PROJECT DESCRIPTION	Expended to 2014	2015	Future Years	Total	Page Ref
		($000)			
GENERATION					
Upgrade Gas Turbine Plant Life Extension - Stephenville		2,655.2	2,525.4	5,180.6	C - 3
Replace Interior Coating on Surge Tank 3 - Bay d'Espoir		1,629.3		1,629.3	C - 5
Overhaul Turbine Valves Unit 1 - Holyrood		1,577.5		1,577.5	C - 7
Upgrade Burnt Dam Spillway Structure - Bay d'Espoir	110.2	1,201.9		1,312.1	
Rehabilitate Salmon River Spillway - Bay d'Espoir		745.6	556.8	1,302.4	C - 9
Upgrade Powerhouse Roofing - Holyrood		1,047.8		1,047.8	C - 11
Replace Station Service Breakers - Cat Arm		644.9	363.4	1,008.3	C - 13
Refurbish Access Road - Cat Arm		990.0		990.0	C - 15
Replace ABB Exciter Unit 2 - Cat Arm		845.9		845.9	C - 17
Upgrade Generator Bearings Units 1 and 3 - Bay d'Espoir		14.7	633.3	648.0	C - 19
Automate Generator Deluge Systems - Bay d'Espoir		645.2		645.2	C - 21
Replace Pump House and Associated Equipment - Bay d'Espoir		22.7	522.5	545.2	C - 23
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	
Purchase Spare Transformer - Paradise River		160.0	348.5	508.5	C - 25
TOTAL GENERATION	352.0	12,977.2	4,949.9	18,279.1	
TRANSMISSION AND RURAL OPERATIONS					
Upgrade Circuit Breakers - Various Sites (2015-2016)		6,189.1	6,873.8	13,062.9	C - 27
Upgrade Power Transformers - Various Sites		4,440.4	7,002.3	11,442.7	C - 29
Provide Service Extensions - All Service Areas		6,080.0		6,080.0	C - 31
Upgrade Circuit Breakers - Various Sites (2014-2015)	3,695.4	1,642.5		5,337.9	
Upgrade Distribution System - Various Sites (2014-2015)	370.2	4,850.1		5,220.3	
Upgrade Distribution Systems - All Service Areas		3,340.0		3,340.0	C - 33
Perform Wood Pole Line Management Program - Various Sites		2,830.6		2,830.6	C - 37
Refurbish Anchors and Footings TL202 and TL206 - Bay d'Espoir to Sunnyside	1,191.7	988.2		2,179.9	
Perform Arc Flash Remediation - Various Sites	1,602.6	413.1		2,015.7	
Upgrade Distribution System - Various Sites (2015-2016)		1,136.1	818.8	1,954.9	C - 39
Inspect Fuel Storage Tanks - Various Sites		1,761.1		1,761.1	C - 41
Replace Instrument Transformers - Various Sites	1,146.0	538.4		1,684.4	
Increase Fuel Storage - Rigolet		1,666.8		1,666.8	C - 44
Perform Grounding Upgrades - Various Sites	1,311.3	345.4		1,656.7	
Replace Disconnect Switches - Various Sites (2015-2016)		963.7	642.9	1,606.6	C - 46
Replace Accommodations and Septic System - Ebbegunbaeg		489.4	1,061.4	1,550.8	C - 48
Install Fire Protection - L'Anse Au Loup		220.6	1,126.2	1,346.8	C - 50
Replace Unit 2038 - Mary's Harbour		103.5	1,241.5	1,345.0	C - 53
Overhaul Diesel Units - Various Sites		1,199.2		1,199.2	C - 55
Install Transformer On line Gas Monitoring - Various Sites		700.5	975.7	1,676.2	C - 57
Construct Second Distribution Feeder - Nain		1,050.3		1,050.3	C - 59
Replace Disconnect Switches - Various Sites (2014-2015)	815.9	189.5		1,005.4	
Install Fire Protection System - Nain	107.1	892.2		999.3	
Install Automated Meter Reading - Various Sites (2015-2016)		559.9	401.8	961.7	C - 61
Replace Programmable Logic Controllers - Various Sites		366.9	591.1	958.0	C - 63
Upgrade Line Depots - Various Sites		953.3		953.3	C - 65
Upgrade Diesel Plant Production Data Collection Equipment - Various Sites	268.9	269.8	280.7	819.4	
Install Automated Meter Reading - Various Sites (2014-2015)	356.9	340.2		697.1	
TOTAL TRANSMISSION AND RURAL OPERATIONS	10,866.0	44,520.8	21,016.2	76,403.0	

PROJECT DESCRIPTION	Expended to 2014	2015	Future Years	Total	Page Ref
		($000)			
GENERAL PROPERTIES					
Replace Vehicles and Aerial Devices - Various Sites (2014-2015)	1,809.1	1,091.0		2,900.1	
Replace Vehicles and Aerial Devices - Various Sites (2015-2016)		2,377.1	225.3	2,602.4	C - 67
Upgrade Microsoft Office Products - Hydro Place	711.6	297.7		1,009.3	
Replace Roof - Hydro Place		671.9		671.9	C - 69
Replace Battery Banks and Chargers - Various Sites	267.0	398.0		665.0	
Replace Personal Computers - Various Sites		573.3		573.3	C - 71
TOTAL GENERAL PROPERTIES	2,787.7	5,409.0	225.3	8,422.0	
TOTAL PROJECTS $500,000 AND OVER	14,005.7	62,907.0	26,191.4	103,104.1	

[1] Project is over $500,000 before cost recoveries. Shown net of cost recoveries in this schedule.

Project Title: Upgrade Circuit Breakers

Location: Various Sites

Category: Transmission and Rural Operations - Terminal Stations

Definition: Pooled

Classification: Normal

Project Description:

This project is to refurbish air blast and SF_6 breakers, replace air blast circuit breakers on an accelerated schedule, and to replace oil circuit breakers throughout Hydro's Island Interconnected System. Hydro has many circuit breakers which have been in service for more than 30 years and are approaching the end of their service life. The refurbishment and replacement of all the circuit breakers are given a priority ranking; this priority is represented as a year for the refurbishment or replacement to be completed. These priorities are determined by the criteria or plan for each circuit breaker type.

The budget estimate for this project is shown in Table 1 below.

Table 1: Budget Estimate

Project Cost: *($ x1,000)*	**2015**	**2016**	**Beyond**	**Total**
Material Supply	1,577.5	1,222.5	0.0	2,800.0
Labour	1,638.8	1,557.1	0.0	3,195.9
Consultant	6.0	8.4	0.0	14.4
Contract Work	2,455.6	990.8	0.0	3,446.4
Other Direct Costs	148.0	169.7	0.0	317.7
Interest and Escalation	363.2	970.4	0.0	1,333.6
Contingency	0.0	1,954.9	0.0	1,954.9
TOTAL	**6,189.1**	**6,873.8**	**0.0**	**13,062.9**

Operating Experience:

The average age of the overall fleet of circuit breakers is well past a utility estimated circuit breaker's midlife of 20 years and is approaching the manufacturers' specified design end-of-life of 40 years. At present, approximately 60 circuit breakers have a service life greater than 40 years.

Hydro has experienced increased maintenance problems and the unavailability of circuit breakers which include:

- air blast circuit breakers with air leaks and sticking valves; and
- SF_6 circuit breakers with SF_6 gas leaks and problems with the operating mechanism.