a worker. The second hazard is related to the two stairwells that lead to the plant administration level. Access to these areas is not snow cleared or easily identified as there is no defined path to these entrances. The lack of a defined and easily snow cleared walkway could have led to worker injuries due to slips and trips.	To address the hazards, a new vestibule was designed and constructed at the laboratory entrance of the plant to eliminate the vacuum effect on the doors and a new easily identified walkway was installed from the main plant walkway to the south stairwell entrance to reduce plant access hazards. This work scope is complete.
Purchase Hydraulic Pole Key Removal Tool *Bay d'Espoir Hydraulic Generating Station*	$46.0	To remove pole keys from the generators, the powerhouse overhead crane was used along with a clamping device attached to the key. Poles are removed from a unit after a failure and occasionally to allow access to the stator for critical maintenance tasks. During a recent crane inspection after a pole removal had been completed it was discovered that the crane hoist cable had come out of the sheave, resulting in the cable riding on the pin that goes through the sheave and block. It is suspected that this issue occurred during a recent clamping tool failure. Such crane deficiencies must be avoided to ensure it is available for critical lifts and to keep personnel that may be in the area safe during a lift.	To address the hazard, a vendor was engaged to design and supply a hydraulic pole key removal tool which provides a safe means to remove pole keys without the use of the critical powerhouse overhead crane. The new tool will remove the possibility of damage to the crane during pole removal, ensuring it is available when required. More importantly, it will eliminate hazards to personnel that would be working in the area during a pole removal. This work scope is complete.
Install Roadway Guard Rails	$16.7	Existing roadway guard rails were swept away along Bear Brook near the Bay d'Espoir Maintenance Garage during Hurricane	To address the hazard, guard rails were purchased and installed. By reinstating

Project Title and Location	Expenditure ($000)	Safety Hazard Identified	Project Scope
Bay d'Espoir Hydraulic Generating Station		Matthew in October 2016 creating a potential for vehicles to travel over the embankment into the waterway.	the guard rails, the safety hazard associated with the potential for vehicles to travel over the embankment into the waterway was eliminated. This work scope is complete.

8.0 Terminal Station In-Service Failures

In the *2017 Capital Budget Application*, Hydro committed to providing a summary of activities completed under the *Terminal Station In-Service Failures Project*. Please see Table 20 for 2017 expenditures undertaken by this project.

Total Approved Budget: **$1,000,000**

Total Expenditure: **$1,440,945**

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Table 20 - Terminal Station In-Service Failures

Project Title and Location	Expenditure ($000)	Failure Identified	Project Scope
Replace Breaker B3L19 Sunnyside Terminal Station	$852.5	Breaker B3L19 (138 kV-SF6) at the Sunnyside Terminal Station failed when it flashed over internally on A and C phases due to lightning on November 21, 2016. An original equipment manufacturer representative (ABB) visited the site to carry out a non-intrusive inspection of the breaker. While the contact resistance on A and C phases and the gas purity on A phase were not ideal, ABB recommended that the breaker could be put back in service, and should be overhauled in the spring/summer of 2017. The overhaul was scheduled and commenced during the week of July 31, 2017. Teardown of the breaker revealed that both A and C phase interrupters suffered significant damage during the November 21, 2016 event and that extensive component replacement would be required in order to put the breaker back in service. Considering the age (27 years) and condition of the breaker, the long lead time for parts to repair the breaker, and the need to restore the breaker for system reliability, it was necessary to immediately replace the breaker.	The failed breaker B3L19 was replaced with an available spare breaker.
Transformer Protective Devices Various Terminal Stations	$232.2	A number of transformer protective devices failed due to moisture ingress into the relays. These devices protect power transformers that are critical to the Island Interconnected System. The protection devices include winding temperature, oil temperature and gas relays. These failures were investigated after an outage on Holyrood T3 when the transformer tripped due to ingress of moisture in the oil temp relay. From a broader review of the others that have been changed out in recent years, it was discovered that recently purchased and installed winding/oil temperature relays were seeing significant moisture build up inside the relay, resulting in the possibility that the relay may cause an inadvertent outage. It was also determined from	Failed transformer protective devices were replaced with a newer, more robust design for the following transformers: • Sunnyside Terminal Station Transformer T4 • Voisey's Bay Nickel Terminal Station Transformer T2 • Western Avalon Terminal Station Transformer T2 • Hardwoods Terminal Station Transformers T2, T4, T5 and GT1 • Holyrood Terminal Station

Project Title and Location	Expenditure ($000)	Failure Identified	Project Scope
		the review that the manufacturer had made a design change in the later part of 2016 to improve their design in order to minimize moisture ingress and condensation and any relays purchased after that will receive an updated improved design.	Transformers UST-1, UST-3, T1, T2, T3, T5, T7, SST-12 and SST-34 • Bottom Brook Terminal Station Transformers T1 and T3 • Massey Drive Terminal Station Transformer T2 • Stephenville Terminal Station Transformer T3
Mobile Transformer Refurbishment Bishops Falls	$151.0	Upon discovery of a leak from one of the oil pumps in the mobile transformer in October 2017, the pump was dismantled for inspection. The inspection revealed that the pump impellor was damaged from internal impact by an object. This was likely caused by a pump seal and part of the seal being sucked into the pump. This work required removal, processing, and reinstallation of the transformer oil.	The mobile transformer was refurbished. Refurbishment included the replacement of gaskets and seals and the processing of the oil.
Replace Station Service Transformer St. Anthony Airport Terminal Station	$116.8	A station service transformer failure occurred in Sally's Cove. As there was no redundant station feed in Sally's Cove, immediate replacement was required. The station service transformer at St. Anthony Airport Terminal Station was identical to the failed unit at Sally's Cove and St. Anthony Airport Terminal Station has a backup station service supply from the distribution system. To ensure continued reliable service to customers, the station service transformer was removed from St. Anthony and installed in Sally's Cove. As this meant St. Anthony Airport Terminal Station was operating on a backup feed from the diesel generators, St. Anthony was vulnerable without immediate replacement.	A replacement station service transformer was procured and installed at the St. Anthony Airport Terminal Station.
Interrupter Replacement	$45.8	Interrupter B1T1 failed in February, 2017. The interrupter switch isolates equipment in the event of overload conditions and, in	The failed interrupter B1T1 was replaced with an available spare.

Project Title and Location	Expenditure ($000)	Failure Identified	Project Scope
Western Avalon Terminal Station		case of faults, interrupts the fault current to avoid damage to protected equipment. A failed interrupter leaves protected equipment vulnerable to overload conditions and can result in equipment failure and extended unplanned customer outages. Immediate replacement of Western Avalon B1T1 interrupter was required to maintain system reliability.	
Upgrade Breaker Failure Protection Hardwoods Terminal Station	$24.4	On March 11, 2017, the breaker failure circuit associated with breaker B1L01 at the Hardwoods Terminal Station failed following a trip due to high winds on 230 kV transmission line TL 201 (Western Avalon to Hardwoods). As a result, 230 kV bus B1 locked out, isolating critical equipment from the bus. This failure contributed to a widespread outage later in the day when 230 kV transmission line TL 218 (Holyrood to Oxen Pond) tripped as well due to high winds. Subsequently, Breaker Failure Protection associated with bus B1 at Hardwoods needed to be upgraded in 2017. Upgrading the Breaker Failure Protection associated with bus B1 was executed without delay in 2017, in order to ensure safe, reliable, and secure operation of bus B1 and associated equipment.	An upgrade of the breaker failure protection associated with bus B1 was completed.
Replace Surge Arrestors Holyrood Terminal Station	$15.1	Three 69 kV surge arrestors failed in Holyrood Terminal Station due to a weather event in March 2017. Surge arresters are used on critical terminal station equipment to protect that equipment from overvoltage due to lightning, extreme system operating voltages and switching transients. In these situations, voltage at the equipment can rise to levels which could damage the equipment's insulation. The surge arrestors act to maintain the voltages within acceptable levels. Without surge arrestors, equipment insulation could be damaged and faults could result during overvoltage events. When a surge arrester fails, it is not repairable and must be replaced immediately; otherwise the	Three failed 69 kV surge arrestors were replaced with available spares.

Project Title and Location	Expenditure ($000)	Failure Identified	Project Scope
		major equipment may be exposed to damaging overvoltage events.	
Replace Surge Arrester Stony Brook Terminal Station	$3.3	The low voltage surge arrester replacement at Stony Brook Terminal Station was based on October 2017 test results (obtained via Stony Brook T2 Doble Preventive Maintenance check). Doble test results indicated that the surge arrester condition was deteriorated and hence at increased risk of failure. Failure of the surge arrester would result in a loss of surge protection of the B phase winding from the 138 kV transmission network and also a forced transformer outage if the failure mode resulted in a fault.	Surge Arrestor was replaced with an available spare.

9.0 Reliability Improvements – Holyrood Thermal Generating Station

This is a one year supplemental project approved and substantially completed in 2017, with some scope carried over into 2018. In *Section 3.2 Equipment Replacement* of the supplementary application for this project, it was stated that:

> *While Hydro has currently identified equipment for immediate replacement, it is possible that additional components may require replacement during the annual outages. Hydro proposes that any item, material in dollar value, that meets capitalization criteria, that is required to be replaced to mitigate an unplanned outage in the coming winter season, and that can be replaced within this project's contingency, would be replaced and communicated to the Board via the year end Capital Expenditures Variance report.*

Hydro identified and completed five additional capital scope items under these criteria during the discovery and execution phases of the project in 2017, as summarized in Table 21, Items 2 to 6. The actual cost of the original approved scope items in this project is forecast to exceed the budget estimate and this is included in Table 21, Item 1.

Total Approved Budget: **$2,610,000**

Total Expenditure: **$3,586,600**

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Table 21 - Reliability Improvements – Holyrood Thermal Generation Station

Item	Description	Cost ($000)	Scope of Work and Justification
1	Additional cost for original planned project scope items	313.6	During the discovery and execution phases of the original scope of work, additional cost were incurred as a result of the as-found condition being worse than expected for some components, with an over-run of the original scope estimate of $313,600.
2	Replacement of steam piping components	442.5	Steam piping components including large flanges with pipe spools, flange studs and bolts, and auxiliary valves. Replacement was necessary to address identified steam leaks.
3	Replacement of Unit 2 condenser cooling water outlet piping	300.0	Inspection of the Unit 2 condenser cooling water piping during the planned unit outage revealed that it was in similar deteriorated condition as Unit 1 condenser cooling water outlet piping. Replacement of Unit 1 condenser cooling water outlet piping was an approved scope item for this project. Replacement of Unit 2 condenser cooling water outlet piping was completed.
4	Replacement of flow elements	160.0	The original project scope including refurbishment of flow elements. Inspection during planned unit outages revealed that elements were at the end of useful life and required full replacement. The flow elements were replaced.
5	Replacement of safety valves for Unit 2 cold reheat, atomizing steam and low pressure / high pressure headers	146.0	The valves for Unit 2 cold reheat, atomizing steam and low pressure / high pressure headers were opening prematurely when in service. The valve service provider inspected the valves and determined that replacement was required. Safety valves for Unit 2 cold reheat, atomizing steam and low pressure / high pressure headers were replaced.
6	Replacement of Unit 1 and Unit 2 air heater water wash piping	60.0	Extensive corrosion of Unit 1 and Unit 2 air heater water wash piping was identified by boiler service provider during planned unit outages, and replacement was necessary. Unit 1 and Unit 2 air heater water wash piping was replaced.
Total		**1,422.1**	

Capital Expenditures and Carryover Report
For the Year Ending December 31, 2018

March 1, 2019

A Report to the Board of Commissioners of Public Utilities

newfoundland labrador hydro
a nalcor energy company

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1.0 Capital Expenditure Overview

During 2018, Newfoundland and Labrador Hydro ("Hydro") invested $157.0 million for the execution of capital projects to contribute to the provision of safe, reliable, and least-cost electricity to customers. The expenditures include new transmission infrastructure, with $10.9 million for the close-out activities for TL 267 between Bay d'Espoir Terminal Station and Western Avalon Terminal Station and $12.0 million to complete TL 266 between Soldiers Pond Terminal Station and Hardwoods Terminal Station. Sustaining capital for Terminal Station infrastructure totalled $33.1 million, including $15.2 million in the Upgrade Circuit Breakers project and $10.5 million in the Terminal Station Refurbishment and Modernization (2017-2018) project. Expenditures to maintain the Hydraulic Generation equipment and infrastructure across the province totaled $23.8 million, including $8.6 million to replace site facilities in Bay d'Espoir and $5.9 million for year one in the Hydraulic Generation Refurbishment and Modernization (2018-2019) project. The Thermal Generation equipment and infrastructure at Holyrood required expenditures totalling $13.0 million, with the most material expenditure of $3.9 million in the Condition Assessment and Miscellaneous Upgrades project. Gas Turbines required $13.7 million in expenditures, the bulk of which ($9.8 million) was for the accelerated Holyrood Gas Turbine Hot Gas Path Level 2 Inspection and Overhaul. This report includes details about the capital expenditures and reportable variances for 2018 and project carryovers to 2019. The variance in actual expenditures compared to budget in Hydro's overall capital program for 2018 was $56.1 million (26.3%). Additional information regarding analysis of the variance is included in Section 5.0.

2.0 Capital Expenditures and Variance Summary

Table 1 provides a summary of Hydro's Capital Expenditures by Year for the period 2013-2018 for all capital projects that were active in 2018, and Table 2 provides a breakdown of the summary by asset type.

Table 1: 2018 Capital Expenditures by Year ($000)

Summary	Capital Budget[1]										Actual Expenditure and Forecast									Variance	
	A					B	C	D (B+C)	E	F (A+C+E)	G					H	I	J	K (G+H+I+J)	K-F	H-D
	2013	2014	2015	2016	2017	Carryover to 2018	Original 2018	Revised 2018	2019 and Beyond	Total	2013	2014	2015	2016	2017	2018	2019 and Beyond	Carryover to 2019	Total	Project Variance	Annual Variance
2018 Projects							90,270.2	90,270.2	58,135.9	148,406.1						71,692.5	53,528.2	22,217.3	147,438.0	(968.1)	(18,577.7)
2017 Projects					30,801.8	10,529.1	45,572.6	56,101.7	3,767.2	80,141.6					19,758.5	31,934.9	3,767.2	6,382.5	61,843.1	(18,298.5)	(24,166.8)
2016 Projects				22,893.1	43,682.6	12,953.9	34,899.2	47,853.1	17,714.1	119,189.0				18,714.6	36,587.8	42,251.1	20,759.1	2,293.4	120,606.0	1,417.0	(5,602.0)
2015 Projects			389.6	868.5	245.1	305.1	0.0	305.1	0.0	1,503.2			534.2	474.1	436.5	580.6	0.0	331.2	2,356.6	853.4	275.5
2014 Projects		211.5	4,431.4	76,322.7	195,454.0	1,069.8	17,418.3	18,488.1	0.0	293,837.9		211.5	2,046.4	59,337.7	213,754.2	10,592.0	0.0	1,716.2	287,658.0	(6,179.9)	(7,896.1)
2013 Projects	593.2	552.8	538.4	1,511.7	471.9	31.9	0.0	31.9	0.0	3,668.0	240.3	699.0	755.5	1,190.3	711.0	(66.0)	0.0	0.0	3,530.1	(137.9)	(97.9)
Grand Total	**593.2**	**764.3**	**5,359.4**	**101,596.0**	**270,655.4**	**24,889.8**	**188,160.3**	**213,050.1**	**79,617.2**	**646,745.8**	**240.3**	**910.5**	**3,336.1**	**79,716.7**	**271,248.0**	**156,985.1**	**78,054.5**	**32,940.6**	**623,431.8**	**(23,314.0)**	**(56,065.0)**

2018 Capital Budget Approved by Board Order No. P.U. 43 (2017) and P.U. 5 (2018)	181,193.7
New Project Approved by Board Order No. 11 (2017)	327.3
New Project Approved by Board Order No. 1 (2018)	748.4
New Project Approved by Board Order No. 1 (2018)	(748.4)
New Project Approved by Board Order No. 6 (2018)	719.4
New Project Approved by Board Order No. 6 (2018)	(50.4)
New Project Approved by Board Order No. 19 (2018)	1,000.0
New Project Approved by Board Order No. 23 (2018)	1,120.6
New Project Approved by Board Order No. 25 (2018)	2,560.5
New Project Approved by Board Order No. 33 (2018)	195.5
New Project Approved by Board Order No. 33 (2018)	(195.5)
New Project Approved by Board Order No. 34 (2018)	195.4
New Project Approved by Board Order No. 38 (2018)	712.3
2018 New Projects under $50,000 Approved by Hydro	381.5
Total Approved Capital Budget Before Carryovers	188,160.3
Carryover Projects 2017 to 2018	24,889.8
Total Approved Capital Budget	**213,050.1**

[1] Annual budgets previous to 2018 pertain to projects that have expenditures in 2018.

Table 2: Total Capital Variance Summary ($000) by Asset Type[1]

Asset Type	Board Approved Budget	Total Project Expenditures and Forecast	Variance
Hydraulic	52,680	49,021	(3,659)
Thermal	18,341	20,699	2,359
Gas Turbines	27,353	25,022	(2,331)
Terminal Stations	126,120	115,248	(10,872)
Transmission	326,860	319,578	(7,282)
Distribution	20,465	18,434	(2,031)
Rural Generation	31,235	30,279	(956)
Properties	4,262	3,464	(798)
Metering	3,408	3,645	237
Rural Systems Tools and Equipment	2,297	2,207	(90)
Information Systems	3,058	2,292	(766)
Telecontrol	6,449	6,126	(323)
Transportation	4,821	5,065	244
Administrative	1,314	1,194	(120)
Allowance for Unforeseen	2,000	4,743	2,743
Supplemental Projects	15,700	16,100	400
Projects Approved for less than $50,000	383	315	(67)
Total Capital Budget	**646,746**	**623,432**	**(23,314)**

[1] The Total Capital includes all projects initiated between 2013 and 2018 that had 2018 expenditures. This includes projects completed in 2018 and those that continue through 2019 and beyond. Please refer to Table 1.

3.0 Capital Expenditures by Category

The following tables provide Hydro's Capital Expenditures by category including:

- Hydraulic Generation;
- Thermal Generation;
- Gas Turbine Generation;
- Terminal Stations;
- Transmission;
- Distribution;
- Rural Generation;
- Properties;
- Metering;
- Tools and Equipment;
- Information Systems;
- Telecontrol projects;
- Transportation;
- Administration;
- Allowance for Unforeseen Items;
- Supplemental Capital projects; and
- Projects less than $50,000.

Table 3: 2018 Capital Expenditures: Hydraulic Generation ($000)

Hydraulic Generation Projects	Capital Budget								Actual Expenditure and Forecast							Variance		
	A			B	C	D (B+C)	E	F (A+C+E)	G			H	I	J	K (G+H+I+J)	K-F	H-D	
	2015	2016	2017	Carryover to 2018	Original 2018	Revised 2018	2019 and Beyond	Total	2015	2016	2017	2018	2019 and Beyond	Carryover to 2019	Total	Project Variance	Annual Variance	Notes
2018 Projects																		
Install Remote Operation of Salmon Spillway - Bay d'Espoir	-	-	-	-	645.9	645.9	1,862.5	2,508.4	-	-	-	885.4	1,862.5	(239.5)	2,508.4	-	239.5	1
Refurbish Backfill on Penstock #1 - Bay d'Espoir	-	-	-	-	1,630.4	1,630.4	-	1,630.4	-	-	-	63.2	-	1,567.2	1,630.4	-	(1,567.2)	2
Hydraulic In-Service Failures	-	-	-	-	1,251.1	1,251.1	-	1,251.1	-	-	-	452.3	-		452.3	(798.8)	(798.8)	3
Energy Efficiency Improvements - Various Sites	-	-	-	-	276.2	276.2	168.9	445.1	-	-	-	209.8	168.9	66.4	445.1	-	(66.4)	
Hydraulic Generation Refurbishment and Modernization - Various Sites	-	-	-	-	10,325.4	10,325.4	4,283.1	14,608.5	-	-	-	5,856.3	4,283.1	2,578.7	12,718.1	(1,890.4)	(4,469.1)	4
Purchase Tools and Equipment Less than $50,000	-	-	-	-	235.2	235.2	-	235.2	-	-	-	255.6	-	-	255.6	20.4	20.4	
2017 Projects																		
Install Asset Health Monitoring System - Upper Salmon	-	-	438.0	223.1	203.4	426.5	-	641.4	-	-	214.9	141.5	-	-	356.4	(285.0)	(285.0)	5
Refurbish Main Generator Breaker - Upper Salmon	-	-	271.1	147.9	-	147.9	-	271.1	-	-	123.2	121.8	-	-	245.0	(26.1)	(26.1)	
Water System Replacements - Bay d'Espoir and Cat Arm	-	-	265.5	88.8	2,288.3	2,377.1	-	2,553.8	-	-	176.7	1,520.7	-	-	1,697.4	(856.4)	(856.4)	6
Refurbish Powerhouse Station Services - Bay d'Espoir	-	-	413.2	370.2	2,473.3	2,843.5	1,460.6	4,347.1	-	-	43.0	1,003.5	1,460.6	1,840.0	4,347.1	-	(1,840.0)	7
Replace Exciter Controls Units 1 to 6 - Bay d'Espoir	-	-	119.2	(63.5)	921.2	857.7	2,306.6	3,347.0	-	-	182.7	628.9	2,306.6	9.3	3,127.5	(219.5)	(228.8)	8
Upgrade Ventilation in Powerhouse 1 and 2 - Bay d'Espoir	-	-	134.1	22.3	863.8	886.1	-	997.9	-	-	111.8	573.8	-	-	685.6	(312.3)	(312.3)	9
Purchase Capital Spares - Hydraulic	-	-	487.4	362.2	-	362.2	-	487.4	-	-	325.2	304.4	-	-	629.6	142.2	(57.8)	10
Replace Slip Rings Units 1-6 - Bay d'Espoir	-	-	312.6	210.2	159.7	369.9	-	472.3	-	-	102.4	17.2	-	352.7	472.3	-	(352.7)	11
Refurbish Sump Level System for Powerhouse 2 - Bay d'Espoir	-	-	38.7	28.1	264.5	292.6	-	303.2	-	-	10.6	220.1	-	-	230.7	(72.5)	(72.5)	
Install Wind Monitoring Station North Salmon Dam SD-2 - Bay d'Espoir	-	-	165.5	113.2	-	113.2	-	165.5	-	-	52.3	114.9	-	-	167.2	1.7	1.7	
Control Structure Refurbishments	-	-	1,735.3	743.9	452.9	1,196.8	-	2,188.2	-	-	991.4	709.3	-	144.1	1,844.8	(343.4)	(487.5)	12
2016 Projects																		
Refurbish Station Water System - Upper Salmon	-	96.6	197.6	94.9	-	94.9	-	294.2	-	38.3	161.0	80.5	-	-	279.8	(14.4)	(14.4)	
Upgrade Work - Cat Arm	-	558.3	1,353.0	910.3	-	910.3	-	1,911.3	-	240.4	760.6	1,376.3	-	30.3	2,407.6	496.3	466.0	13
Rehabilitate Shoreline Protection - Cat Arm	-	112.2	1,030.7	977.2	-	977.2	-	1,142.9	-	104.7	61.0	89.2	-	888.0	1,142.9	-	(888.0)	14
Replace Site Facilities - Bay d'Espoir	-	928.3	4,736.3	3,162.6	6,316.7	9,479.3	-	11,981.3	-	270.4	2,231.6	8,574.9	-	904.4	11,981.3	-	(904.4)	
Replace Spherical By-Pass Valves Units 1 and 2 - Bay d'Espoir	-	183.6	167.9	144.9	-	144.9	-	351.5	-	154.8	51.8	192.0	-	-	398.6	47.1	47.1	
2015 Projects																		
Replace Pump House and Associated Equipment - Bay d'Espoir	22.7	522.5	-	253.6	-	253.6	-	545.2	137.0	128.6	26.0	373.9	-	331.2	996.7	451.5	120.3	15
Total Hydraulic Generation Projects	**22.7**	**2,401.5**	**11,866.1**	**7,789.9**	**28,308.0**	**36,097.9**	**10,081.7**	**52,680.0**	**137.0**	**937.2**	**5,626.2**	**23,765.5**	**10,081.7**	**8,472.8**	**49,020.4**	**(3,659.6)**	**(12,332.4)**	

Table 4: 2018 Capital Expenditures: Thermal Generation ($000)

Thermal Generation Projects	Capital Budget								Actual Expenditure and Forecast							Variance		
	A			B	C	D (B+C)	E	F (A+C+E)	G			H	I	J	K (G+H+I+J)	K-F	H-D	
	2015	2016	2017	Carryover to 2018	Original 2018	Revised 2018	2019 and Beyond	Total	2015	2016	2017	2018	2019 and Beyond	Carryover to 2019	Total	Project Variance	Annual Variance	Notes
2018 Projects																		
Thermal In-Service Failures	-	-	-	-	1,250.0	1,250.0	-	1,250.0	-	-	-	2,699.9	-	-	2,699.9	1,449.9	1,449.9	16
Overhaul Pumps - Holyrood	-	-	-	-	438.3	438.3	-	438.3	-	-	-	302.7	-	-	302.7	(135.6)	(135.6)	17
Condition Assessment and Miscellaneous Upgrades - Holyrood	-	-	-	-	2,749.6	2,749.6	-	2,749.6	-	-	-	3,906.9	-	-	3,906.9	1,157.3	1,157.3	18
Overhaul Unit 1 Generator - Holyrood	-	-	-	-	1,005.0	1,005.0	-	1,005.0	-	-	-	1,060.6	-	-	1,060.6	55.6	55.6	
Overhaul Unit 1 Turbine Valves - Holyrood	-	-	-	-	2,485.7	2,485.7	-	2,485.7	-	-	-	2,247.7	-	-	2,247.7	(238.0)	(238.0)	
Upgrade Cranes and Hoists - Holyrood	-	-	-	-	80.3	80.3	300.3	380.6	-	-	-	38.6	300.3	41.7	380.6	-	(41.7)	
Install Raw Water Line - Holyrood	-	-	-	-	1,252.6	1,252.6	-	1,252.6	-	-	-	1,528.5	-	-	1,528.5	275.9	275.9	19
Install Fire Detection in Outbuildings - Holyrood	-	-	-	-	198.6	198.6	-	198.6	-	-	-	70.4	-	128.2	198.6	-	(128.2)	20
Purchase Tools and Equipment Less than $50,000	-	-	-	-	16.5	16.5	-	16.5	-	-	-	16.5	-	-	16.5	-	-	
2017 Projects																		
Upgrade Holyrood Access Road - Holyrood	-	-	579.3	-	583.4	583.4	-	1,162.7	-	-	825.7	-	-	-	825.7	(337.0)	(583.4)	21
Upgrade Underground Plant Drainage System - Holyrood	-	-	923.1	(10.7)		(10.7)	-	923.1	-	-	1,825.2	65.6	-	-	1,890.8	967.7	76.3	22
2016 Projects																		
Upgrade Powerhouse Building Envelope - Holyrood	-	2,723.8	2,969.9	1,076	784.1	1,859.7	-	6,477.8	-	2,239.9	2,378.2	1,022.7	-	-	5,640.8	(837.0)	(837.0)	23
Total Thermal Generation Projects	**-**	**2,723.8**	**4,472.3**	**1,064.9**	**10,844.1**	**11,909.0**	**300.3**	**18,340.5**	**-**	**2,239.9**	**5,029.1**	**12,960.1**	**300.3**	**169.9**	**20,699.3**	**2,358.8**	**1,051.1**	

Table 5: 2018 Capital Expenditures: Gas Turbine Generation ($000)

Gas Turbine Generation Projects	Capital Budget								Actual Expenditure and Forecast							Variance		
	A			B	C	D (B+C)	E	F (A+C+E)	G			H	I	J	K (G+H+I+J)	K-F	H-D	
	2015	2016	2017	Carryover to 2018	Original 2018	Revised 2018	2019 and Beyond	Total	2015	2016	2017	2018	2019 and Beyond	Carryover to 2019	Total	Project Variance	Annual Variance	Notes
2018 Projects																		
Purchase Capital Spares - Gas Turbines	-	-	-	-	626.9	626.9	-	626.9	-	-	-	534.7	-	-	534.7	(92.2)	(92.2)	
Gas Turbine Equipment Replacement and Refurbishment - Hardwoods and Stephenville	-	-	-	-	997.9	997.9	429.3	1,427.2	-	-	-	371.3	429.3	480.2	1,280.8	(146.4)	(626.6)	24
Increase Fuel and Water Treatment System Capacity - Holyrood Gas Turbine	-	-	-	-	8,829.9	8,829.9	3,012.7	11,842.6	-	-	-	2,583.8	3,012.7	6,093.1	11,689.6	(153.0)	(6,246.1)	25
Turbine Hot Gas Path Level 2 Inspection and Overhaul - Holyrood Gas Turbine	-	-	-	-	6,538.8	6,538.8	4,607.7	11,146.5	-	-	-	9,770.7	-	682.9	10,453.6	(692.9)	3,231.9	26
2017 Projects																		
Gas Turbine Life Extension - Stephenville	-	-	847.5	24.1	505.7	529.8	-	1,353.2	-	-	342.2	251.7	-	-	593.9	(759.3)	(278.1)	27
Gas Turbine Life Extension - Hardwoods	-	-	675.3	28.3	281.4	309.7	-	956.7	-	-	273.6	195.6	-	-	469.2	(487.5)	(114.1)	28
Total Gas Turbine Generation Projects	**-**	**-**	**1,522.8**	**52.4**	**17,780.6**	**17,833.0**	**8,049.7**	**27,353.1**	**-**	**-**	**615.8**	**13,707.8**	**3,442.0**	**7,256.2**	**25,021.8**	**(2,331.3)**	**(4,125.2)**	

Table 6: 2018 Capital Expenditures: Terminal Stations ($000)

Terminal Stations Projects	Capital Budget										Actual Expenditure and Forecast									Variance		
	A					B	C	D (B+C)	E	F (A+C+E)	G					H	I	J	K (G+H+I+J)	K-F	H-D	
	2013	2014	2015	2016	2017	Carryover to 2018	Original 2018	Revised 2018	2019 and Beyond	Total	2013	2014	2015	2016	2017	2018	2019 and Beyond	Carryover to 2019	Total	Project Variance	Annual Variance	Notes
2018 Projects																						
Terminal Station In-Service Failures	-	-	-	-	-	-	1,000.0	1,000.0	-	1,000.0	-	-	-	-	-	2,268.8	-	-	2,268.8	1,268.8	1,268.8	29
Upgrade Aluminum Support Structures - Holyrood	-	-	-	-	-	-	287.6	287.6	-	287.6	-	-	-	-	-	143.1	-	-	143.1	(144.5)	(144.5)	30
Replace Transformer T1 - Buchans	-	-	-	-	-	-	249.0	249.0	2,086.1	2,335.1	-	-	-	-	-	99.0	2,086.1	150.0	2,335.1	-	(150.0)	31
Install Breaker Bypass Switch - Howley	-	-	-	-	-	-	83.1	83.1	-	83.1	-	-	-	-	-	-	-	-	-	(83.1)	(83.1)	
Implement Terminal Station Flood Mitigation - Springdale	-	-	-	-	-	-	186.2	186.2	787.8	974.0	-	-	-	-	-	135.8	787.8	50.4	974.0	-	(50.4)	
Purchase Mobile DC Power Systems	-	-	-	-	-	-	270.9	270.9	695.6	966.5	-	-	-	-	-	41.9	695.6	229.0	966.5	-	(229.0)	32
Terminal Station Refurbishment and Modernization - Various Sites	-	-	-	-	-		8,170.6	8,170.6	18,625.1	26,795.7	-	-	-	-	-	1,983.8	18,625.1	5,839.7	26,448.6	(347.1)	(6,186.8)	33
2017 Projects																						
Upgrade Corner Brook Frequency Converter - Corner Brook	-	-	-	-	194.6	152.4	2,749.2	2,901.6	-	2,943.8	-	-	-	-	42.2	(42.2)	-	-	0.0	(2,943.8)	(2,943.8)	34
Replace 66 kV Station Service Feed - Holyrood	-	-	-	-	62.8	(17.9)	1,198.6	1,180.7	-	1,261.4	-	-	-	-	80.7	235.0	-	945.7	1,261.4	0.0	(945.7)	35
Replace Substation - Holyrood	-	-	-	-	439.4	324.0	758.6	1,082.6	-	1,198.0	-	-	-	-	115.4	369.7	-	313.1	798.2	(399.8)	(712.9)	36
Replace Power Transformers - Oxen Pond	-	-	-	-	297.5	188.4	850.1	1,038.5	-	1,147.6	-	-	-	-	109.1	539.1	-	-	648.2	(499.4)	(499.4)	37
Terminal Station Refurbishment and Modernization - Various Sites	-	-	-	-	10,831.3	3,138.3	16,550.8	19,689.1		27,382.1	-	-	-	-	5,852.1	10,464.4		2,327.7	18,644.2	(8,737.9)	(9,224.7)	38
2016 Projects																						
Upgrade Circuit Breakers - Various Sites	-	-	-	6,969.1	10,808.7	3,300.5	15,408.6	18,709.1	17,714.1	50,900.5	-	-	-	5,599.5	8,877.8	15,184.2	20,759.1	479.9	50,900.5	(0.0)	(3,524.9)	39
Replace Protective Relays - Various Sites	-	-	-	700.6	1,156.4	267.5	-	267.5	-	1,857.0	-	-	-	1,425.8	1,134.5	754.4	-	-	3,314.7	1,457.7	486.9	40
Replace Disconnect Switches - Various Sites	-	-	-	646.9	1,320.9	771.2	-	771.2	-	1,967.8	-	-	-	131.7	1,064.9	225.0	-	-	1,421.6	(546.2)	(546.2)	41
Upgrade Data Alarm Systems - Various Sites	-	-	-	74.4	234.1	142.8	-	142.8	-	308.5	-	-	-	49.7	116.0	144.6	-	(1.8)	308.5	0.0	1.8	
Install Breaker Failure Protection - Various Sites	-	-	-	65.7	211.3	22.2	-	22.2	-	277.0	-	-	-	81.8	382.4	234.7	-	(7.4)	691.5	414.5	212.5	42
Install Fire Protection in 230 kV Stations - Bay d'Espoir	-	-	-	200.0	566.0	681.7	-	681.7	-	766.0	-	-	-	91.4	100.7	400.8	-	-	592.9	(173.1)	(280.9)	43
2013 Projects																						
Replace Instrument Transformers - Various Sites	593.2	552.8	538.4	1,511.7	471.9	31.9	-	31.9	-	3,668.0	240.3	699.0	755.5	1,190.3	711.0	(66.0)	-	-	3,530.1	(137.9)	(97.9)	
Total Terminal Stations Projects	**593.2**	**552.8**	**538.4**	**10,168.4**	**26,594.9**	**9,003.0**	**47,763.3**	**56,766.3**	**39,908.7**	**126,119.7**	**240.3**	**699.0**	**755.5**	**8,570.2**	**18,586.9**	**33,116.1**	**42,953.7**	**10,326.3**	**115,248.0**	**(10,871.7)**	**(23,650.2)**	

Table 7: 2018 Capital Expenditures: Transmission ($000)

Transmission Projects	Capital Budget									Actual Expenditure and Forecast									Variance		
	A				B	C	D (B+C)	E	F (A+C+E)	G				H	I	J	K(G+H+I+J)		K-F	H-D	
	2014	2015	2016	2017	Carryover to 2018	Original 2018	Revised 2018	2019 and Beyond	Total	2014	2015	2016	2017	2018	2019 and Beyond	Carryover to 2019	Total		Project Variance	Annual Variance	Notes
2018 Projects																					
Wood Pole Line Management Program - Various Sites	-	-	-	-	-	3,532.9	3,532.9	-	3,532.9	-	-	-	-	3,185.6	-	-	3,185.6		(347.3)	(347.3)	44
2017 Projects																					
Transmission Line Upgrades - TL212 and TL218	-	-	-	1,378.2	1,091.1	1,133.3	2,224.4	-	2,511.5	-	-	-	287.1	1,440.6	-	-	1,727.7		(783.8)	(783.8)	45
Replace Insulators - TL227	-	-	-	145.6	128.9	271.3	400.2	-	416.9	-	-	-	16.7	282.7	-	-	299.4		(117.5)	(117.5)	46
2016 Projects																					
Construct 230 kV Transmission Line - Soldiers Pond to Hardwoods	-	-	3,699.0	10,985.4	(27.8)	11,876.5	11,848.7	-	26,560.9	-	-	3,501.6	11,210.6	11,995.0	-	-	26,707.2		146.3	146.3	
2014 Projects																					
Refurbish Anchors and Footings TL202 and TL206 - Bay d'Espoir to Sunnyside	211.5	28.4	1,038.4	901.6	1,829.8	-	1,829.8	-	2,179.9	211.5	28.2	19.9	90.5	(350.1)	-	-	0.0		(2,179.9)	(2,179.9)	47
230 kV Transmission Line - Bay d'Espoir to Western Avalon	-	4,403.0	75,284.3	194,552.4	(760.0)	17,418.3	16,658.3	-	291,658.0	-	2,018.2	59,317.8	213,663.7	10,942.1	-	1,716.2	287,658.0		(4,000.0)	(5,716.2)	48
Total Transmission Projects	**211.5**	**4,431.4**	**80,021.7**	**207,963.2**	**2,262.0**	**34,232.3**	**36,494.3**	**-**	**326,860.1**	**211.5**	**2,046.4**	**62,839.3**	**225,268.6**	**27,495.9**	**-**	**1,716.2**	**319,577.9**		**(7,282.2)**	**(8,998.4)**	

Table 8: 2018 Capital Expenditures: Distribution ($000)

Distribution Projects	Capital Budget								Actual Expenditure and Forecast							Variance		
	A			B	C	D (B+C)	E	F (A+C+E)	G			H	I	J	K (G+H+I+J)	K-F	H-D	
	2015	2016	2017	Carryover to 2018	Original 2018	Revised 2018	2019 and Beyond	Total	2015	2016	2017	2018	2019 and Beyond	Carryover to 2019	Total	Project Variance	Annual Variance	Notes
2018 Projects																		
Provide Service Extensions - All Service Areas	-	-	-	-	4,642.0	4,642.0	-	4,642.0	-	-	-	3,709.1	-	-	3,709.1	(932.9)	(932.9)	49
Provide Service Extensions - All Service Areas - CIAC	-	-	-	-	(122.0)	(122.0)	-	(122.0)	-	-	-	(88.9)	-	-	(88.9)	33.1	33.1	
Upgrade Distribution Systems - All Service Areas	-	-	-	-	3,711.0	3,711.0	-	3,711.0	-	-	-	3,230.6	-	-	3,230.6	(480.4)	(480.4)	50
Upgrade Distribution Systems - All Service Areas - CIAC	-	-	-	-	(61.0)	(61.0)	-	(61.0)	-	-	-	(25.0)	-	-	(25.0)	36.0	36.0	
Distribution System Upgrades - Various Sites	-	-	-	-	383.8	383.8	2,771.2	3,155.0	-	-	-	193.6	2,771.2	190.2	3,155.0	-	(190.2)	51
Install Recloser Remote Control - English Harbour West and Barachoix	-	-	-	-	63.7	63.7	275.0	338.7	-	-	-	13.8	275.0	49.9	338.7	-	(49.9)	
Additions for Load Growth - Happy Valley	-	-	-	-	505.0	505.0	-	505.0	-	-	-	222.5	-	-	222.5	(282.5)	(282.5)	52
2017 Projects																		
Distribution Upgrades - Various Sites	-	-	64.2	(14.5)	1,130.9	1,116.4	-	1,195.1	-	-	78.7	915.3	-	-	994.0	(201.1)	(201.1)	53
Install Recloser Remote Control - Bottom Waters	-	-	47.1	(16.8)	418.6	401.8	-	465.7	-	-	63.9	425.3	-	-	489.2	23.5	23.5	
2016 Projects																		
Upgrade Distribution Systems - Various Sites	-	285.6	6,350.3	911.0	-	911.0	-	6,635.9	-	361.8	5,363.1	683.2	-	-	6,408.1	(227.8)	(227.8)	54
Total Distribution Projects	**-**	**285.6**	**6,461.6**	**879.7**	**10,672.0**	**11,551.7**	**3,046.2**	**20,465.4**	**-**	**361.8**	**5,505.7**	**9,279.5**	**3,046.2**	**240.1**	**18,433.3**	**(2,032.1)**	**(2,272.2)**	

Table 9: 2018 Capital Expenditures: Rural Generation ($000)

Rural Generation Projects	A			B	C	D (B+C)	E	F (A+C+E)	G			H	I	J	K (G+H+I+J)	K-F	H-D	
	2015	2016	2017	Carryover to 2018	Original 2018	Revised 2018	2019 and Beyond	Total	2015	2016	2017	2018	2019 and Beyond	Carryover to 2019	Total	Project Variance	Annual Variance	Notes
2018 Projects																		
Overhaul Diesel Units - Various Sites	-	-	-	-	2,852.4	2,852.4	-	2,852.4	-	-	-	2,029.0	-	-	2,029.0	(823.4)	(823.4)	55
Diesel Plant Engine Cooling System Upgrades - Various Sites	-	-	-	-	638.4	638.4	671.6	1,310.0	-	-	-	149.3	671.6	489.1	1,310.0	-	(489.1)	56
Additions for Load Growth - Makkovik and Rigolet	-	-	-	-	730.1	730.1	-	730.1	-	-	-	302.0	-	-	302.0	(428.1)	(428.1)	57
Upgrade Ventilation - Cartwright	-	-	-	-	465.7	465.7	-	465.7	-	-	-	46.5	-	419.2	465.7	-	(419.2)	58
Diesel Plant Fire Protection - Postville	-	-	-	-	505.6	505.6	336.4	842.0	-	-	-	37.2	336.4	468.4	842.0	-	(468.4)	59
Inspect Fuel Storage Tanks - Black Tickle	-	-	-	-	818.7	818.7	-	818.7	-	-	-	481.7	-	337.0	818.7	-	(337.0)	60
Install Sub-Surface Drainage System - Paradise River	-	-	-	-	524.9	524.9	-	524.9	-	-	-	721.6	-	-	721.6	196.7	196.7	61
Replace Secondary Containment System Liner - Nain	-	-	-	-	1,639.2	1,639.2	1,450.4	3,089.6	-	-	-	672.5	1,450.4	2,471.7	4,594.6	1,505.0	(966.7)	62
Diesel Genset Replacements - Makkovik	-	-	-	-	604.1	604.1	8,296.1	8,900.2	-	-	-	1,585.1	8,296.1	(981.0)	8,900.2	-	981.0	63
Replace Automation Equipment - St. Anthony	-	-	-	-	307.4	307.4	1,565.9	1,873.3	-	-	-	127.2	1,565.9	180.2	1,873.3	-	(180.2)	64
Replace Human Machine Interface - St. Lewis	-	-	-	-	280.8	280.8	-	280.8	-	-	-	242.5	-	-	242.5	(38.3)	(38.3)	
2017 Projects																		
Diesel Plant Engine Auxiliary Upgrades - Various Sites	-	-	790.6	145.9	416.3	562.2	-	1,206.9	-	-	644.7	481.9	-	-	1,126.6	(80.3)	(80.3)	
Replace Automation Equipment - Mary's Harbour	-	-	120.3	32.9	1,021.7	1,054.6	-	1,142.0	-	-	87.4	960.4	-	-	1,047.8	(94.2)	(94.2)	
Diesel Genset Replacements - Port Hope Simpson and Charlottetown	-	-	658.8	445.2	5,148.0	5,593.2	-	5,806.8	-	-	213.6	3,973.8	-	-	4,187.4	(1,619.4)	(1,619.4)	65
2016 Projects																		
Upgrade Human Machine Interface - Various Sites	-	114.0	320.0	73.0	-	73.0	-	434.0	-	125.3	235.7	96.9	-	-	457.9	23.9	23.9	
2015 Projects																		
Replace Programmable Logic Controllers - Various Sites	366.9	346.0	245.1	51.5	-	51.5	-	958.0	397.2	345.5	410.5	206.7	-	-	1,359.9	401.9	155.2	66
Total Rural Generation Projects	**366.9**	**460.0**	**2,134.8**	**748.5**	**15,953.3**	**16,701.8**	**12,320.4**	**31,235.4**	**397.2**	**470.8**	**1,591.9**	**12,114.3**	**12,320.4**	**3,384.6**	**30,279.2**	**(956.1)**	**(4,587.5)**	

Table 10: 2018 Capital Expenditures: Properties ($000)

Properties Projects	Capital Budget								Actual Expenditure and Forecast							Variance		
	A			B	C	D (B+C)	E	F (A+C+E)	G			H	I	J	K (G+H+I+J)	K-F	H-D	
	2015	2016	2017	Carryover to 2018	Original 2018	Revised 2018	2019 and Beyond	Total	2015	2016	2017	2018	2019 and Beyond	Carryover to 2019	Total	Project Variance	Annual Variance	Notes
2018 Projects																		
Upgrade Office Facilities and Control Buildings - Various	-	-	-	-	1,180.6	1,180.6	-	1,180.6	-	-	-	955.8	-		955.8	(224.8)	(224.8)	67
Line Depot Condition Assessment and Refurbishment - Various	-	-	-	-	1,233.0	1,233.0	-	1,233.0	-	-	-	1,005.6	-		1,005.6	(227.4)	(227.4)	68
Install Fall Protection Equipment - Various	-	-	-	-	46.7	46.7	-	46.7	-	-	-	40.1	-		40.1	(6.6)	(6.6)	
Install Energy Efficiency Lighting in Diesel Plants - Various	-	-	-	-	104.0	104.0	241.2	345.2	-	-	-	68.0	241.2	36.0	345.2	-	(36.0)	
2017 Projects																		
Construct New Facilities - Various Sites	-	-	422.0	184.2	1,034.1	1,218.3	-	1,456.1	-	-	237.8	429.8	-	449.9	1,117.5	(338.6)	(788.5)	69
Total Properties Projects	**-**	**-**	**422.0**	**184.2**	**3,598.4**	**3,782.6**	**241.2**	**4,261.6**	**-**	**-**	**237.8**	**2,499.3**	**241.2**	**485.9**	**3,464.2**	**(797.4)**	**(1,283.3)**	

Table 11: 2018 Capital Expenditures: Metering ($000)

Metering Projects	Capital Budget								Actual Expenditure and Forecast							Variance		
	A			B	C	D (B+C)	E	F (A+C+E)	G			H	I	J	K (G+H+I+J)	K-F	H-D	
	2015	2016	2017	Carryover to 2018	Original 2018	Revised 2018	2019 and Beyond	Total	2015	2016	2017	2018	2019 and Beyond	Carryover to 2019	Total	Project Variance	Annual Variance	Notes
2018 Projects																		
Install Automated Meter Reading - Bottom Waters	-	-	-	-	75.2	75.2	-	75.2	-	-	-	-	-	-	-	(75.2)	(75.2)	
Purchase Metering and Metering Equipment - Various Sites	-	-	-	-	198.5	198.5	-	198.5	-	-	-	236.6	-	-	236.6	38.1	38.1	
2017 Projects																		
Install Automated Meter Reading - Happy Valley	-	-	78.6	(105.2)	1,891.6	1,786.4	-	1,970.2	-	-	183.8	1,606.7	-	-	1,790.5	(179.7)	(179.7)	70
Purchase New Meter Calibration Test Console - Hydro Place	-	-	196.9	212.7	-	212.7	-	196.9	-	-	0.1	209.2	-	-	209.3	12.4	(3.5)	
2016 Projects																		
Install Automated Meter Reading - Labrador West	-	433.8	533.4	(3.2)	-	(3.2)	-	967.2	-	130.4	1,232.8	45.1	-	-	1,408.3	441.1	48.3	71
Total Metering Projects	**-**	**433.8**	**808.9**	**104.3**	**2,165.3**	**2,269.6**	**-**	**3,408.0**	**-**	**130.4**	**1,416.8**	**2,097.6**	**-**	**-**	**3,644.8**	**236.8**	**(172.0)**	

Table 12: 2018 Capital Expenditures: Tools and Equipment ($000)

Tools and Equipment	Capital Budget								Actual Expenditure and Forecast							Variance		
	A			B	C	D (B+C)	E	F (A+C+E)	G			H	I	J	K (G+H+I+J)	K-F	H-D	
	2015	2016	2017	Carryover to 2018	Original 2018	Revised 2018	2019 and Beyond	Total	2015	2016	2017	2018	2019 and Beyond	Carryover to 2019	Total	Project Variance	Annual Variance	Notes
2018 Projects																		
Replace Light Duty Mobile Equipment - Various Sites	-	-	-	-	429.0	429.0	-	429.0	-	-	-	416.6	-		416.6	(12.4)	(12.4)	
Replace Front End Loader Unit No. 9628	-	-	-	-	170.2	170.2	-	170.2	-	-	-	168.7	-		168.7	(1.5)	(1.5)	
Replace Off-Road Track Vehicles - Bishop's Falls and Bay d'Espoir	-	-	-	-	213.7	213.7	986.3	1,200.0	-	-	-	249.5	986.3	(35.8)	1,200.0	-	35.8	
Tools and Equipment Less than $50,000	-	-	-	-	497.7	497.7	-	497.7	-	-	-	422.1	-		422.1	(75.6)	(75.6)	
Total Tools and Equipment Projects	**-**	**-**	**-**	**-**	**1,310.6**	**1,310.6**	**986.3**	**2,296.9**	**-**	**-**	**-**	**1,256.9**	**986.3**	**(35.8)**	**2,207.4**	**(89.5)**	**(53.7)**	

Table 13: 2018 Capital Expenditures: Information Systems ($000)

Information Systems Projects	Capital Budget								Actual Expenditure and Forecast							Variance		
	A			B	C	D (B+C)	E	F (A+C+E)	G			H	I	J	K (G+H+I+J)	K-F	H-D	
	2015	2016	2017	Carryover to 2018	Original 2018	Revised 2018	2019 and Beyond	Total	2015	2016	2017	2018	2019 and Beyond	Carryover to 2019	Total	Project Variance	Annual Variance	Notes
2018 Projects																		
Upgrade Software Applications - Hydro Place	-	-	-	-	114.7	114.7	-	114.7	-	-	-	68.9	-	-	68.9	(45.8)	(45.8)	
Refresh Security Software - Hydro Place	-	-	-	-	62.2	62.2	-	62.2	-	-	-	63.2	-	-	63.2	1.0	1.0	
Perform Minor Enhancements - Hydro Place	-	-	-	-	49.4	49.4	-	49.4	-	-	-	43.3	-	-	43.3	(6.1)	(6.1)	
Replace Personal Computers - Hydro Place	-	-	-	-	493.0	493.0	-	493.0	-	-	-	94.5	-	-	94.5	(398.5)	(398.5)	72
Upgrade Core IT Infrastructure - Hydro Place	-	-	-	-	352.4	352.4	-	352.4	-	-	-	453.8	-	-	453.8	101.4	101.4	73
Replace Peripheral Infrastructure - Hydro Place	-	-	-	-	258.4	258.4	-	258.4	-	-	-	260.1	-	-	260.1	1.7	1.7	
Upgrade Energy Management System - Hydro Place	-	-	-	-	336.8	336.8	-	336.8	-	-	-	-	-	-	-	(336.8)	(336.8)	74
2016 Projects																		
Upgrade Microsoft Office - Hydro Place	-	683.7	953.4	20.1	957.3	977.4	-	2,594.4	-	656.9	960.0	822.3	-	-	2,439.2	(155.2)	(155.1)	75
Cost Recoveries	-	(317.1)	(442.2)	(9.0)	(444.0)	(453.0)	-	(1,203.3)	-	(304.8)	(445.5)	(380.7)	-	-	(1,131.0)	72.3	72.3	
Total Information Systems Projects	**-**	**366.6**	**511.2**	**11.1**	**2,180.2**	**2,191.3**	**-**	**3,058.0**	**-**	**352.1**	**514.5**	**1,425.4**	**-**	**-**	**2,292.0**	**(766.0)**	**(765.9)**	

Table 14: 2018 Capital Expenditures: Telecontrol ($000)

Telecontrol Projects	Capital Budget								Actual Expenditure and Forecast							Variance		
	A			B	C	D (B+C)	E	F (A+C+E)	G			H	I	J	K (G+H+I+J)	K-F	H-D	
	2015	2016	2017	Carryover to 2018	Original 2018	Revised 2018	2019 and Beyond	Total	2015	2016	2017	2018	2019 and Beyond	Carryover to 2019	Total	Project Variance	Annual Variance	Notes
2018 Projects																		
Replace PBX Phone Systems - Various	-	-	-	-	91.7	91.7	1,150.6	1,242.3	-	-	-	134.9	1,150.6	(43.2)	1,242.3	-	43.2	
Replace MDR 6000 Microwave Radio - Various	-	-	-	-	64.0	64.0	1,137.0	1,201.0	-	-	-	81.5	1,137.0	(17.5)	1,201.0	-	17.5	
Replace Teleprotection - TL261	-	-	-	-	57.6	57.6	459.8	517.4	-	-	-	60.1	459.8	(2.5)	517.4	-	2.5	
Replace Network Communications Equipment - Various	-	-	-	-	199.5	199.5	-	199.5	-	-	-	239.1	-	-	239.1	39.6	39.6	
Upgrade Site Facilities - Various	-	-	-	-	49.0	49.0	-	49.0	-	-	-	46.8	-	-	46.8	(2.2)	(2.2)	
Replace Radomes - Various	-	-	-	-	360.3	360.3	-	360.3	-	-	-	331.1	-	-	331.1	(29.2)	(29.2)	
Replace RTUs - Various	-	-	-	-	118.3	118.3	-	118.3	-	-	-	108.5	-	-	108.5	(9.8)	(9.8)	
Replace Air Conditioners - Various	-	-	-	-	74.4	74.4	-	74.4	-	-	-	75.5	-	-	75.5	1.1	1.1	
Replace Battery Banks and Chargers - Various	-	-	-	-	382.1	382.1	555.8	937.9	-	-	-	231.3	555.8	150.8	937.9	-	(150.8)	76
Purchase Tools and Equipment less than $50,000	-	-	-	-	46.0	46.0	-	46.0	-	-	-	30.7	-	-	30.7	(15.3)	(15.3)	
2017 Projects																		
Replace Battery Banks and Chargers - Various Sites (2017-2018)	-	-	379.3	(4.3)	566.2	561.9	-	945.5	-	-	217.6	555.1	-	-	772.7	(172.8)	(6.8)	77
Upgrade Telecontrol Facilities - Mary March Hill and Blue Grass Hill	-	-	91.2	(32.1)	665.9	633.8	-	757.1	-	-	123.3	500.0	-	-	623.3	(133.8)	(133.8)	78
Total Telecontrol Projects	**-**	**-**	**470.5**	**(36.4)**	**2,675.0**	**2,638.6**	**3,303.2**	**6,448.7**	**-**	**-**	**340.9**	**2,394.6**	**3,303.2**	**88**	**6,126.3**	**(322.4)**	**(244.0)**	

Table 15: 2018 Capital Expenditures: Transportation and Administrative ($000)

Transportation	Capital Budget								Actual Expenditure and Forecast							Variance		
	A			B	C	D (B+C)	E	F (A+C+E)	G			H	I	J	K (G+H+I+J)	K-F	H-D	
	2015	2016	2017	Carryover to 2018	Original 2018	Revised 2018	2019 and Beyond	Total	2015	2016	2017	2018	2019 and Beyond	Carryover to 2019	Total	Project Variance	Annual Variance	Notes
2018 Projects																		
Replace Vehicles and Aerial Devices - Various Sites	-	-	-	-	1,667.2	1,667.2	753.7	2,420.9	-	-	-	1,165.1	753.7	502.1	2,420.9	-	(502.1)	79
2017 Projects																		
Replace Vehicles and Aerial Devices - Various Sites	-	-	2,001.4	725.6	398.8	1,124.4	-	2,400.2	-	-	1,275.8	1,368.1	-	-	2,643.9	243.7	243.7	80
Total Transportation Projects	-	-	2,001.4	725.6	2,066.0	2,791.6	753.7	4,821.1	-	-	1,275.8	2,533.2	753.7	502.1	5,064.8	243.7	(258.4)	

Administrative	Capital Budget								Actual Expenditure and Forecast							Variance		
	A			B	C	D (B+C)	E	F (A+C+E)	G			H	I	J	K (G+H+I+J)	K-F	H-D	
	2015	2016	2017	Carryover to 2018	Original 2018	Revised 2018	2019 and Beyond	Total	2015	2016	2017	2018	2019 and Beyond	Carryover to 2019	Total	Project Variance	Annual Variance	Notes
2018 Projects																		
Remove Safety Hazards - Various	-	-	-	-	199.4	199.4	-	199.4	-	-	-	166.3	-	-	166.3	(33.1)	(33.1)	
Upgrade Exterior of Building - Hydro Place	-	-	-	-	260.2	260.2	405.7	665.9	-	-	-	232.6	405.7	27.6	665.9	-	(27.6)	
Replace Washroom Fixtures - Hydro Place	-	-	-	-	49.5	49.5	-	49.5	-	-	-	50.3	-	-	50.3	0.8	0.8	
Security Improvements - Hydro Place	-	-	-	-	45.5	45.5	-	45.5	-	-	-	8.5	-	-	8.5	(37.0)	(37.0)	
Purchase Office Equipment	-	-	-	-	90.0	90.0	-	90.0	-	-	-	26.3	-	-	26.3	(63.7)	(63.7)	
2016 Projects																		
Replace Air Conditioning Units 8 and 14 - Hydro Place	-	34.6	229.5	19.5	-	19.5	-	264.1	-	31.0	213.6	31.8	-	-	276.4	12.3	12.3	
Total Administrative Projects	**-**	**34.6**	**229.5**	**19.5**	**644.6**	**664.1**	**405.7**	**1,314.4**	**-**	**31.0**	**213.6**	**515.8**	**405.7**	**27.6**	**1,193.7**	**(120.7)**	**(148.3)**	

Table 16: 2018 Capital Expenditures: Allowance for Unforeseen Items, Supplemental Capital Projects, and Projects less than $50,000 ($000)

Allowance For Unforeseen	Capital Budget								Actual Expenditure and Forecast							Variance		
	A			B	C	D (B+C)	E	F (A+C+E)	G			H	I	J	K (G+H+I+J)	K-F	H-D	
	2015	2016	2017	Carryover to 2018	Original 2018	Revised 2018	2019 and Beyond	Total	2015	2016	2017	2018	2019 and Beyond	Carryover to 2019	Total	Project Variance	Annual Variance	Notes
2018 Projects																		
Allowance for Unforeseen Items	-	-	-	-	1,000.0	1,000.0	-	1,000.0	-	-	-	-	-	-	-	(1,000.0)	(1,000.0)	81
Penstock #3 Refurbishment - Bay d'Espoir	-	-	-	-	-	-	-	-	-	-	-	4,743.2	-	-	4,743.2	4,743.2	4,743.2	81
Allowance for Unforeseen - Top Up P.U. 19 (2018)	-	-	-	-	1,000.0	1,000.0	-	1,000.0	-	-	-	-	-		-	(1,000.0)	(1,000.0)	81
Replace Engine #2051 - Rigolet	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total Allowance For Unforeseen	**-**	**-**	**-**	**-**	**2,000.0**	**2,000.0**	**-**	**2,000.0**	**-**	**-**	**-**	**4,743.2**	**-**	**-**	**4,743.2**	**2,743.2**	**2,743.2**	

Supplemental Projects	Capital Budget								Actual Expenditure and Forecast							Variance		
	A			B	C	D (B+C)	E	F (A+C+E)	G			H	I	J	K (G+H+I+J)	K-F	H-D	
	2015	2016	2017	Carryover to 2018	Original 2018	Revised 2018	2019 and Beyond	Total	2015	2016	2017	2018	2019 and Beyond	Carryover to 2019	Total	Project Variance	Annual Variance	Notes
2018 Projects																		
Provide Service to Western Regional Servce Baord's Waste Transfer Site - Hampden	-	-	-	-	748.4	748.4	-	748.4	-	-	-	644.5	-		644.5	(103.9)	(103.9)	82
Provide Service to Western Regional Servce Baord's Waste Transfer Site - Hampden - CIAC	-	-	-	-	(748.4)	(748.4)	-	(748.4)	-	-	-	(644.5)	-		(644.5)	103.9	103.9	82
Perform Voltage Conversion of the Distribution Feeder VA26 - Labrador City	-	-	-	-	719.4	719.4	-	719.4	-	-	-	705.1	-		705.1	(14.3)	(14.3)	
Perform Voltage Conversion of the Distribution Feeder VA26 - Labrador City - CIAC	-	-	-	-	(50.4)	(50.4)	-	(50.4)	-	-	-	-	-		0.0	50.4	50.4	
Penstock Condition Assessments - Bay d'Espoir	-	-	-	-	1,120.6	1,120.6	-	1,120.6	-	-	-	1,682.5	-	223.8	1,906.3	785.7	561.9	83
Improve Boiler Capacity - Holyrood	-	-	-	-	2,560.5	2,560.5	-	2,560.5	-	-	-	1,665.9	-		1,665.9	(894.6)	(894.6)	84
Mary's Harbour Hydro Integration	-	-	-	-	195.5	195.5	-	195.5	-	-	-	49.2	-	146.3	195.5	-	(146.3)	85
Mary's Harbour Hydro Integration - CIAC	-	-	-	-	(195.5)	(195.5)	-	(195.5)	-	-	-	-	-	(195.5)	(195.5)	-	195.5	85
Gang Switch - Happy Valley-Goose Bay	-	-	-	-	195.4	195.4	-	195.4	-	-	-	85.2	-		85.2	(110.2)	(110.2)	86
TL226 and TL239 Reroute	-	-	-	-	712.3	712.3	220.1	932.4	-	-	-	579.8	220.1	132.5	932.4	-	(132.5)	87
2017 Projects																		
Terminal Station Upgrades - Wabush	-	-	2,585.2	1,644.5	327.3	1,971.8	-	2,912.5	-	-	940.7	1,021.4	-		1,962.1	(950.4)	(950.4)	88
Reliability Improvements - Holyrood	-	-	2,610.0	16.7	-	16.7	-	2,610.0	-	-	3,586.6	297.3	-		3,883.9	1,273.9	280.6	89
								-										
2016 Projects																		
Purchase of 12 MW Diesel Generation - Holyrood	-	4,700.0	-	418.9	-	418.9	-	4,700.0	-	3,784.0	497.1	678.2	-		4,959.3	259.3	259.3	90
Total Supplemental Projects Approved by PUB	**-**	**4,700.0**	**5,195.2**	**2,080.1**	**5,585.1**	**7,665.2**	**220.1**	**15,700.4**	**-**	**3,784.0**	**5,024.4**	**6,764.6**	**220.1**	**307.1**	**16,100.2**	**399.8**	**(900.6)**	

Projects Less than $50,000	Capital Budget								Actual Expenditure and Forecast							Variance		
	A			B	C	D (B+C)	E	F (A+C+E)	G			H	I	J	K (G+H+I+J)	K-F	H-D	
	2015	2016	2017	Carryover to 2018	Original 2018	Revised 2018	2019 and Beyond	Total	2015	2016	2017	2018	2019 and Beyond	Carryover to 2019	Total	Project Variance	Annual Variance	Notes
2018 Projects																		
Replace Alternator Bearing - Stephenville Gas Turbine	-	-	-	-	47.9	47.9	-	47.9	-	-	-	48.7	-	-	48.7	0.8	0.8	
Back-up Control Center Cooling Upgrade - Holyrood	-	-	-	-	49.0	49.0	-	49.0	-	-	-	41.5	-	-	41.5	(7.5)	(7.5)	
Stage 2 Emergency Diesel Generator Refurbishment - Holyrood	-	-	-	-	49.5	49.5	-	49.5	-	-	-	9.3	-	-	9.3	(40.2)	(40.2)	
Penstock 3 Laser Scanning - Bay d'Espoir	-	-	-	-	46.3	46.3	-	46.3	-	-	-	31.3	-	-	31.3	(15.0)	(15.0)	
Penstock 3 Press Transducer - Bay d'Espoir	-	-	-	-	29.5	29.5	-	29.5	-	-	-	45.1	-	-	45.1	15.6	15.6	
Parking Lot Access Improvements - Hydro Place	-	-	-	-	47.4	47.4	-	47.4	-	-	-	41.5	-	-	41.5	(5.9)	(5.9)	
Replace Heat Sensors Tanks - Holyrood	-	-	-	-	49.8	49.8	-	49.8	-	-	-	48.1	-	-	48.1	(1.7)	(1.7)	
Main Breaker Replacement-HYP	-	-	-	-	18.4	18.4	-	18.4	-	-	-	17.5	-	-	17.5	(0.9)	(0.9)	
2017 Projects																		
Replace Tracks for V7601 Groomer - Bay d'Espoir	-	-	1.0	1.0	43.7	44.7	-	44.7	-	-	-	32.3	-	-	32.3	(12.4)	(12.4)	
Total Projects Less than $50,000	**-**	**-**	**1.0**	**1.0**	**381.5**	**382.5**	**-**	**382.5**	**-**	**-**	**-**	**315.3**	**-**	**-**	**315.3**	**(67.2)**	**(67.2)**	

4.0 Variance Explanations (Greater than $100,000 and 10% Variance from Budget)

The projects discussed in the following section have 2018 variances (project total or annual as indicated) of more than 10% and $100,000 when comparing the approved budget to the 2018 expenditures, whether it is a single- or multi-year project. The projects are ordered and numbered based upon the order and number they appear in the preceding set of tables.

4.1 Hydraulic Generation Projects (Table 3)

1. <u>Install Remote Operation of Salmon Spillway: Bay d'Espoir</u>

Annual Variance ($000)

Budget: 645.9 Expenditures: 885.4 Variance: 239.5

This is a two-year project (2018–2019) that commenced in 2018. The variance in 2018 expenditures is attributed to the advancement of a portion of the 2019 planned activities into 2018. This project remains on schedule with no change to the overall scope, budget, or completion date.

2. <u>Refurbish Backfill on Penstock #1: Bay d'Espoir</u>

Annual Variance ($000)

Budget: 1,630.4 Expenditures: 63.2 Variance: (1,567.2)

This is a one-year project that commenced in 2018 and has carried over into 2019. An engineering consultant's report concerning Bay d'Espoir Penstock 1 failure recommended suspending this work on the backfill until a long-term solution for the penstock is selected. The long-term solution is not expected to be available until March 2019. This project's justification, budget, and schedule will be re-evaluated at that time.

3. <u>Hydraulic In-Service Failures</u>

Project Variance ($000)

Budget: 1,251.1 Expenditures: 452.3 Variance: (798.8)

This was a one-year project completed in 2018. The budget for the project was based on prediction of the magnitude of in-service failures using historical data and engineering judgement. The 2018 project variance is attributed to the actual number of failures incurred. A detailed list of work executed under this project is found in Section 9.0.

4. <u>Hydraulic Generation Refurbishment and Modernization: Various Sites</u>

Annual Variance ($000)

Budget: 10,325.4 Expenditures: 5,856.3 Variance: (4,469.1)

Project Variance ($000)

Budget: 14,608.5 Expenditures & Forecast: 12,718.1 Variance: (1,890.4)

This is a two-year project (2018–2019) that commenced in 2018. The variance in 2018 expenditures is primarily attributed to a rescheduling of a portion of the planned work to 2019 for the following projects:

- Internal and external refurbishment of Bay d'Espoir Surge Tank 1. It was determined during project planning that the available generation outage duration in 2018 was inadequate to complete the entire scope. The external tank work was completed in 2018 and the internal tank work has been rescheduled to 2019.
- Refurbishment at Hinds Lake Control Structure and Bay d'Espoir Intake 1 Structure. A change in contracting strategy resulted in a portion of the engineering, procurement and construction activity originally planned for 2018 to be rescheduled to 2019.

- Bay d'Espoir Unit 2 Turbine Overhaul. The variance in 2018 expenditures is also attributed to a reduced volume of work than that originally estimated for Bay d'Espoir Unit 2 Turbine Overhaul. Upon disassembly of the Unit 2, it was found that the discharge wear ring could be refurbished in-place, rather than replaced.

5. <u>Install Asset Health Monitoring System: Upper Salmon</u>

Annual Variance ($000)

Budget: 426.5	Expenditures: 141.5	Variance: (285.0)

Project Variance ($000)

Budget: 641.4	Expenditures: 356.4	Variance: (285.0)

This was a two-year project (2017–2018) that was completed in 2018. The construction activities for this project were estimated based on having the construction completed by contractors. Hydro was able to leverage an opportunity to execute the activities using internal operations and maintenance resources, resulting in overall project expenditures less than budget.

6. <u>Water System Replacements: Bay d'Espoir and Cat Arm</u>

Annual Variance ($000)

Budget: 2,377.1	Expenditures: 1,520.7	Variance: (856.4)

Project Variance ($000)

Budget: 2,553.8	Expenditures: 1,697.4	Variance: (856.4)

This was a two-year project (2017–2018) that was completed in 2018. The variance in 2018 and total project expenditures is attributed to the implementation of a more cost-effective construction strategy for this project through the implementation of three-dimensional laser scanning that was not previously considered. Three-dimensional laser

scanning was used as a design tool, allowing piping sections to be prefabricated off-site and reducing the overall installation costs during unit outages.

7. <u>Refurbish Powerhouse Station Services: Bay d'Espoir</u>

Annual Variance ($000)

Budget: 2,843.5 Expenditures: 1,003.5 Variance: (1,840.0)

This is a three-year project (2017–2019) that commenced in 2017. The variance in 2018 expenditures is attributed to a portion of the procurement and construction activity that was originally planned for 2018 now expected in 2019. The engineering for this project was delayed in 2017 and partially recovered in 2018, however the long lead time to procure materials did align with the 2018 planned generation outages. There is no change to the overall project scope, budget, or completion date.

8. <u>Replace Exciter Controls Units 1 to 6: Bay d'Espoir</u>

Annual Variance ($000)

Budget: 857.7 Expenditures: 628.9 Variance: (228.8)

This is a three-year project (2017–2019) that commenced in 2017. The variance in 2018 expenditures is attributed to less than estimated engineering costs. The planned scope of work for 2018 is complete. The project remains on schedule with no change to the overall project scope, budget, or completion date.

9. <u>Upgrade Ventilation in Powerhouse 1 and 2: Bay d'Espoir</u>

Annual Variance ($000)

Budget: 886.1 Expenditures: 573.8 Variance: (312.3)

Project Variance ($000)

Budget: 997.9 Expenditures: 685.6 Variance: (312.3)

This was a two-year project (2017–2018) that was completed in 2018. The variance in 2018 and total project expenditure is attributed to cancellation of a portion of the project scope. During design development, it was determined that the planned generator heat recovery and distribution system for Bay d'Espoir Powerhouse 1, consisting of sheet metal ductwork from the top of each generating unit to the lower levels of the powerhouse, would be prone to damage each time the unit is disassembled, resulting in high repair costs over the life of the asset. Therefore, the heat recovery and distribution system scope was cancelled. The other project scope, to replace roof ventilators and upgrade ventilation louvers in Bay d'Espoir Powerhouses 1 and 2, was completed as planned.

10. <u>Purchase Capital Spares: Hydraulic</u>

Project Variance ($000)

Budget: 487.4 Expenditures: 629.6 Variance: 142.2

This was a planned one-year project that commenced in 2017 and was carried over and completed in 2018. The variance in total project expenditures is attributed to the addition of the procurement of a spare set of generator bearing coolers for the Hinds Lake Unit to the project scope. As stated in the "2017 Capital Expenditures and Carryover Report," Hydro experienced failures of generator bearing coolers in Hinds Lake and determined that spare coolers were required in the event of additional failures in the 2017–2018 winter season.

11. <u>Replace Slip Rings Units 1 to 6: Bay d'Espoir</u>

Annual Variance ($000)

Budget: 369.9 Expenditures: 17.2 Variance: (352.7)

This is a two-year project (2017–2018) that commenced in 2017 and has been carried over into 2019. The rescheduling of the 2018 construction to 2019 resulted in the

variance in 2018 expenditures. The project scope is to replace slip rings on six units at Bay d'Espoir. Two were installed in 2017. Three were not installed in 2018 based on a condition assessment during the unit outages, and were initially considered for cancellation. Upon disassembly of Unit 2 (the fourth installation planned for 2018), it was determined that actual dimensions varied from drawings and the new slip ring could not be installed. It was also identified that there was accelerated brush wear on Unit 2. This new information resulted in a reassessment of the decision to not replace the other three slip rings planned for 2018 and led to reinstatement of the original recommendation to install the new slip rings. Given that the 2018 outages had already been completed, the remaining slip rings will be installed in 2019.

12. <u>Control Structure Refurbishments</u>

Annual Variance ($000)

Budget: 1,196.8 Expenditures: 709.3 Variance: (487.5)

Project Variance ($000)

Budget: 2,188.2 Expenditures & Forecast: 1,844.8 Variance: (343.4)

This is a two-year project (2017–2018) that commenced in 2017 and has carried over into 2019. The project scope includes refurbishment work at four water control structures. The work was completed at three of the locations (North Salmon Spillway Structure, Granite Canal Intake Structure, and Ebbegunbaeg Control Structure); however, the work for Burnt Dam has been rescheduled to 2019 due to a delay in completing the engineering design.

13. <u>Upgrade Work: Cat Arm</u>

Annual Variance ($000)

Budget: 910.3 Expenditures: 1,376.3 Variance: 466.0

Project Variance ($000)

Budget: 1,911.3 Expenditures & Forecast: 2,407.6 Variance: 496.3

This is a two-year project (2016–2017) that commenced in 2016 and has been carried over into 2019. One aspect of the project scope is the purchase and installation of two deflector servomotors. These servomotors have a long lead time and could not be ordered until an existing servomotor of the same design was installed, tested, and proven to meet the performance specifications. The existing servomotor was installed in September 2018 and determined to meet the performance specifications. The new servomotors have been ordered and will be received and installed in 2019.

Another aspect of the project scope was to refurbish the spherical valve control system. A portion of the variance in 2018 and in total project expenditures is associated with this scope. In particular, it is attributed to increased material requirements identified during detailed engineering design. As well, there were cost increases as a result of a change in construction strategy from the original plan of internal labour to use of contractor due to unavailability of internal resources. This scope was completed in 2018.

14. <u>Rehabilitate Shoreline Protection: Cat Arm</u>

Annual Variance ($000)

Budget: 977.2 Expenditures: 89.2 Variance: (888.0)

This is a two-year project (2016–2017) that commenced in 2016 and carried over into 2019. During project planning, it was determined that there is risk of rock fall from the adjacent cliff into the construction zone. The identification of the necessity for risk

mitigation to ensure a safe work site resulted in a pause on the project to estimate the associated cost and, if necessary, re-evaluate the project alternatives. A site survey was completed in September 2018 and a cost estimate for mitigation of the safety hazard was completed in December 2018. These costs will be used in 2019 to update the project estimate and re-evaluate the cost benefit analysis of project alternatives prior to proceeding any further.

15. <u>Replace Pump House and Associated Equipment: Bay d'Espoir</u>

Annual Variance ($000)

Budget: 253.6 Expenditures: 373.9 Variance: 120.3

Project Variance ($000)

Budget: 545.2 Expenditures & Forecast: 996.7 Variance: 451.5

This is a two-year project (2015–2016) that has carried over into 2019. The variance in 2018 and total project expenditures is attributed to higher than expected construction costs. Construction was originally tendered in 2016, but was not awarded since tendered prices were significantly higher than the budget. A reassessment of the design and execution strategy was undertaken, but did not result in any anticipated significant savings. Replacement of the pump house became critical after damage sustained from flooding during Hurricane Matthew in 2016. The work was retendered and construction began in the summer of 2018. Delivery of the prefabricated pump house building was late in 2018 resulting in carry over of the final construction activity to 2019.

4.2 Thermal Generation Projects (Table 4)

16. <u>Thermal In-Service Failures</u>

Project Variance ($000)

Budget: 1,250.0 Expenditures: 2,699.9 Variance: 1,449.9

This was a one-year project completed in 2018. The budget for the project was based on prediction of the magnitude of in-service failures using historical data and engineering judgement. The variance in project expenditures is attributed to the actual number of failures incurred. A detailed list of work executed under this project is found in Section 10.0 of this report.

17. <u>Overhaul Pumps: Holyrood</u>

Project Variance ($000)

Budget: 438.3 Expenditures: 302.7 Variance: (135.6)

This was a one-year project completed in 2018. The variance in project expenditures is attributed to lower than expected materials and contract labour costs.

18. <u>Condition Assessment and Miscellaneous Upgrades: Holyrood</u>

Project Variance ($000)

Budget: 2,749.6 Expenditures: 3,906.9 Variance: 1,157.3

This was a one-year project completed in 2018. The variance in expenditures is attributed to higher than expected contract pricing for work on the boilers, stacks, marine terminal arms, and brush holders. Also, following disassembly of the Unit 3 travelling screen, its condition was determined to be poorer than originally expected. This resulted in additional refurbishment requirements. As well, additional fuel storage tank inspections were required to meet the requirements of the *Storage and Handling of Gasoline and Associated Products Regulations, 2003*.

19. <u>Install Raw Water Line: Holyrood</u>

Project Variance ($000)

Budget: 1,252.6 Expenditures: 1,528.5 Variance: 275.9

This was a one-year project completed in 2018. The variance in expenditures is attributed to additional design requirements determined during detailed project planning and engineering, including: (i) the requirement for a higher grade of piping than originally estimated, (ii) the requirement to bury the piping to a greater depth than originally estimated, (iii) the requirement to install an intake at the Quarry Brook Dam, and (iv) the requirement to incorporate a powerhouse utilidor crossing into the design. The utilidor includes cables, piping, and a walkway that could not be relocated.

20. <u>Install Fire Detection in Outbuildings: Holyrood</u>

Annual Variance ($000)

Budget: 198.6 Expenditures: 70.4 Variance: (128.2)

This is a one-year project that commenced in 2018 and carried over into 2019. The variance in 2018 expenditures is attributed to the rescheduling of a portion of the construction activity to 2019. The rescheduling was the result of difficulties experienced during installation of the overhead cables. The existing aerial enclosure was determined to be unsuitable for the type of cable being installed and requires modifications. Materials have been ordered for the necessary modifications and construction is expected to be completed in the first quarter of 2019.

21. <u>Upgrade Holyrood Access Road: Holyrood</u>

Annual Variance ($000)

Budget: 583.4 Expenditures: 0.0 Variance: (583.4)

Project Variance ($000)

Budget: 1,162.7 Expenditures: 825.7 Variance: (337.0)

This was a two-year project (2017–2018) completed in 2017. Hydro tendered the construction work with optional pricing to complete all of the construction in the first

year. The optional pricing was favorable and Hydro proceeded with completion of the project in 2017. The variance in project expenditures is attributed to lower than estimated contract pricing as well as savings associated with completing the project in a single year.

22. <u>Upgrade Underground Plant Drainage System: Holyrood</u>

Project Variance ($000)

Budget: 923.1	Expenditures: 1,890.8	Variance: 967.7

This was a one-year project that commenced in 2017 and was carried over and completed in 2018. The variance in overall project expenditure is attributed to the requirement to replace more piping than originally estimated (due to further deterioration of the piping from the time of the budget proposal), higher than expected contract tender prices, and the requirement for asbestos removal, which was not included in the original estimate.

23. <u>Upgrade Powerhouse Building Envelope: Holyrood</u>

Annual Variance ($000)

Budget: 1,859.7	Expenditures: 1,022.7	Variance: (837.0)

Project Variance ($000)

Budget: 6,477.8	Expenditures: 5,640.8	Variance: (837.0)

This was a three-year project (2016–2018) that commenced in 2016 and was completed in 2018. The variance in project expenditure is attributed to lower than estimated engineering and construction costs.

4.3 Gas Turbine Generation Projects (Table 5)

24. <u>Gas Turbine Equipment Replacement and Refurbishment: Hardwoods and Stephenville</u>

Annual Variance ($000)

Budget: 997.9 Expenditures: 371.3 Variance: (626.6)

Project Variance ($000)

Budget: 1,427.2 Expenditures & Forecast: 1,280.8 Variance: (146.4)

This is a two-year project (2018–2019) that commenced in 2018. The variance in 2018 expenditures is attributed to the rescheduling of the air intake refurbishment from 2018 to 2019. This work was rescheduled to allow project management and engineering resources to focus on higher priority gas turbine work including the separate project to inspect and overhaul the hot gas path for Holyrood Gas Turbine, which was required to be advanced from 2019 to 2018. The other planned scope for 2018, to refurbish the exhaust stacks, was completed in 2018 as originally planned. The variance in overall project budget is attributed to lower than estimated tendered prices for the exhaust stack work.

25. <u>Increase Fuel and Water Treatment System Capacity: Holyrood Gas Turbine</u>

Annual Variance ($000)

Budget: 8,829.9 Expenditures: 2,583.8 Variance: (6,246.1)

This is a two-year project (2018–2019) that commenced in 2018. The variance in 2018 expenditures is attributed to the rescheduling of the fuel tank construction from 2018 to 2019. The rescheduling is due to longer than estimated time required to complete the detailed engineering. In 2018, the engineering was completed, steel was purchased, new tank dyke was constructed, and road relocation was completed. The tanks will be constructed in 2019 and are expected to be in service prior to the start of the 2019–

2020 winter operating season. The other project scope associated with the water treatment system is proceeding as originally planned, with construction planned for 2019.

26. <u>Turbine Hot Gas Path Level 2 Inspection and Overhaul: Holyrood Gas Turbine</u>

Annual Variance ($000)

Budget: 6,538.8	Expenditures: 9,770.7	Variance: 3,231.9

This is a two-year project (2018–2019) that commenced in 2018 and was substantially completed in 2018. Hydro reported to the Newfoundland and Labrador Board of Commissioners of Public Utilities (the "Board") in a letter dated July 26, 2018, that the overhaul had to be advanced and completed in 2018 due to greater than anticipated use of the Holyrood gas turbine since its last inspection and overhaul. The variance in 2018 expenditures is due to the advancement; however, the variance in overall project budget (less than the reportable criteria but discussed for context) is attributed to a reduction of project scope. Upon disassembly and inspection, it was determined that the interstage seals did not require replacement. The inspection and overhaul was completed and the unit was returned to service in the fourth quarter of 2018. Project close out activities are expected to conclude in the first quarter of 2019.

27. <u>Gas Turbine Life Extension: Stephenville</u>

Annual Variance ($000)

Budget: 529.8	Expenditures: 251.7	Variance: (278.1)

Project Variance ($000)

Budget: 1,353.2	Expenditures: 593.9	Variance: (759.3)

This was a two-year project (2017–2018) that was completed in 2018. The variance in both the 2018 expenditures and total project expenditures are attributed to the removal of a portion of the project scope. Due to the anticipated retirement of the

Hardwoods and Stephenville Gas Turbines, Hydro continues to assess any proposed capital expenditures for these units. After a comprehensive review of the project scope prior to project execution, Hydro removed the installation of closed circuit television cameras from the scope, and planned instrumentation upgrades were revised to include only those requiring immediate replacement, based on function testing and evaluation results. The replacement of lube oil filters was also removed from the scope based on updated condition assessment, expected remaining service life, and the availability of spare filters.

28. <u>Gas Turbine Life Extension: Hardwoods</u>

Annual Variance ($000)

Budget: 309.7	Expenditures: 195.6	Variance: (114.1)

Project Variance ($000)

Budget: 956.7	Expenditures: 469.2	Variance: (487.5)

This was a two-year project (2017–2018) that was completed in 2018. The variance in both the 2018 expenditures and total project expenditures are attributed to the removal of a portion of the project scope. Due to the anticipated retirement of the Hardwoods and Stephenville Gas Turbines, Hydro continues to assess any proposed capital expenditures for these units. After a comprehensive review of the project scope prior to project execution, Hydro removed the installation of closed circuit television cameras from the scope, and planned instrumentation upgrades were revised to include only those requiring immediate replacement, based on function testing and evaluation results. The replacement of lube oil filters was also removed from the scope based on updated condition assessment, expected remaining service life, and the availability of spare filters.

4.4 Terminal Stations Projects (Table 6)

29. <u>Terminal Station In-Service Failures</u>

Project Variance ($000)

Budget: 1,000.0 Expenditures: 2,268.8 Variance: 1,268.8

This was a one-year project completed in 2018. The budget for the project was based on prediction of the magnitude of in-service failures using historical data and engineering judgement. The 2018 variance is attributed to the actual number of failures incurred. A detailed list of work executed under this project is found in Section 8.0 of this report.

30. <u>Upgrade Aluminum Support Structures: Holyrood</u>

Project Variance ($000)

Budget: 287.6 Expenditures: 143.1 Variance: (144.5)

This was a one-year project completed in 2018. The variance in project expenditures is attributed to cost savings measures identified during project planning and engineering. Hydro was able to use existing temporary support structures from a previous project during construction of the permanent support structures, eliminating the need to fabricate additional temporary support structures. The project was executed in parallel with the Terminal Station Refurbishment and Modernization project, allowing Hydro to realize efficiencies for engineering, procurement and construction effort.

31. <u>Replace Transformer T1: Buchans</u>

Annual Variance ($000)

Budget: 249.0 Expenditures: 99.0 Variance: (150.0)

This is a two-year project (2018–2019) that commenced in 2018. The variance in 2018 expenditures is attributed to a portion of the engineering and procurement activity

being rescheduled from late 2018 to early 2019. This delay is not expected to impact the overall project completion date or budget.

32. <u>Purchase Mobile DC Power Systems</u>

Annual Variance ($000)

Budget: 270.9 Expenditures: 41.9 Variance: (229.0)

This is a two-year project (2018–2019) that commenced in 2018. The variance in 2018 expenditures is attributed to the revised time frame for delivery of equipment originally expected in 2018, now expected in 2019. The project scope includes the procurement of three mobile DC power systems, one of which was originally expected to be received in 2018. Hydro now expects to receive all three in 2019.

33. <u>Terminal Station Refurbishment and Modernization: Various Sites</u>

Annual Variance ($000)

Budget: 8,170.6 Expenditures: 1,983.8 Variance: (6,186.8)

This is a two-year project (2018–2019) that commenced in 2018 and includes a number of consolidated program-type terminal station projects across several sites. The variance is primarily attributed to the rescheduling of various project scope items from 2018 to 2019 due to outage duration constraints, resource constraints, delayed material procurement, and longer than anticipated material lead time deliveries. Items delayed from 2018 to 2019 include: (i) the transformer and generator protection upgrade at Upper Salmon, (ii) transformer bushing deliveries, (iii) disconnect deliveries, (iv) the installation of four disconnect switches and one breaker at Wabush, and (v) delayed instrument transformer material costs. The instrument transformers are available in Hydro's inventory and will be attributed to the capital project as drawn from inventory in 2019, whereas the original budget assumed those costs would be in 2018.

34. <u>Upgrade Corner Brook Frequency Converter: Corner Brook</u>

Annual Variance ($000)

Budget: 2,901.6 Expenditures: (42.2) Variance: (2,943.8)

Project Variance ($000)

Budget: 2,943.8 Expenditures: 0.0 Variance: (2,943.8)

This is a two-year project (2017–2018) that commenced in 2017, was placed on hold to confirm alignment with the customer, and subsequently was cancelled as a result of the sale of the Corner Brook Frequency Convertor to Corner Brook Pulp and Paper Limited. The sale was approved by Board Order P.U. 26(2018) on August 9, 2018. Hydro reversed any costs incurred as a result of the front-end engineering, and design costs associated with the capital project at the time the project was cancelled.

35. <u>Replace 66 kV Station Service Feed: Holyrood</u>

Annual Variance ($000)

Budget: 1,180.7 Expenditures: 235.0 Variance: (945.7)

This is a two-year project (2017–2018) that has carried over into 2019. The variance in 2018 expenditure is attributed to the rescheduling of the construction activity to 2019. The rescheduling is the result of late procurement of the cables and associated components with long delivery times. The materials were not received in time for the planned generation outage in 2018.

36. Replace Substation: Holyrood

Annual Variance ($000)

Budget: 1,082.6 Expenditures: 369.7 Variance: (712.9)

Project Variance ($000)

Budget: 1,198.0 Expenditures & Forecast: 798.2 Variance: (399.8)

This is a two-year project (2017–2018) that has carried over into 2019. The variance in 2018 expenditure is attributed to the rescheduling of the construction activity to 2019, following identification of a lower cost alternative for the project. The variance in total project expenditures and forecast is attributed to the planned implementation of that lower cost alternative. During project engineering, connection of a power supply from Newfoundland Power was identified as a viable alternative and the project was placed on pause. The alternative was estimated and determined to be the least-cost solution compared to the original project scope to construct a new substation. A new project scope and schedule was developed in coordination with Newfoundland Power, which includes construction activity in 2019. Hydro expects he project to be completed in 2019 at the forecasted lower cost.

37. Replace Power Transformers: Oxen Pond

Annual Variance ($000)

Budget: 1,038.5 Expenditures: 539.1 Variance: (499.4)

Project Variance ($000)

Budget: 1,147.6 Expenditures: 648.2 Variance: (499.4)

This is a two-year project (2017–2018) that was completed in 2018. The variance in both 2018 and total project expenditures are attributed to lower than estimated tender pricing for the transformers supply and installation.

38. <u>Terminal Station Refurbishment and Modernization: Various Sites</u>

Annual Variance ($000)

Budget: 19,689.1 Expenditures: 10,464.4 Variance: (9,224.7)

Project Variance ($000)

Budget: 27,382.1 Expenditures & Forecast: 18,644.2 Variance: (8,737.9)

This is a two-year project (2017–2018) that commenced in 2017 and has carried over to 2019. The project includes a number of consolidated program-type terminal station projects across several sites. The variance in total project expenditures is primarily associated with the refurbishment or replacement of power transformers and disconnect switches. In particular, the variance is attributed to a portion of the work being executed for less that the budgeted cost and some scope reduction as new asset condition information became available. Bushing replacements for Holyrood T5 and T7 and Bay d'Espoir T10 and transformer dehydrators for Happy Valley T3 and Oxen Pond T2 were removed from this project and will be executed as part of the 2019 Terminal Station Refurbishment and Modernization project, which has sufficient budget for this work.

The variance in 2018 expenditures is attributed to the scope reductions described above, as well as the carryover of the following project activity to the 2019 Terminal Station Refurbishment and Modernization project, which has sufficient budget for this work:

- Replacement of four disconnect switches at Western Avalon, Sunnyside, and Holyrood, due to system outage limitations;
- Construction activity for the breaker failure protection at Berry Hill and Peter's Barren, due to a review of alternatives for the telecommunications requirements of the project;

- Grounding system upgrades at three terminal stations, due to more complex designs required to address exceptionally high ground potential rise at these locations;
- Final tie-in and commissioning of the protective relay replacements at Bay d'Espoir, due to unavailability of an outage in 2018; and
- Protective relay replacements at Holyrood, due to additional engineering requirements and an unforeseen condition with the transformer T7.

39. <u>Upgrade Circuit Breakers: Various Sites</u>

Annual Variance ($000)

Budget: 18,709.1 Expenditures: 15,184.2 Variance: (3,524.9)

This is a five-year project (2016–2020) that commenced in 2016 and includes breaker replacements and refurbishments at a number of terminal station sites each year. The variance in 2018 expenditures is primarily attributed to rescheduling of various project scope items to other years within the project. This is primarily due to new condition information, changing priorities for system reliability, and balancing of the overall work plan. Four circuit breaker replacements planned for 2018 were rescheduled to 2019, including two at Western Avalon Terminal Station, one at Bay d'Espoir Terminal Station 1, and one at Wabush Terminal Station. The rescheduling of the breakers at Western Avalon and Bay d'Espoir was due to the impacts of other major system upgrade projects on both resources and overall site congestion. The rescheduling of the breaker at Wabush was a result of the technical and economic difficulty associated with finding an additional suitable outage window given the potential reliability impact on Iron Ore Company of Canada.

In Hydro's 2019 Capital Budget Application, 10 circuit breakers were removed from the project scope, as reflected in the presented overall project budget. An updated assessment of these breakers concluded that replacement could be deferred until

2021/2022. Hydro will apply to replace these breakers in a subsequent application to the Board as part of the 2021 Capital Budget Application. The 10 breakers removed from scope were: Happy Valley 13-1, Bay d'Espoir B13T11, Massey Drive B3T3, Stephenville B2L405 and B2T3, Stony Brook B3L130, L05L31 and B3L22, and Buchans L28L32 and B1L28.

40. <u>Replace Protective Replays: Various Sites</u>

Annual Variance ($000)

Budget: 267.5 Expenditures: 754.4 Variance: 486.9

Project Variance ($000)

Budget: 1,857.0 Expenditures: 3,314.7 Variance: 1,457.7

This is a two-year project (2016–2017) that commenced in 2016 and was carried over and completed in 2018. The variance in both 2018 and total project expenditures are attributed to higher than estimated engineering, procurement, and construction costs. During the design phase of the project, revisions to Hydro's design standard for protective relays were required. The changes to the standard were made to address lessons learned from system events. The updated standard significantly impacted the overall design for these protection systems. This increased the engineering design effort on this project and resulted in increased procurement and construction costs due to the requirement for additional components to adhere to the new standard. Also contributing to the variance was additional engineering and contract costs resulting from discrepancies between design drawings and field conditions for the work in Bay d'Espoir. This resulted in a rescheduling of the work from the spring to the fall and a need to mobilize a different contractor for the work.

41. Replace Disconnect Switches: Various Sites

Annual Variance ($000)

Budget: 771.2 Expenditures: 225.0 Variance: (546.2)

Project Variance ($000)

Budget: 1,967.8 Expenditures: 1,421.6 Variance: (546.2)

This is a two-year project (2016–2017) that carried over and was completed in 2018. The variance in both 2018 and total project expenditures are attributed to lower than estimated construction costs. As well, one of the disconnect switches planned for replacement at Bay d'Espoir could not be completed due to unavailability of an outage to complete the work. This scope of work was removed from the project and will be executed in 2019 as part of the Terminal Station Refurbishment and Modernization project, which has sufficient budget for this work.

42. Install Breaker Failure Protection: Various Sites

Annual Variance ($000)

Budget: 22.2 Expenditures: 234.7 Variance: 212.5

Project Variance ($000)

Budget: 277.0 Expenditures & Forecast: 691.5 Variance: 414.5

This is a two-year project (2016–2017) that has carried over to 2019. The variance in both 2018 expenditure and total project expenditures and forecast are attributed to higher than estimated engineering, procurement and construction costs. During the design phase of the project, revisions to Hydro's design standard for breaker failure protection were required. The changes to the standard were made to address lessons learned from system events. The updated standard significantly impacted the overall design for breaker failure protection. This increased the engineering design effort on

this project and resulted in increased procurement and construction costs due to the requirement for additional components to adhere to the new standard. A requirement for additional telecommunications cabling was identified for the work at Howley, Indian River, and Deer Lake and this work has been scheduled for 2019.

43. <u>Install Fire Protection in 230 kV Stations: Bay d'Espoir</u>

Annual Variance ($000)

Budget: 681.7	Expenditures: 400.8	Variance: (280.9)

Project Variance ($000)

Budget: 766.0	Expenditures: 592.9	Variance: (173.1)

This was a two-year project (2016–2017) that carried over and was completed in 2018. The variance in 2018 and total project expenditures are attributed to the utilization of a less complex design for the fire protection system, which resulted in a reduction in contract costs.

4.5 Transmission Projects (Table 7)

44. <u>Wood Pole Line Management Program: Various Sites</u>

Project Variance ($000)

Budget: 3,532.9	Expenditures: 3,185.6	Variance: (347.3)

This was a one-year project completed in 2018. The variance in expenditures was attributed to the unavailability of outages of TL 203. This resulted in the inability to complete pole replacements. The work will be completed under the 2019 Wood Pole Line Management Program.

45. <u>Transmission Line Upgrades: TL 212 and TL 218</u>

Annual Variance ($000)

Budget: 2,224.4	Expenditures: 1,440.6	Variance: (783.8)

Project Variance ($000)

Budget: 2,511.5	Expenditures: 1,727.7	Variance: (783.8)

This is a two-year project (2017–2018) that commenced in 2017 and was completed in 2018. The variance in annual expenditure is attributed to lower than estimated procurement and construction costs.

46. <u>Replace Insulators: TL 227</u>

Annual Variance ($000)

Budget: 400.2	Expenditures: 282.7	Variance: (117.5)

Project Variance ($000)

Budget: 416.9	Expenditures: 299.4	Variance: (117.5)

This is a two-year project (2017–2018) that commenced in 2017 and was completed in 2018. The variance in annual expenditure is attributed to lower than estimated construction costs.

47. <u>Refurbish Anchors and Footings TL 202 and TL 206: Bay d'Espoir to Sunnyside</u>

Annual Variance ($000)

Budget: 1,829.8	Expenditures: (350.1)	Variance: (2,179.9)

Project Variance ($000)

Budget: 2,179.9	Expenditures: 0.00	Variance: (2,179.9)

This is a two-year project (2014–2015) that commenced in 2014 and was carried over into 2018 for execution during the construction of TL 267, taking advantage of the access required for TL 267. In 2018, a detailed reassessment of the approved work scope was completed. The anchors exhibited surface corrosion, but there was no apparent deep pitting or loss of structural integrity. Hydro will continue to monitor the anchors and foundations as part of its maintenance program. Hydro has concluded that the refurbishment work is not required and the project has been cancelled; however, a future capital project may be initiated if justified. Hydro reversed any costs incurred to date associated with the capital project at the time the project was cancelled.

48. <u>230 kV Transmission Line: Bay d'Espoir to Western Avalon</u>

Annual Variance ($000)

Budget: 16,658.3 Expenditures: 10,942.1 Variance: (5,716.2)

This is a five-year project (2014–2018) that commenced in 2014 and carried over into 2019. The variance in funds in 2018 is attributed to a portion of the final line reclamation tasks being deferred to summer of 2019, including the removal of bridges and reclamation along the right of way. The deferral of the tasks is due to high water levels preventing the safe removal of the bridges in 2018. There is no change to the overall project scope or budget.

4.6 Distribution Projects (Table 8)

49. <u>Provide Service Extensions: All Service Areas</u>

Project Variance ($000)

Budget: 4,642.0 Expenditures: 3,709.1 Variance: (932.9)

This is an annual budget that is based on data from past experience to provide service extensions to customers. The variance is due to less than forecasted distribution service extension requests.

50. Upgrade Distribution Systems: All Service Areas

Project Variance ($000)

Budget: 3,711.0 Expenditures: 3,230.6 Variance: (480.4)

This is an annual budget that is based on data from past experience to provide upgrades to the in-service distribution system. The variance is due to less than forecasted upgrade requirements.

51. Distribution System Upgrades: Various Sites

Annual Variance ($000)

Budget: 383.8 Expenditures: 193.6 Variance: (190.2)

This is a two-year project (2018–2019) that commenced in 2018. The variance in 2018 expenditures is attributed to the deferral of material procurement that was not required until 2019. There is no change to the overall project scope or budget.

52. Additions for Load Growth: Happy Valley

Project Variance ($000)

Budget: 505.0 Expenditures: 222.5 Variance: (282.5)

This was a one-year project completed in 2018. The variance in expenditures was attributed to the development of a new distribution standard for 300 A regulators that were utilized in this project. The new standard satisfied project requirements, which enabled the existing regulator structure to be reused, thus resulting in lower procurement and construction costs.

53. Distribution Upgrades: Various Sites

Annual Variance ($000)

Budget: 1,116.4	Expenditures: 915.3	Variance: (201.1)

Project Variance ($000)

Budget: 1,195.1	Expenditures: 994.0	Variance: (201.1)

This is a two-year project (2017–2018) that commenced in 2017 and was completed in 2018. The variance in annual expenditure is attributed to lower than estimated construction and procurement costs.

54. Upgrade Distribution Systems: Various Sites

Annual Variance ($000)

Budget: 911.0	Expenditures: 683.2	Variance: (227.8)

This is a two-year project (2016–2017) that commenced in 2016 and was carried over to and completed in 2018. The carryover was required to complete the replacement of the underground distribution system in Bay d'Espoir, which was delayed in 2017 due to late material delivery. The variance in annual expenditure is attributed to lower than estimated construction and procurement costs. The total project expenditure is within 3% of the overall project budget.

4.7 Rural Generation Projects (Table 9)

55. Overhaul Diesel Units: Various Sites

Project Variance ($000)

Budget: 2,852.4	Expenditures: 2,029.0	Variance: (823.4)

This was a one-year project completed in 2018. The project is part of an ongoing program to overhaul diesel engines to sustain reliability of diesel generating plants.

Project estimates are based on the projected number of engines that will reach the criteria for overhaul, and typical extent of refurbishment. The project variance is attributed to less refurbishment than typically required for some of the engines, which remained unknown until the engines were disassembled.

56. <u>Diesel Plant Engine Cooling System Upgrades: Various Sites</u>

Annual Variance ($000)

Budget: 638.4 Expenditures: 149.3 Variance: (489.1)

This is a two-year project that commenced in 2018. The variance in 2018 expenditures is attributed to a rescheduling of the work to optimize internal labour scheduling and travel requirements. The construction at Port Hope Simpson was advanced and completed in 2018 in conjunction with the Diesel Genset Replacements Project at that location. The construction at Black Tickle was rescheduled to 2019.

57. <u>Additions for Load Growth: Makkovik and Rigolet</u>

Project Variance ($000)

Budget: 730.1 Expenditures: 302.0 Variance: (428.1)

This was a one-year project completed in 2018. The variance in project expenditures is attributed to material and construction costs being less than originally estimated.

58. <u>Upgrade Ventilation: Cartwright</u>

Annual Variance ($000)

Budget: 465.7 Expenditures: 46.5 Variance: (419.2)

This is a one-year project that commenced in 2018 and has been carried over into 2019. The variance in 2018 expenditures is attributed to rescheduling of the construction to 2019. The public tendering process for this project resulted in only one bid and there

was insufficient budget to award. Hydro decided to combine the ventilation upgrades with the Diesel Genset Replacement project planned for Cartwright in 2019, which may result in some cost savings.

59. <u>Diesel Plant Fire Protection: Postville</u>

Annual Variance ($000)

Budget: 505.6 Expenditures: 37.2 Variance: (468.4)

This is a two-year project (2018–2019) that commenced in 2018. The variance in 2018 expenditures is attributed to rescheduling of the engineering to start in the fourth quarter of 2018 and continue into the first quarter of 2019.

60. <u>Inspect Fuel Storage Tanks: Black Tickle</u>

Annual Variance ($000)

Budget: 818.7 Expenditures: 481.7 Variance: (337.0)

This is a one year project that commenced in 2018 and has been carried over into 2019. The internal inspections of two fuel storage tanks were completed in 2018 as planned. The inspection for one of the tanks revealed that minor refurbishment was required and this refurbishment was completed in 2018. The inspection of the second tank revealed that a complete tank bottom replacement was required. Materials were ordered and the tank bottom replacement has been scheduled for 2019. It is estimated that there is sufficient budget remaining in the project to complete the tank bottom replacement.

61. <u>Install Sub-Surface Drainage System: Paradise River</u>

Project Variance ($000)

Budget: 524.9 Expenditures: 721.6 Variance: 196.7

This was a one-year project completed in 2018. The variance in project expenditures is attributed to higher than estimated costs for the site construction work required to adequately address the potential environmental impacts.

62. <u>Replace Secondary Containment System Liner: Nain</u>

Annual Variance ($000)

Budget: 1,639.2 Expenditures: 672.5 Variance: (966.7)

Project Variance ($000)

Budget: 3,089.6 Expenditures & Forecast: 4,594.6 Variance: 1,505.0

This is a two-year project (2018–2019) that commenced in 2018. The planned scope was to relocate all four existing fuel storage tanks to facilitate replacement of the secondary containment system liner. A constructability review of the planned scope was completed early in the project design phase, identifying a risk to cost and schedule. The identified risk in the work required to move the tanks during liner replacement warranted consideration, given that three small tanks are 45 years old and had unknown refurbishment requirements. Instead of removing, refurbishing, and reinstalling the three old tanks, there was an alternative to remove the three tanks and construct a new vertical fuel storage tank. Both alternatives were studied and it was concluded that the estimated cost is not materially different, but the risk to project cost, schedule, and asset integrity was materially higher to move, refurbish, and reinstall the old tanks than the alternative to construct a new tank. A decision was made to proceed with the alternative to replace the tank.

The variance in project expenditures and forecast is due to higher than estimated cost for civil construction. With the completion of the geotechnical study and detailed design, it was determined that significantly more earthworks would be required to replace the dyke liner and provide the required foundation support for the tanks. This

additional work is required regardless of the decision between the replacement or refurbishment of the tanks. Additionally, publically tendered pricing for the construction was higher than estimated.

The variance in 2018 expenditure is due to a change in the execution plan for the work. The original budget assumed site construction work would start in 2018. Due to the length of time required to consider the new alternative and complete the detailed engineering, as well as an unanticipated long delivery time for the steel plate, the execution plan was modified to perform all site construction work in 2019.

63. <u>Diesel Genset Replacements: Makkovik</u>

Annual Variance ($000)

Budget: 604.1 Expenditures: 1,585.1 Variance: 981.0

This is a three-year project (2018–2020) that commenced in 2018. The annual variance is attributed to an advancement of a portion of the 2019 construction work into 2018. Given the short construction season at Makkovik, construction of the foundation and other civil work was advanced to decrease scope congestion in 2019, thus mitigating schedule risk.

64. <u>Replace Automation Equipment: St. Anthony</u>

Annual Variance ($000)

Budget: 307.4 Expenditures: 127.2 Variance: (180.2)

This is a two-year project (2018–2019) that commenced in 2018. The variance in 2018 expenditures is attributed to material delivery originally planned for 2018 that will now be delivered in 2019. This change in material delivery does not impact the overall project schedule.

65. Diesel Genset Replacements: Port Hope Simpson and Charlottetown

Annual Variance ($000)

Budget: 5,593.2 Expenditures: 3,973.8 Variance: (1,619.4)

Project Variance ($000)

Budget: 5,806.8 Expenditures: 4,187.4 Variance: (1,619.4)

This is a two-year project (2017–2018) that was completed in 2018. The variance in total project expenditures is attributed to lower than estimated engineering and construction costs.

66. Replace Programmable Logic Controllers: Various Sites

Annual Variance ($000)

Budget: 51.5 Expenditures: 206.7 Variance: 155.2

Project Variance ($000)

Budget: 958.0 Expenditures: 1,359.9 Variance: 401.9

This is a three-year project (2015–2017) that carried over and was completed in 2018. The variance in project expenditures and 2018 expenditures are attributed to actual engineering and construction effort exceeding the original estimates prepared in 2014.

4.8 Properties Projects (Table 10)

67. Upgrade Office Facilities and Control Buildings: Various Sites

Project Variance ($000)

Budget: 1,180.6 Expenditures: 955.8 Variance: (224.8)

This was a one-year project that was completed in 2018. The variance in project expenditures is attributed to the condition assessment and engineering for future

projects not being required as originally planned due to adjustments to the long term asset plan for office facilities and control buildings. All of the planned construction activity in this project was completed in 2018.

68. <u>Line Depot Condition Assessment and Refurbishment Program: Various Sites</u>

Project Variance ($000)

Budget: 1,233.0 Expenditures: 1,005.6 Variance: (227.4)

This was a one year project that was completed in 2018. The variance in project expenditures is attributed to less engineering effort required than originally estimated.

69. <u>Construct New Facilities: Various Sites</u>

Annual Variance ($000)

Budget: 1,218.3 Expenditures: 429.8 Variance: (788.5)

Project Variance ($000)

Budget: 1,456.1 Expenditures & Forecast: 1,117.5 Variance: (338.6)

This is a two-year project (2017–2018) that commenced in 2017 and has carried over to 2019. The project scope consists of the construction of storage buildings at the Makkovik and Charlottetown Diesel Plants. The Charlottetown storage building was constructed in 2017. The Makkovik storage building construction has been rescheduled from 2018 to 2019, to be completed in conjunction with a diesel plant building and yard extension. The diesel plant building and yard extension is part of the scope of a separate project, approved in Board Order No. P.U. 43(2017), to replace a diesel generator set. Completing these projects together will optimize the use of available space on the property, reduce the risk of design conflicts, and possibly result in cost savings.

4.9 Metering Projects (Table 11)

70. <u>Install Automated Meter Reading: Happy Valley</u>

Annual Variance ($000)

Budget: 1,786.4 Expenditures: 1,606.7 Variance: (179.7)

This was a two-year project (2017–2018) that was completed in 2018. The variance in project expenditures is attributed to cancellation of a portion of the scope. The project scope included the replacement of 519 three-phase meters, of which 319 were cancelled due to a discontinuation of the product by the vendor, which accounts for the bulk of the variance. The cancelled meters will be reviewed for possible inclusion in a future application using different technology. The other project scope items, including terminal station equipment and 4370 single-phase meters, were installed as planned. The total project expenditure is within 9% of the overall project budget.

71. <u>Install Automated Meter Reading: Labrador West</u>

Project Variance ($000)

Budget: 967.2 Expenditures: 1,408.3 Variance: 441.1

This is a two-year project (2016–2017) that was carried over and completed in 2018. The variance in project expenditures is attributed to the requirement for additional terminal station equipment and higher than estimated unit pricing for the new automatic meter reading equipment. An updated project cost estimate and updated assumptions for project benefits were used to re-evaluate the project in 2017. The updated cost-benefit analysis confirmed that the project remained the least-cost alternative versus the status quo.

4.10 Tools and Equipment Projects (Table 12)

There are no reportable variances under Tools and Equipment Projects.

4.11 Information Systems Projects (Table 13)

72. Replace Personal Computers: Hydro Place

Project Variance ($000)

Budget: 493.0 Expenditures: 94.5 Variance: (398.5)

This was a one-year project completed in 2018. The Replace Personal Computers project was based on a replacement cycle of four years for laptops, five years for desktops and workstations, and six years for thin clients. As of 2018, an update to the Personal Computer Replacement Program was made to extend in-service life and Hydro has adopted a five to seven year computer life cycle utilizing extended warranties and run-to-failure modes. The expenditures for 2018 were reduced to reflect the extension to the replacement cycle.

73. Upgrade Core IT Infrastructure: Hydro Place

Project Variance ($000)

Budget: 352.4 Expenditures: 453.8 Variance: 101.4

This was a one-year project completed in 2018. In 2017, the Hydro became aware of a new concern with the security of the Energy Management System ("EMS") and Administrative services sharing common physical equipment. Upon review, it was determined that a logical separation between the EMS and the Administrative Core IT Servers, Storage, and Networks was required. The risk mitigation was to physically separate the two systems. Additional expenditure was necessary to meet this new security requirement.

74. Upgrade Energy Management System: Hydro Place

Project Variance ($000)

Budget: 336.8 Expenditures: 0.00 Variance: (336.8)

This was a one-year project. In consultation with the EMS supplier during review of industry best practices of other utilities, it was identified that a bi-annual EMS upgrade would not increase risk and will reduce costs. Many similar clients already follow this upgrade schedule and had seen no negative consequences. Hydro has adopted this best practice, shifted to a bi-annual upgrade cycle in 2018, and cancelled the 2018 project. The EMS will be upgraded in 2019 and every two years thereafter.

75. <u>Upgrade Microsoft Office: Hydro Place</u>

Annual Variance ($000)

Budget: 977.4	Expenditures: 822.3	Variance: (155.1)

This was a three-year project (2016–2018) that was completed in 2018. The final cost was lower than budgeted due to a reduction in software costs, fewer licenses required than were originally planned, and a reduction in consultant service requirements. The total project expenditure is within 6% of the overall project budget.

4.12 Telecontrol Projects (Table 14)

76. <u>Replace Battery Banks and Chargers: Various</u>

Annual Variance ($000)

Budget: 382.1	Expenditures: 231.3	Variance: (150.8)

This is a two-year project (2018–2019) that commenced in 2018. The variance in 2018 expenditures is attributed to lower than estimated construction and procurement costs. There is no change to the overall project scope or completion date.

77. <u>Replace Battery Banks and Chargers: Various Sites (2017–2018)</u>

Project Variance ($000)

Budget: 945.5	Expenditures: 772.7	Variance: (172.8)

This was a two-year project (2017–2018) that was completed in 2018. The variance in total project expenditures is attributed to lower than estimated construction and procurement costs and a reduction in scope. The replacement of battery chargers at Upper Salmon was removed from this project scope and will be executed as part of the 2018-2019 Replace Battery Banks and Chargers project, which has sufficient budget for this work. This rescheduling was required due to lack of outage availability in 2018 to complete the construction. All other battery banks and chargers in this project were replaced as planned.

78. <u>Upgrade Telecontrol Facilities: Mary March Hill and Blue Grass Hill</u>

Annual Variance ($000)

Budget: 633.8	Expenditures: 500.0	Variance: (133.8)

Project Variance ($000)

Budget: 757.1	Expenditures: 623.3	Variance: (133.8)

This was a two-year project (2017–2018) that was completed in 2018. The variance in 2018 expenditures and total project expenditures is attributed to lower than estimated tendered pricing for the construction and procurement.

4.13 Transportation Projects (Table 15)

79. <u>Replace Vehicles and Aerial Devices: Various Sites</u>

Annual Variance ($000)

Budget: 1,667.2	Expenditures: 1,165.1	Variance: (502.1)

This is a two-year project (2018–2019). Two units, with a value approximately equal to the total variance, were scheduled for delivery in 2018 but were delayed and are expected in 2019.

80. Replace Vehicles and Aerial Devices: Various Sites

Annual Variance ($000)

Budget: 1,124.4	Expenditures: 1,368.1	Variance: 243.7

Project Variance ($000)

Budget: 2,400.2	Expenditures: 2,643.9	Variance: 243.7

This is a two-year project (2017–2018) that was completed in 2018. Expenditures were higher than forecasted due to higher than estimated vehicle prices.

4.14 Administrative Projects (Table 15)

There are no reportable variances under Administrative Projects

4.15 Allowance for Unforeseen Items (Table 16)

81. Allowance for Unforeseen Items

Project Variance ($000)

Budget: 1,000.0	Expenditures: 4,743.2	Variance: 3,743.2

The Allowance for Unforeseen Items is an annual allotment that permits Hydro to act expeditiously to deal with events affecting the electrical system that cannot wait for specific approval of the Board. One project, Penstock #3 Refurbishment - Bay d'Espoir, was executed using this account. The report on this item has been filed with the Board. Hydro received approval to restore the Allowance for Unforeseen Items account value to $1 million, Board Order No. P.U. 19(2018). Although a failed Generator in Rigolet was initiated on December 20, 2018, no costs were attributed to the Allowance for Unforeseen Items funding in 2018, and the expenditures for the Rigolet engine will be captured in the 2019 allowance.

4.16 Supplemental Projects (Table 16)

82. **Provide Service to Western Regional Service Board's Waste Transfer Site: Hampden**

Project Variance ($000)

Budget: 748.4 Expenditures: 644.5 Variance: (103.9)

This was a one-year Contribution in aid of Construction ("CIAC") project completed in 2018. The variance in annual expenditures, and CIAC recovery, is attributed to lower than estimated procurement and construction costs.

83. **Penstock Condition Assessments: Bay d'Espoir**

Annual Variance ($000)

Budget: 1,120.6 Expenditures: 1,682.5 Variance: 561.9

Project Variance ($000)

Budget: 1,120.6 Expenditures & Forecast: 1,906.3 Variance: 785.7

This is a one-year supplemental capital project that was approved in 2018 and carried over into 2019. The requirement to complete unforeseen work on Penstock 3 (a separate project under the Allowance for Unforeseen Items) led to a revised generation outage schedule, which resulted in the field work for this project being completed later in the year than originally planned. The field work was completed and Hydro is collecting operational data through the fall and winter of 2018–2019. The engineering reports, which are the final deliverable of this project, will be produced in 2019. The variances in 2018 and total project expenditures are attributed to higher than expected contract tender prices for the field work completed in 2018.

84. **Improve Boiler Capacity: Holyrood**

Project Variance ($000)

Budget: 2,560.5 Expenditures: 1,665.9 Variance: (894.6)

This was a one-year supplemental project approved and completed in 2018. The variance in project expenditure is attributed to lower than expected construction costs. The estimate was based on a construction schedule utilizing double shifts, which was not required. Additionally, based on engineering recommendations provided by Babcock & Wilcox, the hot end basket liners did not need to be replaced. In Section 2.0 Project Description of the supplementary application for this project, it was stated:

> *Hydro proposes that any additional items, material in dollar value and that meets capitalization criteria, that require replacement and is related to the scope of work, will be replaced within this project's budget. Such additions will be communicated to the Board via the year end Capital Expenditures Variance report.*

There were no additional scope items for this project.

85. <u>Mary's Harbour Hydro Integration</u>

Project Variance ($000)

Budget: 195.5 Expenditures: 49.2 Variance: (146.3)

This is a one-year supplemental capital project approved in 2018 and carried over into 2019. The variance in 2018 expenditures is attributed to a rescheduling of the commissioning activity to 2019 to align with Mary's Harbour Hydro's revised project schedule, which was delayed. The project cost is being fully recovered from Mary's Harbour Hydro.

86. <u>Gang Switch: Happy Valley-Goose Bay</u>

Project Variance ($000)

Budget: 195.4 Expenditures: 85.2 Variance: (110.2)

This was a one-year supplemental project completed in 2018. The variance in annual expenditures is attributed to lower than estimated procurement costs of the switches.

87. TL 226 and TL 239 Reroute

Annual Variance ($000)

Budget: 712.3 Expenditures: 579.8 Variance: (132.5)

This was a two-year (2018–2019) supplemental project commenced in 2018. The variance in expenditures was attributed to delays in the construction of TL 226 due to adverse weather conditions. The work will be completed in 2019 and there is no change to the overall project scope or budget.

88. Terminal Station Upgrades: Wabush

Annual Variance ($000)

Budget: 1,971.8 Expenditures: 1,021.4 Variance: (950.4)

Project Variance ($000)

Budget: 2,912.5 Expenditures: 1,962.1 Variance: (950.4)

This is a two-year supplemental capital project (2017–2018) that was completed in 2018. The variances in 2018 and total project expenditures are attributed to actual construction costs being less than estimated. The original estimate was based on using contractor forces but the work was able to be completed using internal resources, eliminating contract management costs and reducing travel cost.

89. Reliability Improvements: Holyrood

Annual Variance ($000)

Budget: 16.7 Expenditures: 297.3 Variance: 280.6

Project Variance ($000)

Budget: 2610.0 Expenditures: 3,883.9 Variance: 1,273.9

This was a one-year supplemental project approved in 2017 and carried over and completed in 2018. This project was substantially completed in 2017 with the exception of the condenser cooling water piping for Unit 1 which was rescheduled to 2018 due to a change in the generation outage schedule. The variance in project expenditure is attributed to new capital scope items identified during discovery and execution phases of the project in 2017. These items were reported in the Capital Expenditures and Carryover Report for the Year Ending December 31, 2017. No additional scope items were added in 2018.

90. <u>Purchase of 12 MW Diesel Generation: Holyrood</u>

Annual Variance ($000)

Budget: 418.9 Expenditures: 678.2 Variance: 259.3

This was a two-year supplemental project approved in 2016 and carried over and completed in 2018. The variance in 2018 expenditure is attributed to higher than expected construction cost. The total project expenditure is within 6% of the overall project budget.

5.0 Capital Budget versus Actual Expenditures 2009 – 2018

Table 17 provides a summary of Hydro's Capital Budget Variances for the years 2009-2018.

Table 17: Capital Budgets/Expenditures 2009-2018

Year	Budget ($000)	Actual Expenditures ($000)	Variance ($000)	Variance (%)
2009	61,544	54,152	7,392	12.0
2010	63,297	55,553	7,744	12.2
2011	67,454	63,116	4,338	6.4
2012	93,840	77,252	16,588	17.7
2013	116,373	84,755	31,618	27.2
2014	280,601	204,728	75,873	27.0
2015	311,177	125,119	186,058	59.8
2016	350,601	203,941	146,660	41.8
2017	340,501	340,741	240	0.1
2018	213,050	156,985	56,065	26.3

In 2018, actual expenditures were below budget in Hydro's overall capital program by $56.1 million (26.3%), as shown in Table 17. The following six capital projects were the primary contributors to the variance. Had these projects been on budget, the overall actual expenditures would have been within 10% of budget.

- Variance 38: Terminal Station Refurbishment and Modernization - Various Sites (2017–2018) (-$9.2 million)
- Variance 25: Increase Fuel and Water Treatment System Capacity - Holyrood Gas Turbine (-$6.2 million)
- Variance 33: Terminal Station Refurbishment and Modernization - Various Sites (2018–2019) (-$6.2 million)
- Variance 48: 230 kV Transmission Line: Bay d'Espoir to Western Avalon (-$5.7 million)
- Variance 4: Hydraulic Generation Refurbishment and Modernization (2017–2018) (-$4.5 million)
- Variance 39: Upgrade Circuit Breakers: Various Sites (-$3.5 million)

Hydro completed an analysis for all 2018 projects that had an annual underspend, assessing the drivers. From this analysis, Hydro determined that:

- Approximately 53% of the variance is attributed to work carrying over to future years;
- Approximately 27% of the variance is attributed to work being completed for less than estimated; and
- Approximately 18% of the variance is attributed to scope changes, including cancelled projects, reduced scope, and less in-service failures than budgeted.

Five main drivers were identified for the under-expenditure:

- Estimates were higher than actuals for completed work. This accounted for approximately $15 million (27%) of the overall under-expenditure. Several projects were over-estimated and, for many projects, contingency was estimated at 20% but was not utilized.
- Work could not be completed due to outages not being available or changed. This accounted for approximately $8 million (15%) of the overall under-expenditure. Much of the capital program is dependent on equipment outages and those outages were not always possible in the durations required due to system constraints or competing outages. This mostly occurred for terminal station work, but a significant portion of scope for the refurbishment of a surge tank in Bay d'Espoir was also deferred due to outage duration.
- Resources constraints resulted in rescheduling work. This accounted for approximately $8 million (13%) of the overall under-expenditure. The project with the largest carry over amount due to resource allocations was the Upgrade Circuit Breakers project. A number of circuit breaker replacements were rescheduled to future years due to the unavailability of resources.
- Schedule at the budget phase was underestimated. This accounted for approximately $6 million (11%) and was associated with a single project: Increase Fuel and Water

Treatment System Capacity - Holyrood Gas Turbine. The design, supply and installation of the new fuel storage tanks were budgeted to be completed in one year, but the work requires two years.

- Several projects were not required and were cancelled. This accounted for approximately $5 million (9%), with two projects accounting for the majority of the $5 million. The Upgrade Corner Brook Frequency Convertor project (with $2.9 million budgeted for 2018) was cancelled due to the sale of the asset. The Refurbish Anchors and Footings TL 202 and TL 206 Project (with $1.8 million budgeted for 2018) was cancelled as a condition assessment determined that the work was not required.

Hydro is implementing a number of improvements that are expected to close the gap between budget and actual expenditures in future years.

- Improve estimates of project contingency. The analysis of the last two years has shown that contingency has been high for many projects. For projects that closed in 2018, the overall contingency was estimated at 17.5% and only 9% was required. As a result of this analysis, Hydro will apply additional analysis and rigour to the amount of contingency estimated for projects, starting with the 2020 budget cycle.
- A more rigorous process for Project Managers, Lead Estimators, Discipline Managers, and Long-Term Asset Planners for budget review prior to finalizing project proposals. The process includes a review and sign-off of scope, schedule, estimates, and contingency amount. This process was trialed for the 2019 budget cycle, enhanced, and rolled out for full implementation for the 2020 budget cycle.
- Hydro has been taking steps for earlier, improved planning of the overall Integrated Annual Work Plan, with an aim to complete Integrated Annual Work Plans ahead of each annual Capital Budget Application. This will decrease the amount of carryover by ensuring that projects proposed are achievable from resource and outage availability perspectives. Advancement of the Integrated Annual Work Plan ahead of the Capital Budget Application is expected to be realized for the 2021 execution year, with some

benefits expected in 2019 and 2020. In 2019, a greater emphasis is being placed on outage planning, with a planner to be focused on overall planning of key generation outages. This enhanced resourcing will allow Hydro to identify and manage conflicts related to overlapping work permit requirements, limited accommodations, use of powerhouse cranes, and availability of construction power. The focus will also allow Hydro to more quickly understand and manage impacts when outage schedules change.

6.0 Carryover Report

Table 18 provides a summary listing of the carryovers for projects initiated between 2014 and 2018.

Table 18: 2018 Carryover Report for the Year Ending December 31, 2018 ($000)

Project Name	Board Approved Budget 2018	Revised Budget 2018	Total Actual Expenditures 2018	Carryover Amount	Original Completion Year
Upgrade Work - Cat Arm	0.0	1,406.5	1,376.2	30.3	2018
Rehabilitate Shoreline Protection - Cat Arm	0.0	977.2	89.2	888.0	2018
Replace Pump House and Associated Equipment - Bay d'Espoir	0.0	705.1	373.9	331.2	2018
Replace Site Facilities - Bay d'Espoir	6,316.7	9,479.2	8,574.8	904.4	2018
Replace Slip Rings Units 1-6 - Bay d'Espoir	159.7	369.9	17.2	352.7	2018
Control Structure Refurbishments	452.9	853.4	709.3	144.1	2018
Refurbish Backfill Penstock 1 - Bay d'Espoir	1,630.4	1,630.4	63.2	1,567.2	2018
Hydraulic Generation Refurbishment and Modernization - Various Sites (2018/19)	5,234.1	4,798.6	2,219.9	2,578.7	2019
Install Fire Detection in Outbuildings - Holyrood	198.6	198.6	70.4	128.2	2018
Upgrade Data Alarm Systems - Various Sites	0.0	142.7	144.5	(1.8)	2018
Install Breaker Failure Protection - Various Sites	0.0	227.3	234.7	(7.4)	2018
Terminal Station Refurbishment and Modernization Program - Various Sites (2017/18)	6,269.5	5,589.8	3,262.1	2,327.7	2018
Replace 66 kV Station Service Feed - Holyrood	1,198.6	1,180.7	235.0	945.7	2018
Replace Substation - Holyrood	758.6	682.8	369.7	313.1	2018
Construct New Facilities Various Sites	333.7	463.8	13.9	449.9	2018
230kV Transmission Line - Bay D'Espoir to Western Avalon	17,418.3	12,658.3	10,942.1	1,716.2	2018
Upgrade Ventilation - Cartwright	465.7	465.7	46.5	419.2	2018
Inspect Fuel Storage Tanks - Black Tickle	818.7	818.7	481.7	337.0	2018
Penstock Condition Assessments - Bay d'Espoir	0.0	1,906.3	1,682.5	223.8	2018
Mary's Harbour Hydro Intergration	0.0	195.5	49.2	146.3	2018
Mary's Harbour Hydro Intergration	0.0	(195.5)	0.0	(195.5)	2018
Replace PBX Phone Systems - Various	91.7	91.7	134.9	(43.2)	2019
Replace MDR 6000 Microwave Radio - Various	64.0	64.0	81.5	(17.5)	2019
Replace Teleprotection - TL261	57.6	57.6	60.1	(2.5)	2019
Replace Battery Banks and Chargers - Various	382.1	382.1	231.3	150.8	2019
Refurbish Powerhouse Station Services - Bay d'Espoir	2,473.3	2,843.5	1,003.5	1,840.0	2019
Replace Exciter Controls Units 1 to 6 - Bay d'Espoir	921.2	638.3	629.0	9.3	2020
Install Remote Operation of Salmon Spillway - Bay d'Espoir	645.9	645.9	885.4	(239.5)	2019
Energy Efficiency Improvements - Various	276.2	276.2	209.8	66.4	2019
Upgrade Cranes and Hoists - Holyrood	80.3	80.3	38.6	41.7	2019
Upgrade Circuit Breakers - Various Sites (2016-2020)	15,408.6	15,664.0	15,184.1	479.9	2020
Terminal Station Refurbishment and Modernization Program - Various Sites (2018/19)	7,441.8	7,441.8	1,602.1	5,839.7	2019
Replace Transformer T1 - Buchans	249.0	249.0	99.0	150.0	2019
Implement Terminal Station Flood Mitigation - Springdale	186.2	186.2	135.8	50.4	2019
Purchase Mobile DC Power Systems	270.9	270.9	41.9	229.0	2019
Gas Turbine Equipment Replacement and Refurbishment - Hardwoods and Stephenville	997.9	851.5	371.3	480.2	2019
Diesel Plant Engine Cooling System Upgrades - Various Sites	638.4	638.4	149.3	489.1	2019
Increase Fuel and Water Treatment System Capacity - Holyrood Gas Turbine	8,829.9	8,676.9	2,583.8	6,093.1	2019
Turbine Hot Gas Path Level 2 Inspection and Overhaul - Holyrood Gas Turbine	6,538.8	10,453.6	9,770.7	682.9	2019
Replace Vehicles and Aerial Devices - Various Sites	1,667.2	1,667.2	1,165.1	502.1	2019
Replace Off-Road Track Vehicles - Bishop Falls and Bay d'Espoir	213.7	213.7	249.5	(35.8)	2019
Distribution System Upgrades - Various Sites	383.8	383.8	193.6	190.2	2019
Install Recloser Remote Control - English Harbour West and Barachoix	63.7	63.7	13.8	49.9	2019
Diesel Plant Fire Protection - Postville	505.6	505.6	37.2	468.4	2019
Install Energy Efficiency Lighting in Diesel Plants - Various	104.0	104.0	68.0	36.0	2020
Replace Secondary Containment System Liner - Nain	1,639.2	3,144.2	672.5	2,471.7	2019
Diesel Genset Replacements - Makkovik	604.1	604.1	1,585.1	(981.0)	2020
Replace Automation Equipment - St. Anthony	307.4	307.4	127.2	180.2	2019
Upgrade Exterior of Building - Hydro Place	260.2	260.2	232.6	27.6	2019
TL226 and TL239 Reroute	0.0	712.3	579.8	132.5	2019
Total 2018 Carryover Projects	**92,558.2**	**102,033.1**	**69,092.5**	**32,940.6**	

7.0 Safety Hazards

In Board Order No. P.U. 38(2010) of the 2011 Capital Budget Application, the Board directed Hydro to include in Hydro's annual report on capital expenditures an explanation as to each project that was undertaken for the Remove Safety Hazards project, setting out the safety hazard that was identified, the location, the steps taken to address the issue and the amount of the expenditure. Table 19 outlines the projects undertaken in 2018.

Total Approved Budget: **$199,400**

Total Expenditure: **$166,300**

Table 19: Safety Hazards

Project Title and Location	Expenditure ($000)	Safety Hazard Identified	Project Scope
Install H_2S Monitoring System, Holyrood Thermal Generating Station	$128.6	In July 2017, Holyrood experienced a release of Immediately Dangerous to Life or Health ("IDLH") levels of hydrogen sulfide (H_2S) gas from the Stage 2 Pumphouse, prompting emergency response and evacuation of the Holyrood site. The source of the H_2S release was determined to be a combination of stagnant water due to a Unit 3 outage, biological sea material and consecutive days of warm temperatures. The pump houses did not have a monitoring system in place at the time of the incident; the release was detected as a result of a strong odor throughout site. Since H_2S is a highly toxic gas, it is imperative to detect its presence immediately in order to evacuate personnel from the impacted area.	To address the hazard, an H_2S Monitoring System was installed in Stage 1 and 2 pump houses, including H_2S sensors and controllers to ensure appropriate detection of H_2S gas. To enhance notification when the presence of H_2S is detected, strobes and horns were installed inside and outside the pump houses.
Replace Shipping and Receiving Concrete Pad, Hydro Place	$27.6	The concrete approach pad outside the shipping and receiving area of Hydro Place sunk below the surrounding asphalt, resulting in an unsafe condition for fork-lift operation.	To address the hazard, the concrete approach pad in front of the shipping and receiving area of Hydro Place was replaced.
Installation of Exciter Module Access Stairs, Hardwoods Gas Turbine	$10.1	The exciter module at Hardwoods Gas Turbine was not easily accessible from both sides of the unit (Ends A and B) due to the main lube oil piping installed between the auxiliary module and the unit. To access the exciter module from End B, employees would have to walk around the auxiliary module. However, they frequently climbed over the main lube oil piping resulting in the potential for slips, trips and falls.	To address the hazard, a new staircase was installed on the End B side of the auxiliary module platform providing quick and safe access for personnel.

8.0 Terminal Station In-Service Failures

Hydro has committed to providing a summary of activities completed under the Terminal Station In-Service Failures project. Table 20 outlines 2018 expenditures undertaken by this project.

Total Approved Budget: **$1,000,000**

Total Expenditure: **$2,268,800**

Table 20: Terminal Station In-Service Failures

Project Title and Location	Expenditure ($000)	Failure Identified	Project Scope
Replace Five 230 kV Instrument Transformers, Churchill Falls Terminal Station	$895.3	Inspection of five instrument transformers in 2017 revealed that the transformers were leaking oil and required replacement: • 230-21 A-Phase CT/PT • 230-21 B-Phase CT • 230-21 C-Phase CT • 230-22 A-Phase CT/PT • 230-23 A-Phase CT/PT	Five new instrument transformers were ordered in 2017. They were received and installed in 2018, replacing the five leaking instrument transformers.
Purchase Spare Circuit Breakers for Standby Equipment Pool	$489.2	Hydro reviewed standby equipment pool requirements for circuit breakers in its 195 terminal stations. With expected delivery periods for replacement circuit breakers ranging from 4-6 months, and to reduce downtime related to a circuit breaker failure, it was determined that one breaker for each of the following voltage ratings should be added to the standby equipment pool: 72.5 kV, 145 kV and 245 kV.	Three spare circuit breakers were purchased for the standby equipment pool: • 72.5 kV circuit breaker • 145 kV circuit breaker • 245 kV circuit breaker
Purchase Spare Disconnect Switches for Standby Equipment Pool	$185.7	Hydro reviewed standby equipment pool requirements for disconnect switches in its 195 terminal stations. With expected delivery periods for replacement disconnect switches of approximately 48 weeks, and to reduce downtime related to disconnect switch failure, it was determined that one disconnect switch for each of the following voltage ratings should be added to the standby equipment pool: 72.5 kV, 145 kV and 245 kV, for both horizontal and vertical configurations.	Six spare disconnect switches were purchased for the standby equipment pool: • 72.5 kV Vertical Mount • 72.5 kV Horizontal Mount • 145 kV Vertical Mount • 145 kV Horizontal Mount • 245 kV Vertical Mount • 245 kV Horizontal Mount
Replace Breaker B7L38, Holyrood Terminal Station	$141.5	On December 16, 2017, severe weather on the Avalon Peninsula resulted in the tripping of TL 242 (Soldiers Pond to Hardwoods), TL 265 (Holyrood to Soldiers Pond), Holyrood L2 (Station service feed to station service transformer SST-12 for the Holyrood Plant) and Holyrood bus B6 and B7 due to a bus lockout. Investigation on December 16, 2017 identified that breaker B7L38 had its line side bushings burned on all three phases as a result of Newfoundland	The breaker B7L38 was replaced with an available spare breaker.

Project Title and Location	Expenditure ($000)	Failure Identified	Project Scope
		Power's breaker at Seal Cove not clearing the fault due to fuses blown in the trip circuit for the breaker. The damage was severe to Breaker B7L38's three line side bushings and the insulators and associated current transformers. Refurbishment of the breaker was ruled out due to the 16-18 week expected delivery time for parts from the original equipment manufacturer. A spare breaker was available in Hydro's inventory.	
Breaker B2L21 Overhaul, Peter's Barren Terminal Station	$79.4	During inspections, Breaker B2L21 was identified as leaking sulfur hexafluoride (SF6) gas to the atmosphere. Overhaul of the breaker was required to prevent a flashover in the breaker and to minimize any loss of SF6 gas.	The breaker B2L21 was overhauled.
Replace X1 Bushing on Transformer T8, Wabush Terminal Station	$75.8	Transformer T8 X1 bushing failed on August 16, 2018 resulting in a forced outage to transformer T8. The bushing failed due to a failed top terminal seal caused by corrosion of the bushing at a sealed joint. The failed bushing was unsuitable for repair due to the corrosion, and transformer T8 cannot operate without an X1 bushing, therefore the restoration of transformer T8 required the replacement of the X1 bushing.	The X1 Bushing on Transformer T8 was replaced.
Transformer T4 Tap Changer Overhaul, Hardwoods Terminal Station	$64.9	Testing of the transformer T4 tap changer conducted in December 2017 revealed that there was a high risk of failure and an immediate overhaul of the tap changer diverter switch was required.	The transformer T4 tap changer was overhauled.
Replace Current Transformer on B9B10-1, Bay d'Espoir Terminal Station 2	$45.0	An infrared scan revealed that the 230 kV Current Transformer on disconnect switch B9B10-1 B-Phase was excessively hot (100°C) at the primary connection terminals. This was determined to be due to galvanic corrosion on the copper-aluminum connection. Upon disassembly, the spacer dowels were found to be melted and a significant oil leak had developed. This condition required 230 kV breaker B9B10 to be taken out of service resulting in the primary ring bus open until the current transformer was replaced. Immediate replacement of the current transformer was required to restore	Bay d'Espoir Terminal Station 2 - The 230 kV Current Transformer on B9B10-1 B-Phase was replaced.

Project Title and Location	Expenditure ($000)	Failure Identified	Project Scope
		system reliability.	
Replace B-Phase Current Transformer on Breaker 46-38, Wabush Terminal Station	$39.7	During inspection, the current transformer on breaker 46-38 B-Phase was found to have an oil leak on the top head unit and it required immediate replacement.	The 46-38 B-Phase Current Transformer was replaced.
Replace Disconnect Switch B3T2-1, Stony Brook Terminal Station	$36.7	Inspection revealed that Disconnect Switch B3T2-1 (138 kV) had damaged hinge side parts that rendered it inoperable on 2 phases. Replacement parts were not available for this breaker, which was 49 years old, and it required replacement.	A new disconnect switch was procured and installed to replace the failed disconnect switch B3T2-1.
Replace A-Phase Current Transformer on B1L32, Stony Brook Terminal Station	$34.4	Inspection revealed that the A-Phase Current Transformer on B1L32 developed an oil leak internal to its junction box around the gland plate, which began leaking out through the box. The current transformer was de-energized to avoid any further oil loss and possible catastrophic failure. The leaking current transformer location had added safety concerns to personnel as it is located directly in front of the Control Building's main door and parking area. Immediate replacement was required to restore B1L32 and the ring bus to service.	The A-Phase Current Transformer on B1L32 was replaced.
Purchase Spare Station Service Voltage Transformer, Oxen Pond Terminal Station	$29.1	It was determined that a spare station service voltage transformer was required after three new Station Service Voltage Transformers were installed in the Oxen Pond Terminal Station for a second station service supply.	A spare station service voltage transformer was purchased for the standby equipment pool.
Purchase Spare Motor Operator for Circuit Switcher for Western Avalon B1T1, B1T2 and Stephenville B1L09	$28.6	In June 2018, circuit switcher B1T1 at Western Avalon was identified as non-operational. Further inspection found that a coupling from the motor going to the linkage that operates the opening and closing of the circuit switcher was broken. The original equipment manufacturer was able to repair the existing equipment; however, replacement parts are not available if future repairs are required. This identified the need to have a spare available in the standby equipment pool.	A spare motor operator was procured for the standby equipment pool.

Project Title and Location	Expenditure ($000)	Failure Identified	Project Scope
Replace 125 VDC Battery Bank, Bear Cove Terminal Station	$25.7	Discharge testing of the 125 Vdc battery bank revealed that multiple cells within the bank had dropped below the acceptable level of 1.75 volts per cell, and the battery bank required replacement.	A replacement 125 Vdc battery bank was procured and installed.
Replace Current/Voltage Transformer on TL205 B-Phase, Buchans Terminal Station	$23.3	Hydro's Energy Control Center operators observed high and low voltage fluctuations in the secondary voltages followed by a protection failure alarm of the 230 kV B-Phase Current/Voltage Transformer on transmission line TL 205. TL 205 was removed from service and crews were dispatched to site. Upon arrival the work crew found oil leaking from the base of the unit. Immediate replacement with an available spare from inventory was required to put TL 205 back in service.	The failed current/voltage transformer was replaced with an available spare.
Replace Bus 2 C-Phase Current/Voltage Transformer, Sunnyside Terminal Station	$20.2	During scheduled six-year maintenance on bus 2 Current/Voltage Transformers in the Sunnyside Terminal Station, the C-Phase Current/Voltage Transformer was found to have a severely corroded terminal block and accessories in its junction box. Upon removal of the terminal block for replacement, the secondary protective spark gap was found to be badly burnt and shorted out. The planned Doble Testing showed a 400-500% increase of its capacitor power factor. Doble Engineering was consulted and they recommended to not re-energize the Current/Voltage Transformer. As a result, immediate replacement was required to restore Bus 2 to service.	Bus 2 C-Phase Current/Voltage Transformer was replaced.
Replace Bus B1 Potential Transformer, Cow Head Terminal Station	$17.9	An inspection in October 2017 identified deterioration of the bus B1 potential transformer due to corrosion, placing it at a high risk of failure, requiring immediate replacement. The potential transformer was manufactured in 2006 and was of a carbon steel design, whereas Hydro's current standard is for stainless steel or aluminum design.	The bus B1 Potential Transformer was replaced with a unit that meets Hydro's current standard (stainless steel/aluminum).
Replace Capacitor Bank 2 Overvoltage Relay, St. Anthony Airport Terminal Station	$13.3	While performing scheduled preventive maintenance on March 28, 2018, capacitor bank overvoltage relay 59N was found to be inoperative and requiring replacement. This resulted in Capacitor Bank 2 being out of service until the relay could be replaced.	An overvoltage relay was procured and installed to replace the failed Capacitor Bank 2 overvoltage relay.

Project Title and Location	Expenditure ($000)	Failure Identified	Project Scope
Replace 6.9 kV Fuse Holder and Fuses, Bottom Brook Terminal Station	$13.2	During the activity to isolate equipment for work protection in June 2018, the 6.9 kV fuse for station service on transformer T3 failed and required replacement. No replacement fuses were available for this vintage, which resulted in the requirement to replace the entire fuse/fuse holder assembly.	The 6.9kV fuse and fuse holder was replaced.
Replace Neutral Overcurrent Relay on Transformer T1, Plum Point Terminal Station	$5.8	On April 9, 2018, protective relaying locked out transformer T1 in response to a fault on Line 1 during blizzard conditions, which lead to a loss of electrical supply to approximately 4,867 customers fed via the Plum Point, Bear Cove, Roddickton, Main Brook, and St. Anthony Terminal Stations. Analysis of the event determined that the neutral overcurrent relay on transformer T1 had tripped for a feeder fault due to the failure of the induction disc to reset. Immediate replacement was required to prevent reoccurrence.	The neutral overcurrent relay on transformer T1 was replaced.
Replace Surge Arrestor H1 on Transformer T12, Bay d'Espoir Terminal Station 2	$4.1	Doble Testing on the surge arresters for Transformer T12, revealed that the H1 surge arrester failed testing. A replacement arrester was required to ensure continued protection for transformer T12.	The surge arrestor H1 on transformer T12 was replaced.

9.0 Hydraulic Generation In-Service Failures

Hydro has committed to providing a summary of activities completed under the Hydraulic Generation In-Service Failures project. Table 21 outlines 2018 expenditures undertaken by this project.

Total Approved Budget: **$1,251,100**

Total Expenditure: **$452,300**

Table 21: Hydraulic Generation In-Service Failures

Project Title and Location	Expenditure ($,000)	Failure Identified	Project Scope
Replace Guide Bearing Assembly, Bay d'Espoir Unit 2	$138.4	The existing generator guide bearing assembly was installed in 2015. It was designed and fabricated by the original equipment manufacturer in order to reduce the misting issues experienced through the top oil pot housing covers and was of a modified design as compared to the original. During the overhaul and refurbishment of Unit 2, inspection damage was found on the journal, bearing, and other rotating components likely caused by the new bearing design. To eliminate the possibility of further damage to the journal, bearing, and other rotating components such as the thrust bearing, rotating ring, and spring beds, it was determined that the generator bearing should be converted back to original design. The original design is time proven and has operated successfully for decades. The misting issue that the new bearing design was installed to address will not affect unit performance since a capital program to add new seals to reduce misting is included within Hydro's five-year capital plan.	The guide bearing was returned to original design using available spare parts.
Circuit Breaker Capital Spare, Hinds Lake	$110.4	The planned scope for this project included the procurement of a spare circuit breaker for Hinds Lake to allow responsive action to failures.	The spare circuit breaker was procured.

Project Title and Location	Expenditure ($,000)	Failure Identified	Project Scope
Replace Thrust Bearing Assembly, Bay d'Espoir Unit 2	$99.8	Upon inspection of the generator main bracket stationary parts, it was observed that the thrust bearing had undergone severe damage to the babbitt on two thrust pads as well as signs of damage on all other pads including perpendicular cracks and heat damage to the babbitt. The bearing was deemed unusable and required immediate replacement. As well, the damage to the thrust bearing scarred the rotating ring bearing surface, a surface that is required to be machine finished to ensure a low coefficient of friction while the unit is rotating. The spring beds were in use for over 20 years, were found to be heavily contaminated with babbitt, and have exhibited changes in length from the original equipment manufacturers (OEM's) drawings. These springs required replacement with the thrust pads and rotating ring to ensure this bearing surface is free from any contaminants and operating as intended as per OEM design.	The thrust bearing assembly, including pads, spring beds and the rotating ring, were replaced.
Replace Sump Pump 1, Bay d'Espoir Powerhouse 1	$42.8	The sump pump was observed to not be operating as intended with the level in the sump not decreasing when it was in operation. There was risk of powerhouse flooding, with the pump unable to move water at a rate equal to the potential inflow of water into the sump.	The sump pump was replaced.
Refurbish Culverts, Bear Brook, Bay d'Espoir	$24.8	The road at the Bear Brook crossing, on the access road to the Bay d'Espoir Generating Station, deteriorated and was in an unacceptable condition for vehicular traffic. Material between the 1200 mm culverts had eroded away and no longer adequately supported the surface of the road.	The material around the culverts, including the bedding material, was replaced. Blast rock was installed to reduce erosion and berms were constructed to redirect water flows.
Procure a Replacement HVAC unit for the Control Room, Cat Arm	$14.2	The control room air conditioning unit failed due to the loss of refrigerant. Copper tubing and fittings were corroded, which increased the possibility of accidental release when completing maintenance.	A replacement HVAC unit was procured. Installation will occur in 2019 when road conditions allow for a contractor to access site to install. Installation costs will be reported under the 2019 Hydraulic In-Service Failures project.

Project Title and Location	Expenditure ($,000)	Failure Identified	Project Scope
Purchase Station Service Transformer Capital Spare, Hinds Lake	$12.9	The planned scope for this project included the procurement of a spare station service transformer for Hinds Lake to allow responsive action to failures.	A spare station service transformer was ordered and will be received in 2019. Material costs will be reported under the 2019 Hydraulic In-Service Failures project.
Replace High Pressure Pump, Hinds Lake	$5.5	During start-up of the generating unit at Hinds Lake, it was discovered that the high pressure pump was unable to meet required pressure and thus the unit controls would not allow the unit to start.	An available spare pump was installed and a new spare was procured.
Purchase Excitation Transformer Capital Spare, Cat Arm	$3.5	The planned scope for this project included the procurement of a spare excitation transformer for Cat Arm to allow responsive action to failures.	A spare excitation transformer was ordered and will be received in 2019. Material costs will be reported under the 2019 Hydraulic In-Service Failures project.

10.0 Thermal Generation In-Service Failures

Hydro has committed to providing a summary of activities completed under the Thermal Generation In-Service Failures project. Table 21 outlines 2018 expenditures undertaken by this project.

Total Approved Budget: **$1,250,000**

Total Expenditure: **$2,699,900**

Table 22: Thermal Generation In-Service Failures

Project Title and Location	Expenditure ($,000)	Failure Identified	Project Scope
Hydraulic System, Holyrood Unit 1	$597.7	Unit 1 tripped off line on November 3, 2018 as a result of turbine steam control valves closing without receiving the command from the control system to do so. An investigation concluded that hydraulic system contamination was the cause of the unit trip. Hydro proceeded to refurbish the hydraulic system on Unit 1.	The hydraulic system for the Unit 1 control valves was refurbished. This included replacement of servo valves, cleaning or replacement of hydraulic actuators, replacement of actuator seals, replacement of filters, cleaning of hydraulic fluid coolers, flushing of the entire system, and replacement of the hydraulic fluid.
Hydraulic System, Holyrood Unit 2	$218.9	The Unit 2 hydraulic system is identical to that for Unit 1 and, while no failures had occurred, Hydro determined it was reasonable to expect that the system for Unit 2 was in the same contaminated condition as for Unit 1. The following issues supported the conclusion that the system was contaminated: (i) the control valve actuator was showing signs of seal deterioration, with smearing deposits noted on the shaft; and (ii) the right hand intercept valve did not fully stroke during on-line testing. Refurbishment was required to prevent a failure, which was likely to occur prior to or during the next winter operating season.	The hydraulic system for the Unit 2 control valves was refurbished. This included replacement of servo valves, cleaning or replacement of hydraulic actuators, replacement of actuator seals, replacement of filters, cleaning of hydraulic fluid coolers, flushing of the entire system, and replacement of the hydraulic fluid. It is noted that the Unit 2 refurbishment is lower cost than the Unit 1 refurbishment because it was completed in a planned rather than emergency manner.

Project Title and Location	Expenditure ($,000)	Failure Identified	Project Scope
Boiler Stop Valve and Hydraulic Ram, Holyrood Unit 1	$703.0	Unit 1 turbine control valves began operating erratically on January 3, 2018. On January 5 to 6, 2018, an outage was taken to replace the servo and clean the hydraulic fluid and filters. This did not solve the problem and on January 20, 2018 erratic operation of the control valves became severe to the point where the unit was taken offline on a forced outage to address the issue. Further investigation revealed that the hydraulic ram for one of the control valves was deteriorated and required refurbishment. For the boiler stop valve, a technical representative for the original equipment manufacturer ("OEM") identified that the internal seating surface was damaged, with excessive clearance between the body and the pressure seal ring. Upon review, and with consideration for the remaining life of Holyrood boilers, it was determined that the boiler stop valve could be eliminated from the system and replaced with a welded pipe spool.	The hydraulic ram for the turbine control valve was refurbished using parts from an available spare ram, and the spare ram was reconditioned and returned to inventory. The boiler stop valve was replaced with a welded pipe spool.
Boiler Observation Ports, Vestibule Refractory and Steam Coil Air Heaters, Holyrood	$341.2	Units 1 and 2 observation ports in the boiler casing, consisting of special glass, metal frames, and refractory seals, were inspected and found to have refractory damage and therefore at an elevated risk of sudden failure. There are two ports for each unit. Unit 2 header vestibule refractory seals around the boiler tube penetrations were inspected and one of the five seals was found to have refractory damage. When this refractory fails, hot gas will enter the vestibules and can cause boiler gas leaks from the vestibule to the powerhouse, which is at a lower pressure. This could lead to health and safety concerns and could lead to a forced outage for repair. Two of the eight steam coil air heaters on Unit 3, which preheat the combustion air prior to the air entering the main air heaters, were found to be leaking steam and had to be isolated in the fall of 2017. All of the coils were inspected in 2018 and found to be in poor condition with damaged and fouled fins, affecting fan performance by increasing the pressure drop across them. Failures of additional loops were reasonably expected.	The observation ports on Units 1 and 2 were replaced. The header vestibule refractory seals were replaced on Unit 2. The eight steam coil air heaters were replaced.

Project Title and Location	Expenditure ($,000)	Failure Identified	Project Scope
Fuel Oil Return Line, Holyrood Marine Terminal	$296.9	The Holyrood Marine Terminal has an 18 inch fuel oil line used to off-load tankers and a separate four inch line to empty fuel oil from the 18 inch line following a tanker off-loading. There are approximately 157 barrels of fuel oil that would be released into the environment if a failure was to occur on the 18 inch line due to arctic sea ice in Holyrood Bay or tanker impact during fuel delivery at this location following a fuel delivery. A visual inspection of the Marine Terminal revealed that the 4 inch return line had lifted vertically off its pipe supports and moved axially towards the ocean by approximately 12 inches. A subsequent assessment of the line indicated that it had significant corrosion underneath the pipe insulation and measured wall thicknesses below the pipe original minimum wall thickness. In addition, the line was no longer resting on its supports and permanent damage was expected from excessive movement. Due to the urgent requirement to mitigate the risk of failure, Hydro decided to replace the line.	The four inch fuel oil return line was replaced, including the piping, supports, heat tracing and insulation.
Variable Frequency Drive Fan Motor and Boiler Feed Pump Motor, Holyrood	$84.2	The Unit 1 West variable frequency drive fan motor exhibited high winding temperatures resulting in an alarm. Load on the unit was reduced to control the motor temperature, but the temperature continued to increase over time, indicating an imminent failure. The unit was removed from service for immediate replacement of the motor using an available spare motor. The Unit 2 West boiler feed pump motor had to be removed from service when the motor bearing failed. As a result, Unit 2 was de-rated to approximately 70 MW until the motor was replaced with the available spare motor.	The Unit 1 West variable frequency drive motor and the Unit 2 West boiler feed pump motor were replaced with available spares. The motors removed from service were refurbished and added to inventory as critical spares.
East Cooling Water Pump Motor, Holyrood Unit 3	$73.3	The drive-end bearing on the Unit 3 East Cooling Water Pump ("CWP") Motor was found to be exhibiting high vibration during the 2017/2018 winter operating season and was running hotter than normal. These observed conditions indicated that failure was imminent and that intervention was required before returning the unit to service for the winter season.	The Unit 3 East Cooling Water Pump Motor was removed, refurbished and returned to service.

Project Title and Location	Expenditure ($,000)	Failure Identified	Project Scope
West Cooling Water Pump Motor, Holyrood Unit 2	$56.7	The Unit 2 West CWP Motor was tested on May 30, 2018 for winding resistance as part of routine maintenance. The test results indicated that the winding insulation had deteriorated to the point where on-line failure could be expected during the next operating season. To restore the motor from this incipient failure condition and ensure reliable operation going forward, it was necessary to have the windings restored.	The motor was replaced with an available spare motor. The motor removed from service was refurbished and added to inventory as a critical spare.
West Forced Draft Fan Motor, Holyrood Unit 2	$53.2	The Unit 2 West Forced Draft (FD) Fan Motor was tested on May 29, 2018 for winding resistance as part of routine maintenance. The test results indicated that the winding insulation has deteriorated to the point where on-line failure could be expected during the next operating season. To restore the motor from this incipient failure condition and ensure reliable operation going forward, it is necessary to have the windings restored.	The motor was replaced with an available spare motor. The motor removed from service was refurbished and added to inventory as a critical spare.
Variable Frequency Drives, Holyrood Units 1 and 2	$104.7	On March 5, 2018, a Unit 2 west Variable Frequency Drive ("VFD") power cell failed and was replaced. The drive bypassed the failed cell and the unit did not trip in this instance. On March 19, 2018, the west VFD tripped on Unit 1. Another power cell had failed and was replaced with an available spare, and two cell control fuses had blown and were replaced with available spares. The fault log was downloaded from the VFD and sent it to the OEM for review and technical assistance. The OEM confirmed that the actions taken by the plant were appropriate. On March 26, 2018, the east VFD tripped on Unit 1, with a failure similar to that which occurred on March 19, 2018. Power cells and fuses were replaced with available spares.	Failed VFD power cells and fuses were replaced with available spares.
Forced Draft Fan Bearing, Holyrood Unit 1	$49.8	On June 17, 2018 the Unit 1 East FD fan inboard bearing liner failed, which led to a forced outage on Unit 1.	The inboard bearing liner was replaced with an available spare and the journal (the bearing surface section of the fan shaft) was refurbished.

Project Title and Location	Expenditure ($,000)	Failure Identified	Project Scope
Turbine Control System (Mark V), Holyrood Unit 1	$75.0	Online testing of the reheat valves for Units 1 and 2 revealed that components in the turbine control system has failed and required replacement. Upon completion of the replacement of the failed components, the reheat valves on both units tested successfully.	Failed components of the turbine control system were replaced, including two solenoids, fuses, circuit boards and ribbon cables on Unit 1 and the servomotors on both of the reheat valves on Unit 2.
Distributed Control System ("DCS"), Holyrood	$32.7	Hydro received a Schneider Electric Customer Advisory detailing a manufacturing defect with the Schneider Electric FCP270 Control Processors ("FCP"). As outlined in the advisory, there was an incipient failure that needed to be corrected before entering into the 2018/2019 winter season to maintain reliability of this critical system. There were three options presented in Schneider Electric's advisory. The option to receive pre-programmed, upgraded FCPs, was the most cost effective and least impactful to Holyrood's operation.	All Schneider Electric FCP270 Control Processors ("FCP") were replaced with factory-updated FCPs. This includes eight FCPs installed in Holyrood's distributed control system and one in inventory.
Distributed Control System ("DCS") Operator Station, Holyrood Unit 3	$12.6	One of the Unit 3 DCS Operator Stations failed on May 4, 2018. The Basic Input/Output System ("BIOS") of the machine was not identifying any hard drive and, therefore, the operating system was not booting. This may have been caused by a critical failure of the hard drive itself, the motherboard's connection to it, or the power supply connection to the hard drive. The computer that failed is one of the oldest operator stations with obsolete hardware, and a motherboard problem would require full replacement of the operator station. For safe and reliable operation through the 2018/2019 winter operating season, all stations are required to be in service. Therefore, the replacement of the failed operator station was required. This operator station will be required post steam.	The Unit 3 DCS Operator Station was replaced.