A Report to the

Board of Commissioners of Public Utilities

2015 Capital Plan

newfoundland labrador hydro
a nalcor energy company

Table of Contents

Introduction

Hydro has a responsibility to provide safe, reliable, and least-cost service to meet the needs of its customers. Providing a reliable supply of electrical energy depends on maintaining assets in sound condition. Utility assets are kept in reliable working condition by routine maintenance and replacement as necessary. Asset additions are also determined through analysis of long term requirements to address future demands for power and energy.

In Board Order No. P.U. 30 (2007), Hydro was directed to file a five-year capital expenditure plan. The Board indicated the plan should focus on strategic spending priorities beginning with the current year of the Application. As well, the capital expenditure plan should identify shifts in spending priorities over the five-year period, the circumstances contributing to these shifts, and alternative approaches under consideration. Additionally, the Board requested a separate section concerning Holyrood, which at the time had an uncertain future due to alternative developments under consideration. With the sanction of Muskrat Falls and the Labrador-Island Link developments in December 2012, the future of the Holyrood plant has been established. The Holyrood section of this plan addresses Hydro's forecasted maintenance and capital requirements for the plant for the next five years.

Hydro maintains an asset base of $1.5 billion. Many of the assets have reached or exceeded their expected service lives and many others are approaching that juncture. Other major assets have not reached their expected service lives but some of their components, auxiliary equipment and systems have, or are about to do so. This includes components of major facilities such as the Bay d'Espoir Generating Station, the Holyrood Thermal Generating Station, the Hardwoods and Stephenville gas turbines and much of Hydro's transmission and distribution systems. Hydro uses an asset management framework to manage these assets.

Hydro has a five year capital plan which contains additional detail on costs and timing of asset replacement and refurbishment. The five-year plan is a living document and is revised on an ongoing basis as new information about the condition of assets becomes available, as asset management strategies evolve, and as demands and priorities change within asset classes. During 2011, Hydro devoted significant effort to developing and refining the five year plans for the various asset classes. A key finding of this work is the general increase in sustaining capital required. Furthermore, the work highlighted additional capital expenditures that will be required to address load growth.

Hydro has a responsibility to maintain its infrastructure to a level that continues to allow Newfoundlanders and Labradorians to live in a modern society, dependent on a safe, reliable and least cost supply of electricity for home and business use.

Five-Year Plan

Hydro plans to invest $1.1 billion in plant and equipment over the 2015 to 2019 period for an average annual capital expenditures of $209 million. Individual year expenditures will range from a low of $67 million in 2019 to a high of $314 million in 2016. Over the period 2009 to 2013, the average annual capital expenditure was $66.1 million. The increase in overall capital expenditure reflects inflation, the requirement for specific projects related to replacement and upgrade of deteriorating facilities, ensuring compliance with legislation, and most particularly additions required to meet load growth.

Expenditures for new generation and transmission assets are included in these estimates, specifically for the upgrade of the transmission line corridor between Bay d'Espoir and Western Avalon, the construction of a third transmission line in from Churchill Falls to the Wabush terminal station, and the remaining costs for addition of a new combustion turbine at Holyrood (planned to be in service in early December 2014). These projects are the subject of separate filings.

Strategic Spending Priorities

Hydro's strategic spending priorities over the next five years address the following areas:

1. Mandatory Issues:

   - Ensuring the safety of Hydro personnel, its contractors, and the general public;
   - Compliance with legislative and regulatory requirements; and
   - Dealing with environmental risks.

2. Meeting projected load growth and customer requests;

3. Achieving cost efficiencies;

4. Applying a consistent Asset Maintenance Philosophy to maintain acceptable asset performance

as identified by:

   - Operating experience
   - Maintenance history
   - Condition assessments
   - Performance Evaluation and Monitoring

Hydro's detailed five year plan is presented in Appendix A. Over this period, the level of capital expenditure is driven by:

- Growth in system demand; and
- Age and Condition of current infrastructure and assets.

Generation

The requirement to invest sustaining capital in generation facilities increased several years ago as parts of Hydro's generating plants reached or surpassed their normally expected service lives. Primary drivers for these projects are the realization of end of service lives for equipment, reductions in reliability or performance, the availability of more efficient technology, and considerations for safety.

Hydraulic

Ensuring reliability is the primary priority for Hydro. Hydro has now completed a rewind program of Units 1-6 at the Bay d'Espoir Generating Station as the windings had deteriorated and begun to show signs of imminent failure. The condition of auxiliary systems and equipment continues to be of great a concern, as their failure could also remove a unit or plant from service. To address this concern, the 2015 Capital Plan includes projects to upgrade hydraulic structures and refurbish Unit No. 3 surge tank. Hydro is proposing to undertake significant rehabilitation at each of its mini hydro projects at Snook's Arm and Venams Bight over the next three years in order to continue to provide least cost and reliable power. Other projects proposed for 2015 include the refurbishment of the access road and replacement of the Unit 2 exciter at the Cat Arm generating facility.

Thermal

On December 17, 2012, the Government of Newfoundland and Labrador announced official sanction of the Muskrat Falls development. The Muskrat Falls in-feed, or the Labrador Island Link (LIL), is expected to be in service in 2017. Holyrood will be required for prime power production throughout the interim period (i.e., to the in-service date of the LIL) and it is intended that the facility remain fully available for generation in stand-by mode until the 2020–2021 timeframe. Unit 3 will operate primarily in synchronous condenser mode beginning in 2017, with the option to return to full generating mode. Post the 2020-2021 timeframe, Units 1 and 2 and the steam components of Unit 3 at Holyrood will be

decommissioned, and Unit 3 will continue to operate in synchronous condenser mode only with no generation capability.

The Holyrood Generating Station Units 1 and 2 are now 45 years old while Unit 3 is 35 years old. The generally accepted life expectancy for thermal plants is 30 years. The Holyrood plant remains critical to the reliable power supply on the Island Interconnected system. The capital upgrades contained in this plan are necessary to replace assets which are at the end of their useful lives, and those which must be replaced to maintain reliability.

Also see the Holyrood Overview section for further discussion pertaining to the five year plan for Holyrood.

Gas Turbines

Maintaining the reliability of Hydro's existing gas turbine assets, which are relied upon to provide emergency and peaking power and function as synchronous condensers to help control voltage on the Island and Labrador Interconnected Systems, is a priority. These facilities accumulate few operating hours generating electricity but are crucial sources of power and energy during emergencies and system peaks and provide voltage support, especially when operating as synchronous condensers. These plants, especially the 50 MW plants at Hardwoods and Stephenville, required relatively little capital expenditure until recent years. Despite their low operating hours, these units are beyond their normal life expectancy and are deteriorating, requiring an increase in capital expenditures to extend their reliable economic service lives to the greatest extent possible. A multiyear life extension project for the Hardwoods plant was begun in 2010 and completed in 2013. A similar project for Stephenville began in 2014 and is proposed to continue through to 2016. The new combustion turbine at Holyrood is planned to be in service in early December 2014.

Hydro's gas turbine plant located at Happy Valley was constructed in 1992. This plant has required only minor upgrades since that time. Projects are planned in 2015 and 2016 to perform an alternator inspection and to install a diesel automation and charger system, respectively.

Terminal Stations

Increasing load and maintaining reliability are the principal drivers for terminal station expenditures over the next five years.

Aging equipment is a major concern and is considered when reviewing short and long term plans. The five-year plan contains expenditures in the form of several programs to upgrade power transformers, install on-line transformer gas monitoring units, and to replace circuit breakers, instrument transformers, surge arrestors, and disconnect switches among others. The plan also contains station specific projects such as performing site work at the Barachoix terminal station for the mobile transformer and to upgrade the control wiring at the Bay d'Espoir terminal station. Hydro will, to the greatest extent possible, continue to consolidate equipment replacements into multi year programs to ease the administrative effort for both the Board and Hydro.

Following the events of January 2014, Hydro has developed a plan to accelerate air blast circuit breaker replacements and have included the requirements for the 2015 accelerated work within its 2015 Upgrade Circuit Breaker application. Hydro will be submitting the details of the overall accelerated replacement plan within a separate report being filed with the Board on August 1, 2014 as recommended in the Board's May 15, Interim Report, regarding the Investigation and Hearing Into Supply Issues and Power Outages On The Island Interconnected System. As a result of the January events Hydro also have plans in place to review : breaker failure applications, events and alarm recording and application of modern digital relays. The outcomes of these reviews will form the basis for other capital projects that are currently not included within the current five year plan.

Transmission

Reliability maintenance is the primary driver for transmission investment. The wood pole line management program forms the backbone of Hydro's asset management strategy for these facilities. This strategy has been in place for ten years and its effectiveness and value has been tested and demonstrated, enabling Hydro to realize the maximum useful life from these transmission systems. The program is based on periodic assessment of the wooden transmission poles and facilitates their replacement before failure, while extracting the maximum possible reliable life from each pole. During

the next five years Hydro plans to upgrade various transmission lines along with other transmission line projects such as the continuation of the work to refurbish footings and anchors on TL202 and TL206 from Bay d'Espoir to Sunnyside. A major project to upgrade the transmission line corridor between Bay d'Espoir and Western Avalon is required to facilitate additional power and energy delivery to the system and meet transmission planning criteria. On the Labrador Interconnected System, a major project to construct a third transmission line between Churchill Falls and the Wabush terminal station is planned to meet the increasing power and energy requirements in the Labrador West region. The safety of Hydro personnel, contractors, and the public is also a priority in the five-year plan for Transmission.

Distribution

New customer additions and reliability maintenance are the strategic areas addressed by the five-year capital plan for distribution assets. This equipment is subject to the same aging and wear as the generation and transmission assets and must be replaced periodically to ensure reliable service. The majority the distribution system expenditures for the next five years will consist of service extensions and upgrades to distribution systems, distribution pole replacement, and substation upgrading, all to maintain or improve system performance. A significant portion of expenditures over the next five years is also related to load growth in Labrador South.

Rural Generation

The replacement of aging infrastructure is required to ensure reliability for Hydro's 21 isolated electrical systems which are supplied with electricity by diesel generating sets. Hydro's diesel generating sets have the shortest lives of all its generating assets, requiring replacement after approximately 100,000 hours of operation. Chart 1 provides the age distribution of the diesel engines in Hydro's rural generating plants. During the next five years Hydro plans to replace or add generating sets in various isolated diesel plants. These replacements and additions are required to ensure that reliable service is provided to Hydro's isolated rural customers. Many of Hydro's diesel plants have deteriorated to a great extent and will require renovation or replacement in the near to medium term. To prioritize this process, Hydro conducted a review of the condition of the older plants to assist in planning the replacement or

modification in a logical sequence. Projects for the replacement and upgrade of diesel plant infrastructure and auxiliary systems are included over the coming five years.

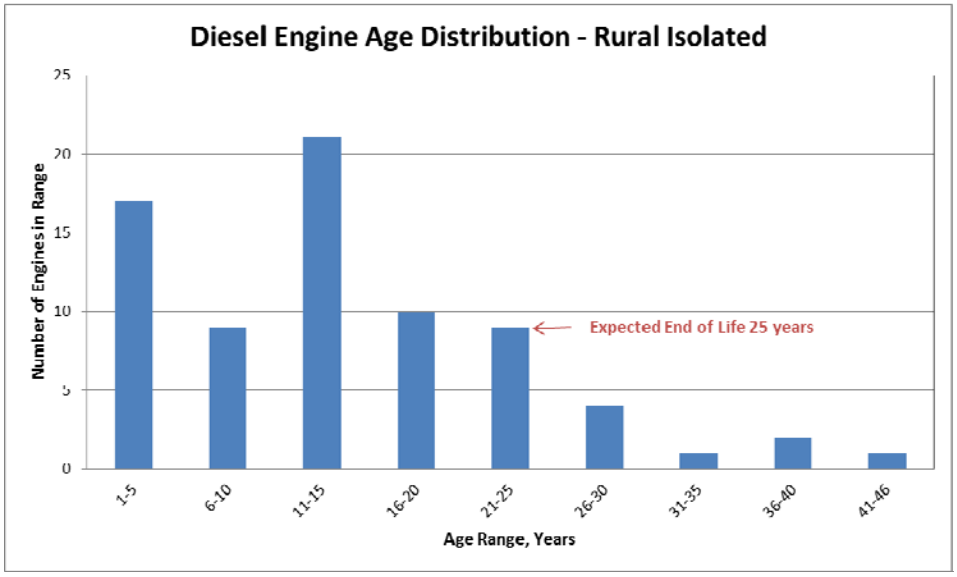

Chart 1: Diesel Engine Age Distribution – Rural Isolated System

Information Systems

Obsolete technology and aging hardware are the strategic drivers which most significantly contribute to the five-year plan for information systems. Hydro's information systems provide the data required to effectively manage and control the activities of the business. Expenditures on these systems and personal computers will average $3.0 million annually during the next five years.

Telecontrol

Obsolete technology and aging hardware are also the strategic reasons which most significantly contribute to the five-year plan for Telecontrol assets. Hydro's communications network is vital to the operation and control of the power systems. Communications must be reliable and rapid to protect and control the generation, transmission and distribution equipment. It is expected that capital expenditures will average approximately $3.3 million annually for the next five years. The most significant of these

projects will be the refurbishment of microwave sites and the the replacement of obsolete radio equipment, power line carriers, mobile radio system and PBX phone systems.

Transportation

Hydro's vehicles and mobile equipment must continue to be both safe and reliable. Hydro operates a diversified and dispersed fleet of mobile equipment throughout the Province that is required to operate and maintain our facilities in a challenging and sometimes harsh physical environment. Hydro selects, operates and maintains this equipment in a manner designed to achieve the least life cycle cost and replacements are scheduled in accordance with criteria submitted to the Board on previous occasions. Hydro anticipates that expenditures on mobile equipment will average approximately $3.4 million annually over the next five years.

Administration

Safety, cost efficiencies, reliability and security are the primary drivers of the five-year administration capital plan. Hydro expects to spend an average of $1.1 million annually on items such as office equipment, building auxiliary systems, and building infrastructure, during the next five years.

APPENDIX A

Five-Year Capital Plan

	Expended to 2014	2015	2016	2017	2018	2019	Total
				($000)			
GENERATION	111,096.2	27,645.1	35,714.7	23,853.4	12,222.0	12,111.4	222,642.8
TRANSMISSION AND RURAL OPERATIONS	59,127.7	234,363.8	267,806.0	182,786.8	144,767.0	45,844.5	934,695.8
GENERAL PROPERTIES	3,041.9	8,401.6	10,192.1	15,730.3	11,719.3	7,747.8	56,833.0
CONTINGENCY FUND		1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	5,000.0
TOTAL CAPITAL BUDGET	**173,265.8**	**271,410.5**	**314,712.8**	**223,370.5**	**169,708.3**	**66,703.7**	**1,219,171.6**
Projects Filed Separately therefore not Included in the 2015 Capital Budget Application:[1]							
Construct Labrador West Transmission Line	37,484.2	163,145.3	128,962.6				
Purchase and Install 100 MW Combustion Turbine - Holyrood	109,677.0	9,323.0					
Construct 230 kV Transmission Line - Bay d'Espoir to Western Avalon	2,412.6	18,964.7	77,225.6	110,064.0	82,991.0		
Replace Transformer - Sunnyside	7,197.8	1,226.4					
Replace Excitation Transformers - Bay d'Espoir	636.7	360.0					
Replace Air Compressor - Holyrood	247.6	61.1					
Voltage Conversion - Labrador City	808.9	1,237.8					
Total Projects filed separately		**194,318.3**					
Total 2015 Capital Budget Application (as per Schedule A)		**77,092.2**					

[1] **Includes projects already filed but not yet approved as well as projects soon to be filed.**

	Expended to 2014	2015	2016	2017	2018	2019	Total
				($000)			
GENERATION							
Hydraulic Plant	823.3	10,033.3	11,675.1	14,931.2	8,911.5	8,699.7	55,074.1
Thermal Plant	546.0	4,854.1	21,242.2	8,863.2	3,250.0	2,750.0	41,505.5
Gas Turbines	109,677.0	12,462.6	2,739.5	0.0	0.0	600.0	125,479.1
Tools and Equipment	49.9	295.1	57.9	59.0	60.5	61.7	584.1
TOTAL GENERATION	111,096.2	27,645.1	35,714.7	23,853.4	12,222.0	12,111.4	222,642.8
TRANSMISSION AND RURAL OPERATIONS							
Terminal Stations	14,255.5	18,233.8	20,606.9	14,326.5	19,376.6	17,452.4	104,251.7
Transmission	41,088.5	185,928.8	211,530.9	127,612.3	98,330.9	4,629.2	669,120.6
Distribution	1,291.4	17,945.1	18,307.0	22,297.8	13,108.0	18,536.0	91,485.3
Generation	1,978.6	7,728.0	11,703.3	13,767.0	11,675.7	3,328.7	50,181.3
Properties	156.8	2,313.6	3,543.0	3,815.1	1,484.5	1,515.6	12,828.6
Metering	356.9	1,096.3	599.7	199.6	200.0	197.1	2,649.6
Tools and Equipment	0.0	1,118.2	1,515.2	768.5	591.3	185.5	4,178.7
TOTAL TRANSMISSION AND RURAL OPERATIONS	59,127.7	234,363.8	267,806.0	182,786.8	144,767.0	45,844.5	934,695.8
GENERAL PROPERTIES							
Information Systems	711.6	2,680.0	3,349.1	3,182.7	2,819.9	2,825.2	15,568.5
Telecontrol	521.2	1,273.0	3,017.0	7,235.4	2,815.9	2,122.7	16,985.2
Transportation	1,809.1	3,468.1	2,400.1	3,251.3	5,315.2	2,582.5	18,826.3
Administrative	0.0	980.5	1,425.9	2,060.9	768.3	217.4	5,453.0
TOTAL GENERAL PROPERTIES	3,041.9	8,401.6	10,192.1	15,730.3	11,719.3	7,747.8	56,833.0
CONTINGENCY FUND		1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	5,000.0
TOTAL CAPITAL BUDGET	173,265.8	271,410.5	314,712.8	223,370.5	169,708.3	66,703.7	1,219,171.6

PROJECT DESCRIPTION	Expended to 2014	2015	2016	2017	2018	2019	Total
				($000)			
HYDRAULIC PLANT							
Refurbish Burnt Dam Spillway Structure - Bay d'Espoir	110.2	1,201.9					1,312.1
Upgrade Generator Bearings - Bay d'Espoir	18.9	410.7	633.3	190.0	200.0		1,452.9
Replace Spherical By Pass Valves - Bay d'Espoir	57.5	96.3					153.8
Upgrade Public Safety Around Dams and Waterways - Various Sites		483.9	370.1	378.0	385.6	315.5	1,933.1
Replace Automatic Greasing Systems Units 2 and 4 - Bay d'Espoir		254.4					254.4
Automate Generator Deluge Systems Units 3, 5 and 6 - Bay d'Espoir		645.2					645.2
Replace Generator Bearing Coolers - Bay d'Espoir		153.8	193.8				347.6
Replace Interior Coating on Surge Tanks - Bay d'Espoir		1,629.3	425.0	437.2			2,491.5
Install Infrared View Ports - Various Sites		83.7	113.1	112.9			309.7
Replace Site Pump House and Associated Equipment - Bay d'Espoir		22.7	522.5				545.2
Refurbish Access Road - Cat Arm		990.0					990.0
Refurbish Unit Relay Protection - Paradise River		8.7	79.7				88.4
Install Hydrometeorological Stations - Various Sites		377.9	321.2				699.1
Overhaul Turbine/Generator - Various Sites		304.4	478.2	365.0	400.0	408.2	1,955.8
Refurbish Generation Unit - Various Sites		352.9	2,052.8				2,405.7
Replace Station Service Breakers - Cat Arm		644.9	363.4				1,008.3
Replace ABB Exciter Unit 2 - Cat Arm		845.9					845.9
Upgrade Equipment Doors - Various Sites		348.5					348.5
Refurbish Salmon River Spillway - Bay d'Espoir		745.6	556.8	469.5		400.0	2,171.9
Refurbish Intakes - Bay d'Espoir		72.6	262.3				334.9
Replace Excitation Transformers - Bay d'Espoir	636.7	360.0					996.7
Install New Vent Chambers, Units 1 to 6 - Bay d'Espoir			75.0	572.4			647.4
Install Exterior Protective Coating on Surge Tanks - Various Sites			725.8	734.7			1,460.5
Refurbish Station Service Water System - Upper Salmon			344.0				344.0
Purchase Generator Bearing Cooler Sets - Cat Arm and Hinds Lake			239.4				239.4
Purchase 1 Turbine Bearing Cooler Set - Cat Arm			65.8				65.8
Pilot Asset Health Monitoring Template - Upper Salmon			598.7	194.4	103.8		896.9
Replace Penstock and Auxiliaries - Venams Bight			387.9	4,409.2			4,797.1
Upgrade Shoreline Protection - Cat Arm			708.4				708.4
Replace Control Room/Communications Room AC - Hinds Lake			150.0				150.0
Replace Generator Cooling Water Piping - Hinds Lake			153.7				153.7
Refurbish Site Facilities - Bay d'Espoir			797.4	933.0			1,730.4
Refurbish Structures - Various Sites			981.8	456.5		1,355.6	2,793.9
( )							
Replace Diesel Generator 2 at Victoria Control Structure - Bay d'Espoir				638.1			638.1
Upgrade Powerhouse 1 and 2 Station Service - Bay d'Espoir				429.8			429.8
Install Permanent Monitoring Vibration System Unit 7 - Bay d'Espoir				124.5			124.5
Upgrade Sump Level System Powerhouse 2 - Bay d'Espoir				185.0			185.0
Replace 6 Slip Rings Assemblies - Various Sites				601.0			601.0

PROJECT DESCRIPTION	Expended to 2014 ($000)	2015	2016	2017	2018	2019	Total
HYDRAULIC PLANT (cont'd.)							
Install Automated Fuel Monitoring - Various Sites				267.4	500.0		767.4
Upgrade Roads - Various Sites				776.8	800.0	498.5	2,075.3
Replace Spherical Valve Control System - Cat Arm				883.0			883.0
Install Partial Discharge Monitors - Paradise River				197.0			197.0
Replace Rectifier Transformers - Various Sites			75.0	740.5	433.9		1,249.4
Replace Plant HP Compressor 1 - Upper Salmon				142.7			142.7
Replace Shaft Seal System - Upper Salmon				150.0			150.0
Upgrade Domestic Water System - Cat Arm				242.6			242.6
Replace Main Generator Bearing - Upper Salmon				300.0			300.0
Replace Dry Air Compressor 1 and 2 Powerhouse 1 - Bay d'Espoir					320.6		320.6
Replace Main Roof on Powerhouse 1 - Bay d'Espoir					534.3		534.3
Make Improvements to Powerhouse 1 Ventilation - Bay d'Espoir					739.5		739.5
Refurbish Relay Protection Units 5 to 7 - Bay d'Espoir					434.4		434.4
Replace Underground Oily Water Separator - Bay d'Espoir					300.0		300.0
Replace Sump Pumps - Various Sites					317.9	109.9	427.8
Replace Cooling Water Pumps Unit 7 - Bay d'Espoir					150.0		150.0
Replace Firewater Pumps - Upper Salmon					280.0		280.0
Install Dynamic Air Gap Monitoring System - Upper Salmon and Hinds Lake					1,160.0		1,160.0
Refurbish Generator Rotor - Hinds Lake					1,701.5		1,701.5
Install New Septic System - Snooks Arm					150.0		150.0
Replace PH #1 Wet Air Compressors 3 and 4 - Bay d'Espoir						500.4	500.4
Replace Data Acquisition System Units 1-7 (include AHM) - Bay d'Espoir						174.6	174.6
Replace Plant HP Compressor 2 - Upper Salmon						275.1	275.1
Replace Units 1-7 Flow Measuring Devices - Bay d'Espoir						251.1	251.1
Replace Unit Relay Protection - Upper Salmon						275.8	275.8
Replace Dual Fuel Tank - Bay d'Espoir						75.0	75.0
Upgrade Units 1- 6 Gen. Floor Annunciator (Year 1 of 4) (Unit 1) - Bay d'Espoir						249.9	249.9
Replace T/G Cooling Water Pump and Strainer - Hinds Lake						120.0	120.0
Replace Drainage Pumps - Hinds Lake						90.1	90.1
Purchase Set of Turbine Head Cover and Bottom Ring Bushings - Hinds Lake						250.0	250.0
Major Overhaul Oper. rings, wicket gates, linkages and head covers - Bay d'Espoir						750.0	750.0
Replace Exciters on 2 Units - Bay d'Espoir						1,400.0	1,400.0
Replace Site Domestic Water Piping - Bay d'Espoir						350.0	350.0
Stabilize PH Slope (Phase 1) - Cat Arm						400.0	400.0
Refurbish Draft Tube Deck Phase 1 - Bay d'Espoir						450.0	450.0
TOTAL HYDRAULIC PLANT	823.3	10,033.3	11,675.1	14,931.2	8,911.5	8,699.7	55,074.1

PROJECT DESCRIPTION	Expended to 2014	2015	2016	2017	2018	2019	Total
				($000)			
THERMAL PLANT							
Replace Economizer Inlet Valves, Units 1 and 2 - Holyrood	192.0	329.1					521.1
Install Cold-Reheat Condensate Drains and High Pressure Heater Trip Level Unit 3 - Holyrood	49.8	467.4					517.2
Install Fire Protection Upgrades - Holyrood	56.6	312.5					369.1
Upgrade Powerhouse Roofing - Holyrood		1,047.8	1,280.0	1,239.2			3,567.0
Replace DC Distribution Panels and Breakers - Holyrood		127.9					127.9
Upgrade Fire Protection (Main Warehouse) - Holyrood		46.2	197.6				243.8
Upgrade Quarry Brook Dam Equipment - Holyrood		498.7					498.7
Overhaul Turbine Valves - Holyrood		1,577.5		1,456.2			3,033.7
Upgrade Waste Water Basin Building - Holyrood			3,470.1				3,470.1
Replace Air Compressor - Holyrood	247.6	61.1					308.7
Rewind Unit 3 Generator Rotor and Install Rotor Flux Probe - Holyrood			8,402.4				8,402.4
Upgrade Cranes and Hoists - Holyrood			600.0				600.0
Install Auxiliary Boiler - Holyrood			500.0	2,500.0			3,000.0
Upgrade UPS - Holyrood			254.1	266.7			520.8
Upgrade Underground Plant Drainage System - Holyrood			1,364.1				1,364.1
Overhaul Steam Turbine Generators - Holyrood			4,810.1				4,810.1
Overhaul Cooling Water Pump - Holyrood			88.9	89.9			178.8
Overhaul Extraction Pump - Holyrood		189.6	88.9	89.9			368.4
Overhaul Boiler Feed Pump - Holyrood		196.3	186.0	188.1			570.4
Upgrade Plant Access Road - Holyrood				807.8			807.8
Install Visible Isolation for 600 V HVAC System Admin Area - Holyrood				76.3			76.3
Replace Stage 2 Diesel - Holyrood				443.2			443.2
Replace 600 V Switchgear and Transformers Unit 3 - Holyrood				1,705.9			1,705.9
Revisit Condition Assessment Level 1 - Holyrood					250.0		250.0
Install New Raw Water Line - Holyrood					2,000.0		2,000.0
Install New Lube Oil / Seal Oil Systems Unit 3 - Holyrood					1,000.0		1,000.0
Replace Stage 1 4169 kV Breakers - Holyrood						1,000.0	1,000.0
Replace 258 V DC Battery Charger and Batteries Unit 3 - Holyrood						750.0	750.0
Upgrade MCC for Sync Condenser Unit 3 - Holyrood						1,000.0	1,000.0
TOTAL THERMAL PLANT	546.0	4,854.1	21,242.2	8,863.2	3,250.0	2,750.0	41,505.5

PROJECT DESCRIPTION	Expended to 2014	2015	2016	2017	2018	2019	Total
				($000)			
GAS TURBINES							
Upgrade Gas Turbine Plant Life Extension - Stephenville		2,655.2	2,525.4				5,180.6
Perform Alternator Inspection - Happy Valley		484.4					484.4
Purchase and Install 100 MW Combustion Turbine - Holyrood	109,677.0	9,323.0					119,000.0
Install Diesel Automation and Charger System - Happy Valley			214.1				214.1
Install Infrared Scanning Ports - Hardwoods						250.0	250.0
Refurbish Bus Duct - Hardwoods						150.0	150.0
Upgrade Control System - Hardwoods						100.0	100.0
Overhaul Engine - Happy Valley						100.0	100.0
TOTAL GAS TURBINE PLANTS	109,677.0	12,462.6	2,739.5	0.0	0.0	600.0	125,479.1
TOOLS AND EQUIPMENT							
Install Handheld Pendant to Overhead Crane - Bay d 'Espoir	49.9	170.8					220.7
Purchase Tools and Equipment $50,000		124.3	57.9	59.0	60.5	61.7	363.4
TOTAL TOOLS AND EQUIPMENT	49.9	295.1	57.9	59.0	60.5	61.7	584.1
TOTAL GENERATION	111,096.2	27,805.1	36,063.2	23,853.4	12,222.0	12,111.4	223,151.3

PROJECT DESCRIPTION	Expended to 2014	2015	2016	2017	2018	2019	Total
				($000)			
TERMINAL STATIONS							
Perform Grounding Upgrades - Various Sites	1,311.3	345.4	338.2	341.5		300.0	2,636.4
Replace Instrument Transformers - Various Sites	1,146.0	538.4	1,511.7	471.9	1,100.4	650.1	5,418.5
Upgrade Circuit Breakers - Various Sites	3,695.4	10,510.4	5,452.7	3,973.2	4,000.0	4,137.0	31,768.7
Replace Disconnects - Various Sites	815.9	1,153.2	642.9	1,040.3	983.3	990.3	5,625.9
Replace Transformer - Sunnyside	7,197.8	1,226.4					8,424.2
Replace Optimho Relays on East Coast - Various Sites	89.1	96.9					186.0
Replace Surge Arrestors - Various Sites		198.1	250.7	148.7	195.4	202.6	995.5
Upgrade Power Transformers - Various Sites		4,440.4	7,002.3	1,988.9	2,036.8	2,085.1	17,553.5
Upgrade Terminal Station Foundations - Various Sites		302.3	310.7	319.4	328.2	337.3	1,597.9
Upgrade Control Wiring to Terminal Stations - Bay d 'Espoir		301.0	100.0	390.9			791.9
Perform Site Work for Mobile Substation - Various Sites		489.3	350.3	192.8			1,032.4
Upgrade Transformer Differential Protection - Grandy Brook		154.0					154.0
Supply and Install Fire Protection in 230 kV Station - Various Sites		67.6	424.3	650.0	650.0	650.0	2,441.9
Upgrade Terminal Station Protection and Control - Various Sites		172.7	307.2	631.0	631.0		1,741.9
Install Transformer On line Gas Monitoring - Various Sites		700.5	975.7				1,676.2
Install Support Structures C2 Capacitor Bank - Hardwoods		199.3					199.3
Replace Station Lighting - Bay d 'Espoir		16.7	160.3				177.0
Upgrade Control Building - Indian River			405.6				405.6
Upgrade Terminal Station for Mobile Substation - Various Sites			224.9	175.0		250.0	649.9
Install Remote Control Sectionalizer TL251(2)(3) - Hampden			334.0				334.0
Replace Terminal Station Compressors - Corner Brook			139.5				139.5
Replace Telecontrol Building and Upgrade Equipment - Daniels Harbour			57.0	769.5			826.5
Replace 66 kV S/S Cable Feed to Plant - Holyrood			197.8				197.8
Replace Compressed Air Systems - Western Avalon				200.0	500.0		700.0
Construct 138 kV Terminal Station - Hawkes Bay				2,280.0	5,013.0		7,293.0
Replace Transformer - Sally's Cove				100.0			100.0
Upgrade Control Building for Staff Working Spaces - Various Sites				453.4	773.5		1,226.9
Upgrade Station Service for Oil Reclaimer - Oxen Pond					200.0		200.0
Replace Outside Service - Holyrood					750.0		750.0
Install Drainage to Stop Surface Flooding - Various Sites					500.0		500.0
Upgrade Station Service - Sunnyside					150.0		150.0
Upgrade Access Road with New Topping - Buchans					250.0		250.0
Install 66 kV Breaker By-Pass Switches - Various Sites					515.0		515.0
Replace T1 2.5 MVA Transformer - Conne River					800.0		800.0

PROJECT DESCRIPTION	Expended to 2014 ($000)	2015	2016	2017	2018	2019	Total
TERMINAL STATIONS (cont'd.)							
Upgrade Protection and Control - Various Sites						500.0	500.0
Replace Equipment Foundations - Various Sites						500.0	500.0
Upgrade Transformers - Various Sites						2,000.0	2,000.0
Replace Transformer - Various Sites						2,600.0	2,600.0
Install Fire Barriers Between T10 and T12 and Between T10 and T11 - Bay d'Espoir						400.0	400.0
Install Data Acquisition and Trending - Corner Brook						500.0	500.0
Install Alternate Station Service - Grand Falls						100.0	100.0
Purchase New Mobile Substation - Bishops Falls						100.0	100.0
Construct Fire Separation Wall Between Power Transformers - Happy Valley						400.0	400.0
Replace Capacitor Banks - Various Sites						400.0	400.0
Upgrade DC Station Service - Various Sites				200.0		100.0	300.0
Replace Insulators - Various Sites						250.0	250.0
TOTAL TERMINAL STATIONS	14,255.5	20,912.6	19,185.8	14,326.5	19,376.6	17,452.4	105,509.4

PROJECT DESCRIPTION	Expended to 2014	2015	2016	2017	2018	2019	Total
				($000)			
TRANSMISSION							
Refurbish Anchors and Footings TL202 and TL206 - Bay d'Espoir to Sunnyside	1,191.7	988.2					2,179.9
Perform Wood Pole Line Management Program - Various Sites		2,830.6	2,903.9	2,706.8	2,734.2	2,833.4	14,008.9
Replace Transmission Line - TL218			525.8	5,651.8	8,540.0		14,717.6
Construct Transmission Line Equipment Off-Loading Areas - Various Sites			887.8	506.4			1,394.2
Install 138 kV Transmission Line Cross Braces - Various Sites			71.0	637.9			708.9
Upgrade Transmission Lines - Various Sites			332.3	6,894.0	3,773.7	235.6	11,235.6
Replace Aircraft Markers at Grand Lake Crossing - TL228			621.9	867.5			1,489.4
Conduct LIDAR Surveys - Various Sites				283.9	292.0	560.2	1,136.1
Construct 230 kV Transmission Line - Bay d'Espoir to Western Avalon	2,412.6	18,964.7	77,225.6	110,064.0	82,991.0		291,657.9
Construct Labrador West Transmission Line	37,484.2	163,145.3	128,962.6				329,592.1
Upgrade Tower Foundations - Various Sites						1,000.0	1,000.0
TOTAL TRANSMISSION	41,088.5	185,928.8	211,530.9	127,612.3	98,330.9	4,629.2	669,120.6

PROJECT DESCRIPTION	Expended to 2014	2015	2016	2017	2018	2019	Total
				($000)			
DISTRIBUTION							
Replace Recloser Control Panels - Various Sites	111.3	84.4					195.7
Provide Service Extensions - All Service Areas		6,080.0	6,200.0	5,850.0	5,960.0	6,080.0	30,170.0
Upgrade Distribution Systems - All Service Areas		3,340.0	3,170.0	3,240.0	3,310.0	3,370.0	16,430.0
Replace Hendrix Insulators - Farewell Head		500.0					500.0
Relocate Voltage Regulator - Hawkes Bay		166.4					166.4
Construct 2nd Distribution Feeder - Nain		1,050.3					1,050.3
Convert Section of Robert's Arm (L3) to 25 kV - South Brook			569.6				569.6
Automate Reclosers - Various Sites			46.3	409.5			455.8
Additions for Load Growth - Labrador South Interconnection - Various Sites			5,628.5	7,782.0			13,410.5
Implement Geographical Information System - Various Sites			90.6				90.6
Upgrade Distribution Systems - Various Sites	370.2	5,486.2	1,297.9	4,542.3	2,379.0	3,805.0	17,880.6
Additions for Load Growth - Distribution Systems - Various Sites			1,304.1		1,000.0		2,304.1
Voltage Conversion - Labrador City	809.9	1,237.8					2,047.7
Extend Three Phase to St. Paul's - Cow Head				474.0			474.0
Replace Submarine Cable - Various Sites					400.0	4,750.0	5,150.0
Replace L4 #4 Copper Wire Primary - Farewell Head					59.0	531.0	590.0
TOTAL DISTRIBUTION	1,291.4	17,945.1	18,307.0	22,297.8	13,108.0	18,536.0	91,485.3

PROJECT DESCRIPTION	Expended to 2014	2015	2016	2017	2018	2019	Total
				($000)			
GENERATION							
Perform Arc Flash Remediation - Various Sites	1,602.6	413.1					2,015.7
Inspect Fuel Storage Tanks - Various Sites		1,761.1	780.1	802.3	824.6	847.7	5,015.8
Overhaul Diesel Units - Various Sites		1,199.2	1,470.4	1,503.4	1,535.7		5,708.7
Install Disconnect Switches for Mobile Generator - Various Sites		10.0	189.3				199.3
Replace Diesel Units - Various Sites		170.3	1,760.8	1,380.0	1,270.0		4,581.1
Purchase Diesel Plant Production Data Equipment - Various Sites	268.9	269.8	280.7				819.4
Upgrade Ventilation Systems - Various Sites		175.9	317.3				493.2
Upgrade Building Exterior - Makkovik		309.5					309.5
Replace Programmable Logic Controllers - Various Sites		366.9	346.0	245.1			958.0
Increase Fuel Storage - Rigolet		1,666.8					1,666.8
Increase Generation Capacity - Makkovik		272.6		397.1	461.7		1,131.4
Upgrade Fuel Storage - Little Bay Islands			125.3				125.3
Upgrade Station Service - Grey River			130.9				130.9
Upgrade Lighting System - Various Sites			157.9				157.9
Install Fire Protection in Diesel Plants - Various Sites	107.1	1,112.8	1,126.2	500.0	500.0		3,346.1
Purchase Accommodations Trailers - Various Sites			120.0				120.0
Perform Plant Improvements as Per 2012 FEED Project - Various Sites			1,700.0	250.0	250.0		2,200.0
Additions for Load Growth - Labrador South Generation			3,198.4	7,546.8	4,023.8		14,769.0
Replace Underground Glycol Line - Francois				100.0			100.0
Insulate Diesel Plant - St. Anthony				63.5			63.5
Install Fire Detection System - Norman Bay				100.0			100.0
Replace Human Machine Interface - Various Sites				200.0	200.0	200.0	600.0
Install Mobile Diesel Quick Connect/Disconnect - Various Sites				178.8			178.8
Install Unit Fuel Metering - Various Sites					600.0		600.0
Install Sectionalizing for Cold Load Pickup - Port Hope Simpson					250.0		250.0
Install Nox Monitors at 2 Sites - Various Sites					302.7		302.7
Build Roadway for Freight Delivery - Norman Bay					307.2		307.2
Upgrade Site Facilities - Various Sites					450.0		450.0
Replace Radiators - Various Sites				500.0	500.0		1,000.0
Replace Diesel Plant - Rigolet					200.0	2,000.0	2,200.0
Install Sequence of Events Monitor in Diesel Plants - Various Sites						281.0	281.0
TOTAL GENERATION	1,978.6	7,728.0	11,703.3	13,767.0	11,675.7	3,328.7	50,181.3

PROJECT DESCRIPTION	Expended to 2014	2015	2016	2017	2018	2019	Total
				($000)			
PROPERTIES							
Legal Survey of Primary Distribution Lines and Right of Ways - Various Sites	156.8	198.9	40.3				396.0
Install Fall Protection Equipment - Various Sites		198.9	198.2	198.7	198.8	198.9	993.5
Install Additional Washrooms - Various Sites		259.3	265.2	271.1	277.2	283.2	1,356.0
Replace Accommodations and Septic System - Ebbegunbaeg		489.4	1,061.4				1,550.8
Upgrade Line Depots - Various Sites		953.3	960.1	983.7	1,008.5	1,033.5	4,939.1
Upgrade HVAC System - Port Saunders		137.0					137.0
Reshingle Roof - Stephenville		76.8					76.8
Upgrade Warehouse Lighting - Bishops Falls			94.9				94.9
Install Pole Storage Ramps - Various Sites			603.8	507.2			1,111.0
Perform Condition Assessment of Buildings - Various Sites			319.1				319.1
Upgrade Classroom and Boardroom in Main Office - Bishops Falls				77.4			77.4
Construct Storage Buildings - Various Sites				549.0			549.0
Replace Warehouse - Bay d'Espoir				1,228.0			1,228.0
TOTAL PROPERTIES	156.8	2,313.6	3,543.0	3,815.1	1,484.5	1,515.6	12,828.6
METERING							
Install Automated Meter Reading - Various Sites	356.9	900.1	401.8				1,658.8
Purchase Meters, Equipment and Tanks - Various Sites		196.2	197.9	199.6	200.0	197.1	990.8
TOTAL METERING	356.9	1,096.3	599.7	199.6	200.0	197.1	2,649.6
TOOLS AND EQUIPMENT							
Purchase Tools and Equipment Less than $50,000		622.7	299.0	273.7	181.3	185.5	1,562.2
Replace Light Duty Mobile Equipment - Various Sites		494.4	489.3	494.8			1,478.5
Replace Off Road Track Vehicle Unit No. 7861 - Stephenville		1.1	397.8				398.9
Replace Bulldozer Unit No. 7657 - Bishops Falls			329.1				329.1
Replace Off Road Track Vehicle Unit No. 7565 - Stephenville					410.0		410.0
TOTAL TOOLS AND EQUIPMENT	0.0	1,118.2	1,515.2	768.5	591.3	185.5	4,178.7
TOTAL TRANSMISSION AND RURAL OPERATIONS	59,127.7	237,042.6	266,384.9	182,786.8	144,767.0	45,844.5	935,953.5

PROJECT DESCRIPTION	Expended to 2014	2015	2016	2017	2018	2019	Total
				($000)			
INFORMATION SYSTEMS							
SOFTWARE APPLICATIONS							
New Infrastructure							
Perform Minor Application Enhancements - Hydro Place		329.5	338.9	348.3	358.0	368.0	1,742.7
Cost Recoveries		(141.6)	(145.7)	(149.7)	(153.9)	(158.2)	(749.1)
Upgrade of Technology							
Upgrade Microsoft Office Products - Hydro Place	1,111.8	465.2	1,116.6	1,141.1	1,166.1	1,192.5	6,193.3
Cost Recoveries	(400.2)	(167.5)	(480.1)	(490.7)	(501.4)	(512.8)	(2,552.7)
Upgrade Energy Management Systems - Hydro Place		194.9	200.5	206.0	231.5	217.8	1,050.7
Replace Customer Care System - Hydro Place		134.9					134.9
Upgrade Lotus Notes - Hydro Place		635.4					635.4
Cost Recoveries		(273.1)					(273.1)
Upgrade Citrix - Hydro Place			262.2				262.2
Cost Recoveries			(97.0)				(97.0)
Upgrade Sharepoint/ Document Repository - Hydro Place			91.6				91.6
Cost Recoveries			(33.9)				(33.9)
Upgrade Meter Reading Software - Hydro Place			134.3				134.3
Upgrade Safety Reporting System Safety Code - Hydro Place			325.8				325.8
Cost Recoveries			(120.5)				(120.5)
Refresh Security Software - Hydro Place			132.5	136.2	140.1	144.2	553.0
Cost Recoveries			(57.0)	(58.6)	(60.2)	(62.0)	(237.8)
Implement Industrial Billing Software MV-PBS - Hydro Place			336.7				336.7
Upgrade ERP System (JDE) - Hydro Place				866.4			866.4
Cost Recoveries				(320.6)			(320.6)
Implement Industrial Billing Software MV90xi - Hydro Place				63.1			63.1
Upgrade Showcase Reporting System				195.3			195.3
Cost Recoveries				(72.3)			(72.3)
Upgrade Business Intelligence and Disclosure Management - Hydro Place					414.1		414.1
Cost Recoveries					(153.2)		(153.2)
Upgrade Database Environment - Hydro Place					209.3		209.3
Cost Recoveries					(77.4)		(77.4)
Refresh Security Card System - Hydro Place					172.2		172.2
Cost Recoveries					(73.7)		(73.7)
Upgrade Electronic Mail System - Hydro Place					592.5	709.5	1,302.0
Cost Recoveries					(219.2)	(305.0)	(524.2)
TOTAL SOFTWARE APPLICATIONS	711.6	1,177.7	2,004.9	1,864.5	2,044.8	1,594.0	9,397.5

PROJECT DESCRIPTION	Expended to 2014	2015	2016	2017	2018	2019	Total
				($000)			
COMPUTER OPERATIONS							
Infrastructure Replacement							
Replace Personal Computers - Various Sites		573.3	600.7	387.2	386.3	568.2	2,515.7
Replace Peripheral Infrastructure - Various Sites		200.5	190.3	177.3	223.5	213.9	1,005.5
Upgrade Enterprise Storage Capacity - Hydro Place		621.3	550.2	553.6	169.2	456.0	2,350.3
Cost Recovery Nalcor		(267.0)	(236.5)	(237.9)	(72.7)	(196.0)	(1,010.1)
Upgrade of Technology							
Upgrade Server Technology Program - Hydro Place		601.3	420.0	768.2	120.7	331.6	2,241.8
Cost Recovery Nalcor		(227.1)	(180.5)	(330.2)	(51.9)	(142.5)	(932.2)
TOTAL COMPUTER OPERATIONS		1,502.3	1,344.2	1,318.2	775.1	1,231.2	6,171.0
TOTAL INFORMATION SYSTEMS	711.6	2,680.0	3,349.1	3,182.7	2,819.9	2,825.2	15,568.5

PROJECT DESCRIPTION	Expended to 2014	2015	2016	2017	2018	2019	Total
				($000)			
TELECONTROL							
NETWORK SERVICES							
Infrastructure Replacement							
Purchase Tools and Equipment Less than $50,000		45.6	46.4	47.6	48.7	49.7	238.0
Replace Radomes - Various Sites			192.0	196.0	196.0	180.0	764.0
Replace Standby Generator - Sandy Brook Hill			237.3				237.3
Replace MDR Microwave Radios - Various Sites			539.0	920.0	86.2	825.0	2,370.2
Refurbish Microwave Shelters - Various Sites			92.1	90.0	90.0		272.1
Replace Power Line Carriers - Various Sites			857.0	4,438.2	1,720.0		7,015.2
Build Communications Shelters - Various Sites				360.0		90.0	450.0
Replace GPS Clocks - Various Sites				52.8			52.8
Replace UPS - Hopedale						300.0	300.0
Refurbish Communication Towers - Various Sites						200.0	200.0
Network Infrastructure							
Replace Battery Banks and Chargers - Various Sites	267.0	398.0	302.0	305.0	250.0	250.0	1,772.0
Replace Network Communications Equipment - Various Sites		169.5	174.0	180.0	185.0	180.0	888.5
Install Substation Communications Management - Various Sites				237.8			237.8
Upgrade of Technology							
Upgrade IP Scada Network - Various Sites	254.2	238.7					492.9
Replace PBX Phone Systems - Various Sites			480.0	360.0	240.0		1,080.0
Replace Telephone Systems - Springdale		132.7					132.7
Replace DTI Phone Turrets in Energy control Center - Hydro Place		44.7					44.7
Replace WIFI Access Points - Various Sites		126.3					126.3
Upgrade Site Facilities - Various Sites		48.3	48.0	48.0		48.0	192.3
Replace Wescom Transceivers - Various Sites			49.2				49.2
Replace GDC Metroplex - Various Sites		69.2					69.2
TOTAL TELECONTROL	521.2	1,273.0	3,017.0	7,235.4	2,815.9	2,122.7	16,985.2

PROJECT DESCRIPTION	Expended to 2014	2015	2016	2017	2018	2019	Total
				($000)			
TRANSPORTATION							
Replace Vehicles and Aerial Devices - Various Sites	1,809.1	3,468.1	2,400.1	3,251.3	5,315.2	2,582.5	18,826.3
TOTAL TRANSPORTATION	1,809.1	3,468.1	2,400.1	3,251.3	5,315.2	2,582.5	18,826.3
ADMINISTRATION							
Purchase Office Equipment		68.0	131.0	71.1			270.1
Remove Safety Hazards - Various Sites		194.9	200.3	205.9	211.6	217.4	1,030.1
Replace Cooling Tower and Auxiliaries - Hydro Place		45.7	311.3				357.0
Replace Roof - Hydro Place		671.9	568.7	749.5			1,990.1
Replace AC Unit 12A and Unit 14 - Hydro Place			214.6				214.6
Upgrade Outside Property - Various Sites				234.8			234.8
Upgrade Fire System - Bishops Falls				799.6	556.7		1,356.3
TOTAL ADMINISTRATION	0.0	980.5	1,425.9	2,060.9	768.3	217.4	5,453.0
TOTAL GENERAL PROPERTIES	3,041.9	8,401.6	10,192.1	15,730.3	11,719.3	7,747.8	56,833.0