NEWFOUNDLAND AND LABRADOR

BOARD OF COMMISSIONERS OF PUBLIC UTILITIES

IN THE MATTER OF
the *Public Utilities Act,* R.S.N. 1990**,** c. P-47, as amended (the *"Act"*)

AND

An Application by Newfoundland and Labrador Hydro ("Hydro") for an Order pursuant to Section 41 of the *Act* approving:

i) its 2006 Capital Budget in the amount of $42,636,000;
ii) its 2006 Capital Purchases and Construction Projects in excess of $50,000;
iii) its proposed estimated Contribution in Aid of Construction of approximately $300,000; and
iv) fixing and determining Hydro's average rate base for 2004 in the amount of $1,476,724,000.

Order No. P. U. 31(2005)

BEFORE:

G. Fred Saunders,
Presiding Chair.

Gerard Martin, Q.C.,
Commissioner.

Walter J.Vincent,
Commissioner.

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I. BACKGROUND

1. Current Industry Structure

Electrical services in the Province of Newfoundland and Labrador are provided by two utilities, Hydro, which is a Crown Corporation, and Newfoundland Power Inc. ("NP"), an investor owned subsidiary of Fortis Inc. Hydro is principally responsible for generation and transmission in the Province, with a relatively small amount of distribution in predominately isolated rural areas. NP operates solely on the Island portion of the Province and is primarily a distribution utility with some generating capacity.

Together, Hydro and NP generate, transmit and distribute electricity to approximately 259,564 domestic and general service customers. NP's operations on the Island service 224,464 customers or 86.5% of all general service and domestic customers. Hydro serves the remaining 13.5% or 35,100 customers as well as 4 regulated and 1 non-regulated industrial customer.

There are two major electrical systems operating within the Province. The Island Interconnected system functions as a stand-alone system comprising various hydroelectric developments, gas turbines, diesel units and thermal power generation at Holyrood. The Labrador Interconnected System is supplied by Churchill Falls and is connected to the North American power grid. The more remote and isolated areas of the Province are serviced by individual diesel generating facilities owned and operated by Hydro.

Deer Lake Power and Abitibi Consolidated Company of Canada also generate energy, which is used primarily for paper mill operations in Corner Brook and Grand Falls-Windsor respectively. In situations where energy production exceeds operational requirements at the mills, Hydro will purchase the excess for the Island grid, as required and if it is cost effective.

Under agreements, Hydro also purchases power from four Non Utility Generators: Star Lake Hydro Partnership (15 MW); Algonquin Power (4 MW); Corner Brook Pulp & Paper (15 MW); and the Exploits Hydro Partnership (32.3 MW). Hydro also purchases non-firm wind energy from Frontier Power Systems Inc.

2. The Application

Hydro filed an Application with the Board of Commissioners of Public Utilities (the "Board") on August 1, 2005 requesting the Board to make an Order:

i) approving its 2006 Capital Budget in the amount of $42,636,000;
ii) approving its 2006 Capital Purchases and Construction Projects in excess of $50,000;
iii) approving its estimated Contributions in Aid of Construction of approximately $300,000; and,
iv) fixing and determining its average rate base for 2004 in the amount of $1,476,724,000.

3. Board Authority

i) Legislation

Section 41 (1) of the Act requires a public utility to submit to the Board for its approval not later than December 15th in each year for the next calendar year an annual capital budget of proposed improvements or additions to its property. In addition, the utility is also required to include an estimate of contributions toward the cost of improvements or additions to its property, which the utility intends to demand from its customers.

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

Section 78 gives the Board the authority to fix and determine the rate base for the service provided or supplied to the public by the utility. It also gives the Board the power to revise the rate base and provides the Board with guidance on the elements that may be included in the rate base.

ii) Process

Public Notice of this Application inviting any person or organization to comment or otherwise participate and to advise the Board in writing before 12:00 noon, Monday, August 15, 2005 appeared in newspapers throughout the Province. Details of the Application and supporting documentation were also posted on the Board's website. Prior to the expiration of the deadline NP filed an Intervenor's Submission and, in accordance with Section 41 (1) of the Board's Regulations, also filed Requests for Information (RFI) indicating that its interest was to receive materials filed with the Application in order to assist in determining its degree of participation in the proceeding. NP also indicated in its submission that it did not intend to present any evidence in relation to Hydro's Application but might wish to avail of the right to cross-examine witnesses or to submit argument at a public hearing of the Application, as the circumstances may require.

Pursuant to Section 41 (1) of the Board's Regulations, information requests were also directed to Hydro from the staff of the Board.

The information requests submitted by NP and the Board were responded to by Hydro and have been considered by the Board in preparing this Order.

In Order No. P.U. 7 (2002-2003) and Order No. P.U. 36 (2002-2003) the Board established interim guidelines to be used by Hydro and NP respectively when submitting future capital budget applications.

During the course of the public hearing into NP's 2003 Capital Budget Application there was considerable discussion and comment by the parties respecting the capital budget process. In acknowledging the concerns expressed at the hearing the Board concluded that a technical

conference to address the issues of process and filing requirements should be held and that all of the parties involved in the process should be given an opportunity to attend and contribute. The technical conference was convened in early 2004 and NP, Hydro, the Industrial Customers and the Consumer Advocate participated and contributed to the process.

After the technical conference the Board established "Provisional Capital Budget Application Guidelines" (the Provisional Guidelines) for use by the utilities, to the extent that it was practical, in preparing their 2006 Capital Budget Applications.

The Board intends to review the process in early 2006 so this Order will not include any further comments regarding the process.

II. HYDRO PROPOSED 2006 CAPITAL BUDGET

1. OVERVIEW

Hydro's proposed Capital Budget for 2006 is $42,636,000 under the following major asset classifications:

Asset	Budget (000s)	%
Generation	$ 9,245	21.7
Transmission and Rural Operations	17,404	40.8
General Properties	14,987	35.2
Allowance For Unforeseen Events	1,000	2.3
Total	**$ 42,636**	**100.0%**

Each asset class is made up of individual expenditures organized into projects, including a description of the project, operating experience, justification for the project and future commitments.

The Application also addresses two matters arising from Hydro's 2003 General Rate Application and Order No. P.U. 14 (2004), namely:

1) Hydro's 10-Year Plan of Projected Operating Maintenance Expenditures for the Holyrood Generating Station (Section G of the Application), and
2) An update of the 2004 Report, "Replace Wood Poles – Transmission" together with a progress report and forecast of the program objectives for 2005 and 2006.

In commenting on its application of the Provisional Guidelines Hydro stated in its covering letter accompanying the Application that it followed these guidelines, however the Application was generally consistent and comparable with past applications to allow ease of comparison.

Requirement Arising out of Previous Board Order

As a result of Board Order P.U. 14 (2004) Hydro was required to commence the annual filing of a 10-year plan of maintenance expenditures for the Holyrood Generating Station. The annual

updates, to be filed with Hydro's Capital Budget Applications, should reflect changing operating circumstances. The Board notes Hydro's compliance, as submitted in Schedule G of its application, with this requirement.

2. GENERATION

As was indicated in the overview, $9,245,000 or 21.7% of Hydro's Proposed 2006 Capital Budget is contained under the heading, Generation. The proposed projects are further defined under four subheads as: New Generation Source, Hydro Plants, Thermal Plant, Gas Turbines, and consist of a total of nineteen separate projects. These projects will be dealt with in the order in which they appear in the Application.

NEW GENERATION SOURCE

B-5 Island Pond Development – Feasibility Study - $998,000

This project consists of a final feasibility study to review the capital cost estimate to construct a hydroelectric generation facility at Island Pond within the existing Bay d'Espoir development area. The proposed Island Pond Development is a 36 MW hydroelectric facility with an average annual energy capability of 203 GWh and a firm annual energy capability of 186 GWh.

This study is a follow-up to feasibility studies that were performed by Shawmont Newfoundland Ltd. in 1988 and AGRA Shawmont Ltd. in 1996. Work to be completed as part of this study consists of all office and field engineering including:

i) a field investigation program to confirm material sources, evaluate structure subsurface conditions, and to confirm location and topographical data;
ii) a review of an alternative development scheme;
iii) preparation and assessment of quantities and unit prices;
iv) preparation of preliminary drawings;
v) preparation of a detailed construction schedule; and
vi) preparation of a definitive cost estimate complete with quantities and cost/cash flows.

The Island Pond Development has been identified as one of Hydro's most competitive alternatives to address future deficits in capacity and energy, which Hydro, based on a comparison of existing system capability and the most recent load forecast, had expected to occur in the 2009 timeframe. In order to address these deficits Hydro maintains that it must be in a position to carry out appropriate planning analyses and engineering feasibility work sufficient to be able to meet forecast customer load requirements.

In response to RFI PUB-1 NLH, Hydro indicates that, should Abitibi Consolidated Inc.'s scheduled closure of the Stephenville Paper Mill and the shutdown of No. 7 paper machine in Grand Falls-Windsor occur, the timing of future capacity and energy deficits will most probably occur in the 2012 to 2014 timeframe. Hydro maintains, in RFI PUB-59 NLH, that the Island Pond Development is required to address these deficits in any event.

The Board finds that this proposal will help to address future capacity and energy deficits and in order to do so will require work to commence in sufficient time to bring the project on stream by the timeframe indicated by Hydro.

B-7 Portland Creek Development – Final Feasibility Study - $796,000

Hydro proposes to construct a 12 MW hydroelectric facility with the powerhouse being situated at the confluence of Portland Creek and Main Port Brook on the Northern Peninsula. This facility will, according to the response to PUB-3 NLH, provide voltage support and additional capacity to the Great Northern Peninsula and the Island Interconnected System. It will also open the area for other potential hydroelectric projects in terms of shared access and transmission. The proposed study is a follow-up to a pre-feasibility study that was conducted by SNC/BAE Joint Venture for Hydro in 1987. This project is intended to address the expected capacity and energy deficits discussed in the preceding project and will bring the proposed Portland Creek Hydroelectric Development to a final engineering feasibility level of study and will include the following:

i) hydrological studies to establish plant size, average energy, firm energy, construction flood and design flood requirements;
ii) a review of aerial photos of the prospective site and related infrastructure;
iii) a field investigation program to confirm material sources, evaluate structure subsurface conditions, and to obtain all necessary location and topographical data;
iv) generation and review of alternative arrangements;
v) preparation and assessment of quantities and cost estimates for various alternatives;
vi) preparation of preliminary drawings;
vii) preparation of a detailed construction schedule; and
viii) preparation of a definitive cost estimate complete with quantities and cost/cash flows.

The Board finds that Hydro must be in a position to carry out appropriate planning analyses sufficiently to be able to meet forecast customer load requirements.

B-9 Wind Generation Inventory Study - $143,200

The rationale for this study is to identify alternate energy sources to address future deficits in capacity and energy. Hydro has identified wind generation as being a potential competitive source of new generation in this Province. The study will consist of all office and field engineering required to identify and define potential wind resource sites for development and supply of alternative energy to the Island Interconnected System. This study will include:

i) a review of Environment Canada's Canadian Wind Energy Atlas and other available information to identify potential sites for future investigation;
ii) a review of aerial photos of the prospective site and related infrastructure;

iii) a field investigation program to obtain all necessary location and topographic information; and,

iv) the erection of wind monitoring towers at two selected sites and the collection of at least a one year period of wind development related environmental data.

The proposed study is intended to identify sites that Hydro may wish to develop.

The Board agrees that Hydro must be in a position to carry out appropriate planning analyses and to explore alternative energy sources to meet forecast customer load requirements.

HYDRO PLANTS

B-119 Replace Penstock - Snook's Arm Generating Station - $1,992,000

In Order No. P.U.53 (2004) the Board approved the design and preliminary engineering work for this project in the amount of $115,000. At that time Hydro expected to incur a further expenditure of $1,815,000 in the year 2006 for a total capital cost of $1,930,000.

The Board notes that the most recent cost estimate to complete this project is now $2,110,000.

In this Application, Hydro has referred the Board to Section B-13, of its 2005 Capital Budget Application and, in particular, the justification provided at the time for this project. The updated economic analysis submitted with this Application indicates a positive net value at the end of the 30-year analysis period with a payback in 10 to 11 years.

B-119 Replace Unit No. 1, Governor Controls – Cat Arm - $311,000

The Board, in Order No P.U. 14 (2005), approved $377,600 for the first phase of this project to replace the electronic control system for the governor of one of the generating units at the Cat Arm Generating Station. The overview of 2005 Capital Expenditures for the quarter ending June 30, 2005, indicates that this project has not yet commenced. From the comments contained at B-119 (2) it would appear that this project is, however, on schedule with no change in scope or forecast costs. Hydro now proposes to install the governor controls at Cat Arm during a scheduled outage in 2006. The amount of $311,000 which Hydro seeks approval of here is additional to the budget amount approved in Order No. P.U.14 (2005).

B-11 Upgrade Controls - Spherical Valve No. 6 – Bay d'Espoir - $199,500

This project involves the upgrade of the control system for spherical valve No. 6 by replacing components, including control valves, piping, tubing and the control panel. This unit, along with the existing spherical valve and control, became operational in 1972. In the last five years there have been 34 maintenance events, which are much more than expected for this type of system that is obsolete and unreliable. Replacement parts have to be reverse engineered and custom made. The failure of the existing control system, Hydro submits, could result in loss of generation, an extended outage, increased risk of spill, or even loss of life.

This is a continuation of a program started in 2001 to upgrade control systems on spherical valves at Bay d'Espoir. This project, involving spherical value No. 6, was actually approved by the Board in Order No. P.U. 53 (2004), but, due to a major problem that developed in late 2004 and 2005 with a maintenance seal on unit No. 5, Hydro decided to switch the upgrade of unit No. 6 to Unit No. 5. The upgrade on Unit No. 5 would have been the last unit to be upgraded in powerhouse No. 1. As it is, the upgrade of Unit No. 6 will now be the last upgrade required for powerhouse No. 1**.**

The Board finds that given the significance of the generating capacity of this unit to the overall system it would be unacceptable to maintain the status quo and risk a lengthy outage and significant cost of repair.

B-13 Replace Underground Fuel Tank – Cat Arm Powerhouse - $136,700

This project involves the removal and disposal of an underground fibreglass bulk storage fuel tank at the Cat Arm Powerhouse and the design, supply and installation of an above-ground, double wall steel fuel tank of the same size complete with all necessary site work.

Hydro advises that this project is required to comply with the Provincial Gasoline and Associated Products Regulations and the Canadian Council of Ministers of the Environment environmental code of practice. The existing single wall, fiberglass tank is in contravention of the current legislation and practice and there is no means of quantifying the amount of fuel used by the diesel generator for fuel reconciliation purposes as required by the regulations.

Hydro proposes to remove and dispose of the underground tank and replace it with an above-ground, double wall, steel fuel tank of the same size together with the required fuel monitoring system and instrumentation in compliance with the legislation.

The Board finds that this proposal is justified in the circumstances.

B-15 Remote Operation of Fisheries Compensation By-Pass Value – Granite Canal - $106,800

The environmental approval for the Granite Canal Development established specific habitat management requirements, one of which requires Hydro to maintain an average monthly flow of water within the man-made spawning and rearing channel called Compensation Creek. These flows are dependent on the supplementing of natural inflows to the creek from water otherwise used for hydraulic production. The natural inflows change daily, while the creek flow requirements change six times per year. The Granite Canal site is remote and is not regularly staffed. The method presently employed to manage and adjust the changing requirements to maintain water levels in Compensation Creek are to have the adjustments manually made in anticipation of future flow requirements. There may, at times, be a two-week period between scheduled staff availability and as a result there is a tendency for the creek to be over compensated and water lost for energy production.

Hydro proposes to modify the existing Fisheries Compensation by-pass valve to permit the Energy Control Centre to adjust the valve's opening remotely in order to quickly respond to changing conditions. Existing electrical and communication infrastructure will be utilized to achieve this end. A cost benefit analysis clearly indicates the justification for this project and indicates a full cost recovery in seven years.

B-19 Install Waste Oil Holding Tanks – Bay d'Espoir, Upper Salmon, Hinds Lake and Paradise River –$82,400

The installation of these tanks is required to comply with the Provincial Used Oil Control Regulations under the *Environmental Protection Act*, the National Fire Code, and Underwriters Laboratory Canada standards.

THERMAL PLANT

B-20 Replace Superheater – Unit No. 2 – Holyrood Generating Station- $318,700

This project consists of the removal and replacement of 31 upper secondary superheater elements within the high temperature superheater of the boiler on Unit No.2 at the Holyrood Generating Plant, which was placed in service in 1969.

In the fall of 2004, 11 of the 31 plattens in the upper section and 5 of the 31 plattens in the lower section were surveyed and found to be below the thickness standard required by the Province's *Boiler and Pressure Vessel Act*. In recent years the frequency of repairs to this section of the superheater has increased dramatically and has resulted in five failures since the 1st of April 2004. The average length of time that the unit was removed from service on each occasion was approximately five days. The total cost to repair a single failure is approximately $25,000 and can be much greater if the failure occurs in an area that is difficult to access. The photographs that were submitted with the Application graphically demonstrate the extent of the problem. The Board accepts this project as being required to ensure system reliability and capability.

B-119 Upgrade Control System – Holyrood Generating Station – $316,000

This is a continuation of a project that began in 2004 with the upgrade of the obsolete Distributed Control System on units 1 and 2. A budget of $1,552,600 to undertake the upgrade was approved in Board Order No. P.U. 35 (2003). The project continued into 2005 with the proposed upgrade of unit 3, with an associated budget of $1,034,000, which was approved in Board Order P.U. 53 (2004). According to the information provided by Hydro in the current application, the upgrade of unit 3 was not completed in 2005 because of the requirement for an extended plant outage. The estimated amount required in 2006 to complete this project is $316,000, which is included in the current budget.

B-119 Addition of Disconnecting Means to 600 Volt MCC Branch Feeders - $859,000

In Order No. P.U. 14 (2005) the Board approved $613,300 for the first phase of this project. The overview of Capital Expenditures for the quarter ending June 30, 2005, shows that this project

has not yet been completed and is now proposed for completion in the year 2006. The Board notes that there has been no change in scope, nature or forecast costs**.**

B-23 Fire Protection Upgrade – Holyrood Generating Station - $916,100

The construction of Stage 1 and Stage 2 of the Holyrood Thermal Generating Station commenced in 1967 and 1977 respectively. The fire protection sprinkler systems designed and installed at that time do not meet current standards.

This project is required to address a number of issues identified by Hydro's Insurance Company, Factory Mutual Global, and Hydro's own personnel regarding fire protection systems, procedures and training programs for operators in responding to a large fire emergency. While Hydro has not experienced a large fire at the Holyrood Generating Thermal Station since commencing operations in 1967, it has concerns for the safety of operating personnel and the potential for extended outage to customers should a fire occur. Factory Mutual Global and Hydro's personnel have identified areas of significant exposure that, if not addressed, could result in significant equipment/building destruction with resulting lost production. While good operating procedures to date have prevented such large-scale loss, this project is required to provide additional automatic suppression and containment systems. The Holyrood Generating Facility has a capacity of 466 MW and is a significant portion of Hydro's generation capability.

A report prepared by Hydro's production division entitled, Holyrood Thermal Generating Station, Fire Protection Upgrade Assessment, dated July 2005, clearly identifies deficiencies in Hydro's fire protection systems and practices. Hydro states that failure to address these issues at this time will not only expose it to equipment, building and production loss, but will expose personnel to unnecessary risk. This project is a two-year project totaling $1,846,300 with $916,100 being expended on the work to be performed commencing in 2006. This work includes the following:

1) extend automatic sprinkler systems to provide coverage to many areas presently not covered and increase concentration in other areas. This will affect 18 individual sprinkler areas;
2) construct metal enclosures around equipment that can potentially create an ignited oil spray situation. The purpose is to contain an oil spray and associated torch type fire inside the enclosure where it can be deluged with water. A total of 10 enclosures will be required;
3) install fire resistant boots on flanged and threaded pipe joints that contain mineral oil at pressures above 50 psig where it is not practical to install metal enclosures as noted in item 2 above;
4) for each of units 1, 2, and 3, relocate the hydrogen and carbon dioxide manual valve stations, presently located below the generators, to an area immediately outside the operator's control room. In the event of a plant emergency requiring a quick release of the explosive hydrogen gas from the generators this modification will allow a more rapid response by operating personnel; and,

v) engage a consultant specialized in preparing such programs for thermal generating plants, to prepare procedures and a comprehensive training program for operators in responding to a large fire emergency.

The Board is satisfied that this proposal will address the identified safety concerns for operating personnel and limit the potential damage to plant equipment and the potential for extended outage to customers.

B-25 Replace Warm Air Make-up Steam Coil – Holyrood Generating Station - $601,700

This project involves the replacement of 13 copper/nickel alloy steam coil sections of the existing system with stainless steel coil sections. The warm air make-up system was installed in 1990 to address safety and health concerns, to improve plant ventilation and satisfy operating unit combustion air requirements. Hydro's operating experience shows that only one of thirteen steam coils has not experienced a tube failure and, on average, 27% of the tubes in each steam coil have failed and have had to be removed from service. This loss of tubes has significantly reduced the heating and ventilation capacity of this system. The replacement of coils is intended to ensure adequate ventilation of the powerhouse to protect the health of personnel. There are, as well, safety concerns should the tubes rupture in a confined space when operating or maintenance personnel are present. The new stainless steel coil sections will address these concerns.

The Board finds that this project is necessary to ensure adequate ventilation of the powerhouse to protect the health and safety of plant personnel.

B-29 HVAC Replacements – Relay, Control and Exciter Rooms – Holyrood Generating Station - $565,400

This project involves replacement of five heating and ventilation units that service the generating unit relay and exciter room and the plant's control room. The exciter room unit will be replaced with a unit of 50% greater capacity. All other units will be replaced with units of similar capacity. Five of the units serving the relay rooms, control room and exciter room are the original units installed in 1967 and are now in excess of 35 years old and are beyond the manufacturer's recommendation for reliable life expectancy. Maintenance costs continue to increase.

Additional electrical equipment has been added to the exciter room since the original construction with the result that the existing unit is sometimes unable to maintain the appropriate temperature. Two of the three manufacturers who supplied the original units are no longer in business and the third has ceased manufacturing replacement parts for the models at Holyrood. All of the units in question use a refrigerant known as R-22, which is to be phased out commencing in 2004 in compliance with Federal Environmental Regulations. A report, prepared for Hydro by Black and McDonald in April of 2005, clearly identifies these and other problems associated with the existing equipment.

Each of the three Generating Units at Holyrood provides from 140 MW to 165 MW of capacity to the system. Hydro states that failure of one of the HVAC units would cause an emergency replacement taking 3 to 4 months to install and would subject the plant and the power system to the potential for major outages in the interim.

The Board accepts Hydro's justification of this proposal in that the units to be replaced are operating well beyond their life expectancy and are not reliable.

B-32 Study of Regeneration Waste Treatment – Holyrood - $172,200

This project consists of a feasibility study to identify the most appropriate manner to treat the regeneration waste streams in order to satisfy Provincial and Federal regulations. In 2003, Hydro initiated a study to review the regeneration wastewater streams at Holyrood to identify the chemical composition at various points during the regeneration process. Water samples were collected and analyzed and it was determined that the waste streams vary from acidic to basic and contain suspended solids and chemicals. Hydro has been able to continue to operate in this manner because of provisional approval provided by the provincial and federal departments involved which permitted discharge of regeneration wastes into seal pits as long as at least one cooling water pump was operating and providing diluting water flow.

The Board finds that the study should be carried out to identify means to comply with regulations and to mitigate the plant's impact on the local environment.

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B-34 Modify Boiler Protection and Control – Holyrood - $116,600

This project consists of a review of the drum level instrumentation on the three units at Holyrood to determine the appropriate transmitter locations, the instruments to be used and the appropriate trip level values, along with other modifications to the drum level control. Hydro reports that over the past five years there has been eight drum level trips that resulted in system under-frequency events. Hydro's personnel have determined that the proposed modifications will contribute to fewer unit trips, and therefore less under-frequency, load-shedding incidents. The loss of a unit at Holyrood will always result in an under-frequency event. The Board agrees with Hydro's justification that the proposed modifications will increase the stability of the boiler during system upsets thereby reducing unnecessary drum level trips.

B-36 Replacement of Paging System – Holyrood Generating Station – $274,500

This project consists of the replacement of the paging system at the Holyrood Generating Station. The Holyrood paging system is used to page staff and warn of potential dangerous situations. It is the primary communication unit for emergency protocols for the plant's Emergency Response Program, which covers fire, first aid, confined space rescue, marine oil spills, and controlled substance spills. The system is considered critical for personnel safety and protection of the plant assets.

The current paging system was installed in 1970, is now 35 years old and is obsolete and has reached the end of its useful life. Hydro explained that the system provides very poor coverage and sound quality with messages being difficult to discern resulting in messages being missed.

Hydro's operating experience disclosed an event on July 6, 2005, which illustrates the potential for harm to employees resulting from the inadequacy of the current paging system. On that occasion, personnel were evacuated from the building due to exhaust gas being discharged inside the powerhouse as a result of a turbocharger failure on the 400 kW emergency generator. It appeared to the employees that the smoke had cleared the lower elevations of the building with a number of employees re-entering the evacuated areas under the mistaken impression that, because of the passage of time, the emergency had been dealt with. In actual fact, the fumes had not been cleared. This fact had been communicated by means of the paging system but, due to the inadequacy of the system, the employees did not receive this information.

Hydro considered three alternatives in its assessment of the current paging system (RFI PUB 60 NLH). Because of safety considerations and the impracticality of replacement with a similar fixed wired paging system it was deemed that use of Hydro's VHF mobile radio system will provide safe and reliable communications covering the whole complex.

The Board finds that this project is justified on the basis of providing primary communications for emergency protocols for the plant's emergency response program which covers fire, first aid, confined space rescue, marine oil spills and controlled substance spills.

Tools and Equipment - $57,000

The proposed expenditure of $57,000 is an annual allotment for replacement of tools and equipment and is consistent with past expenditures for the replacement of these items.

GAS TURBINES

B-38 Replace Automatic Voltage Regulator – Hardwoods Gas Turbine - $241,500

This project consists of the replacement of the original Automatic Voltage Regulator (AVR) at the Hardwoods Gas Turbine. The 50MW turbine provides voltage support, emergency supply and also serves as a peaking unit. The turbine is over 30 years old and in the past five years has operated an average of 1722 hours providing voltage support and 27.6 hours of generation. Loss of this turbine could affect transmission and generation maintenance planning and the ability to serve customers over peak periods. Hydro states that the automatic regulator is also over 30 years old and is no longer supported by the manufacturer. The Board finds that this is a critical component of the eastern transmission system and its failure could result in an extended outage until a new unit is installed.

The Board will approve each of the proposed expenditures for improvements and additions in relation to Generation and the total budget for Generation in the amount of $9,245,000.

TRANSMISSION AND RURAL OPERATIONS (TRO)

TRO is responsible for the design, construction, operation and maintenance of Hydro's transmission, distribution and isolated diesel systems in Newfoundland and Labrador. Assets managed by TRO include 3,700 kilometres of high voltage transmission lines, 2850 kilometres of distribution lines, 55 high voltage terminal stations, 34 sub-stations, 27 diesel plants and 3 gas turbines. These structures and plant are located on the Island interconnected grid, the Labrador interconnected system and the isolated rural systems. Hydro provides service to approximately 31,000 customers in approximately 200 communities, while the isolated systems provide service to approximately 4,400 customers in 44 communities. Hydro is the main generator of electrical power and energy for the Province producing in excess of 80% of the electricity supply for the Island, and operating the interconnected transmission grid for the Province.

TRANSMISSION

B-39 Wood Pole Line Management - $2,302,600

This is the second year of an ongoing program of inspection, treatment and replacement of poles, conductor and hardware on Hydro's transmission system.

Hydro maintains approximately 26,000 poles over 2800 km of wood pole transmission lines operating at 69, 138 and 230 kV. Historically, Hydro's pole inspection and maintenance practices followed the traditional utility approach of sounding inspections only. Since 1998 Hydro has been taking core samples of poles to test for preservative retention levels and pole decay. This core and preservative testing has confirmed that there are a significant number of poles having a preservative level below what is required to maintain the design criteria of the lines. Between 1998 and 2003 certain poles were replaced because the preservative level had lowered to the point that decay had advanced and the poles were no longer structurally sound. These inspections and analysis confirmed that a more formal wood pole line management program was required.

A report titled "Wood Pole Line Management Using RCM Principles" was filed with Hydro's 2005 Capital Budget Application under Section G, Appendix 2. This report recommended that a formal program be established consisting of visual inspections, non-destructive testing and selected treatment of the wood poles. The program is intended to extend the life of the wood pole assets by an average of ten years with a net benefit of $4.5 million in deferred replacement costs over that same period.

An Executive Summary Report of the Wood Pole Line Management Program was filed in support of this Application providing an update of the 2004 Program, a progress report on the 2005 work and a forecast of the proposed objectives for 2006 and beyond.

In Order No. P.U. 53 (2004), the Board found that "This approach (by Hydro) is a more strategic method of managing wood poles and conductors and associated equipment and is persuaded that the new WPLM Program, based on RCM principles, will lead to an extension of the life of the assets, as well as a more reliable method of determining the residual life of each asset. One of

the obvious benefits of RCM will be to defer replacement of these assets thereby resulting in a direct benefit to the ratepayers". The Board approved the capital expenditures for Wood Pole Line Management as submitted in Hydro's 2005 Capital Budget and agrees that the program should be continued in 2006.

B-41 Replace Insulators TL 231 (230 kV Bay d'Espoir – Stoney Brook) - $916,600

TL 231 is a 230kV steel tower transmission line constructed in 1976 to connect Bay d'Espoir to the Stoney Brook Terminal Station – a distance of 105.3 km. To date all the Canadian Ohio Brass (COB) insulators on the angle and dead-end structures have been replaced. This proposal is to replace the remaining COB insulators on the tangent structures on the line. COB insulators, over time have been found to develop cracks in their cement component and have to be replaced. The replacement program has been ongoing for a number of years.

In response to RFI PUB-11 NLH, Hydro stated that to the end of 2004 replacement of COB insulators on transmission lines cost approximately $2.2 million. It is planning to have all COB insulators on transmission lines replaced by the end of 2008 and that the anticipated costs for replacements in the period 2005 to 2008 are approximately $4.9 million.

The Board accepts Hydro's justification for this project and agrees that COB insulators, because of their known fault, should be replaced.

B-43 Upgrade Corner Brook Frequency Converter - $616,500

This project consists of the rewinding of frequency converter transformer T1 and an upgrade of the converter building cooling and ventilation systems. Transformer maintenance tests have shown the transformer's condition to be suspect and the probability of a catastrophic failure to be high. Hydro reports the converter is operating satisfactorily, however the lack of adequate ventilation results in the unit operating at higher than recommended temperatures, which could lead to unit outages.

An Engineering Condition Assessment was completed on this unit in April, 2005, the purpose of which was to review the general condition of the converter and the facility and to compare the present condition of the unit and facility to the "Condition Assessment of 50/60 Cycle Frequency Final Report" which was submitted to Hydro in September of 1998 by Acres International Limited. It was recommended that the transformer be rewound and the building ventilation and cooling systems be upgraded. Using the findings of these reports it was decided to carry out the necessary repairs and replacements during the period 2006 to 2008.

Hydro submits and the Board agrees that the work is necessary at this time to avoid the loss of the converter for an extended period which could result in Deer Lake Power being unable to convert 50 Hz generation to 60 Hz for the paper mill's consumption.

SYSTEM PERFORMANCE AND PROTECTION

B-45 Upgrade 138 kV and 66 kV Protection Systems - $108,900

This project consists of the purchase and installation of microprocessor based relays and associated equipment, to upgrade the protection on the 138 kV and 66 kV systems in the Bottom Brook Terminal Station, which serves NP, Abitibi Consolidated and Hydro Rural. The existing protection equipment is the older electromagnetic relays, which are difficult to maintain and calibrate.

In justifying this project Hydro states that the new equipment will provide significant improvements to transmission line reliability by providing faster fault clearing times and will be self-monitoring to the extent that if there are problems with the relay it will be alarmed, functionally blocked, and addressed before the relay fault causes any problem. The relays will also provide remotely retrievable fault distance location information.

The Board agrees that this project will provide the equipment that will add significant improvements to transmission line reliability by enabling improved and timely analysis for correction of problems.

B-47 Replace Data Collection and Monitoring System (Hawke Hill) - $56,000

The Hawke Hill test site, located near the intersection of the Trans-Canada Highway and the Holyrood Access Road, is used to collect data on ice storms. This project consists of the replacement of the existing data collection and monitoring system at the Hawke Hill test site. A radio link is included to provide higher reliability and security in the acquisition of data. The present system, which is DOS based, was installed in 1993 and is no longer supported by the manufacturer.

The Board finds that the upgrade is required to maintain reliability, improve processing and ensure a faster solution to any problem that occurs.

TERMINALS

B-49 Replace Insulators - $306,800

This project consists of the purchase, installation and replacement of 230, 138, 69 and 25 kV station post and suspension insulators at various terminal stations. Due to the number of insulators and outages required to complete this work, it is planned to carry it out over a five-year period. This proposal is for the first year of the replacement program.

In 2005, a survey of all terminal stations identified all suspect insulators that were manufactured by the Canadian Ohio Brass Company (COB) and are part of the group of insulators that exhibit failures due to cement growth causing radial cracks that result in moisture intrusion.

The Board finds that this project is justified to prevent delivery point interruptions and a decreased level of service to customers.

B-51 Replace Battery Chargers - $89,700

This project consists of the purchase and installation of replacement battery chargers at Deer Lake, Bay d'Espoir, Western Avalon and Corner Brook Frequency Converter Terminal Stations. With the loss of the charger the battery bank will discharge and be depleted such that the station protection and control and information to ECC would become unavailable. Hydro reports that the existing chargers have recently required significant repairs and are approaching or beyond the normal expected service life.

Given the importance of the battery chargers in providing system reliability, Hydro considers it prudent and the Board agrees it is necessary to implement a program to replace the outdated chargers on the system.

B-53 Replace Air Compressor and Dryer at Grand Falls Frequency Converter Terminal Station - $79,700

This project consists of replacing a compressor and heat-regenerated air dryer at the Grand Falls Frequency Converter Terminal Station. Hydro reports that the compressor has been in service since 1964 and the dryer, a 1972 vintage has been subject to failures and repair parts are virtually impossible to source. Consequently, the long-term reliability of the compressor and the dryer cannot be assured.

In response to RFI PUB-13 NLH, Hydro explained that the role of the Grand Falls Frequency Converter Terminal Station was originally to transform 60 Hz loads to 50 Hz for use in the mill. With the conversion of all 50 Hz mill equipment to 60 Hz, the requirement for the converter was eliminated and the converter was decommissioned in April 2002. The role of the station now is to provide 60 Hz power and energy to the mill.

Hydro maintains and the Board agrees that the compressed air system is critical to the terminal station's air operated equipment and should be replaced.

B-55 Replace Air Compressors (Holyrood Terminal Station) - $79,900

This project consists of the replacement of two Ingersoll Rand high-pressure compressors and the associated condensate oil/water separator at the Holyrood Terminal Station. Permitting and inspection of the new installation is required under the *Boiler, Pressure Vessel, and Compressed Gas Regulations*. These compressors have been in service since the early 1970's and each has approximately 13,000 operating hours. Since late 1999 there have been 62 corrective maintenance jobs on the compressor.

The Board accepts Hydro's justification that the compressed air system is critical to the operation of the 230 kV air blast breakers in the station and if the compressed air supply to the breaker fails, the breaker will not operate. This will result in a higher risk of equipment damage as

remote breakers will have to operate on backup protection and as an added consequence it poses a safety risk because of the delayed isolation of faulted equipment.

B-57 Replace Instrument Transformers - $78,400

This project, which is an annual allotment, consists of the purchase and installation of replacement transformers at various terminal stations across the Hydro system. When these units fail the normal utility practice is to replace them, as they are not repairable. Approximately 6 instrument transformers fail each year and need to be replaced.

The Board is satisfied that instrument transformers provide critical input to protection, control and metering equipment required for the reliable operation and protection of the electrical system.

B-59 Replace Battery Banks - $71,600

This project consists of the purchase and installation of new lead/calcium, flooded cell battery banks at Grandy Brook, Indian River and Bay d'Espoir Terminal Stations.

Hydro states that the station batteries proposed for replacement under this project are approaching or beyond the normal expected service life.

The direct current station service system consists of a battery charger, battery bank and DC distribution panel. This DC source provides the control voltage for the station protection, remote and local controls, event logging and annunciation. With the loss of the battery bank, the station protection and control and information to the Energy Control Centre would not be available.

The Board agrees that in order to provide system reliability it is necessary to replace these battery banks at this time.

B-61 Replace Surge Arrestors - $70,000

This project is for the purchase and installation of replacement surge arrestors at various terminal stations across the Hydro system.

Surge arrestors provide critical over voltage protection for power system equipment from lightning and switching surges. Replacements are typically required as a result of maintenance assessments, in-service failures, and equipment that has reached the end of its useful service life. Normally, fifteen replacements are required annually as a result of maintenance assessments and in-service failures.

The Board agrees with Hydro's justification of this project that the timely replacement of surge arrestors prior to age or condition related in-service failures will improve system reliability.

B-63 Install Transformer Oil Monitoring System (Upper Salmon) - $52,600

This project consists of the purchase and installation of an on-line transformer oil monitoring and alarm system for the Upper Salmon transformer. Hydro explained in its description of the project that the unit transformer at Upper Salmon is consistently operating at 8 to 10 degrees higher than other unit transformers, with the same operating range. High operating temperatures have an accelerated aging effect on power transformers that can lead to early failure of the unit. The data retrieved from this system will also serve as a tool to trend gases, temperature and loading for other transformer condition assessment and life extension purposes.

Hydro states that the installation of a replacement system could take up to one year to complete as a result of long delivery times and that the Upper Salmon's plant capacity of 84MW would be unavailable to the system during that time.

The Board agrees that this project should proceed in order to avoid an extended system failure that could take up to one year to complete and require expensive thermal energy replacement from Holyrood.

DISTRIBUTION

B-65 Upgrade Distribution Feeders - $2,017,400

This project consists of the replacement of poles, insulators, conductors and hardware within the following distribution systems:

1. St. Anthony L6 (Feeder No. 30106) – St. Lunaire to L'Anse aux Meadows;
2. Bear Cove L6 (Feeder No. 20806) – Bear Cove to Eddies Cove East;
3. Hawkes Bay L1 & L3 (Feeder Nos. 20101 & 20103) – Hawkes Bay to Port aux Choix; and
4. Black Tickle (Feeder No. 40801) – Black Tickle to Domino.

For all of these systems, the poles, conductors, hardware, etc. are the original equipment that has been in service for approximately 30 years or more. The systems are in coastal regions where they are subject to extreme winds and salt spray off the ocean.

Hydro points out that a safety hazard exists in that deteriorated blackjack poles on these systems create climbing hazards for line personnel due to spur kick out and/or pole failure.

In 2005, Hydro conducted a review of its isolated and interconnected distribution feeders to determine which systems should be targeted for reliability improvements. These reliability improvements were prioritized to justify capital spending beginning in 2006. The performance indices for all feeders were analyzed and improvement targets for the poor performers were established. Based on these targets, upgrades to specific feeders or groups of feeders were defined and scheduled for completion over a five-year period.

A report titled "A Performance Target Methodology for the Distribution Feeders of the Newfoundland and Labrador Hydro Electrical System – June 15, 2005" (Application, Section H, Tab 4), was submitted in support of this project. This report summarizes how the study was completed, and provides more detail on the analysis. The appendix to the report contains tables showing the SAIFI and SAIDI indices for each of the feeders to be upgraded. These upgrades are intended to bring the indices to the target values stated in the tables.

The Board agrees that the proposed distribution feeder upgrades are required at this time in order to avoid future outages and reduce the safety risk to employees.

B-68 Provide Service Extensions - $1,984,000

This project is an annual allotment based on past expenditures to provide for service connections and streetlights to new customers. The budget was developed based on the five-year average of service extension expenditures for the period 2000 – 2004 in 2004 dollars assuming escalation in 2005 and 2006 of approximately 2%.

The Board accepts the calculation of the annual allotment for service extensions proposed by Hydro for this project.

B-70 Upgrade Distribution Systems - $1,912,000

This project is an annual allotment based on historical expenditures to provide for the replacement of deteriorated poles, substandard structures, corroded and damaged conductors, rusty and overloaded transformers/streetlights/reclosers and other associated equipment. All historical dollars were converted to 2004 dollars using the GDP Implicit Price Deflator and five-year average calculated.

This upgrading is identified through preventive maintenance inspections or damage caused by storms and adverse weather conditions and salt contamination.

The Board accepts the calculation of the annual allotment for distribution system upgrades proposed by Hydro for this project.

B-72 Replace Insulators - $1,020,200

This project consists of replacement of all remaining Canadian Porcelain (CP) and Canadian Ohio Brass (COB) insulators on the following distribution lines:

1. South Brook L5 & L7 (Feeder Nos. 10105 & 10107) - Serving the communities of Roberts Arm, Pilley's Island, Long Island, Port Anson, Miles Cove, Brighton and Triton;
2. Farewell Head L$ & L% (Feeder Nos. 11004 & 11005) – Serving the communities of Shoal Bay, Barr'd Island, Joe Batt's Arm. Tilting and Fogo; and
3. Bottom Waters L4, L6, L7 & L8 (Feeder Nos. 10204, 10206, 10207 and 10208).

Hydro reports that these insulators, which have been in service for approximately 35 years, have been a problem throughout the system due to failures caused by cement growth and hairline cracks of the porcelain, which results in electrical and mechanical breakdown.

In response to RFI NP-5 NLH, Hydro stated, "that insulators have the greatest potential to cause an outage to the entire line and affect the most customers".

The Board accepts Hydro's justification for this project in that COB insulators have been a problem throughout the system and should be replaced to avoid electrical and mechanical breakdown.

B-74 Replace Poles - $331,800

This project consists of the replacement of 35 deteriorated poles in Nain and 30 deteriorated poles on the portion of the Bottom Waters system serving the communities of Woodstock, Pacquet and Ming's Bight. The systems are operating satisfactorily however, extended outages have occurred on those occasions where it has been difficult to access the repair site, particularly for the Nain system.

The poles are over 30 years old and were identified as being "B" condition which indicates that they be replaced in one to five years. Once identified as "B" condition, the replacement schedule is determined through a judgment of a number of operational factors such as: the pole condition; its location on the system; its accessibility; system performance statistics; etc. Operational staff uses these factors to determine if the pole needs to be replaced in the first year or whether it can wait for a future year in the 5-year timeframe. This proposal is to replace those "B" condition poles that Hydro believes cannot be left for replacement beyond 2006.

The Board accepts Hydro's justification for this project that deteriorated poles may create climbing hazards for line personnel, and failures will result in significant interruptions of power supply to the customers in these communities.

B-76 Purchase and Install Voltage Regulator – Distribution Feeder L7 (Happy Valley) – $121,900

This project involves the purchase and installation of three, single-phase 7.2/14.4 kV, 200A voltage regulators on feeder L7 at the Happy Valley distribution system.

Due to steadily increasing load on this feeder in recent years and, specifically, a new school opening in Sheshatshui in September 2006, voltage levels at customer service entrances will drop below CSA standards during peak demand periods, with the existing system. Alternatives considered by Hydro to remedy the problem included demand side management, reconductoring, or building a second feeder and adding a second voltage regulator bank.

The Board accepts Hydro's decision to add a second voltage regulator bank to remedy this problem beyond the forecast period.

GENERATION (TRO)

B-78 Construction of New Diesel Plant (St. Lewis) - $2,226,500

This proposal is for the construction of a pre-engineered metal building, measuring approximately 10m in width, 20m in length and 6m in height, containing a new three-unit diesel plant on Hydro's fenced property, in close proximity to the existing tank farm, at St. Lewis, Labrador. The existing plant has three diesel units installed inside the diesel hall and a mobile diesel unit installed outside the building. The mobile diesel was put in place in 1997 to meet growing power requirements and, due to inadequate space inside the building, was set up outside adjacent to the substation.

Hydro proposes to replace the two diesel units (No. 292 and No. 200) because of their age and number of operating hours. As well, both have undergone at least five overhauls and are not considered capable of providing reliable capacity to address customer firm load. Experience has shown that it is generally not practical or effective to overhaul an engine more than five times. In addition to the initial savings on maintenance and overhaul costs, Hydro maintains that the new units will provide greater fuel efficiency and reduced emissions.

Two new gensets, a 450kW unit and a 350kW unit, and their associated systems, will be purchased and installed in the new plant. The total project cost of $2,226,500 includes the purchase and installation of the two new gensets as well as the installation of a third genset (Unit No.2015, a 250kW unit), which will be removed from the old plant. The other two gensets installed in the old plant will be retired. The mobile unit will be made available for use wherever required within the Hydro system in Labrador or on the Island portion of the Province (RFI – PUB-22 NLH)

In support of this proposal, Hydro provided a report titled "St. Lewis Diesel Plant-Condition Assessment Report and Investigation of Replacement Alternatives – June 17, 2005". This report, and the project description and justification details provided by Hydro, reveals that the existing plant is 35 years old, consisting of a wood frame, plywood clad building with a concrete floor. It is in a deteriorated condition and does not have the floor space around, or the clearance above the gensets, to permit the safe performance of operating and maintenance tasks. The existing congested conditions are a result of increased energy requirements of the community over the years requiring the installation of larger units and auxiliary equipment. The lack of space results in operational and maintenance tasks being performed in close proximity to operating equipment, which exposes workers to unsafe conditions.

The main areas of concern with the existing plant are summarized, as follows, on page 2 of the abovementioned report:

Structural/Cladding	Inadequate Floor Areas	Inadequate Wall Area
Lack of Separate Control Room	Inadequate Ventilation	Inadequate Insulation
Inadequate Ceiling Height	Noise Issues	Inadequate Storage
Fire Prevention	Environment	Safety

Hydro investigated the following alternatives before deciding to proceed with this proposal to construct a new plant on existing property.

1. Upgrade the Existing Plant - This alternative was eliminated as the existing structure is in a deteriorated condition and the floor and wall areas are inadequate such that no amount of adjustment would produce any significant improvement.
2. Rebuild the Existing Plant – Since this would have to be carried out while the plant continued to operate it was eliminated as an alternative. Past experience at other sites has highlighted the safety and scheduling issues connected with this type of construction.
3. Interconnection to Port Hope Simpson or Mary's Harbour – The construction of a new distribution line to provide an interconnection was eliminated because it was determined not to be cost effective.

The Board agrees that the existing plant falls well below Hydro's present operating standards and design criteria and should be replaced.

B-81 Installation of Fall Protection Systems – Various Locations - $268,100

This project consists of the design, supply and installation of fall protection equipment, where required, at all Hydro locations. There are approximately 310 locations affected, and installations will be prioritized upon approval to proceed.

In 1999, the Provincial Government passed legislation requiring that all workers, when accessing an elevated surface that is 3 metres above the next lower level, use fall protection systems.

In Hydro's 2005 Capital Budget Application, a 4-year fall protection budget in the amount of $993,000.00 was proposed. The concept was to prepare and prioritize a list of all facilities, which required a fall protection system and in 2005, install systems on those with the highest priority. The portion of the work proposed for 2005 was estimated at $206,200.

Details of the progress and status of this program were filed by Hydro with this application in a report titled "The Installation of Fall Protection Systems for TRO and Production Divisions – June 22, 2005".

The Board accepts Hydro's proposal to spend $268,100 to install fall protection climbing devices at various fuel storage tanks, buildings and equipment located in its service area.

B-83 Replace Diesel Generation Units - $663,200

This project consists of the replacement of diesel generating Unit No. 289 at Black Tickle and Unit No. 223 at Rigolet. These generating units will be replaced with equivalent sized units because there is no requirement to meet an increased demand at either of these sites.

Unit No. 289 at Black Tickle was purchased in 1978 and has 83,348 cumulative hours of

operation. It has had five major overhauls and 13,573 hours have accumulated since the last major overhaul.

Unit No. 223 at Rigolet was also purchased in 1978 and has 81,400 accumulated operating hours, five major overhauls and 17,361 operating hours since the last major overhaul.

Hydro's experience has shown that it is generally not practical or effective to overhaul an engine more than five times. In addition to the initial savings on maintenance and overhaul costs, new units will provide greater fuel efficiency and reduced emissions.

Hydro maintains, and the Board agrees, that replacement of these units is justified on the basis of age, accumulated hours of operation and the number of overhauls.

B-85 Replace Control Panel - Rigolet Diesel Plant - $135,200

This project consists of the purchase and installation of a replacement 600 volt, 800-amp diesel control panel complete with a draw out type breaker. As well, this project includes the purchase and installation of analog sensors on the diesel unit.

The existing generating unit control panel, with a fixed molded case breaker, has no draw out or lockable features to provide a safety isolation point, and therefore, requires a total plant outage for maintenance checks and emergency repairs.

Hydro states that the control panel to be replaced was installed in the 1970's and is now obsolete. The current standard for a generating unit breaker is a draw out design, which allows for removal and isolation of the breaker without any power interruption.

The Board accepts Hydro's justification for this project that a modern electrically operated breaker will provide faster breaker action during synchronizing, and include a synchronizing check capability which ensures proper synchronizing, thus eliminating potential damage to the generator and associated equipment.

B-86 Install NOx Monitor - Little Bay Islands - $106,300

This project consists of the installation of an ambient Nitrous Oxide (NOx) monitor within the community of Little Bay Islands to allow for measurement of ambient NOx levels associated with the operation of the diesel plant.

Hydro states that this project is being completed at the direction of the Provincial Department of Environment and Conservation and is related to requirements of a Certificate of Approval and Compliance Agreements for isolated diesel systems.

B-87 Replace Generating Unit Breakers - $67,900

This project consists of the purchase and installation of 600 volt, 400-amp draw out type breakers with solid-state over-current relay and test switch to replace the fixed molded case

breakers on diesel generating units at Francois (1), Grey River (1) and Little Bay Islands (3). It also includes the replacement of 600V power and control cables, as required, and the purchase of one spare breaker.

The molded case breakers to be replaced are of 1970/80's vintage and are used on diesel generating units for load/fault interruption. Since the breakers are a fixed design they require a total diesel plant outage for maintenance checks and emergency repairs, and only provide for manual synchronization.

Hydro reports that the appropriate modern design for a diesel unit breaker is a draw out type which allows for removal of the breaker for maintenance and emergency repair without a power interruption, and includes electrical closing for fast breaker action during synchronizing of diesel units. This current standard breaker design also includes a synchronizing check capability, which ensures proper synchronizing thus eliminating the potential for damage to the generator and associated equipment.

The Board accepts Hydro's justification for this project and agrees that the improved design of the breakers will improve overall plant efficiency.

GENERAL

B-88 Purchase Meters and Equipment - $92,500

This project is an annual allotment and consists of the purchase of demand/energy meters, current and potential transformers, metering cable and associated hardware for use throughout the Hydro system.

Demand/energy meters are expected to last a minimum of twenty years. After that time each meter is evaluated for condition and retired from service or refurbished and returned to service.

The Board accepts Hydro's annual allotment for the purchase of meters and equipment to avoid customer connection delays.

B-91 Replace Off Road Track Vehicles - $636,000

This project is for the replacement of four off-road tracked vehicles and equipment, as follows:

1. Unit V7631, a 1985 model crew cab/backhoe combination at Bishops Falls will be replaced with a muskeg/boom/dump-configured unit;
2. Unit V7633, a 1985 model muskeg/backhoe/boom unit at Whitbourne will be replaced with an excavator;
3. Unit V7647, a 1988 model muskeg/backhoe/boom unit at Springdale will be replaced with an excavator; and
4. Unit V7725, a 1990 model muskeg/backhoe/boom unit at Bay d'Espoir will be replaced with an excavator.

The primary use of this equipment is to facilitate distribution and transmission line repair.

The Board accepts Hydro's replacement criteria for heavy-duty off-road tracked equipment of 15 – 20 years, combined with its operating condition, the extent of repairs needed and its level of compliance with current health and safety standards.

The Board will approve each of the proposed expenditures for improvements and additions in relation to Transmission and Rural Operations and the total budget for Transmission and Rural Operations in the amount of $17,404,000.

4. GENERAL PROPERTIES

INFORMATION SYSTEMS AND TELECOMMUNICATIONS

B-93 Application Enhancements – $780,500 ($945,800 - Less Cost Revovery – CF(L)Co - $165,300)

These application enhancements are described by Hydro as continuing requirements. The proposed project is shown as a five-fold project as follows:

(i) Minor Enhancements - $120,867 ($149,219 Less Cost Recovery – CF(L)Co – $28,352)

The focus of these enhancements is to increase operational efficiencies and improve customer service. In the past this has been used to enhance safety, environmental compliance and audit applications and to meet board directives such as full time equivalent reporting and equalized billing. Hydro maintains that this is justified on the basis of meeting business requirements during the year.

(ii) Capital Assets Projection and Depreciation Modeling - $75,853

Hydro proposes to investigate and make changes to the process and application that it uses in its capital asset projection and depreciation model. The current application used is separate from JD Edwards and interfaces with it to extract data. The application provides projection and scenario models and analysis capability.

(iii) Enhancements to the Capital and Operating Process Applications - $382,948 ($472,776 Less Cost Recovery – CF(L)Co - $89,827)

Hydro proposes to make changes to the application that it uses for its Capital and Operating work management processes. This will allow for the streamlining of the budget preparation and approval process, workforce allocation planning and outage management planning.

(iv) IT Infrastructure Management Tool - Net Cost: $50,361 ($62,175 Less Cost Recovery – CF(L)Co -$11,813)

Hydro submits that, in order for it to focus on efficiency and reliability of service for its complex portfolio of IT infrastructure, the continued implementation of standard IT processes and supporting tools is essential. IS&T are currently working with Hydro Generation to implement the processes and tools to support non-traditional infrastructure. When outputs from a Release Management process are not well defined and managed, faulty versions of changes are released causing downtime and increased workload. In order to continue to focus on efficiency and reliability this project proposes to add another module to an existing tool to support the Release Management process, which will be implemented in 2006.

(v) Enterprise Reporting Enhancement - Net Cost: $150,480 ($185,778 Less Cost Recovery – CF(L)Co -$35,298

Hydro proposes this expenditure to provide its employees the ability to access reports using a standard web browser ensuring information is available in a more timely and efficient manner. Reports will be run on a scheduled basis without human intervention and placed in a centralized repository.

A financial analysis of the cost and benefits of this project indicated a positive net present value benefit with the proposed enhancements. Application enhancements are a continuing requirement for Hydro to ensure efficiencies.

The Board agrees that these application enhancement projects will assist Hydro in its efforts to better manage and operate certain management tools already in place so as to maintain and improve efficiency and customer service.

B-96 Corporate Application Environment – St. John's - $555,800 ($591,500 Less Cost Recovery CF(L)Co -$35,700)

There are approximately 43 applications and supporting systems that enable Hydro to operate and provide least cost and reliable power to customers. In order to accomplish this, upgrades to application environments through their life cycle is a normal and necessary requirement. Each year Hydro reviews its application portfolio and uses two main criteria to determine if an upgrade to an environment is warranted. First, the status of vendor support for all applications is reviewed. Next, any functionality improvements are reviewed in the context of providing business value, either in terms of efficiencies gained through improved functionality, or improvements in service.

The following projects are proposed for 2006 Budget year:

JDE Enterprise Resource Planning (ERP) Technology Review - $36,274 ($44,782 Less Cost Recovery – CF(L)Co - $8,509)

Hydro states that the need exists to develop a strategy as to how it will deploy and evolve applications to support its business for the future. Also, the latest release of JD Edwards will no longer support the Utility Customer Information System application and the existing user interface technology. This review will allow Hydro to plan for future enhancements of the application based on its business needs and vendor support limitations.

Upgrade to Industrial Customer Billing Software - $155,494

Hydro proposes upgrading to the latest version supported by the vendor. The Industrial Customer Billing software has been in place since January 2000 and is the primary bulk meter interrogation and billing application. The vendor no longer supports the Industrial Customer Billing software that is used to interrogate the meters monitoring the energy and demand usage of Hydro's Industrial Customers. This is proposed to ensure the integrity and accuracy of billing information for Hydro's Industrial Customers.

Upgrade to the Existing Diesel Plant Automation Systems - $217,070

Hydro proposes to upgrade the existing software in nine of Hydro's automated diesel generating plants. The manufacturer no longer supports the existing version. This upgrade will ensure that Hydro's generation facilities, for its remote customers, perform in an efficient and reliable manner.

Upgrade of the Aspen Relay Database Application - $31,099

The vendor no longer supports the existing database application. This proposal is to upgrade to the current version to ensure that data is secure and accurate and that Hydro is able to deliver power to customers at least cost and in a reliable manner.

Upgrade of ShowCase Strategy Application - $115,874 ($143,055 – Less Cost Recovery – CF(L)Co -$27,180)

Hydro proposes this lifecycle upgrade to keep the ShowCase application current with the vendor upgrade program.

The Board accepts Hydro's proposed upgrades to its application environments to improve functionality and improve service to customers.

B-99 Peripheral Infrastructure Replacement – Stephenville Office - $199,100

This project consists of the replacement of three multi-function devices and the purchase of one new multi-function device for the Stephenville office.

This is the continuation of the Evergreen Program to replace peripheral devices as they reach the end of their useful life. The typical service life for a peripheral device is five years. These devices have been in service for five to six years and have exceeded 500,000 copies with an average volume of 20,000 copies per month.

The Board accepts this expenditure to replace peripheral infrastructure on the basis of the equipment having reached the end of its useful life.

B-100 Replace Power Line Carrier – TL 240 – Happy Valley to Churchill Falls - $188,600

The powerline carrier on TL 240 carries power system protection circuits as well as operational voice and data in support of the Energy Control Centre.

This project is for the design, supply, installation and commissioning of a power line carrier to replace the existing system and associated equipment on TL 240 between Churchill Falls and Happy Valley Terminal Station. Hydro reports the present system is 28 years old and is now obsolete and the manufacturer no longer supports the product.

The Board accepts Hydro's justification for this expenditure that continued use of the present system poses a risk of failure with the loss of communications that is required for the protection and control of the power system.

B-101 Microwave Site Refurbishing – Bay d'Espoir Hill and Blue Grass Hill - $407,300

This project involves the refurbishing of two West Coast microwave sites – one located at Blue Grass Hill and the other on Bay D'Espoir Hill. Hydro reports this microwave system has been in service since 1979 with no major repairs and is part of Hydro's critical infrastructure, supporting system protection signalling, as well as other functions related to the monitoring and control of the corporations generation, transmission and distribution assets.

The Board accepts Hydro's justification that this program will extend the life of these sites and without refurbishing, they would deteriorate to a level where catastrophic structural failure could occur resulting in a direct loss of control of the grid for the Energy Control Centre (ECC).

B-103 Replace Battery Systems – Multiple Sites - $403,600

This project proposes the replacement of battery systems at the Terminal Stations located in Daniels Harbour, Hawke's Bay and St. Anthony Airport and St. Anthony Diesel Plant; the replacement of DC Power Plants at Deer Lake Terminal Station and Hinds Lake Generating Station; and the replacement of both battery and power plant at Burnt Dam and Godaleich Hill.

The decision to replace batteries is based on a combination of age, observation and testing. Failure to replace this equipment is likely to result in a battery bank failure, which could cause customer outages.

The Board agrees with Hydro's assessment that the DC power plants being replaced which are all more than 20 years old have reached the end of their useful lives.

B-105 Replace Remote Terminal Units (RTUs) – Various Sites - $350,900

This project is to replace four (4) RTUs at Holyrood, Stephenville, Come By Chance and Roddickton. This is phase seven of a nine-phase plan to replace all obsolete RTUs. The spares salvaged will be used to extend the life of the remaining units.

These units are reported to be 19 to 20 years old and have been manufacturer discontinued. Hydro maintains that failure to replace this equipment may result in an impact on service to customers. The RTUs being replaced are critical to the operation of the provincial power grid and to the reliable supply of power to the Avalon Peninsula. Come By Chance terminal station supplies North Atlantic Refining Ltd., which is highly sensitive to outages.

The Board finds the continuation of this program is necessary to ensure an infrastructure capable of delivery of reliable service to customers.

B-107 West Coast Communication Study - $175,100

This project consists of a study to evaluate all viable communications options that may be suitable for collection and transmission of data gathered at the West Coast 230 KV Substations for support of operations, administration and maintenance. A communication plan will be produced and a preliminary engineering design will be prepared on the most cost effective option. Present technology will not be capable of supporting future data requirements for system performance and system operations applications.

The cost benefit analysis and preliminary engineering design will provide Hydro with the most viable communications solution for the West Coast and ongoing support for core business such as teleprotection, real time system operations and operational voice for the provincial Energy Control Centre.

The Board accepts Hydro's justification for this proposal that the operational data obtained would be used to improve system planning, maintenance and operation of the provincial electrical system, reduce costs and extend the life of the core electrical system assets.

B-109 Replace Telephone Isolation Equipment-Happy Valley - $57,300

The existing installation of the telephone isolation equipment does not meet the distance clearances as determined by the station's zone of influence, required by Hydro. This project involves replacing the present telephone isolation equipment with a fibre optic cable.

The Board accepts Hydro's justification that a fibre optic system will meet safety requirements and provide improved communications reliability and enhance protection for personnel.

B-110 Communications Network Technology – Various Locations - $96,700

Hydro proposes to replace eight obsolete telecommunication network components as well as provide additional capacity on other network components. It also includes the installation of facilities required in the future to extend network access and voice connectivity. The existing components are obsolete and cannot be updated. The switches to be upgraded do not have the capacity to service the ongoing bandwidth enhancement requirements of the business. Hydro's refresh life cycle for network devices is eight years.

The Board agrees that the replacement equipment devices will correct network performance problems and allow traffic management to improve without requiring additional operating cost for leased services.

B-120 Replace Energy Management System – Energy Control Centre - $5,382,000

This project, which was started in 2003 as a four-year project, will be completed in 2006. Despite the fact that the Board has approved total budgeted expenditures of $11,028,600 [$1,213,500 – Order No. P.U. 29 (2002-2003), $4,292,700 – Order No. P.U. 29 (2003) and $5,522,400 – Order No. P.U. 53 (2004)] the actual expenditures to the end of 2005 are expected to total $4,856,000. Hydro has included in the current Application the amount of $5,382,000 that is budgeted to be spent in 2006, bringing the anticipated total for this project to $10,238,000, a saving of $790,600 from the amount originally approved by the Board. This revision results from a higher Canadian dollar exchange rate with the US dollar and a decision to manage some of the work internally rather than to contract it to an outside party.

B-120 Replace VHF Mobile Radio System - $3,677,000 ($5,473,000 – Less Cost Recovery - Department of Transportation and Works - $1,796,000)

This is a two-year project, which the Board approved [Order No.P.U.53 (2004)] to commence in 2005 with an expenditure of $2,915,000 in that year. In 2006, Hydro is proposing to spend an additional $3,677,000. The project is proceeding as planned with no change in scope, nature or forecast.

Administrative

B-112 Replace Vehicles – Various Locations - $1,733.000

This project, which occurs annually, involves replacement of 40 vehicles. Vehicles are screened against the replacement criteria before being identified for replacement. When a unit has met the age or kilometre criteria, the unit is further evaluated for its condition and maintenance history.

New vehicle replacements are required in order to ensure maximum reliability with minimum equipment downtime. Hydro maintains, and the Board agrees, that having work crews equipped with reliable and technologically current work vehicles ensures their safety while at the same time enhancing efficient delivery of services.

A lease/purchase analysis is used to determine the least cost alternative.

B-114 Construct New Warehouse – Port Saunders - $430,900

This project consists of the construction of a 280 square meter pre-engineered metal building, one story in height, equipped with shelving and lay down areas and suitable for inventory storage and handling.

Prior to the interconnection of the Great Northern Peninsula in 1996, Hydro's operations on the Great Northern Peninsula and Southern Labrador were centred in regional offices in Port Saunders and St. Anthony. The St. Anthony office was responsible for all diesel and associated distribution operations from St. Anthony to Norman Bay in Labrador. The majority of this activity was related to diesel plant systems, particularly the main plant at St. Anthony. The Port Saunders office was responsible for distribution operations from Deer Lake to Bear Cove and Roddickton, Main Brook and Englee. The Stephenville regional office was responsible for all transmission systems on the peninsula. This resulted in a limited sized inventory and materials handling facility at Port Saunders. At St. Anthony, the main materials handling requirements centred around the required inventory for diesel plants, particularly the St. Anthony plant. All transmission materials for the peninsula were processed through regional offices in Stephenville and Bishop Falls.

The interconnection of the GNP in 1996 provided Hydro with the opportunity to restructure its operations on the Northern Peninsula and in Southern Labrador. The interconnection resulted in the St. Anthony diesel plant being changed to stand-by status, and thus a downsizing in operational requirements for that part of the region. At the same time, the responsibilities for the transmission systems were transferred to the Port Saunders region. Overall, across Hydro, the six regional offices were reduced to three and the operational centre for the Northern Peninsula and Southern Labrador was more appropriately relocated to Port Saunders.

As these structural reorganizations were underway, Hydro was also reviewing and modifying its goods and services and work execution processes. These modifications took the form of reducing inventory levels and entering into long-term partnerships with suppliers. These revisions to the business processes changed the nature and space requirements of the materials handling facilities. The Port Saunders site is now the central control point for the regional operations and for the materials distribution throughout the Northern regional operations area.

The existing warehouse at Port Saunders is 150 square meters. This space was sufficient for the limited requirements of distribution materials management, which was the limit of the operations previously performed by the Port Saunders office. Since the interconnection of the GNP, the corporate reorganizations and the revisions to the goods and services process, this facility is no longer adequate. Port Saunders is now the operational centre for Hydro operations from Deer Lake on the Island to Norman Bay on the Labrador coast. The focus now is on both transmission and distribution operations from this site. This requires that all materials for diesel, distribution and transmission work be processed, handled and transhipped from Port Saunders.

In response to RFI PUB-57 NLH, Hydro indicated that the following four options were investigated to determine the solution to inadequate warehouse space at Port Saunders:

(i) Leasing;
(ii) Extending the existing building;
(iii) Using existing space at St. Anthony; and,
(iv) Constructing a new building.

The leasing option was ruled out because there were no suitable facilities available. Extending the existing building was ruled out for a variety of reasons relating to foundations, ground water problems, water supplies, site layout, workflow patterns and helicopter landing clearances. Reuse of existing space at St. Anthony was ruled out because of its remoteness from the operational centre and the difficulties it would cause in efficiently supplying the crews with materials. Hydro states that construction of a new facility on the Port Saunders site will provide the greatest benefits for material handling for the crews operating out of Port Saunders and for the materials being transhipped to the remote sites in Southern Labrador.

The nature and quantity of the materials being processed requires an increase in space to approximately 280 square meters. As the existing space at Port Saunders is an open bay area at the end of the office space an extension of this space to the required 280 square meters was not deemed practical. The existing space in the office building will be used for line maintenance personnel and their tools and equipment that require indoor storage. As well, the space will be used for the pre-assembly of hardware and the provision of a lay-down area needed for planned activities.

The Board finds that considering all of the circumstances outlined by Hydro its proposal to construct a new warehouse at Port Saunders is acceptable.

B-117 Replace Storage Ramps – Bishop's Falls - $158,900

This project consists of replacing the existing storage ramps with a steel structure decked with treated timber platforms. These ramps are located in Bishop's Falls Central Stores yard and are used for the outside storage of transformers and related distribution and transmission hardware. An assessment of the old ramps identified design shortcomings and recommended replacement. The existing ramps are 20 to 25 years old and present a safety concern. Hydro's plan is to replace ramps #66 and #67 and to strengthen Ramp #116 in 2006. Ramp #72 will be proposed in the 2007 capital budget.

The Board agrees that personal safety and the protection of stored assets are sufficient justification for this proposal to proceed.

The Board will approve each of the proposed expenditures for improvements and additions in relation to General Properties and the total budget for General Properties in the amount of $14,987,000.

ALLOWANCE FOR UNFORESEEN EVENTS - $1,000,000

In approving this amount the Board confirms the conditions prescribed in Order No. P.U. 7 (2002-2003)

(i) The cost of the project must be greater than $50,000

(ii) The project must be seen both by Hydro and subsequently by the Board to be urgent. Circumstances must require that immediate action be taken, and it must be evident that any delay resulting from the time taken to file an application with the Board could have serious negative consequences for Hydro, its customers, or the public. These consequences may be financial, or for reasons of safety or reliability.

(iii) A report must be filed with the Board detailing the circumstances of the need, the alternatives that have been considered, the financial effects of each of the alternatives, and reasons for the choice. Any reliability or safety issues should be reported in detail at this time. Also included must be a time line that indicates the date of the requirement for emergency action, the date of the decision of Hydro, the date on which the action was begun, and the expected date of completion of the projects.

(iv) The reports on expenditures from the *"Allowance for Unforeseen Events"* for the year must be entered as part of the Application for Approval of the Capital Budget for the following year.

(v) The *"Allowance for Unforeseen Events"* will be considered by the Board annually at the time it considers the Hydro capital budget and may be varied from year to year. Unused balances in the account will not carry forward.

The Board will approve the proposed Allowance for Unforeseen Events in the amount of $1,000,000.

III TOTAL CAPITAL BUDGET

On the basis of the extensive documentation and evidence that was presented by Hydro in support of its 2006 Capital Budget Application, and the additional evidence provided in response to Requests For Information, the Board finds that the proposed capital budget for 2006 is prudent and reasonable and will, therefore, approve the 2006 total capital budget in the amount of $42,636,000, as submitted.

IV RATE BASE

2004 AVERAGE RATE BASE

The following table, taken from Section I of Hydro's Application, shows the calculation of the actual average rate base for 2004 compared with 2003.

(000s)	2003	2004
Capital Assets	$1,904,557	$1,922,374
Less:		
Contributions in aid of Construction	85,055	85,081
Accumulated Depreciation	456,695	481,081
Net Assets not in Service	4	4
Muskrat Falls	2,049	2,149
Net Capital Assets	1,360,754	1,353,339
Balance Previous Year	1,234,420	1,360,754
Average Capital Assets	1,297,587	1,357,047
Working Capital	3,456	2,945
Fuel	18,310	15,611
Supplies Inventory	18,565	18,615
Average Deferred Charges	84,494	82,506
Average Rate Base	**$1,422,412**	**$1,476,724**

Source: Hydro's Capital Budget Application, Section I, Page 1-1

Grant Thornton, the Board's Financial Consultant, reviewed Hydro's calculation of the actual average rate base for 2004 and concluded that the average rate base of $1,476,724,000 included in Hydro's Application, Section I, Page I-1 is accurate and in accordance with Board Orders and established regulatory practice.

The Board will fix and determine Hydro's Rate Base for 2004 in the amount of $1,476,724,000

IT IS THEREFORE ORDERED THAT:

1. **Pursuant to subsection 41(3) of the *Act*, improvements and additions to Hydro's property for construction and purchases in excess of $50,000, and leases in excess of $5,000 in a year, as set out in Section B to the Application and attached as Schedule A to this Order, are approved.**

2. **Pursuant to subsection 41(1) of the *Act,* the 2006 Capital Budget for improvements and additions to Hydro's property in the amount of $42,636,000 is approved.**

3. **Pursuant to section 78 of the *Act* Hydro's average rate base for the year ending December 31st, 2004 is hereby fixed and determined at $1,476,724,000.**

4. **Hydro shall pay all costs and expenses of the Board incurred in connection with this Application.**

DATED at St. John's, Newfoundland and Labrador, this 30th day of November 2005.

G. Fred Saunders,
Presiding Chair.

Gerard Martin, Q.C.,
Commissioner.

Walter Vincent,
Commissioner.

G. Cheryl Blundon,
Board Secretary.

SCHEDULE A

ORDER NO. P.U. 31(2005)

ISSUED: November 30, 2005

NEWFOUNDLAND AND LABRADOR HYDRO

2006 CAPITAL BUDGET APPLICATION

SECTION B

NEWFOUNDLAND & LABRADOR HYDRO

2006 CAPITAL BUDGET - OVERVIEW PROJECTS OVER $50,000

($,000)

	Exp To 2005	2006	Future Years	Total
GENERATION	3,624	9,149	4,530	17,303
TRANSMISSION & RURAL OPERATIONS	0	16,465	522	16,987
GENERAL PROPERTIES	5,975	14,598	220	20,793
ALLOWANCE FOR UNFORSEEN EVENTS	0	1,000	0	1,000
TOTAL CAPITAL BUDGET	9,599	41,212	5,272	56,083

NEWFOUNDLAND & LABRADOR HYDRO
GENERATION
2006 CAPITAL BUDGET - PROJECTS OVER $50,000 BY CATEGORY

($,000)

PROJECT DESCRIPTION	Exp To 2005	2006	Future Years	Total	In-Ser Date	Explanation Page Ref.
Island Pond Development - Feasibility Update		998		998	Nov. 06	B-5
Final Feasibility Study - Portland Creek Development		796		796	Nov. 06	B-7
Wind Generation Inventory Study		143	33	176	Jul. 07	B-9
Replace Penstock - Snook's Arm Generating Station	118	1,992		2,110	Nov. 06	B-119(1)
Replace Unit 1 Governor Controls - Cat Arm	378	311		689	Dec. 06	B-119 (2)
Upgrade Controls Spherical Valve #6 - Bay d'Espoir		200		200	Jul. 06	B-11
Replace Underground Fuel Tanks - Cat Arm Powerhouse		137		137	Nov. 06	B-13
Remote Operation of Fisheries Comp. By-Pass Valve - Granite Canal		107		107	Aug. 06	B-15
Install Waste Oil Holding Tanks - BDE, USL, HLK & PRV		82		82	Oct. 06	B-19
Replace Superheater Unit 2 - Holyrood		319	2,818	3,137	Oct. 07	B-20
Upgrade Control Systems - Holyrood	2,515	316		2,831	Dec. 06	B-119(3)
Addition of Disconnecting Means to 600 Volt MCC Branch Feeders -Holyrood	613	859	749	2,221	Dec. 07	B-119(4)
Fire Protection Upgrades - Holyrood		916	930	1,846	Dec. 07	B-23
Replace Warm Air Make-Up Units Steam Coil - Holyrood		602		602	Sep. 06	B-25
HVAC Replacements - Stage 1 & 2 , Relay, Control & Exciter Rms - Holyrood		565		565	Oct. 06	B-29
Study Regeneration Waste Treatment - Holyrood		172		172	Aug. 06	B-32
Modify Boiler Protection and Control - Holyrood		117		117	Nov. 06	B-34
Replacement of Paging System - Holyrood		275		275	Oct. 06	B-36
Replace Automatic Voltage Regulator - Hardwoods		242		242	Nov. 06	B-38
TOTAL GENERATION	3,624	9,149	4,530	17,303		

NEWFOUNDLAND & LABRADOR HYDRO
TRANSMISSION & RURAL OPERATIONS
2006 CAPITAL BUDGET - PROJECTS OVER $50,000 BY CATEGORY
($,000)

PROJECT DESCRIPTION	Exp To 2005	2006	Future Years	Total	In-Ser Date	Explanation Page Ref.
Wood Pole Line Management - Various Sites		2,303		2,303	Dec. 06	B-39
Replace Insulators TL231 - (230kV Bay d'Espoir - Stoney Brook)		917		917	Sep. 06	B-41
Upgrade Corner Brook Frequency Converter		617		617	Nov. 08	B-43
Upgrade 138 kV and 66 kV Protection Systems - Bottom Brook		109		109	Oct. 06	B-45
Replace Data Collection and Monitoring System - Hawke Hill		56		56	Dec. 06	B-47
Replace Insulators - Various Stations		307		307	Oct. 06	B-49
Replace Battery Chargers - Various Stations (BDE, DLK, GFC & WAV)		90		90	Oct. 06	B-51
Replace Compressor and Dryer - Grand Falls Frequency Converter Station		80		80	Aug. 06	B-53
Replace Air Compressors - Holyrood Terminal Station		80		80	Aug. 06	B-55
Replace Instrument Transformers - Various Stations		78		78	Nov. 06	B-57
Replace Battery Bank - Various Stations (GBK,IRV,BDE)		72		72	Sep. 06	B-59
Replace Surge Arrestors - Various Stations		70		70	Nov. 06	B-61
Install Transformer Oil Monitoring System - Upper Salmon		53		53	Oct. 06	B-63
Upgrade Distribution Feeders - Various Locations		2,017		2,017	Oct. 06	B-65
Provide Service Extensions		1,984		1,984	Dec. 06	B-68
Upgrade Distribution Systems		1,912		1,912	Dec. 06	B-70
Replace Insulators - Various Locations		1,020		1,020	Dec. 06	B-72
Replace Poles - Various Locations		332		332	Oct. 06	B-74
Purchase and Install Voltage Regulator L7 - Happy Valley		122		122	Oct. 06	B-76
Construct New Diesel Plant - St. Lewis		2,227		2,227	Oct. 06	B-78
Installation of Fall Arrest Equipment - Various Locations		268	522	790	Dec. 06	B-81
Replace Diesel Generating Units _ Various Locations		663		663	Oct. 06	B-83
Replace Control Panel - Rigolet		135		135	Nov. 06	B-85
Install NOx Monitor - Little Bay Islands		106		106	Aug. 06	B-86
Replace Generating Unit Breakers - Francois,Grey River, Little Bay Islands		68		68	Nov. 06	B-87
Purchase Meters & Equipment - All Service Areas		93		93	Dec. 06	B-88
Legal Survey of Distribution Line Right-of-Ways - Various Sites		50		50	Oct. 06	B-89
Replace Off Road Track Vehicles		636		636	Apr. 06	B-91
TOTAL TRANSMISSION & RURAL OPERATIONS	0	16,465	522	16,987		

NEWFOUNDLAND & LABRADOR HYDRO
GENERAL PROPERTIES
2006 CAPITAL BUDGET - PROJECTS OVER $50,000 BY CATEGORY
($,000)

PROJECT DESCRIPTION	Exp To 2005	2006	Future Years	Total	In-Ser Date	Explanation Page Ref.
Replace Energy Management System - Energy Control Centre	4,856	5,382		10,238	Jul. 06	B-120 (5)
Applications Enhancements		946		946	Dec. 06	B-93
Cost Recovery CF(L)Co		(165)		(165)		
Corporate Applications Environment		592		592	Dec. 06	B-96
Cost Recovery CF(L)Co		(36)		(36)		
Peripheral Infrastructure Replacement		199		199	Nov. 06	B-99
Replace VHF Mobile Radio System	2,915	5,473		8,388	Dec. 06	B-120 (6)
Cost Recovery - Department of Transportation and Works	(1,796)	(1,796)		(3,592)		
Replace Power Line Carrier TL240 - Happy Valley - Churchill Falls		189	220	409	Oct. 07	B-100
Microwave Site Refurbishing - Bay d'Espoir Hill and Blue Grass Hill		407		407	Dec. 06	B-101
Replace Battery System - Multiple Sites		404		404	Dec. 06	B-103
Replace Remote Terminal Units - Various Sites		351		351	Dec. 06	B-105
West Coast Communications Study - Engineering Design		175		175	Dec. 06	B-107
Replace Telephone Isolation Equipment - Happy Valley		57		57	Dec. 06	B-109
Communications Network Technology		97		97	Dec. 06	B-110
Replace Vehicles - Various Locations		1,733		1,733	Aug. 06	B-112
Construct New Warehouse - Port Saunders		431		431	Oct. 06	B-114
Replace Storage Ramps - Bishop's Falls		159		159	Sep. 06	B-117
TOTAL GENERAL PROPERTIES	5,975	14,598	220	20,793		

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Island Pond Development - Feasibility Update

Location: Island Pond

Division: Production

Category: Generation - New Generation Source

Type: Other

Classification: Normal

Project Description:

The project consists of a review of the final feasibility level capital cost estimate to construct a hydroelectric facility at Island Pond within the existing Bay d'Espoir development area. Work consists of all office and field engineering including:

- a field investigation program to confirm material sources, evaluate structure subsurface conditions, and to confirm location and topographical data;
- a review of an alternative development scheme;
- preparation and assessment of quantities and unit prices;
- preparation of preliminary drawings;
- preparation of a detailed construction schedule; and,
- preparation of a definitive cost estimate complete with quantities and cost/cash flows.

The Island Pond development is a proposed 36 MW hydroelectric facility with average and firm annual energy capability of 203 GWh and 186 GWh respectively. A feasibility study was completed in the late 1980s and later reviewed in 1996.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	0.0	0.0	0.0	0.0
Labour	65.0	0.0	0.0	65.0
Consultant	750.0	0.0	0.0	750.0
Contract Work	0.0	0.0	0.0	0.0
Other Direct Costs	0.0	0.0	0.0	0.0
O/H, AFUDC & Escalation	101.5	0.0	0.0	101.5
Contingency	81.5	0.0	0.0	81.5
Total	**998.0**	**0.0**	**0.0**	**998.0**

Operating Experience:

Not applicable.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Island Pond Development - Feasibility Update **(cont'd.)**

Project Justification:

The Island Pond development is one of Hydro's most competitive alternatives to address future deficits in capacity and energy. A review of the current cost estimate based on additional field data, technology improvements and market conditions, is required to ensure the level of confidence needed prior to any decision to proceed with the project.

Based on a comparison of existing system capability and the most recent load forecast, Hydro expects deficits in capacity and energy to occur in the 2009 timeframe. In order to address these deficits, Hydro must be in a position to carry out appropriate planning analyses and have identified and advanced the engineering feasibility of alternative projects sufficiently to be able to meet forecast customer load requirements.

Future Plans:

The results of this review will be incorporated in future analysis directed at deciding the next source of generation for the Island Interconnected System.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Portland Creek Development - Final Feasibility Study

Location: Portland Creek

Division: Production

Category: Generation - New Generation Source

Type: Other

Classification: Normal

Project Description:

The study consists of all office and field engineering required to bring the Portland Creek hydroelectric development to a final engineering feasibility level of study. It includes:

- hydrological studies to establish plant size, average energy, firm energy, construction flood and design flood requirements;
- a review of aerial photos of the prospective site and related infrastructure;
- a field investigation program to confirm material sources, evaluate structure subsurface conditions, and to obtain all necessary location and topographical data;
- generation and review of alternative arrangements;
- preparation and assessment of quantities and cost estimates for various alternatives;
- preparation of preliminary drawings;
- preparation of a detailed construction schedule; and,
- preparation of a definitive cost estimate complete with quantities and cost/cash flows.

The Portland Creek Development is a proposed 12 MW hydroelectric facility with an average annual energy capability of 90 GWh. The project was last reviewed in a 1987 pre-feasibility report.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	0.0	0.0	0.0	0.0
Labour	100.0	0.0	0.0	100.0
Consultant	550.0	0.0	0.0	550.0
Contract Work	0.0	0.0	0.0	0.0
Other Direct Costs	0.0	0.0	0.0	0.0
O/H, AFUDC & Escalation	81.0	0.0	0.0	81.0
Contingency	65.0	0.0	0.0	65.0
Total	**796.0**	**0.0**	**0.0**	**796.0**

Operating Experience:

Not applicable.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Portland Creek Development - Final Feasibility Study **(cont'd.)**

Project Justification:

The Portland Creek hydroelectric development has the potential to be a competitive source of new generation capability to address future customer requirements. A final engineering feasibility study is required to identify, with sufficient confidence, the technical and capital cost parameters for the project such that it can be included in any analysis of alternatives to meet future load requirements.

Based on a comparison of existing system capability and the most recent load forecast, Hydro expects deficits in capacity and energy to occur in the 2009 timeframe. In order to address these deficits, Hydro must be in a position to carry out appropriate planning analyses and have identified and advanced the engineering feasibility of alternative projects sufficiently to be able to meet forecast customer load requirements.

Future Plans:

The results of this feasibility study will be incorporated in future analysis directed at deciding the next source of generation for the Island Interconnected System.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Wind Generation Inventory Study

Location: Island Interconnected System

Division: Production

Category: Generation - New Generation Source

Type: Other

Classification: Normal

Project Description:

The study consists of all office and field engineering required to identify and define a number of potential wind resource sites for development and supply of wind generation by Hydro to the Island Interconnect system. It includes:

- a review of Environment Canada's Canadian Wind Energy Atlas and other available information to identify potential sites for further investigation;
- a review of aerial photos of the prospective site and related infrastructure;
- a field investigation program to obtain all necessary location and topographic information; and,
- the erection of wind monitoring towers at two selected sites and the collection of at least a one year period of wind development related environmental data.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	0.0	0.0	0.0	0.0
Labour	11.0	5.0	0.0	16.0
Consultant	115.0	5.0	0.0	120.0
Contract Work	0.0	0.0	0.0	0.0
Other Direct Costs	0.0	0.0	0.0	0.0
O/H, AFUDC & Escalation	17.2	9.7	0.0	26.9
Contingency	0.0	13.6	0.0	13.6
Total	**143.2**	**33.3**	**0.0**	**176.5**

Operating Experience:

Not applicable.

Project Justification:

Wind generation has the potential to be a competitive source of new generation to address a portion of future generation requirements on the Island Interconnected system. An inventory study is required to identify and define a number of potential sites for wind generation developments such that they can be constructed by Hydro in order to provide direct experience with the technology and serve as an alternative generation supply.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Wind Generation Inventory Study **(cont'd.)**

Project Justification: (cont'd.)

Based on a comparison of existing system capability and the most recent load forecast, Hydro expects deficits in capacity and energy to occur in the 2009 timeframe. In order to address these deficits, Hydro must be in a position to carry out appropriate planning analyses and have identified and advanced the engineering feasibility of alternative projects sufficiently to be able to meet forecast customer load requirements.

Future Plans:

The results of this study will be incorporated in future analysis directed at deciding the next source of generation for the Island Interconnected system.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Upgrade Controls Spherical Valve No. 6

Location: Bay d'Espoir

Division: Production

Category: Generation - Hydro Plants

Type: Other

Classification: Normal

Project Description:

This project involves the upgrade of the control system for spherical valve No. 6 by replacing components, including control valves, piping, tubing and control panel. It is a continuation of a program started in 2001 to upgrade control systems on spherical valves at Bay d'Espoir. The Board has previously approved upgrades on five of the six systems at Bay d'Espoir Powerhouse No. 1. The new controls will have stainless steel mechanical components for corrosion protection and a programmable logic controller with manual over-rides.

In Hydro's 2005 Capital Budget Application, funds were requested to complete the upgrade on this unit. However, late in 2004 and early 2005 there were indications of a major problem with the maintenance seal on the adjacent Unit No. 5 which shares the same penstock. As this could have prevented maintenance on that unit because of the inability to provide adequate turbine isolation, it was decided to switch the upgrade for 2005 to that unit. The spherical valve on Unit No. 5 would have been the last unit in powerhouse No. 1 requiring the upgrade and would have normally been proposed for an upgrade in 2006 as part of the ongoing replacement program.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	100.0	0.0	0.0	100.0
Labour	61.7	0.0	0.0	61.7
Consultant	0.0	0.0	0.0	0.0
Contract Work	0.0	0.0	0.0	0.0
Other Direct Costs	1.5	0.0	0.0	1.5
O/H, AFUDC & Escalation	20.0	0.0	0.0	20.0
Contingency	16.3	0.0	0.0	16.3
Total	**199.5**	**0.0**	**0.0**	**199.5**

Operating Experience:

Bay d'Espoir unit No. 6 along with the existing spherical valve and control became operational in January 1972. This generating unit typically operates for 5,500 hours each year. In the last five years there have been 34 maintenance events for this control system, which is much higher than expected for this type of system. Control systems on unit Nos. 1, 2, 3, 4, and 5 have been upgraded since 2001.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Upgrade Controls Spherical Valve No. 6 **(cont'd.)**

Project Justification:

The control system for spherical valve No. 6 is obsolete and unreliable. Replacement parts have to be reverse engineered and custom made. The spherical valve is the main valve allowing water flow to the turbine. The failure of the existing control system can result in the following events:

a) Single unit outage (75 MW) due to spherical valve not opening, with loss of generation and an extended outage;

b) Outage of two units (150 MW) on the same penstock and potential damage to the unit if the spherical valve stays open during a unit runaway condition forcing a head gate closure; and,

c) Loss of all six units (450 MW) in powerhouse No.1 if the spherical valve or seals fail while the turbine access door is open for maintenance resulting in the flooding of powerhouse No. 1, with the potential for the loss of life.

Depending on the time of year when a failure occurs, replacement capacity and energy, if available, would have to be obtained through increased thermal production at Holyrood or gas turbine sites at significantly higher cost. As well, a lengthy outage would increase the risk of spill during high inflow periods. The cost of replacement energy from Holyrood arising from an outage of two units (150 MW) is $184,000/day assuming fuel at $32.20 per barrel. It would be unacceptable to maintain the status quo and risk the loss of capacity given the significance of this generation capacity to the overall system.

Future Plans:

This is the last unit in Bay d'Espoir Powerhouse No. 1 requiring this upgrade. Unit No. 7 at Bay d'Espoir does not have a spherical valve.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Underground Fuel Tank - Cat Arm Powerhouse

Location: Cat Arm

Division: Production

Category: Generation - Hydro Plants

Type: Other

Classification: Mandatory

Project Description:

This project involves the removal and disposal of an underground fiberglass bulk storage fuel tank (31,780 litre) at the Cat Arm Powerhouse and the design, supply and installation of an above-ground, double wall steel fuel tank of the same size complete with all necessary site work including: foundation, piping, fuel monitoring system and instrumentation.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	40.0	0.0	0.0	40.0
Labour	71.7	0.0	0.0	71.7
Consultant	0.0	0.0	0.0	0.0
Contract Work	0.0	0.0	0.0	0.0
Other Direct Costs	0.0	0.0	0.0	0.0
O/H, AFUDC & Escalation	13.9	0.0	0.0	13.9
Contingency	11.1	0.0	0.0	11.1
Total	**136.7**	**0.0**	**0.0**	**136.7**

Operating Experience:

The existing fiberglass underground storage tank was installed in 1984 as part of the original construction of the Cat Arm project. The tank has been in continuous service without significant maintenance work performed since it was installed.

Project Justification:

The existing bulk storage fuel tank is a single wall, fiberglass, underground tank. Neither the tank, nor the piping system has secondary containment or leak detection measures. The system is in contravention of the current Canadian Council of Ministers of the Environment (CCME) environmental code of practice for underground storage tank systems containing petroleum products and allied petroleum products, and the Provincial Gasoline and Associated Products (GAP) Regulations. As well, there is no means of quantifying the amount of fuel used by the diesel generator, for fuel reconciliation purposes as required by the provincial GAP Regulations.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Underground Fuel Tank - Cat Arm Powerhouse **(cont'd.)**

Project Justification: (cont'd.)

To ensure that this project will be completed at the least possible cost, Newfoundland and Labrador Hydro will solicit competitive bids for all material and external labour.

Future Plans:

None.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Remote Operation of Fisheries Compensation By-Pass Valve

Location: Granite Canal

Division: Production

Category: Generation - Hydro Plants

Type: Other

Classification: Justifiable

Project Description:

This project consists of motorizing the existing fisheries compensation by-pass valve and providing the Energy Control Centre (ECC) with the ability to adjust the valve's opening remotely, in order to quickly respond to changing conditions. As the bypass structure presently has remotely operated, motorized bypass gates, the electrical and communications infrastructure currently available at the site will be utilized.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	12.3	0.0	0.0	12.3
Labour	62.4	0.0	0.0	62.4
Consultant	2.5	0.0	0.0	2.5
Contract Work	0.0	0.0	0.0	0.0
Other Direct Costs	10.8	0.0	0.0	10.8
O/H, AFUDC & Escalation	9.9	0.0	0.0	9.9
Contingency	8.9	0.0	0.0	8.9
Total	**106.8**	**0.0**	**0.0**	**106.8**

Operating Experience:

The environmental approval for the Granite Canal development established specific fisheries habitat management requirements. The Fisheries compensation valve located at the bypass structure is used to maintain fish habitat at Granite Canal. One requirement stipulates that an average monthly flow be maintained within the man made spawning and rearing channel called Compensation Creek. To ensure adequate year-round flow, natural inflows to the creek are supplemented from water otherwise used for hydraulic production. The supplemental volumes are dependent on creek flow requirements, which change six times per year, and natural inflows which change daily. At present, the method for managing these changing requirements is to identify when personnel will be at the remote site and to have adjustments manually made in anticipation of future flow requirements.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Remote Operation of Fisheries Compensation By-Pass Valve **(cont'd.)**

Operating Experience: (cont'd.)

The Granite Canal site is remote and not regularly staffed. It has generally not been possible to have the valve's opening adjusted often in an attempt to react to changing environmental conditions. There may, at times, be a two-week period between scheduled staff availability. As a result, there is a tendency for the creek to be over compensated to avoid being in violation of the agreed compensation levels and water is lost for energy production.

Project Justification:

During 2004, approximately 27.5 Mm^3 of water was contributed to compensate the creek, while an analysis indicated that 23.7 Mm^3 would have been adequate. This lost hydroelectric production is the equivalent of approximately 567 barrels of fuel at Holyrood which would cost approximately $18,000, based on the current fuel cost projection of $32.20/bbl for 2006. The project is estimated to provide a net benefit of $99,554 over 15 years and project costs are fully recovered in seven years (see attached Cost Benefit Analysis). To ensure that this project will be completed at the least possible cost, Newfoundland and Labrador Hydro will solicit competitive bids for all material and external labour.

Future Plans:

None.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

PROJECT COST / BENEFIT ANALYSIS
Granite Canal Fisheries Compensation Valve

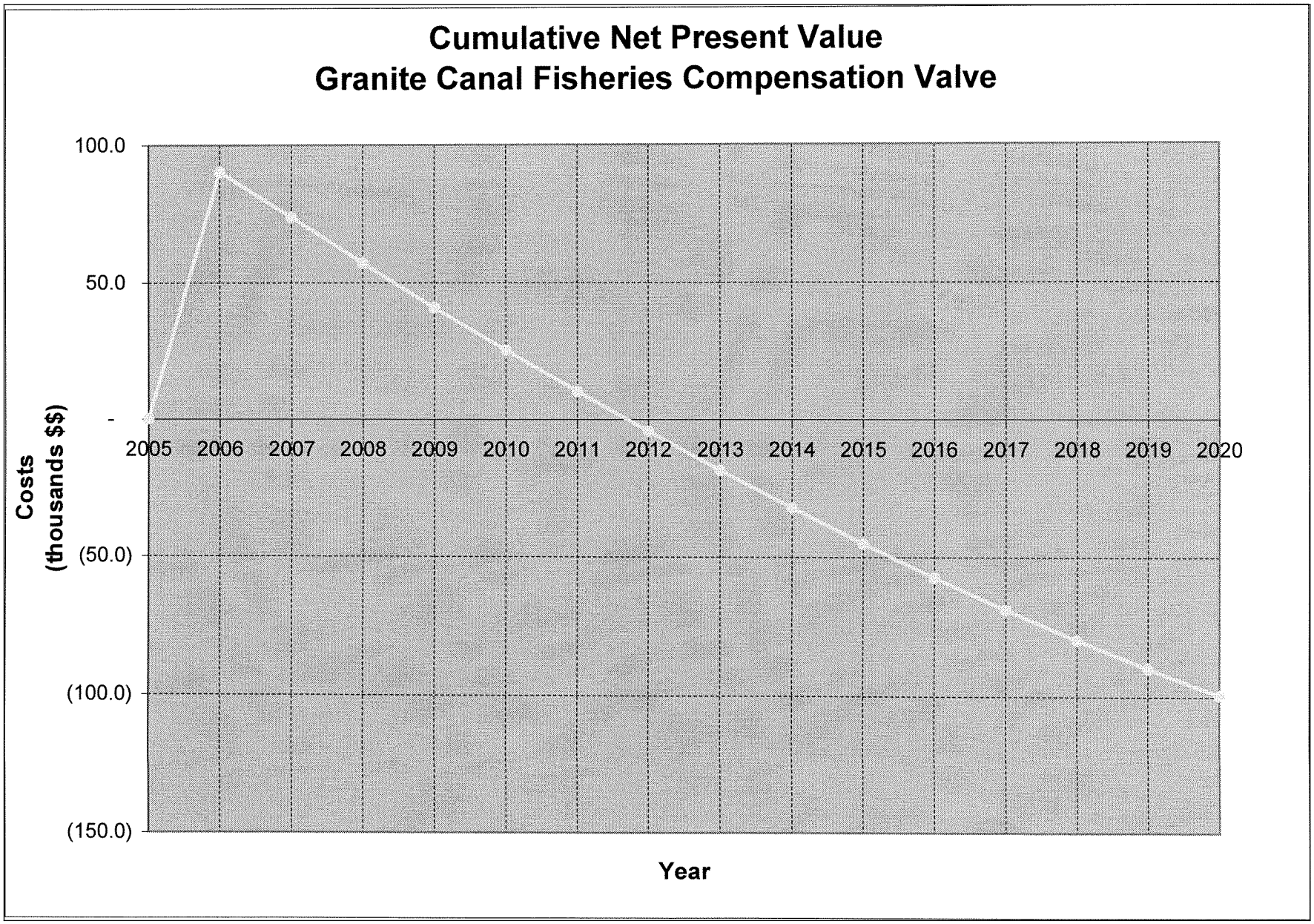
Note: Costs are shown as positive values;Benefits as negative values

Current Year	**2005**
Present Worth Year	2006
Number of Years in Study	15
Discount Rate	8.4%
Total In-service Project Cost	$ 106,800
In-service Year	2006
Other Project Cost ***after*** In-service (if applicable)	$ -
Other Project Year (if applicable)	
Replacement Cost (if applicable)	$ -
Replacement Year (if applicable)	
Project cost in Ending (**E**) or Beginning (**B**) Year $$	E
O&M costs - 75% Materials, 25% Labour (**75**) or 50% Materials, 50% Labour (**50**) or User (**U**)	50

A	B		C	D	E	F	G	H	I	J	K
Year		Fuel Series $/bbl	Annual O&M Cost $	Annual Fuel Cost $	Other Cost $	Total Costs $	Fuel Savings $	Benefit 2 *(specify)* $	NET $	P.W. January 2006	Cumulative Present Worth
0	2005		-	-	-	-	-	-	-	-	-
1	2006	32.20	102	-	-	106,902	(9,129)	-	97,773	90,197	90,197
2	2007	34.15	208	-	-	208	(19,363)	-	(19,155)	(16,301)	73,896
3	2008	38.10	212	-	-	212	(21,603)	-	(21,390)	(16,793)	57,103
4	2009	39.90	217	-	-	217	(22,623)	-	(22,406)	(16,227)	40,875
5	2010	41.40	222	-	-	222	(23,474)	-	(23,252)	(15,535)	25,340
6	2011	43.80	227	-	-	227	(24,835)	-	(24,608)	(15,167)	10,173
7	2012	45.80	232	-	-	232	(25,969)	-	(25,737)	(14,634)	(4,460)
8	2013	47.83	237	-	-	237	(27,120)	-	(26,883)	(14,101)	(18,561)
9	2014	49.85	242	-	-	242	(28,265)	-	(28,023)	(13,560)	(32,121)
10	2015	51.80	247	-	-	247	(29,371)	-	(29,123)	(13,000)	(45,121)
11	2016	52.88	253	-	-	253	(29,983)	-	(29,730)	(12,243)	(57,363)
12	2017	53.95	259	-	-	259	(30,590)	-	(30,331)	(11,522)	(68,886)
13	2018	55.05	264	-	-	264	(31,213)	-	(30,949)	(10,846)	(79,731)
14	2019	56.18	270	-	-	270	(31,854)	-	(31,584)	(10,211)	(89,942)
15	2020	57.33	277	-	-	277	(32,506)	-	(32,229)	(9,612)	(99,554)
						-			-	-	-
						-			-	-	-
						-			-	-	-
						-			-	-	-
						-			-	-	-
						-			-	-	-
						-			-	-	-
						-			-	-	-
						-			-	-	-

ASSUMPTIONS:

* Fuel Series used is Thermal Fuel Price Forecast of 10-May-05
* Granite Canal hydraulic conversion rate is 0.094 GWh/MCM
* Holyrood thermal efficiency is 630 kWh/bbl


Cumulative Net Present Value
Granite Canal Fisheries Compensation Valve
100.0
50.0
-
(50.0)
(100.0)
(150.0)
Costs
(thousands $$)
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Year

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Install Waste Oil Holding Tanks

Location: Bay d'Espoir, Upper Salmon, Hinds Lake and Paradise River

Division: Production

Category: Generation - Hydro Plants

Type: Pooled

Classification: Mandatory

Project Description:

This project involves purchase and installation of five waste oil storage tanks at various Hydro plants. Each tank shall be equipped with the necessary instrumentation and protection devices to ensure compliance with the Newfoundland and Labrador Regulation 82/02 - Used Oil Control Regulations and all currently applicable regulations and standards including: National Fire Code (NFC), Underwriters Laboratory Canada ULC/ORD C142.22 - latest revision, Underwriters Laboratory Canada UL 142, CAN4-630-M84 and/or CAN4-601-M84.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	51.4	0.0	0.0	51.4
Labour	15.3	0.0	0.0	15.3
Consultant	0.0	0.0	0.0	0.0
Contract Work	0.0	0.0	0.0	0.0
Other Direct Costs	0.0	0.0	0.0	0.0
O/H, AFUDC & Escalation	9.0	0.0	0.0	9.0
Contingency	6.7	0.0	0.0	6.7
Total	**82.4**	**0.0**	**0.0**	**82.4**

Operating Experience:

Used oil at Hydro's generation facilities is currently stored in 205 litre drums until such time as it can be collected by an approved disposal contractor.

Project Justification:

As the current waste oil storage practice is not compliant with the Newfoundland and Labrador Regulation 82/02 - Used Oil Control Regulations under the Environmental Protection Act (O.C. 2002-430), an appropriate method for storage must be made available at these locations.

To ensure that this project will be completed at the least possible cost, Newfoundland and Labrador Hydro will solicit competitive bids for all material and external labour.

Future Plans:

None.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Superheater - Unit No. 2
Location: Holyrood Generating Station
Division: Production
Category: Generation - Thermal Plant
Type: Other
Classification: Mandatory

Project Description:

This project consists of the removal and replacement of 31 upper secondary superheater elements within the high temperature superheater of the boiler on Unit No. 2 at the Holyrood Generating Plant.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	0.0	0.0	0.0	0.0
Labour	20.0	80.0	0.0	100.0
Consultant	0.0	0.0	0.0	0.0
Contract Work	265.0	2,145.0	0.0	2,410.0
Other Direct Costs	0.0	0.0	0.0	0.0
Corp O/H, AFUDC, Esc.	33.7	341.9	0.0	375.6
Contingency	0.0	251.0	0.0	251.0
Total	**318.7**	**2,817.9**	**0.0**	**3,136.6**

Operating Experience:

Unit No. 2 at Holyrood was placed in service in 1969. The normally accepted design life for thermal power plant boilers and their components is 30 years and it is normal for tube leaks to begin to occur after approximately 15 years of service. Although this boiler is now over 30 years old, because of the relatively low annual operating factor at Holyrood particularly in the early years, its effective operating age is considered to be about 17 years. The superheater consists of two sections (primary and secondary) and is used to raise the temperature of saturated steam to higher temperature in order to transport more energy to the turbine. Steam conditions leaving the secondary superheater are 1950 psi and 1005°F. The secondary superheater is exposed to the hottest gases exiting the furnace, at 2400°F.

The operation of the high temperature superheater has been reliable until recently. Tube leaks requiring outages to effect repairs have occurred in November 2002, April 2004, November 2004 (two failures), February 2005 and April 2005.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Superheater - Unit No. 2 **(cont'd.)**

Project Justification:

Holyrood Unit No. 2 with an installed capacity of 175 MW is a significant portion of Hydro's generation capacity and must be maintained to ensure system reliability and capability. The frequency of repairs to this section of the superheater has increased dramatically in recent years. Since 2004-04-01, five failures have occurred, removing the unit from service for approximately five days each time. The total cost to repair a single failure is approximately $25,000, although it can be much greater if the failure occurs in an area which is difficult to access. Tube wall thickness has deteriorated to below that required by the Province's Boiler and Pressure Vessel Act (which uses the internationally recognized ASME Boiler and Pressure Vessel Code as its design standard). In the fall of 2004, 11 of the 31 plattens in the upper section and five of the 31 plattens in the lower section were surveyed and found to be below the thickness required by Code. Many locations were found where the tube thickness is less than the 80% that is required under the Boiler and Pressure Vessel Code. When a tube failure occurs, the boiler must be immediately shut down due to the high rate of water loss. The repair time varies depending on the extent of damage caused by the burst tube. If these superheater platens are not replaced, the frequency of tube failures will increase and boiler reliability will suffer significantly, compromising Hydro's ability to service its customers. The attached photos illustrate the damage.

Future Plans:

None.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Failed superheater tube 2005-02-05

Failed superheater tube 2005-04-05

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Fire Protection Upgrade
Location: Holyrood Generating Station
Division: Production
Category: Generation - Thermal Plant
Type: Other
Classification: Normal

Project Description:

This project includes a number of measures to address fire protection issues as identified by Hydro's insurance company, Factory Mutual Global and Hydro's operating personnel. The scope of work includes the following:

1. Extend automatic sprinkler systems to provide coverage to many areas presently not covered and increase concentration in other areas. This will affect 18 individual sprinkler areas;
2. Construct metal enclosures around equipment that can potentially create an ignited oilspray situation. The purpose is to contain an oil spray and associated torch type fire inside the enclosure where it can be deluged with water. A total of 10 enclosures will be required;
3. Install fire resistant boots on flanged and threaded pipe joints that contain mineral oil at pressures above 50 psig where it is not practical to install metal enclosures as noted in item 2 above;
4. For each of units 1, 2 and 3, relocate the hydrogen and carbon dioxide manual valve stations, presently located below the generators, to an area immediately outside the operator's control room. In the event of a plant emergency requiring a quick release of the explosive hydrogen gas from the generators this modification will allow a more rapid response by operating personnel; and,
5. Engage a consultant specialized in preparing such programs for thermal generating plants, to prepare procedures and comprehensive training program for operators in responding to a large fire emergency.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	0.0	0.0	0.0	0.0
Labour	100.5	82.5	0.0	183.0
Consultant	0.0	75.0	0.0	75.0
Contract Work	720.0	444.0	0.0	1,164.0
Other Direct Costs	0.0	0.0	0.0	0.0
Corp O/H, AFUDC, Esc.	95.6	186.5	0.0	282.1
Contingency	0.0	142.2	0.0	142.2
Total	**916.1**	**930.2**	**0.0**	**1,846.3**

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Fire Protection Upgrade **(cont'd.)**

Operating Experience:

The construction of Stage 1 and 2 of the Holyrood Thermal Generating Station commenced in 1967 and 1977 respectively. The fire protection sprinkler systems designed and installed at that time do not meet current standards.

To date, the Holyrood plant has not experienced a fire which would have resulted in a large equipment/building or associated production loss. Good operating procedures have contributed to this record, however, key areas of exposure have been identified which, under the right circumstances, could quickly escalate into a large-scale loss without additional automatic suppression and containment systems. Laboratory tests conducted at FM Global research facilities in 2004 highlight the difficulty in containing and extinguishing fires fueled by pressurized mineral oils.

Project Justification:

The Holyrood Generating facility with a capacity of 466 MW is a significant portion of Hydro's generation capability. In recent years, Hydro's insurance company (FM Global) has identified areas of significant exposure while performing regular plant inspections.

Until recently, methods for mitigating some types of exposures have not been clearly documented by recognized industry standards. Such is the case related to fires emanating from pressurized mineral oil sprays. In 2004, FM Global performed large-scale mock-up demonstrations at its research facility concerning oil fires which clearly show the difficulty in containing oil fires in turbine halls. Subsequently, an engineering bulletin of recommendations, including more detailed construction guidelines, was issued by FM Global for managing this risk.

Please refer to the report titled "Holyrood Generating Station, Fire Protection Upgrade Assessment in Section H, Tab 1.

This proposal will address the identified safety concerns for operating personnel and limit the potential damage to plant equipment and the potential for extended outage to customers which, depending on the extent of damage, can range from months to years.

Future Plans:

None.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Warm Air Make-Up Steam Coil
Location: Holyrood Generating Station
Division: Production
Category: Generation - Thermal Plant
Type: Other
Classification: Normal

Project Description:

This project consists of the replacement of 13 copper/nickel alloy steam coil sections of the existing Warm Air Make-Up system with stainless steel coil sections.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	378.0	0.0	0.0	378.0
Labour	35.0	0.0	0.0	35.0
Consultant	0.0	0.0	0.0	0.0
Contract Work	79.0	0.0	0.0	79.0
Other Direct Costs	0.0	0.0	0.0	0.0
Corp O/H, AFUDC, Esc.	60.5	0.0	0.0	60.5
Contingency	49.2	0.0	0.0	49.2
Total	**601.7**	**0.0**	**0.0**	**601.7**

Operating Experience:

The Warm Air Make-Up system was installed in 1990 to address safety and health concerns with regards to improving plant ventilation and satisfy operating unit combustion air requirements. Make-up air handling units supply 100% of the boiler house and turbine hall ventilation requirements. Each of the make-up air handling units contain two copper/nickel alloy steam coil sections. These units have regularly experienced tube leaks in the steam coil sections in recent years mainly due to freezing of steam condensate in the tubes. Additionally, some of the tubes have been subjected to attack by high pH ammoniated condensate.

Project Justification:

An investigation has shown that the tubes in the steam coil sections have been subjected to freezing and corrosive attack from pH ammoniated condensate. At present, only one steam coil has not experienced a tube failure and on average 27% of the tubes in each steam coil have failed and have been removed from service. This loss of tubes has significantly reduced the heating and ventilation capacity of the system and coils must be replaced to ensure adequate ventilation of the

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Warm Air Make-Up Steam Coil **(cont'd.)**

Project Justification: (cont'd.)

powerhouse, to protect the health of personnel. As well, there are safety concerns were tubes to rupture in a confined space in the presence of operating/maintenance personnel. The attached photos illustrate the condition of the steam coils.

Future Plans:

None.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

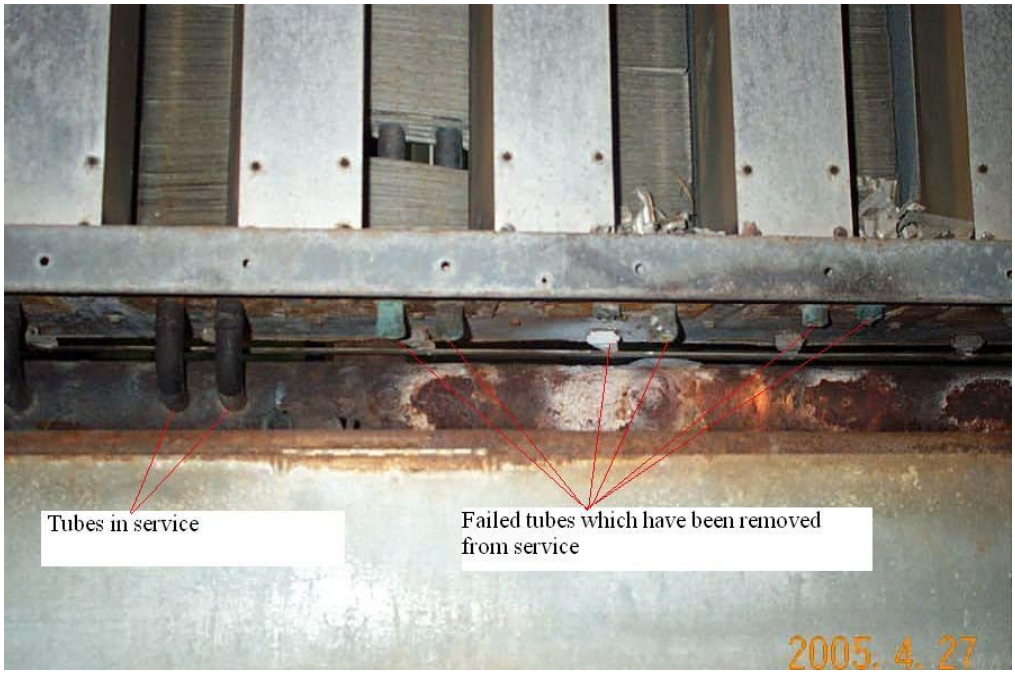
Project Title: Replace Warm Air Make-Up Steam Coil **(cont'd.)**

Steam coil with one ruptured tube removed and its connection capped

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Warm Air Make-Up Steam Coil **(cont'd.)**

Ruptured steam tube



Steam coil section with failed tubes

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: HVAC Replacements - Relay, Control and Exciter Rooms
Location: Holyrood Generating Station
Division: Production
Category: Generation - Thermal Plant
Type: Other
Classification: Normal

Project Description:

This project involves the replacement of five heating and ventilation units which serve the generating unit relay and exciter rooms and the plant control room. All but the exciter room unit will be replaced with units of similar capacity. The exciter room unit will be replaced with a unit of 50% greater capacity. This project will include the removal and disposal of the existing units in accordance with provincial environmental regulations and the supply and installation of replacement units with associated mechanical, electrical and civil work as required.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	230.0	0.0	0.0	230.0
Labour	84.5	0.0	0.0	84.5
Consultant	0.0	0.0	0.0	0.0
Contract Work	145.0	0.0	0.0	145.0
Other Direct Costs	0.0	0.0	0.0	0.0
Corp O/H, AFUDC, Esc.	59.9	0.0	0.0	59.9
Contingency	46.0	0.0	0.0	46.0
Total	**565.4**	**0.0**	**0.0**	**565.4**

Operating Experience:

Stage 1 and 2 of the Holyrood Thermal Generating Station commenced in 1967 and 1977 respectively. When the construction took place, heating and cooling equipment was installed in various areas to maintain proper environmental conditions for the production equipment and also for the operating personnel working in these areas. Over the years, some of the plant's HVAC units have been replaced at the end of their service lives. However, five units serving the relay rooms, operator's control room, and the exciter room are the original units and are now in excess of 25 years old. They are well beyond the manufacturer's recommendation for reliable life expectancy.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: HVAC Replacements - Relay, Control and Exciter Rooms **(cont'd.)**

Operating Experience: (cont'd.)
The existing HVAC units have met cooling demand to this point in time however maintenance issues are arising with increasing frequency. Issues in recent years include: internal controls failure, refrigerant leaks, coil leaks requiring soldering, vibration problems, compressor failure and condenser high-pressure cutout.

Additional electrical equipment has been added to the exciter room since the original construction period thereby increasing the cooling load of this room resulting in the existing HVAC unit occasionally failing to maintain the appropriate temperature. On occasion, temporary fans have had to be installed to flush air through the room to reduce temperatures.

Project Justification:
HVAC units are required to maintain proper environmental conditions inside the relay rooms, operator's control room, and exciter room. This is required to prevent overheating of critical protection and control equipment housed inside these areas which would result in component failure and disruption to power generation.

The HVAC units proposed for replacement are the original units installed with the plant and have exceeded their expected service life. They were manufactured by three different companies, two of which are no longer in business and the third has not made parts for the models at Holyrood for a number of years. A condition report prepared in 2004 by Hydro's HVAC service contractor, Black & McDonald (see attached), notes that all units are operating well beyond their life expectancy and are not reliable.

All of the HVAC units in question operate using a refrigerant R-22 which is discontinued due to environmental concerns and Federal regulations have required that production of this refrigerant be phased out commencing in 2004.

Should a failure occur to a critical generator unit protection or control component, it would likely result in an extended customer outage as these generating units provide 140 MW to 165 MW of capacity to the system. An emergency replacement of the HVAC will take three to four months to install and subject the plant and the power systems to the potential for major outages in the interim.

Future Plans:
None.

19 A Dundee Ave.
Mt. Pearl, NL
A1N 4R6

Newfoundland And Labrador Hydro
P. O. Box 12400
St. John's, NL
A1B 4K7

April 28, 2005

Att: Nelson Seymour

As per your request, here is a report on the following A/C units at Holyrood .

HVAC Unit Serving Exciter Rm:

- Unit is approx. 25 to 30 years old.
- The life expectancy is 12 to 15 years according to manufacturer.
- Unit has had a high volume of repairs in the past and it is anticipated that his will continue in the future. The unit is no longer considered to be reliable.
- The capacity for cooling is too small as additional equipment has been added to this room since the A/C unit was originally installed.
- The unit has water-cooled condensers that are located in critical areas near electrical equipment. This is a poor arrangement as a water leak could damage electrical equipment.
- Energy consumption of the old unit is excessive compared to newer ones.

HVAC Units (Four) Serving Relay Rooms 1 & 2:

- Unit is approx. 25 to 30 years old.
- The life expectancy is 12 to 15 years according to manufacturer.
- Unit has had a high volume of repairs in the past and it is anticipated that his will continue in the future. The unit is no longer considered to be reliable.
- The unit has water-cooled condensers that are located in critical areas near electrical equipment. This is a poor arrangement as a water leak could damage electrical equipment.
- Energy consumption of the old units is excessive compared to newer ones.

All of the existing air conditioning units above operate using refrigerant R 22 which is not environmentally friendly. Federal regulations required that production of this refrigerant be phased out commencing in 2004. It is recommended that your old existing A/C units be replaced with new ones operating on an approved environmentally friendly refrigerant.

Regards

David Finn
Service Division

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Study of Regeneration Waste Treatment
Location: Holyrood
Division: Production
Category: Generation - Thermal Plant
Type: Other
Classification: Mandatory

Project Description:

This project consists of a feasibility study to identify the most appropriate manner to treat the regeneration waste streams in order to satisfy the requirements of the Province's water and sewer regulations. The study will include: reviewing the operation of the existing wastewater treatment plant; investigating possible treatment methods for polisher and water deionization wastes; performing a laboratory bench scale investigation of potentially viable treatment methods; and preparing preliminary capital cost estimates for selected alternatives.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	0.0	0.0	0.0	0.0
Labour	26.0	0.0	0.0	26.0
Consultant	116.0	0.0	0.0	116.0
Contract Work	0.0	0.0	0.0	0.0
Other Direct Costs	10.0	0.0	0.0	10.0
O/H, AFUDC & Escalation	5.0	0.0	0.0	5.0
Contingency	15.2	0.0	0.0	15.2
Total	**172.2**	**0.0**	**0.0**	**172.2**

Operating Experience:

During each operating season, the Holyrood plant performs many regenerations of the water treatment plant deionization and condensate polisher trains resulting in a discharge of large volumes of contaminated water into Conception Bay.

Project Justification:

In 2003, Hydro initiated a study to review the regeneration wastewater streams at Holyrood to identify the chemical composition at various points during the regeneration process. Water samples were collected during a number of condensate polisher and water treatment train regenerations and

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Study of Regeneration Waste Treatment **(cont'd.)**

Project Justification: (cont'd.)

were analyzed. These wastewater streams are currently discharged directly to the environment without any sort of treatment. Discharges resulting from these processes are estimated in excess of 3.4 million US gal/year. The waste streams vary from acidic to basic and contain suspended solids and chemicals, including ammonia, contravening the Province's Environmental Legislation (Regulation 65/03 Environmental Control Water and Sewage Regulations, 2003 - Water Resources Act O.C. 2003-231). Hydro has been able to continue to operate in this manner because of provisional approval provided by the Provincial and Federal Environmental Departments which permitted discharge of regeneration wastes into seal pits as long as at least one cooling water pump was operating and providing diluting flow. This study is being pursued to identify means to comply with regulations and to mitigate the plant's impact on the local environment.

Future Plans:

Following the completion of this study, Hydro will prepare a capital budget proposal and seek approval for the construction of a treatment facility.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Modify Boiler Protection and Control
Location: Holyrood
Division: Production
Category: Generation - Thermal Plant
Type: Other
Classification: Normal

Project Description:

This project consists of a review of the drum level instrumentation on the three units at Holyrood to determine the appropriate transmitter locations, the instruments to be used, and the appropriate trip level values. As well, the current 3-element drum level control will be changed to a 4-element control with the addition of drum pressure and a modification will be made to the steam flow calculation to correct steam flow for any changes in throttle conditions. The proposal includes the installation of extension piping on the lower level connections on Unit No. 3 to eliminate any effect from the economizer water discharge. The piping would be extended along the drum length towards the drum centre.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	2.0	0.0	0.0	2.0
Labour	50.0	0.0	0.0	50.0
Consultant	43.0	0.0	0.0	43.0
Contract Work	0.0	0.0	0.0	0.0
Other Direct Costs	0.0	0.0	0.0	0.0
O/H, AFUDC & Escalation	12.1	0.0	0.0	12.1
Contingency	9.5	0.0	0.0	9.5
Total	**116.6**	**0.0**	**0.0**	**116.6**

Operating Experience:

Boiler controls on the three units have been modified over the years consistent with changes made to the distributed control systems and as needed to correct problems. Over the past five years, there have been eight drum level trips which resulted in system underfrequency events.

A review was undertaken of the boiler/turbine protection on the three units at Holyrood and changes were identified for the drum level instrumentation, the drum level control and the steam flow calculation for all three boilers.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Modify Boiler Protection and Control **(cont'd.)**

Project Justification:

The proposed modifications are consistent with current modern utility practices and will increase the stability of the boiler during system upsets and should reduce unnecessary drum level trips. The loss of a Holyrood unit at 140 - 165 MW will always result in an underfrequency event. This project will contribute to fewer unit trips and therefore fewer under-frequency load-shedding incidents.

Future Plans:

None.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replacement of Paging System
Location: Holyrood Generating Station
Division: Production
Category: Generation - Thermal Plant
Type: Other
Classification: Mandatory

Project Description:

This project consists of the replacement of the paging system at the Holyrood Generating Station. The new paging system will extend coverage to plant out buildings, waste water treatment plant, pump houses, warehouse, training centre, pipe shop, chemical storage building, tank farm and the marine terminal. The system will also permit paging using the existing office telephones which will facilitate future expansion, when required.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	170.0	0.0	0.0	170.0
Labour	10.0	0.0	0.0	10.0
Consultant	0.0	0.0	0.0	0.0
Contract Work	42.4	0.0	0.0	42.4
Other Direct Costs	0.0	0.0	0.0	0.0
O/H, AFUDC & Escalation	29.9	0.0	0.0	29.9
Contingency	22.2	0.0	0.0	22.2
Total	**274.5**	**0.0**	**0.0**	**274.5**

Operating Experience:

The current paging system at the Holyrood Generation Station was part of the original installation in 1970 and now is 35 years old and has reached the end of its useful life and is obsolete. The system has poor sound quality and is not able to support desired expanded functionality either in features or extended area coverage. A recent event illustrates the concerns. On July 6, 2005 a turbocharger failure on the 400 kW emergency diesel generator resulted in exhaust gas being discharged inside the powerhouse resulting in an emergency evacuation of all employees. As it looked to employees that the smoke had cleared from the lower elevations of the building and because clear and audible update instructions could not be understood in the evacuation/roll call locations, a number of employees re-entered the evacuated areas after what they had believed to be adequate time for the emergency to have been dealt with, despite communication to the contrary by operating personnel dealing with the emergency. However, this information was not received due to the inadequacy of the current paging system.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replacement of Paging System **(cont'd.)**

Project Justification:

The Holyrood paging system is used to page staff, and warn of potential dangerous situations. The current system cannot easily be extended to cover certain areas of the facilities out buildings. Additionally parts have deteriorated and replacement availability has been an issue with some being unavailable and obsolete.

The Holyrood paging system is the primary communications link for emergency protocols for the plant's Emergency Response Program (ERP) which covers fire, first aid, confined space rescue, marine oil spills and controlled substance spills. This system is considered critical for personnel safety and protection of the plant assets. The current system has very poor sound quality, messages are often missed and are generally difficult to discern, many of the speakers and feeds are in need of continual repair, which results in higher maintenance costs. The lack of parts and the presence of a number of areas with poor or no coverage has been identified as a safety concern.

Future Plans:

None.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Automatic Voltage Regulator

Location: Hardwoods Gas Turbine

Division: Production

Category: Generation - Gas Turbine

Type: Other

Classification: Normal

Project Description:

This project consists of the replacement of the original Automatic Voltage Regulator (AVR) at the Hardwoods Gas Turbine. The project will be completed by internal forces.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	145.0	0.0	0.0	145.0
Labour	49.0	0.0	0.0	49.0
Consultant	0.0	0.0	0.0	0.0
Contract Work	0.0	0.0	0.0	0.0
Other Direct Costs	2.0	0.0	0.0	2.0
O/H, AFUDC & Escalation	25.9	0.0	0.0	25.9
Contingency	19.6	0.0	0.0	19.6
Total	**241.5**	**0.0**	**0.0**	**241.5**

Operating Experience:

The 50 MW Hardwoods Gas Turbine is over 30 years old. Over the past five years, the unit has operated an average of 1722 hours providing voltage support and 27.6 hours providing generation. Problems have been experienced with the AVR, the latest occurred in 2004. Hydro has not been able to obtain technical support or locate spare parts in a timely manner as the manufacturer no longer supports the product.

Project Justification:

The existing AVR is over 30 years old and problems have been experienced. The manufacturer no longer makes replacement parts or supports the product. The AVR needs to be replaced before a major component failure renders it irreparable and results in an extended outage until a new unit is installed. This gas turbine serves as a peaking unit and provides voltage support and emergency supply to the eastern transmission system. Its loss could affect transmission and generation maintenance planning, ability to serve customers over peak and to provide critical voltage support to the eastern network.

Future Plans:

None.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Wood Pole Line Management
Location: Various Sites
Division: Transmission & Rural Operations
Category: Transmission
Type: Pooled
Classification: Normal

Project Description:

The project is the second year of an ongoing program of inspection, treatment and replacement of line components (poles, conductor and hardware) on Hydro's transmission system.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	295.0	0.0	0.0	295.0
Labour	1,236.0	0.0	0.0	1,236.0
Consultant	50.0	0.0	0.0	50.0
Contract Work	0.0	0.0	0.0	0.0
Other Direct Costs	326.0	0.0	0.0	326.0
O/H, AFUDC & Escalation	204.9	0.0	0.0	204.9
Contingency	190.7	0.0	0.0	190.7
Total	**2,302.6**	**0.0**	**0.0**	**2,302.6**

Operating Experience:

Hydro operates approximately 2800 km (26,000 poles) of wood pole transmission lines operating at 69, 138 and 230 kV. Historically, Hydro's pole inspection and maintenance practices followed the traditional utility approach of sounding inspections, only. In 1998, Hydro decided to take core samples on selected poles to test for preservative retention levels and pole decay. The results of these additional tests raised concerns regarding the general preservative retention levels in wood poles. Between 1998 and 2003, additional coring and preservative testing confirmed that there were a significant number of poles which had a preservative level below what was required to maintain the design criteria for the lines. During this period, certain poles were replaced because the preservative level had lowered to the point that decay had advanced and the pole was no longer structurally sound. These inspections and analysis confirmed that a more formal wood pole line management program was required.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Wood Pole Line Management **(cont'd.)**

Project Justification:

A report titled "Wood Pole Line Management Using RCM Principles" was filed with Hydro's 2005 Capital Budget Application under Section G: Appendix 2. This report recommended that a formal program be established to manage wood pole line assets. The program consists of visual inspection, non-destructive testing and selected treatment of the wood poles. Poles that are deteriorated beyond the point where treatment could extend the life are identified for replacement. Field data is collected and stored electronically, and a comprehensive database of the program results is maintained. The program will extend the life of the wood pole assets by an average of ten years with a net benefit of $4.5 million in deferred replacement costs over that same period.

An Executive Summary Report is included in Section H, Tab 2, of the Application which provides an update of the 2004 program, a progress report of 2005 work and a forecast of the proposed objectives for 2006 and beyond.

Future Plans:

This is an ongoing program that will provide for all poles to be inspected and treated and any poles rejected will be replaced.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Insulators TL 231 (230 kV Bay d'Espoir - Stoney Brook)
Location: Bay d'Espoir to Stoney Brook
Division: Transmission & Rural Operations
Category: Transmission
Type: Other
Classification: Normal

Project Description:

TL231 is a 230 kV transmission line connecting Bay d'Espoir to the Stoney Brook Terminal Station - a distance of 105.3 km. It is a steel tower line constructed in 1976 to link the Bay d'Espoir generating plant to the central region of the island. To date all COB insulators on the angle and dead-end structures have been replaced. This project consists of the replacement of the remaining COB insulators on the tangent structures on the line.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	332.0	0.0	0.0	332.0
Labour	100.0	0.0	0.0	100.0
Consultant	20.0	0.0	0.0	20.0
Contract Work	270.0	0.0	0.0	270.0
Other Direct Costs	22.0	0.0	0.0	22.0
O/H, AFUDC & Escalation	98.2	0.0	0.0	98.2
Contingency	74.4	0.0	0.0	74.4
Total	**916.6**	**0.0**	**0.0**	**916.6**

Operating Experience:

Each year, the annual Preventive Maintenance (PM) cycle indicates the number of defective insulators is rising as the line ages due to the known problem with COB insulators.

Project Justification:

These insulators were manufactured by the Canadian Ohio Brass Company, commonly referred to as COB, and were installed during the original construction of TL231 in 1976. These COB insulators are a part of a group of insulators that have experienced industry wide failures due to cement growth causing radial cracks that resulted in moisture intrusion. With more failures expected with each PM cycle, the replacement of only the defective insulators is cost prohibitive and a poor long-term maintenance strategy. The most effective remedy at this time is to replace all the remaining units.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Insulators TL 231 (230 kV Bay d'Espoir - Stoney Brook) **(cont'd.)**

Project Justification: (cont'd.)

To ensure that this project will be completed at the lowest possible cost, Hydro will solicit competitive bids for all materials and external labour.

Future Plans:

None.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Upgrade Corner Brook Frequency Converter
Location: Corner Brook
Division: Transmission & Rural Operations
Category: Transmission
Type: Clustered
Classification: Normal

Project Description:

This project consists of the rewinding of frequency converter transformer T1 and an upgrade of the converter building cooling and ventilation systems.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	337.0	0.0	0.0	337.0
Labour	129.2	0.0	0.0	129.2
Consultant	0.0	0.0	0.0	0.0
Contract Work	37.5	0.0	0.0	37.5
Other Direct Costs	0.0	0.0	0.0	0.0
O/H, AFUDC & Escalation	62.4	0.0	0.0	62.4
Contingency	50.4	0.0	0.0	50.4
Total	**616.5**	**0.0**	**0.0**	**616.5**

Operating Experience:

Transformer maintenance tests have shown the transformer's condition to be suspect and the probability of a catastrophic failure to be high. The converter is operating satisfactorily, however the lack of adequate ventilation results in the unit operating at higher than recommended temperatures which could lead to unit outages.

Project Justification:

This work is recommended as a result of an Engineering Condition Assessment of the Corner Brook Frequency Converter completed in April, 2005. Please refer to Section H, Tab 3. It is recommended that the transformer be rewound, to avoid a catastrophic failure, and possible damage to other equipment. The recommendations also include an upgrade to the converter building ventilation and cooling systems so that the converter overheating problems are eliminated. The loss of the converter for an extended period would result in Deer Lake Power being unable to convert 50 Hz generation to 60 Hz for the paper mill's consumption and would consequently increase the mill's requirement from Hydro for the duration of the outage and would pose a risk of spill at the Deer Lake Plant depending on the reservoir conditions.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Upgrade Corner Brook Frequency Converter **(cont'd.)**

Project Justification: (cont'd.)

To ensure that this project will be completed at the lowest possible cost, Hydro will solicit competitive bids for all materials and external labour.

Future Plans:

None.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Upgrade 138 kV and 66 kV Protection Systems
Location: Bottom Brook Terminal Station
Division: Transmission & Rural Operations
Category: Transmission
Type: Other
Classification: Normal

Project Description:

This project consists of the purchase and installation of microprocessor based relays and associated equipment, to upgrade the protection on the 138 kV and 66 kV systems in the Bottom Brook Terminal Station. The station serves Newfoundland Power, Abitibi Consolidated and Hydro Rural.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	38.0	0.0	0.0	38.0
Labour	50.0	0.0	0.0	50.0
Consultant	0.0	0.0	0.0	0.0
Contract Work	0.0	0.0	0.0	0.0
Other Direct Costs	1.0	0.0	0.0	1.0
O/H, AFUDC & Escalation	11.0	0.0	0.0	11.0
Contingency	8.9	0.0	0.0	8.9
Total	**108.9**	**0.0**	**0.0**	**108.9**

Operating Experience:

The existing protection equipment is the older electromagnetic relays, which are difficult to maintain and calibrate.

Project Justification:

This project will improve the protection on the 138 kV and 66 kV systems which presently have electromagnetic relays for both zone and ground protection. The new equipment will provide faster fault clearing times and will be self-monitoring to the extent that if there are problems with the relay it will be alarmed, functionally blocked, and addressed before the relay fault causes any problem. The relays will also provide remotely retrievable fault distance location information. This new equipment will provide significant improvements to line reliability by enabling improved and timely analysis for correction of problems. This is part of an ongoing initiative to improve protection systems on the bulk electrical system.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Upgrade 138 kV and 66 kV Protection Systems **(cont'd.)**

Project Justification: (cont'd.)

To ensure that this project will be completed at the lowest possible cost, Hydro will solicit competitive bids for all materials and external labour.

Future Plans:

None.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Data Collection and Monitoring System

Location: Hawke Hill Monitoring Site

Division: Transmission & Rural Operations

Category: Transmission

Type: Other

Classification: Normal

Project Description:

This project consists of the replacement of existing data collection and monitoring system at the Hawke Hill Test Site with all new data collection A/D boards, serial ports and counter boards, and software. A radio link is included to provide higher reliability and security in the acquisition of data.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	0.0	0.0	0.0	0.0
Labour	20.0	0.0	0.0	20.0
Consultant	0.0	0.0	0.0	0.0
Contract Work	0.0	0.0	0.0	0.0
Other Direct Costs	25.0	0.0	0.0	25.0
O/H, AFUDC & Escalation	6.5	0.0	0.0	6.5
Contingency	4.5	0.0	0.0	4.5
Total	**56.0**	**0.0**	**0.0**	**56.0**

Operating Experience:

The Hawke Hill Test Site was commissioned in 1993. This site is operating satisfactorily and has collected data from several icing storms. The data collected is used by Hydro to develop and validate design criteria for existing lines and for line upgrades and to validate ice models for long-term operational needs.

Project Justification:

The data acquisition and collection system presently in place is the original system installed in 1993. The operating system is DOS based, the hardware is outdated and manufacturer support is not readily available. When problems occur, it is difficult to source the parts needed and it is very cumbersome to maintain. The system is obsolete and therefore, any new hardware would not be supported by the existing software.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Data Collection and Monitoring System **(cont'd.)**

Project Justification: (cont'd.)

The upgrade is required to maintain reliability, improve processing and ensure a faster solution to any problems that occur. As well, it will ensure the continuity of support in the future as repairs to the existing site may no longer be possible.

To ensure that this project will be completed at the lowest possible cost, Hydro will solicit competitive bids for all materials and external labour.

Future Plans:

None.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Insulators

Location: Various Terminal Stations

Division: Transmission & Rural Operations

Category: Terminals

Type: Pooled

Classification: Normal

Project Description:

This project consists of the purchase, installation and replacement of 230, 138, 69 and 25 kV, station post and suspension insulators at various terminal stations. Due to the quantity of insulators to be changed and the number of outages required to complete this work, it is planned to complete the replacements over a 5-year period. This proposal is for the first year of the replacement program.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	120.0	0.0	0.0	120.0
Labour	114.0	0.0	0.0	114.0
Consultant	0.0	0.0	0.0	0.0
Contract Work	0.0	0.0	0.0	0.0
Other Direct Costs	14.0	0.0	0.0	14.0
O/H, AFUDC & Escalation	34.0	0.0	0.0	34.0
Contingency	24.8	0.0	0.0	24.8
Total	**306.8**	**0.0**	**0.0**	**306.8**

Operating Experience:

In 2005, a survey of all terminal stations was completed and all suspect insulators were identified. These suspect insulators have a history of creating problems throughout the Hydro system where failures occur during adverse weather conditions and as a result, restoration times are impacted considerably. Inspections have identified hairline cracks in the porcelain and in the cement bonding between the porcelain, and the metal castings.

Project Justification:

The insulators identified for this proposal were manufactured by the Canadian Ohio Brass Company (COB). These are part of a group of insulators that exhibit failures due to cement growth causing radial cracks that result in moisture intrusion. The cracking porcelain and consequent decrease in mechanical strength has the potential for the insulator to break apart, thus presenting a safety hazard for workers. As well, insulator failure will result in delivery point interruptions and decrease the level of service to customers. The most effective remedy is to replace these insulators.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Insulators **(cont'd.)**

Project Justification: (cont'd.)

To ensure that this project will be completed at the lowest possible cost, Hydro will solicit competitive bids for all materials and external labour.

Future Plans:

This is the first year of a program of replacement of insulators at various stations. Replacements in future years will be proposed separately. This project will be complete in 2006.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Battery Chargers
Location: Various Terminal Stations
Division: Transmission & Rural Operations
Category: Terminals
Type: Pooled
Classification: Normal

Project Description:

The project consists of the purchase and installation of replacement battery chargers at Deer Lake, Bay d'Espoir, Western Avalon and Corner Brook Frequency Converter terminal stations. The battery chargers will be designed to be compatible with the existing battery banks.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	50.0	0.0	0.0	50.0
Labour	24.0	0.0	0.0	24.0
Consultant	0.0	0.0	0.0	0.0
Contract Work	0.0	0.0	0.0	0.0
Other Direct Costs	0.0	0.0	0.0	0.0
O/H, AFUDC & Escalation	8.3	0.0	0.0	8.3
Contingency	7.4	0.0	0.0	7.4
Total	**89.7**	**0.0**	**0.0**	**89.7**

Operating Experience:

A review of the maintenance history on battery chargers was completed and indicated problems caused by Staticon and Cigentic chargers which were 15 years old or more. The Cigentic chargers in Deer Lake and Bay d'Espoir were installed in 1980 and 1981 respectively. The Staticon charger in Western Avalon was installed in 1986 and the charger in Corner Brook Frequency Converter was a unit originally installed in another location. These chargers have recently required significant repairs and are approaching or beyond the normal expected service life.

Project Justification:

The station service direct current (DC) system consists of a battery charger, battery bank and DC distribution panel. This DC source provides the control voltage for the station protection, remote and local controls, event logging, and annunciation. With the loss of the charger, the battery bank will discharge and be depleted such that station protection and control and information to ECC would become unavailable. Given the importance of the battery chargers in providing system reliability, Hydro considers it prudent to implement a program to replace the outdated chargers on the system.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Battery Chargers **(cont'd.)**

Project Justification: (cont'd.)

To ensure that this project will be completed at the lowest possible cost, Hydro will solicit competitive bids for all materials and external labour.

Future Plans:

This is the first year of a multi-year program for replacement of battery chargers at various stations. Replacements in future years will be proposed separately.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Air Compressor and Dryer
Location: Grand Falls Frequency Converter Station
Division: Transmission & Rural Operations
Category: Terminals
Type: Other
Classification: Normal

Project Description:

This project consists of replacing a compressor, and heat-regenerated air dryer at the Grand Falls Frequency Converter Terminal Station. The replacement compressor will be similar to the other unit in the station for parts compatibility and stocking purposes. The dryer will be an electronically controlled, low air consumption, energy efficient model. Permitting and inspection is required under the Boiler, Pressure Vessel, and Compressed Gas Regulations.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	40.0	0.0	0.0	40.0
Labour	23.0	0.0	0.0	23.0
Consultant	0.0	0.0	0.0	0.0
Contract Work	0.0	0.0	0.0	0.0
Other Direct Costs	2.5	0.0	0.0	2.5
O/H, AFUDC & Escalation	7.6	0.0	0.0	7.6
Contingency	6.6	0.0	0.0	6.6
Total	**79.7**	**0.0**	**0.0**	**79.7**

Operating Experience:

The compressor is a Broomwade unit that has been in service since 1964 and has a cumulative run time of 19,558 hours. When the other compressor in the station was replaced in 2000, it was stripped for parts to extend the life of this compressor. These parts have now all been used. Since late 1999 the compressor has had a total of 20 corrective maintenance jobs completed at a total cost of $8,560. Currently, parts for the 1964 vintage compressor are unavailable.

Similarly, the air dryer, a 1972 vintage unit has been subject to failures. In particular, in recent years critical repair parts have been virtually impossible to source. As a result, the long-term reliability of this asset cannot be assured.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Air Compressor and Dryer **(cont'd.)**

Project Justification:

The compressed air system is critical to the terminal station's air operated equipment and due to age, operating hours, reduced reliability and lack of availability of replacement parts the compressor and the air dryer must be replaced. As parts are unavailable due to the age of the compressor and air dryer, a repair option is not practical.

To ensure that this project will be completed at the lowest possible cost, Hydro will solicit competitive bids for all materials and external labour.

Future Plans:

None.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Air Compressors
Location: Holyrood Terminal Station
Division: Transmission & Rural Operations
Category: Terminals
Type: Other
Classification: Normal

Project Description:

This project consists of the replacement of two Ingersoll Rand 3-stage high-pressure compressors and associated condensate oil/water separator at the Holyrood Terminal Station. Permitting and inspection of the new installation is required under the Boiler, Pressure Vessel, and Compressed Gas Regulations.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	45.0	0.0	0.0	45.0
Labour	21.0	0.0	0.0	21.0
Consultant	0.0	0.0	0.0	0.0
Contract Work	0.0	0.0	0.0	0.0
Other Direct Costs	0.0	0.0	0.0	0.0
O/H, AFUDC & Escalation	7.2	0.0	0.0	7.2
Contingency	6.7	0.0	0.0	6.7
Total	**79.9**	**0.0**	**0.0**	**79.9**

Operating Experience:

These compressors have been in service since the early 1970's and each have approximately 13,000 operating hours. Since late 1999, there have been 62 corrective maintenance jobs on the compressors for a total cost of $73,447.

Project Justification:

The compressed air system is critical to the operation of 230 kV air blast circuit breakers in the Holyrood Terminal Station. The compressed air has a dual function in that it provides the mechanical energy to close the breaker as well as provide the interrupting medium to extinguish the arc during the breaker opening operation. If the compressed air supply to the breaker fails, the breaker will not operate. This will result in a higher risk of equipment damage as remote breakers will have to operate on back-up protection and as an added consequence it poses a safety risk because of the delayed isolation of faulted equipment. As well, the extent and duration of any outage to customers will increase.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Air Compressors **(cont'd.)**

Project Justification: (cont'd.)

To ensure that this project will be completed at the lowest possible cost, Hydro will solicit competitive bids for all materials and external labour.

Future Plans:

None.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Instrument Transformers
Location: Various Terminal Stations
Division: Transmission & Rural Operations
Category: Terminals
Type: Pooled
Classification: Normal

Project Description:

This project consists of the purchase and installation of replacement instrument transformers (potential transformers, capacitive voltage transformers and current transformers) at various terminal stations across the Hydro system.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	60.0	0.0	0.0	60.0
Labour	4.5	0.0	0.0	4.5
Consultant	0.0	0.0	0.0	0.0
Contract Work	0.0	0.0	0.0	0.0
Other Direct Costs	0.6	0.0	0.0	0.6
O/H, AFUDC & Escalation	6.8	0.0	0.0	6.8
Contingency	6.5	0.0	0.0	6.5
Total	**78.4**	**0.0**	**0.0**	**78.4**

Operating Experience:

Instrument transformers have a typical service life of 30 - 40 years, depending on the service conditions. Units are inspected and tested regularly and replacements are made based on these maintenance assessments or on "in-service" failures. The maintenance assessments for instrument transformers are visual inspection and voltage/current checks of the secondary circuits. Typically, approximately six instrument transformers fail or need to be replaced each year.

Project Justification:

Instrument transformers provide critical input to protection, control and metering equipment required for the reliable operation and protection of the electrical system. Instrument transformers which fail in-service can result in faults on the electrical system and outages to customers.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Instrument Transformers **(cont'd.)**

Project Justification: (cont'd.)

When these units fail the normal utility practice is to replace them as they are not repairable and to hold a reserve inventory sufficient to replace in service units based on maintenance assessments or failure.

To ensure that this project will be completed at the lowest possible cost, Hydro will solicit competitive bids for all materials.

Future Plans:

This is an annual allotment which will be adjusted from year to year depending on ongoing performance.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Battery Banks
Location: Various Terminal Stations
Division: Transmission & Rural Operations
Category: Terminals
Type: Pooled
Classification: Normal

Project Description:

The project consists of the purchase and installation of new lead/calcium, flooded cell, battery banks at Grandy Brook, Indian River and Bay d'Espoir Terminal Stations. The batteries will be designed to be mounted on the existing battery racks and will be compatible with the existing chargers, which are fully operational and do not need to be replaced at this time. The old batteries will be removed from service and disposed of at an approved disposal site. The replacement batteries will be the same size and rating as the existing units because the station DC load requirements have not changed.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	35.0	0.0	0.0	35.0
Labour	24.0	0.0	0.0	24.0
Consultant	0.0	0.0	0.0	0.0
Contract Work	0.0	0.0	0.0	0.0
Other Direct Costs	0.0	0.0	0.0	0.0
O/H, AFUDC & Escalation	6.7	0.0	0.0	6.7
Contingency	5.9	0.0	0.0	5.9
Total	**71.6**	**0.0**	**0.0**	**71.6**

Operating Experience:

The station batteries proposed for replacement are approaching or beyond the normal expected service live. For Grandy Brook, Indian River and Bay d'Espoir stations, the flooded cell batteries were installed in 1985, 1987 and 1987 respectively. Through maintenance inspections, the batteries show signs of deterioration and are approaching or beyond the expected 20 year service life for a flooded cell battery bank.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Battery Banks **(cont'd.)**

Project Justification:

The direct current (DC) station service system consists of a battery charger, battery bank and DC distribution panel. This DC source provides the control voltage for the station protection, remote and local controls, event logging, and annunciation. With the loss of the battery bank, the station protection and control and information to Energy Control Centre would not be available. Given the importance of the battery banks in providing system reliability, it is necessary to replace these battery banks at this time.

To ensure that this project will be completed at the lowest possible cost, Hydro will solicit competitive bids for all materials and external labour.

Future Plans:

None.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Surge Arrestors
Location: Various Terminal Stations
Division: Transmission & Rural Operations
Category: Terminals
Type: Pooled
Classification: Normal

Project Description:

This project consists of the purchase and installation of replacement surge arrestors at various terminal stations across the system.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	48.0	0.0	0.0	48.0
Labour	10.0	0.0	0.0	10.0
Consultant	0.0	0.0	0.0	0.0
Contract Work	0.0	0.0	0.0	0.0
Other Direct Costs	0.0	0.0	0.0	0.0
O/H, AFUDC & Escalation	6.2	0.0	0.0	6.2
Contingency	5.8	0.0	0.0	5.8
Total	**70.0**	**0.0**	**0.0**	**70.0**

Operating Experience:

Surge arrestors provide critical overvoltage protection for power system equipment from lightning and switching surges. Throughout the system there are surge arrestors in the 69 kV, 138 kV and 230 kV voltage classes. Replacements are typically required as a result of maintenance assessments, in-service failures, and equipment that has reached the end of its useful service life. Equipment manufacturers indicate the useful service life of surge arrestors as twenty years. Typically, fifteen surge arrestors will require replacement per year across the system.

Project Justification:

In-service failures of surge arrestors due to severe lightning strikes and switching surges are unavoidable and require immediate replacement to ensure system overvoltage protection. Lightning arrestors can fail catastrophically resulting in system disturbances, and a high potential for damage to adjacent equipment. The timely replacement of surge arrestors prior to age or condition related in-service failures will improve system reliability.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Surge Arrestors **(cont'd.)**

Project Justification: (cont'd.)

To ensure that this project will be completed at the lowest possible cost, Hydro will solicit competitive bids for all materials and external labour.

Future Plans:

None.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Install Transformer Oil Monitoring System
Location: Upper Salmon Terminal Station
Division: Transmission & Rural Operations
Category: Terminals
Type: Other
Classification: Normal

Project Description:

This project consists of the purchase and installation of an on-line transformer oil monitoring and alarm system for the Upper Salmon Transformer. The monitoring system will continually monitor and trend dissolved gases and the temperature of the transformer oil.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	29.0	0.0	0.0	29.0
Labour	14.0	0.0	0.0	14.0
Consultant	0.0	0.0	0.0	0.0
Contract Work	0.0	0.0	0.0	0.0
Other Direct Costs	0.0	0.0	0.0	0.0
O/H, AFUDC & Escalation	5.3	0.0	0.0	5.3
Contingency	4.3	0.0	0.0	4.3
Total	**52.6**	**0.0**	**0.0**	**52.6**

Operating Experience:

The unit transformer at Upper Salmon is consistently operating at 8 - 10 ºC higher than other unit transformers, with the same operating range. Oil samples are regularly taken to measure oil quality and analyze dissolved gases.

Project Justification:

Higher operating temperatures have an accelerated aging effect on power transformers. The oil quality results of this transformer show several parameters outside the American Society for Testing and Materials ASTM D3487 standard which places the unit at a high risk for failure.

Electrical and thermal stresses lead to the breakdown of transformer dielectric oil and the development of a variety of gases. These gases indicate the presence of developing faults. On-line gas in oil and temperature monitoring will provide daily information on the condition of the transformer and provide data to help to detect faults and minimize downtime and increase

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Install Transformer Oil Monitoring System **(cont'd.)**

Project Justification: (cont'd.)
equipment availability. The data will also serve as a tool to trend gases, temperature and loading for transformer condition assessment and life extension purposes.

Should the transformer fail, the cost of replacement is in the order of $1.5 million and the installation could take up to one year to complete due to the long delivery time for system transformers. In that event, the Upper Salmon plant's capacity of 84 MW would be unavailable to the system and it would be necessary to spill water around the facility to maintain generation at Bay d'Espoir. This spillage would be equivalent to approximately $77,000 per day assuming replacement energy from Holyrood at $32.20/bbl. The oil monitoring equipment is deemed the only alternative that will enable operation and loading of the transformer while providing a continuous feedback of the transformer's condition. This should defer the cost of replacement, while minimizing the risk of having the unit fail and having to manage without it.

To ensure that this project will be completed at the lowest possible cost, Hydro will solicit competitive bids for all materials and external labour.

Future Plans:
None.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Upgrade Distribution Feeders
Location: Various Locations
Division: Transmission & Rural Operations
Category: Distribution
Type: Pooled
Classification: Normal

Project Description:

The project consists of general upgrades to the following distribution systems:

1. St. Anthony L6 (Feeder No. 30106): This system serves the communities from St. Lunaire to L'Anse aux Meadows;
2. Bear Cove L6 (Feeder No. 20806): This system serves the communities from Bear Cove to Eddies Cove East;
3. Hawkes Bay L1 & L3 (Feeder Nos. 20101 and 20103): This system serves the communities from Hawkes Bay to Port aux Choix; and,
4. Black Tickle (Feeder No. 40801): This system serves the isolated communities of Black Tickle and Domino.

For St. Anthony, the project consists of the replacement of 123 blackjack poles, 350 insulators and 380 suspension insulators, 163 cutouts and 190 spans of primary conductor.

At Bear Cove, the project consists of the replacement of 121 blackjack poles, 431 pin type insulators, 347 suspension insulators and 314 cutouts.

The project at Hawkes Bay consists of the replacement of 113 spans of primary conductor, 55 blackjack poles 340 insulators.

At Black Tickle, the upgrading consists of the re-installation of approximately 20 poles servicing the airport and the installation of 20 sets of storm guys on the line to Domino, installation of two gang switches and the re-installation of 10 poles in the community which are presently installed above rock with rock anchors and pins. Also included is the re-sagging of conductor, tightening of guys, and the replacement of service drops.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Upgrade Distribution Feeders **(cont'd.)**

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	524.5	0.0	0.0	524.5
Labour	225.0	0.0	0.0	225.0
Consultant	0.0	0.0	0.0	0.0
Contract Work	860.0	0.0	0.0	860.0
Other Direct Costs	52.0	0.0	0.0	52.0
O/H, AFUDC & Escalation	201.7	0.0	0.0	201.7
Contingency	154.2	0.0	0.0	154.2
Total	**2,017.4**	**0.0**	**0.0**	**2,017.4**

The breakdown of the total project cost by individual systems is as follows:

Project Cost: *($ x1,000)*	**St.Anthony L6**	**Bear Cove L6**	**Hawkes Bay L1 & L3**	**Black Tickle**
Material Supply	211.5	192.0	64.5	56.5
Labour	72.0	62.0	44.0	47.0
Consultant	0.0	0.0	0.0	0.0
Contract Work	340.0	205.0	190.0	125.0
Other Direct Costs	16.0	12.0	11.5	12.5
O/H, AFUDC & Escalation	74.8	59.6	38.6	28.7
Contingency	64.0	47.1	31.0	12.1
Total	**778.3**	**577.7**	**379.6**	**281.8**

Operating Experience:

For all these systems, the poles, conductors, hardware, etc. is the original equipment, and has been in service for approximately 30 years or more. The systems are in coastal regions where they are regularly subjected to extreme winds and salt spray off the ocean. Over the years, numerous outages have occurred due to long spans, salt contamination and insulator failures. Past upgrading has included midspan pole installations and some insulator and cross arm replacements which have improved feeder performance.

The systems have a high number of blackjack poles that have been in place since the original construction and have been identified as "B" condition (one - five years life remaining). The insulators are the original equipment that have a history of failure due to cement growth and hairline cracks of the porcelain which results in electrical and mechanical breakdown. The conductor is the original conductor and in many cases has a steel core which is corroded. The cutouts are prone to porcelain failure when being opened or closed and are a safety risk to employees.

At Black Tickle, in particular, there have been several storms which resulted in problems with the distribution system. There are poles requiring resetting, problems with line slapping and blown fuses due to primary faults and transformer failures. The entire system requires upgrading, re-sagging of conductor, re-tensioning of guys and replacement of non-standard connectors.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Upgrade Distribution Feeders **(cont'd.)**

Project Justification:
The deteriorated poles on these systems create climbing hazards for line personnel due to spur kick out and/or pole failure which is more prevalent with the blackjack species. The insulators have been identified as a problem throughout the Hydro system and have been targeted for replacement due to the undesirable impact they have on the system performance. Safety Alerts have been issued on these insulators due to the possibility of insulator failure while a worker is climbing the pole. This could create a flash incident, or possible injury from falling porcelain. The cutouts are prone to failure of the porcelain when opened or closed and are a safety risk to employees. Falling shards of the broken porcelain pose a risk to the worker and the dangling energized lead could contact other equipment putting the worker at risk of electrical contact. In summary, this project is proposed in order to improve distribution feeder performance and to eliminate the safety hazards caused by old and worn equipment.

In 2005, Newfoundland and Labrador Hydro conducted a review of its isolated and interconnected distribution feeders to determine which systems should be targeted for reliability improvements. These reliability improvements were prioritized to justify capital spending beginning in 2006. The performance indices for all feeders were analyzed and improvement targets for the poor performers were established. Based on these targets, upgrades to specific feeders or groups of feeders were defined and scheduled to be completed over a five-year period. A report titled "A Performance Target Methodology for the Distribution Feeders of the Newfoundland and Labrador Hydro Electrical System - June 15, 2005" is contained in Section H, Tab 4. This report summarizes how the study was completed, and provides more detail on the analysis. The report's appendix contains tables showing the SAIFI and SAIDI Indices for each of the feeders proposed to be upgraded. These upgrades are intended to bring the indices to the target values stated in the tables. The upgrades to the Black Tickle system did not originate from the feeder performance review, however they were identified in a operational review completed in 2004.

To ensure that this project will be completed at the lowest possible cost, Hydro will solicit competitive bids for all materials and external labour.

Future Plans:
None.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Provide Service Extensions
Location: All Service Areas
Division: Transmission & Rural Operations
Category: Distribution
Type: Pooled
Classification: Normal

Project Description:

This project is an annual allotment based on past expenditures to provide for service connections (including street lights) to new customers. This summary identifies the total budget for all three operating regions.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	843.0	0.0	0.0	843.0
Labour	810.0	0.0	0.0	810.0
Consultant	0.0	0.0	0.0	0.0
Contract Work	0.0	0.0	0.0	0.0
Other Direct Costs	0.0	0.0	0.0	0.0
O/H, AFUDC & Escalation	151.0	0.0	0.0	151.0
Contingency	180.0	0.0	0.0	180.0
Total	**1,984.0**	**0.0**	**0.0**	**1,984.0**

Operating Experience:

An analysis of average historical expenditure (i.e. 2000 - 2004) on new customer connections is shown in the following table. All historical dollars were converted to 2004 dollars using the GDP Implicit Price Deflator and a 5-year average calculated.

Region	**Avg. Yearly Expenditures (2000 - 2004) ($000)**
Central	$ 730
Northern	$ 556
Labrador	$ 616
Total	$ 1,902

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Provide Service Extensions **(cont'd.)**

Project Justification:

Based on the five-year average of service extension expenditures for the period 2000 - 2004 (in 2004 dollars) the following budget was developed assuming escalation in 2005 and 2006 of approximately 2.0%.

Region	**2006 Budget ($000)**
Central	$ 761
Northern	$ 580
Labrador	$ 643
Total	$ 1,984

To ensure that this project is completed at the lowest possible cost, Hydro will solicit competitive bids for all materials and external labour.

Future Plans:

This is an annual allotment, which is adjusted from year to year depending on historical expenditures.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Upgrade Distribution Systems
Location: All Service Areas
Division: Transmission & Rural Operations
Category: Distribution
Type: Pooled
Classification: Normal

Project Description:

This project is an annual allotment based on past expenditures to provide for the replacement of deteriorated poles, substandard structures, corroded and damaged conductors, rusty and overloaded transformers/street lights/reclosers and other associated equipment. This upgrading is identified through preventive maintenance inspections or damage caused by storms and adverse weather conditions and salt contamination. This summarizes the total budget for all three regions.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	812.0	0.0	0.0	812.0
Labour	780.0	0.0	0.0	780.0
Consultant	0.0	0.0	0.0	0.0
Contract Work	0.0	0.0	0.0	0.0
Other Direct Costs	0.0	0.0	0.0	0.0
O/H, AFUDC & Escalation	145.0	0.0	0.0	145.0
Contingency	175.0	0.0	0.0	175.0
Total	**1,912.0**	**0.0**	**0.0**	**1,912.0**

Operating Experience:

An analysis of historical expenditures (i.e. 2000 - 2004) on distribution upgrades is shown in the following table. All historical dollars (table below) were converted to 2004 dollars using the GDP Implicit Price Deflator and 5-year average calculated.

Region	**Avg. Yearly Expenditures (2000 - 2004) ($000)**
Central	$ 672
Northern	$ 802
Labrador	$ 360
Total	$ 1,834

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Upgrade Distribution Systems **(cont'd.)**

Project Justification:

Based on this five-year average for distribution system upgrades for the period 2000 - 2004 the following budget was developed using an escalation in 2005 and 2006 of approximately 2.0%.

Region	**2006 Budget ($000)**
Central	$ 701
Northern	$ 836
Labrador	$ 375
Total	$ 1,912

To ensure that this project is completed at the lowest possible cost, Hydro will solicit competitive bids for all materials and external labour.

Future Plans:

This is an annual allotment which is adjusted from year to year depending on historical expenditures.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Insulators

Location: Various Locations

Division: Transmission & Rural Operations

Category: Distribution

Type: Pooled

Classification: Normal

Project Description:

This project consists of insulator replacements on the following systems:

1. South Brook L5 & L7 (Feeder Nos. 10105 and 10107): Serving the communities Roberts' Arm, Pilley's Island, Long Island, Port Anson, Miles Cove, Brighton and Triton;
2. Farewell Head L4 & L5 (Feeder Nos. 11004 and 11005): Serving the communities of Shoal Bay, Barr'd Island, Joe Batt's Arm, Tilting and Fogo; and,
3. Bottom Waters L4, L6, L7 & L8 (Feeder Nos. 10204, 10206, 10207 and 10208): Serving the communities of Brent's Cove, Harbour Round, Burlington, Middle Arm and Smith's Harbour, La Scie and Nipper's Harbour.

This project consists of replacement of all remaining Canadian Porcelain (CP) and Canadian Ohio Brass (COB) insulators on these distribution systems.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	313.5	0.0	0.0	313.5
Labour	135.0	0.0	0.0	135.0
Consultant	0.0	0.0	0.0	0.0
Contract Work	345.5	0.0	0.0	345.5
Other Direct Costs	48.0	0.0	0.0	48.0
O/H, AFUDC & Escalation	104.7	0.0	0.0	104.7
Contingency	73.5	0.0	0.0	73.5
Total	**1,020.2**	**0.0**	**0.0**	**1,020.2**

The breakdown of these total costs by the individual system is as follows:

Project Cost: *($ x1,000)*	**South Brook**	**Farewell Head**	**Bottom Waters**
Material Supply	161.0	54.0	98.5
Labour	54.0	34.0	47.0
Consultant	0.0	0.0	0.0
Contract Work	130.5	121.0	94.0
Other Direct Costs	14.0	14.0	20.0
O/H, AFUDC & Escalation	45.1	26.5	33.1
Contingency	36.1	11.3	26.1
Total	**440.7**	**260.8**	**318.7**

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Insulators **(cont'd.)**

Operating Experience:

These insulators have been in service for approximately 35 years and were manufactured by Canadian Ohio Brass and Canadian Porcelain. They have been a problem throughout the system because of the history of failures due to cement growth and hairline cracks of the porcelain which results in electrical and mechanical breakdown.

Project Justification:

Replacement of these insulators is essential to improve system security and reliability. Mechanical breakdown of the insulators reduces their mechanical strength and creates a safety hazard during climbing activities by line workers.

In 2005, Newfoundland and Labrador Hydro conducted a review of its isolated and interconnected distribution feeders to determine which systems should be targeted for reliability improvements. These reliability improvements were prioritized to justify capital spending beginning in 2006. The performance indices for all feeders were analyzed and improvement targets for the poor performers were established. Based on these targets, upgrades to specific feeders or groups of feeders were defined and scheduled to be completed over a five-year period. A report titled "A Performance Target Methodology for the Distribution Feeders of the Newfoundland and Labrador Hydro Electrical System - June 15, 2005" is contained in Section H, Tab 4. This report summarizes how the study was completed, and provides more detail on the analysis. The report's appendix contains tables showing the SAIFI and SAIDI Indices for each of the feeders where insulators are being replaced. These replacements are intended to bring the indices to the target values stated in the tables.

To ensure that this project will be completed at the lowest possible cost, Hydro will solicit competitive bids for all materials and external labour.

Future Plans:

None.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Poles
Location: Various Locations
Division: Transmission & Rural Operations
Category: Transmission
Type: Pooled
Classification: Normal

Project Description:

This project consists of the replacement of 35 deteriorated poles in Nain and 30 deteriorated poles on the portion of the Bottom Waters system serving the communities of Woodstock, Pacquet and Ming's Bight.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	71.0	0.0	0.0	71.0
Labour	79.0	0.0	0.0	79.0
Consultant	0.0	0.0	0.0	0.0
Contract Work	113.0	0.0	0.0	113.0
Other Direct Costs	20.0	0.0	0.0	20.0
O/H, AFUDC & Escalation	34.6	0.0	0.0	34.6
Contingency	14.2	0.0	0.0	14.2
Total	**331.8**	**0.0**	**0.0**	**331.8**

The breakdown of costs for each system is:

Project Cost: *($ x1,000)*	**Nain**	**Bottom Waters**
Material Supply	35.0	36.0
Labour	41.0	38.0
Consultant	0.0	0.0
Contract Work	67.0	46.0
Other Direct Costs	10.0	10.0
O/H, AFUDC & Escalation	18.7	15.9
Contingency	7.7	6.5
Total	**179.4**	**152.4**

Operating Experience:

The systems are operating satisfactorily however, when deteriorated poles fail customer outages occur and repair crews are dispatched to complete repairs. Extensive outages have occurred on those occasions where it has been difficult to access the repair site, particularly for the Nain system.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Poles **(cont'd.)**

Project Justification:

Preventative maintenance inspections have identified 30 poles on the Bottom Waters system and 35 poles on the Nain system to be of substandard quality due to age deterioration resulting in unacceptable number of near vertical splits. The poles are over 30 years old and were identified as being "B" condition which indicates that they be replaced in one - five years. Deteriorated poles create climbing hazards for the line personnel, and failures will result in significant interruptions of power supply to the customers in these communities.

To ensure that this project will be completed at the lowest possible cost, Hydro will solicit competitive bids for all materials and external labour.

Future Plans:

None.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Purchase and Install Voltage Regulator L7 - Happy Valley
Location: Happy Valley/Goose Bay
Division: Transmission & Rural Operations
Category: Distribution
Type: Other
Classification: Normal

Project Description:

The project consists of the purchase and installation of three, single-phase 7.2/14.4 kV, 200 A voltage regulators on feeder L7 at the Happy Valley distribution system. The regulators will be placed approximately 9 km from the Happy Valley Terminal Station.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	70.0	0.0	0.0	70.0
Labour	30.0	0.0	0.0	30.0
Consultant	0.0	0.0	0.0	0.0
Contract Work	0.0	0.0	0.0	0.0
Other Direct Costs	4.0	0.0	0.0	4.0
O/H, AFUDC & Escalation	12.7	0.0	0.0	12.7
Contingency	5.2	0.0	0.0	5.2
Total	**121.9**	**0.0**	**0.0**	**121.9**

Operating Experience:

This is a new installation.

Project Justification:

Due to steadily increasing load on this feeder in recent years and specifically, a new school opening in Sheshatshui in September 2006, voltage levels at customer service entrances will drop below CSA standards during peak demand periods, with the existing system. The addition of a second voltage regulator bank will remedy this problem beyond the forecast period. Other alternatives considered included: the opportunity for a demand side management to defer the expenditure which was determined not to be viable (see attached); and reconductoring or building a second feeder which are an order of magnitude greater in cost and thus it was not pursued further.

Future Plans:

None.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Demand Side Management Analysis for Capital Budget Proposal

Project Title: **Sheshatshui Voltage Regulator**

Description: Install new voltage regulator bank on HVY-L7 in 2006

Overview: NLH views DSM as an opportunity to defer or postpone capital costs. The deferral can be evaluated in economic terms as the difference in the present value of the utility revenue requirement under varying commencement years for the investment. The difference represents a DSM budget constraint and is the maximum amount of money that can be expended in order to defer the investment. The analysis proceeds by determing the necessary demand or energy savings required to defer the investment and then evaluates whether the DSM budget constraint can achieve the required saving. This DSM review represents a preliminary screening to ensure there are no obvious DSM opportunities missed.

Conclusion : DSM is not a viable option for deferring or displacing the voltage regulator required as a result of load growth in the Sheshatshui area.

	Load Forecast (HR OPLF Fall 2004)	2005	2006	2007	2008	2009
1	Peak Demand Forecast (kW) L7	8,510	9,825	9,957	10055	10,136
2	Domestic Customers - # L7	486	486	486	486	486
3	Existing Planning Capacity	8,500	kW			
4	Capital Budget Proposal for Voltage Regulator	$121,900	2006$			

		1 Yr	2 Yr	3 Yr	4 Yr	5 Yr
5=1-8500	Required Demand Savings for Capital Deferral (kW) (Difference of forecast peak demand and peak demand target at capacity)	NA	1,325	1,457	1,555	1,636
	DSM Budget Calculation (Calculated assuming 2% inflation and 8.4% corporate cost of capital)					
6	Capital Budget Deferral Factors*	5.9%	11.5%	16.7%	21.6%	26.2%
7=6*4	Total DSM Deferral Budget (1yr discount)	$6,639	$12,887	$18,765	$24,297	$29,501
8=7/5	DSM Budget Per Required Demand Savings kW	NA	$10	$13	$16	$18

* Percentage of capital cost that can be incurred to defer project for 1 to 5 years, and still be indifferent in economic terms.

	DSM Supply Cost - $ per kW Achieved	$/kW*
9	Domestic Hot Water Load Control (DLC)	$355

* includes provision for distribution losses.

	Maximum Achievable Winter Peak Demand Reduction (Max kW reduction at lowest DSM supply cost and full DSM deferral budget)	1 Yr	2 Yr	3 Yr	4 Yr	5 Yr
10=7/9	DHW - kW	19	36	53	68	83
11=10-5	Achievable DSM Less Required DSM Savings-kW	NA	(1,289)	(1,404)	(1,487)	(1,553)

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Construction of New Diesel Plant

Location: St. Lewis - Labrador

Division: Transmission & Rural Operations

Category: Rural Operations

Type: Clustered

Classification: Normal

Project Description:

This project consists of the construction of a new three-unit diesel plant on Hydro's fenced property, in proximity to the existing tank farm. The plant building will be a pre-engineered metal building. Two new gensets, a 450kW unit and a 350kW unit, and their associated systems, will be purchased and installed in the new plant. A third genset, Unit No. 2015, a 250kW unit, will be removed from the old plant and installed in the new plant. The other two gensets presently in service in the plant will be retired. The existing plant will remain in operation until construction of the new plant is complete.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	684.5	0.0	0.0	684.5
Labour	387.4	0.0	0.0	387.4
Consultant	10.0	0.0	0.0	10.0
Contract Work	675.0	0.0	0.0	675.0
Other Direct Costs	64.4	0.0	0.0	64.4
O/H, AFUDC & Escalation	223.0	0.0	0.0	223.0
Contingency	182.2	0.0	0.0	182.2
Total	**2,226.5**	**0.0**	**0.0**	**2,226.5**

Operating Experience:

The existing plant equipment operates satisfactorily, and meets system demand. However, maintenance and operating activities are severely limited and hampered by the lack of space and the condition of the building.

The plant is a 35 year old, wood frame, plywood clad building with a concrete floor. It is in a deteriorated condition and does not have the floor space around or the clearance above the gensets to permit the safe performance of operating and maintenance tasks. The plant is cluttered and there is no free wall space to facilitate adding any new equipment.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Construction of New Diesel Plant **(cont'd.)**

Operating Experience: (cont'd.)

At present there are three generators installed in the plant building and a fourth mobile generating unit installed outside. Unit No. 292 at St. Lewis was purchased in 1984 and has 91,236 accumulated operating hours and has been overhauled five times. It has accumulated 16,236 operating hours since the last major overhaul and is due for replacement. Unit No. 200 at St. Lewis was purchased in 1982 and has 106,182 accumulated operating hours and has been overhauled five times. It has accumulated 18,741 operating hours since the last major overhaul and is due for replacement.

Further details on the condition of the plant and replacement alternatives considered are contained in the report "St. Lewis Diesel Plant - Condition Assessment Report and Investigation of Replacement Alternatives - June 17, 2005" attached in Section H, Tab 5.

Project Justification:

The plant is cluttered and lacking in space, both around equipment and in headroom above the gensets. Maintenance and operating tasks must be performed in close proximity to operating equipment without adequate maneuvering room to do so efficiently and safely. There is no free wall space to facilitate adding any new equipment and this has led to disorganized equipment installation and concerns with respect to operating efficiencies. The low headroom in the engine hall causes problems with heat buildup in the summertime and subsequently reduces the capacity of the units to carry rated loads. In addition, there is no capability to provide secondary containment should there be an oil spill inside the plant.

The replacement of the two diesel units (No. 292 and No. 200) is proposed given their age and extensive operating hours. As well, both have undergone at least five overhauls and are not considered capable of providing reliable capacity to address customer firm load. Experience has shown that it is generally not practical or effective to overhaul the engine more than five times. In addition to the initial savings on maintenance and overhaul costs, new units will provide greater fuel efficiency and reduced emissions. The additional capacity provided by the new units will not increase the firm capacity of the plant as the current requirement for the mobile diesel at this location will be eliminated.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Construction of New Diesel Plant **(cont'd.)**

Project Justification: (cont'd.)

It is important to note that the diesel replacements have been included with the construction of the new diesel plant as they would logically be undertaken together, however, Hydro believes the unit replacement, which based on separate justification, should be approved and proceed whether or not approval is given for construction of the new diesel plant.

A number of alternatives to the plant's replacement were investigated and are outlined in the attached report (please refer to section H, Tab 5). The construction of a new plant on the existing property was the preferred alternative.

To ensure that this project will be completed at the lowest possible cost, Hydro will solicit competitive bids for all materials and external labour.

Future Plans:

None.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Installation of Fall Protection Systems

Location: Various Locations

Division: Transmission & Rural Operations

Category: Transmission

Type: Pooled

Classification: Mandatory

Project Description:

This project consists of the design, supply and installation of fall protection equipment, where required, at all Hydro locations. These locations include fuel storage tanks, powerhouses, office buildings, terminal station control buildings, accommodation trailers, water control structures, power transformers and any auxiliary buildings. There are approximately 310 locations affected, and installations will be prioritized upon approval to proceed.

In Hydro's 2005 Capital Budget Application, a 4-year fall protection budget was proposed. The concept was to prepare and prioritize a list of all facilities which required a fall protection system and in 2005, install systems on those with the highest priority. Details on the progress of this program is contained in the report titled "The Installation of Fall Protection Systems for TRO and Production Divisions - June 22, 2005" in Section H, Tab 6.

Project Cost: *($ x1,000)*	**2006**	**2007**	**2008**	**Total**
Material Supply	30.0	30.0	30.0	90.0
Labour	65.0	40.0	28.0	133.0
Consultant	5.0	3.0	3.0	11.0
Contract Work	140.0	130.0	80.0	350.0
Other Direct Costs	6.0	6.0	6.0	18.0
O/H, AFUDC & Escalation	22.1	41.9	63.8	127.8
Contingency	0.0	0.0	60.2	60.2
Total	**268.1**	**250.9**	**271.0**	**790.0**

Operating Experience:

There is no fall protection equipment at these locations at present. When work is undertaken, temporary fall protection equipment is used.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Installation of Fall Protection Systems **(cont'd.)**

Project Justification:

In 1999, the Provincial Government passed legislation requiring that fall protection systems be used by all workers when accessing an elevated surface which is 3 m above the next lower level. Personnel need to access building roofs, fuel storage tank tops, water control structures and elevated equipment to perform operational and maintenance tasks. Many of these tasks, such as measuring depth of fuel via a tank top vent for fuel reconciliation purposes, are required by legislation.

To ensure that this project will be completed at the lowest possible cost, Hydro will solicit competitive bids for all materials and external labour.

Future Plans:

Please refer to the attached report in Section H, Tab 6.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Diesel Generation Units

Location: Various Locations

Division: Transmission & Rural Operations

Category: Rural Operations

Type: Pooled

Classification: Normal

Project Description:

This project consists of the replacement of diesel generating Unit No. 289 at Black Tickle and Unit No. 223 at Rigolet. These generating units will be replaced with equivalent sized units because there is no requirement to meet an increased demand at either of these sites.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	357.5	0.0	0.0	357.5
Labour	155.5	0.0	0.0	155.5
Consultant	0.0	0.0	0.0	0.0
Contract Work	0.0	0.0	0.0	0.0
Other Direct Costs	31.0	0.0	0.0	31.0
O/H, AFUDC & Escalation	64.7	0.0	0.0	64.7
Contingency	54.5	0.0	0.0	54.5
Total	**663.2**	**0.0**	**0.0**	**663.2**

The breakdown of these costs at each site are as follows:

Project Cost: *($ x1,000)*	**Black Tickle**	**Rigolet**
Material Supply	178.0	179.5
Labour	78.0	77.5
Consultant	0.0	0.0
Contract Work	0.0	0.0
Other Direct Costs	15.5	15.5
O/H, AFUDC & Escalation	32.3	32.4
Contingency	27.2	27.3
Total	**331.0**	**332.2**

Operating Experience:

Unit 289 at Black Tickle was purchased in 1978 and has 83,348 cumulative operating hours. It has had five major overhauls and 13,573 operating hours has accumulated since the last major overhaul.

Unit 223 at Rigolet was purchased in 1978 and has 81,400 accumulated operating hours. It has had five major overhauls and 17,361 operating hours has accumulated since the last major overhaul.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Diesel Generation Units **(cont'd.)**

Project Justification:

Replacement of all units is justified on the basis of age of the units, accumulated operating hours and number of major overhauls. All units have in excess of 90,000 hours, and five major overhauls. Experience has shown that it is generally not practical or effective to overhaul the engine more than five times. In addition to the initial savings on maintenance and overhaul costs, new units will provide greater fuel efficiency and reduced emissions.

To ensure that this project will be completed at the lowest possible cost, Hydro will solicit competitive bids for all materials and external labour.

Future Plans:

None.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Control Panel

Location: Rigolet Diesel Plant

Division: Transmission & Rural Operations

Category: Rural Operations

Type: Other

Classification: Normal

Project Description:

This project consists of the purchase and installation of a replacement 600 volt, 800-amp diesel control panel complete with a draw out type breaker. As well, it includes the purchase and installation of analog sensors on the diesel unit.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	68.0	0.0	0.0	68.0
Labour	35.5	0.0	0.0	35.5
Consultant	0.0	0.0	0.0	0.0
Contract Work	0.0	0.0	0.0	0.0
Other Direct Costs	7.0	0.0	0.0	7.0
O/H, AFUDC & Escalation	13.6	0.0	0.0	13.6
Contingency	11.1	0.0	0.0	11.1
Total	**135.2**	**0.0**	**0.0**	**135.2**

Operating Experience:

The control panel to be replaced was installed in the 1970's and is now obsolete. It is used on the diesel generating unit for load and fault interruption and manual synchronizing. Improper synchronizing has, in the past, resulted in damage to the generator exciter and voltage regulator.

Project Justification:

The existing generating unit control panel with a fixed molded case breaker has no draw out or lockable features to provide a safety isolation point, and therefore requires a total plant outage for maintenance checks and emergency repairs. The current standard for a generating unit breaker is a draw out design which allows for removal and isolation of the breaker without any power interruption. A modern electrically operated breaker will provide faster breaker action during synchronizing, and include a synchronizing check capability which ensures proper synchronizing thus eliminating potential damage to generator and associated equipment.

To ensure that this project will be completed at the lowest possible cost, Hydro will solicit competitive bids for all materials and external labour.

Future Plans:

None.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Install NOx Monitor
Location: Little Bay Islands
Division: Transmission & Rural Operations
Category: Rural Operations
Type: Other
Classification: Mandatory

Project Description:

This project consists of the installation of an ambient Nitrous Oxide (NOx) monitor within the community of Little Bay Islands to allow for measurement of ambient NOx levels associated with the operation of the diesel plant. The exact location of the monitor will be selected based on dispersion modeling and in consultation with the Provincial Department of Environment and Conservation.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	52.7	0.0	0.0	52.7
Labour	24.7	0.0	0.0	24.7
Consultant	5.0	0.0	0.0	5.0
Contract Work	3.5	0.0	0.0	3.5
Other Direct Costs	1.5	0.0	0.0	1.5
O/H, AFUDC & Escalation	10.2	0.0	0.0	10.2
Contingency	8.7	0.0	0.0	8.7
Total	**106.3**	**0.0**	**0.0**	**106.3**

Operating Experience:

This is a new equipment installation. Nitrous oxides (NOx) are produced in the emissions of diesel plant exhaust.

Project Justification:

This project is being completed at the direction of the Provincial Department of Environment and Conservation and is related to requirements of a Certificate of Approval and Compliance Agreements for isolated diesel systems.

Future Plans:

None.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Generating Unit Breakers
Location: Various Sites
Division: Transmission & Rural Operations
Category: Rural Operations
Type: Pooled
Classification: Normal

Project Description:

The project consists of the purchase and installation of 600 volt, 400 amp draw out type breakers with solid-state over-current relay and test switch to replace the fixed molded case breakers on diesel generating units at Francois (1), Grey River (1) and Little Bay Islands (3). As well, it includes the replacement of 600V power and control cables as required and the purchase of one spare breaker.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	25.0	0.0	0.0	25.0
Labour	25.6	0.0	0.0	25.6
Consultant	0.0	0.0	0.0	0.0
Contract Work	0.0	0.0	0.0	0.0
Other Direct Costs	5.0	0.0	0.0	5.0
O/H, AFUDC & Escalation	6.8	0.0	0.0	6.8
Contingency	5.5	0.0	0.0	5.5
Total	**67.9**	**0.0**	**0.0**	**67.9**

Operating Experience:

The molded case breakers proposed to be replaced are of 1970/80's vintage and are used on diesel generating units for load/fault interruption. Since the breakers are a fixed design they require a total diesel plant outage for maintenance checks and emergency repairs, and only provide for manual synchronizing.

Project Justification:

The appropriate modern design for a diesel unit breaker is a draw out type which allows for removal of the breaker for maintenance and emergency repair without a power interruption, and includes electrical closing for fast breaker action during synchronizing of diesel units. This current standard breaker design also includes a synchronizing check capability which ensures proper synchronizing thus eliminating the potential for damage to the generator and associated equipment.

Future Plans:

None.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Purchase Meters and Equipment

Location: All Service Areas

Division: Transmission & Rural Operations

Category: Transmission

Type: Pooled

Classification: Normal

Project Description:

This project consists of the purchase of demand/energy meters, current and potential transformers, metering cable and associated hardware for use throughout Hydro's system.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	90.0	0.0	0.0	90.0
Labour	0.0	0.0	0.0	0.0
Consultant	0.0	0.0	0.0	0.0
Contract Work	0.0	0.0	0.0	0.0
Other Direct Costs	0.0	0.0	0.0	0.0
O/H, AFUDC & Escalation	2.5	0.0	0.0	2.5
Contingency	0.0	0.0	0.0	0.0
Total	**92.5**	**0.0**	**0.0**	**92.5**

Operating Experience:

Revenue meters and associated equipment are required for new customer services and the replacement of old, worn, damaged or vandalized meters.

Project Justification:

Demand/Energy meters are expected to last a minimum of twenty years. Each meter is evaluated after that time for condition and either retired from service or refurbished and returned to service. Failure to supply metering equipment as required could result in customer connection delays.

To ensure that the project will be completed at the lowest possible cost, Hydro will solicit competitive bids for all materials.

Future Plans:

This is an annual allotment which will be adjusted from year to year depending on historical information.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Legal Survey of Distribution Line Right-of-Ways
Location: Various Sites
Division: Transmission & Rural Operations
Category: Distribution
Type: Other
Classification: Normal

Project Description:

This project consists of the completion of legal surveys and the preparation of documentation to acquire Crown Lands easement rights for approximately 600 km of distribution line right-of-ways across Hydro's system.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	0.0	0.0	0.0	0.0
Labour	35.0	0.0	0.0	35.0
Consultant	0.0	0.0	0.0	0.0
Contract Work	0.0	0.0	0.0	0.0
Other Direct Costs	5.0	0.0	0.0	5.0
O/H, AFUDC & Escalation	5.9	0.0	0.0	5.9
Contingency	4.0	0.0	0.0	4.0
Total	**49.9**	**0.0**	**0.0**	**49.9**

Operating Experience:

Prior to 1985, it was Hydro's practice to construct and operate transmission and distribution lines without obtaining easement rights over Crown Land as Hydro was an agent of the Crown. In 1985, it was decided to obtain easement rights for all property underlying newly constructed lines and to obtain easement rights for property for the pre-1985 lines. To-date, the easement rights to all property associated with transmission lines have been obtained and there is approximately 1,900 km of distribution lines left without easement rights.

Project Justification:

As the right-of-ways for the distribution lines occupy Crown Land contrary to the Crown Lands Act, the lack of easement rights presents a significant risk to Hydro operations should competing requirements for the land arise. It is important that appropriate easement rights be acquired to permit proper maintenance and upgrading of the lines.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Legal Survey of Distribution Line Right-of-Ways **(cont'd.)**

Future Plans:

This is an annual program which began in 2004 and easement rights for the whole distribution system are planned to be in place by the end of 2008.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Off Road Track Vehicles

Location: Various Locations

Division: Transmission & Rural Operations

Category: General Properties - Transportation

Type: Pooled

Classification: Normal

Project Description:

This project consists of the replacement of the following off-road tracked vehicles and equipment:

1. Unit V7631, a 1985 model crew-cab/backhoe combination at Bishop's Falls will be replaced with a muskeg/boom/dump configured unit;

2. Unit V7633, a 1985 model muskeg/backhoe/boom unit currently in service at Whitbourne will be replaced with an excavator;

3. Unit V7647, a 1988 model muskeg/backhoe/boom unit currently in service at Springdale will be replaced with an excavator; and,

4. Unit V7725, a 1990 model muskeg/backhoe/boom unit currently in service at Bay d'Espoir will be replaced with an excavator.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	560.0	0.0	0.0	560.0
Labour	0.0	0.0	0.0	0.0
Consultant	0.0	0.0	0.0	0.0
Contract Work	0.0	0.0	0.0	0.0
Other Direct Costs	0.0	0.0	0.0	0.0
O/H, AFUDC & Escalation	20.0	0.0	0.0	20.0
Contingency	56.0	0.0	0.0	56.0
Total	**636.0**	**0.0**	**0.0**	**636.0**

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Off Road Track Vehicles **(cont'd.)**

The breakdown of replacement costs for equipment at each location is:

Project Cost:	*($ x1,000)*	**Bishops Falls**	**Whitbourne**	**Springdale**	**Bay d'Espoir**
Material Supply		230.0	110.0	110.0	110.0
Labour		0.0	0.0	0.0	0.0
Consultant		0.0	0.0	0.0	0.0
Contract Work		0.0	0.0	0.0	0.0
Other Direct Costs		0.0	0.0	0.0	0.0
O/H, AFUDC & Escalation		6.2	4.6	4.6	4.6
Contingency		23.0	11.0	11.0	11.0
Total		**259.2**	**125.6**	**125.6**	**125.6**

Operating Experience:
The units at Bishops Falls and Whitbourne will be 21 years old at the time of replacement. The unit at Springdale and the unit at Bay d'Espoir will be 18 and 16 years old respectively at the time of replacement.

Project Justification:
Hydro's replacement criteria for heavy-duty off-road tracked equipment with respect to age is 15 - 20 years, combined with its operating condition, the extent of repairs needed and its level of compliance with current safety and health standards. Technological improvements in cab design have reduced noise and heat levels, and there are improvements to seat design steering mechanisms and operator controls. Transmission line maintenance crews should be equipped with a crew-cab/backhoe combination units and distribution crews be equipped with muskegs and excavator units. These options are believed to provide the most appropriate alternative where these crews need transport capability as well as excavating capability. The primary use for this equipment is to facilitate distribution and transmission line maintenance and for emergency repair.

Future Plans:
None.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Application Enhancements
Location: St. John's
Division: Production
Category: Information Systems & Telecommunications
Type: Pooled
Classification: Normal

Project Description:

The application enhancement projects proposed are as follows:

- Minor enhancements to applications in response to unforeseen requirements such as legislative and changing business requirements;
- Revisions to the Capital Asset Projection and Depreciation Modeling application used by Rates and Financial Planning;
- Enhancements to the Capital and Operating Process Applications. This project supports enhancements to existing applications to improve business efficiencies as well as to meet requirements of the Board for improvements in information presentation and justification;
- IT Management Tool to support Release Management Process; and,
- Enhancement of the Enterprise Reporting System. This project proposes the acquisition and implementation of an additional module in the existing Showcase toolset in order to enhance the reporting of information from the business applications.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	196.0	0.0	0.0	196.0
Labour	289.2	0.0	0.0	289.2
Consultant	0.0	0.0	0.0	0.0
Contract Work	275.4	0.0	0.0	275.4
Other Direct Costs	0.0	0.0	0.0	0.0
O/H, AFUDC & Escalation	109.2	0.0	0.0	109.2
Contingency	76.0	0.0	0.0	76.0
Sub-Total	945.8	0.0	0.0	945.8
Cost Recoveries	(165.3)	0.0	0.0	(165.3)
Total	**780.5**	**0.0**	**0.0**	**780.5**

Operating Experience:

In order to maintain and improve efficiency Hydro must continue to leverage its applications portfolio. The applications allow Hydro to achieve operating efficiencies and improve customer service. When Hydro selects application enhancement projects it uses the following criteria:

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Application Enhancements **(cont'd.)**

Operating Experience: (cont'd.)

(1) existing solutions and services will be considered first before seeking alternatives; and (2) if business needs are not adequately satisfied, purchased solutions and services will be evaluated before building solutions or services unless there is a compelling business reason to do so.

Project Justification:

1) **Minor Enhancements**

Total: $149,219 CF(L)Co: $28,352 Net: $120,867

Minor enhancements are justified on the basis of meeting business requirements during the year. The focus of these enhancements is to increase operational efficiencies and improve customer service. This project has been used in the past to create enhancements to safety, environmental compliance and audit applications as well as to fulfill Board directed initiatives such as full time equivalent reporting and equalized billing.

2) **Capital Asset Projection and Depreciation Modeling**

Total: $75,853

This project is to investigate and make changes to the process and application that Hydro currently uses for its capital asset projection and depreciation model. The current application used is separate from JDE and interfaces with it to extract data. The application provides projection and scenario models as well as version control and analysis capability.

3) **Enhancements to the Capital and Operating Process Applications**

Total: $472,776 CF(L)Co: $89,827 Net: $382,948

This project is to make changes to the applications that Hydro currently uses for its capital and operating work management processes. This will allow for the streamlining of the budget preparation and approval process, workforce allocation planning, and outage management planning.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Application Enhancements **(cont'd.)**

Project Justification: (cont'd.)

4) **IT Infrastructure Management Tool**

Total: $62,175 CF(L)Co: $11,813 Net: $50,361

In order to continue to focus on efficiency and reliability of service for Hydro's growing and complex portfolio of IT infrastructure the continued implementation of standard IT processes and supporting tools are essential. This project proposes to add another module to an existing tool to support the Release Management process which will be implemented in 2006. Typical IT services impacted by Release Management in a utility environment are end user computing, applications such as JD Edwards that impact the business and Hydro's customers, Energy Management functions including the EMS and RTU's and power system teleprotection devices. IS&T is currently working with Hydro Generation to implement the processes and tools to support non traditional IT infrastructure such as programmable logic controllers, etc.

From a cost benefit perspective when outputs from a Release Management process are not well defined and managed, faulty versions of changes are released into the system causing downtime for the various users of our systems including Hydro's customers and increased workload for the Service (Help) Desk.

5) **Enterprise Reporting Enhancement**

Total: $185,778 CF(L)Co: $35,298 Net: $150,480

This will allow Hydro employees to access reports from the JD Edwards system in a more efficient manner. Reports will be run on a scheduled basis without human intervention and placed in a centralized repository. The software will allow Hydro employees to access the reports using a standard web browser, thereby ensuring information is available in a more timely and efficient manner.

A financial analysis of the costs and benefits associated with this project, as directed by the Board in Order P.U. 53 (2004) page 57 is attached in Section H, Tab 7. The analysis indicate a positive net present value benefit with the proposed enhancements.

Future Plans:

Application enhancements are a continuing requirement in order for Hydro to ensure efficiencies.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Corporate Application Environment

Location: St. John's

Division: Production

Category: Information Systems & Telecommunications

Type: Pooled

Classification: Normal

Project Description:

The projects which are pooled under this proposal are:

- Enterprise Resource Technology Review. This proposes a review of the current JD Edwards implementation, an assessment of how it can be further leveraged and development of a detailed roadmap for the application for the next five years;
- Upgrade to the existing industrial billing software used to interrogate our industrial customers' meters;
- Upgrade to the existing Diesel Plant Automation systems;
- Upgrade to the existing Aspen Relay setting database; and,
- Upgrade of ShowCase Strategy Application.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	260.0	0.0	0.0	260.0
Labour	100.5	0.0	0.0	100.5
Consultant	0.0	0.0	0.0	0.0
Contract Work	105.0	0.0	0.0	105.0
Other Direct Costs	10.0	0.0	0.0	10.0
O/H, AFUDC & Escalation	68.4	0.0	0.0	68.4
Contingency	47.6	0.0	0.0	47.6
Sub-Total	591.5	0.0	0.0	591.5
Cost Recoveries	(35.7)	0.0	0.0	(35.7)
Total	**555.8**	**0.0**	**0.0**	**555.8**

Operating Experience:

There are approximately 43 applications and supporting systems that enable Hydro to operate and provide least cost and reliable power to customers. In order to accomplish this, upgrades to application environments through their life cycle is a normal and necessary requirement. Each year, Hydro reviews its application portfolio and uses two main criteria to determine if an upgrade to an environment is warranted. First, the status of vendor support for all applications is reviewed. Next, any functionality improvements are reviewed in the context of providing business value either in terms of efficiencies gained through improved functionality or improvements in service.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Corporate Application Environment **(cont'd.)**

Project Justification:

1) **JDE Enterprise Resource Planning (ERP) Technology Review**

Total: $44,782 CF(L)Co: $8,509 Net: $36,274

The recent acquisition of JD Edwards by PeopleSoft, followed by its acquisition by Oracle, leaves uncertainty regarding the future direction of a major piece of Hydro's technology infrastructure. Hydro needs a clear strategy for how it will deploy and evolve applications to support its business processes and build a solid foundation for the future. Also, the latest release of JD Edwards will no longer support the Utility Customer Information System (UCIS) application and the existing user interface technology. All these issues will be addressed through the review, allowing Hydro to plan future enhancements of the application based on business needs and vendor support limitations.

2) **Upgrade to Industrial Customer Billing Software**

Total: $155,494

This project proposes upgrading to the latest version supported by the vendor. The Industrial Customer Billing software has been in place since January 2000 and is the primary bulk meter interrogation and billing application. Changes in metering technologies and system configurations have been well accommodated within the current version of the application. The current version of the software used to interrogate the meters monitoring the energy and demand usage of our industrial customers requires an operating system which is no longer supported by the vendor. This project as proposed will ensure the integrity and accuracy of billing information for our industrial customers.

3) **Upgrade to the existing Diesel Plant Automation systems**

Total: $217,070

This project proposes the upgrade of the existing software used in nine of Hydro’s automated diesel generating plants. The existing version is no longer supported by the manufacturer and this upgrade will ensure that Hydro generation facilities for its remote customers perform in an efficient and reliable manner.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Corporate Application Environment **(cont'd.)**

Project Justification: (cont'd.)

4) **Upgrade of the Aspen Relay Database Application**

Total: $31,099

The existing database application is no longer supported by the vendor. This project proposes an upgrade to the current version supported by the vendor. The application is used to store power system relay protection information. It is necessary that this data be secure and accurate to ensure Hydro is able to deliver power to customers in a least cost and reliable manner.

5) **Upgrade of ShowCase Strategy Application**

Total: $143,055 CF(L)Co: $27,180 Net: $115,874

This is a lifecycle upgrade to keep the ShowCase application current with the vendor upgrade program. Software must be regularly upgraded to maintain the benefits of vendor advancements in system functionality.

Future Plans:

Application enhancements and upgrades are an ongoing life cycle based on business demands and vendor support levels.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Peripheral Infrastructure Replacement

Location: Hydro Place

Division: Production

Category: Information Systems & Telecommunications

Type: Pooled

Classification: Normal

Project Description:

Project Description:

This project consists of the replacement of three Multi-Function Devices and the purchase of one new Multi-Function Device for the Stephenville office.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	154.0	0.0	0.0	154.0
Labour	4.0	0.0	0.0	4.0
Consultant	0.0	0.0	0.0	0.0
Contract Work	0.0	0.0	0.0	0.0
Other Direct Costs	0.0	0.0	0.0	0.0
O/H, AFUDC & Escalation	25.3	0.0	0.0	25.3
Contingency	15.8	0.0	0.0	15.8
Total	**199.1**	**0.0**	**0.0**	**199.1**

Operating Experience:

The units scheduled for replacement have been in service for five to six years and have exceeded 500,000 copies with an average volume of 20,000 copies per month. As the devices reach and exceed their rated capacity, they require more maintenance and service time resulting in loss of reliability and productivity. The typical service life for a peripheral device is five years.

Project Justification:

This is the continuation of the evergreen program to replace peripheral devices as they reach the end of their useful life. Hydro's infrastructure is supported by the manufacturer's maintenance agreement that covers the cost of consumables, except paper, and maintenance based on a monthly price per page. The additional multi-functional device is a replacement for a standalone analog copier which was installed in 1999.

Future Plans:

The ongoing plan involves a coordinated effort to keep Hydro's peripheral infrastructure in good working order and using current technologies.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Power Line Carrier - TL240
Location: Happy Valley - Churchill Falls
Division: Production
Category: Information Systems & Telecommunications
Type: Other
Classification: Normal

Project Description:

The Powerline Carrier on TL240 carries power system protection circuits as well as operational voice and data in support of the Energy Control Centre. This project consists of the design, supply, installation and commissioning of a Powerline Carrier (PLC) to replace the existing system and associated equipment on TL240 between Churchill Falls and Happy Valley Terminal Station.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	137.5	117.3	0.0	254.8
Labour	31.2	31.7	0.0	62.9
Consultant	0.0	0.0	0.0	0.0
Contract Work	0.0	0.0	0.0	0.0
Other Direct Costs	0.0	0.0	0.0	0.0
O/H, AFUDC & Escalation	19.9	39.4	0.0	59.3
Contingency	0.0	31.8	0.0	31.8
Total	**188.6**	**220.20**	**0.0**	**408.8**

Operating Experience:

This Powerline Carrier is 28 years old. Reliability is an issue due a lack of replacement parts, manufacturer support and repair services.

Project Justification:

The equipment has been in service for over 28 years and is now obsolete. The manufacturer no longer supports the product, and has discontinued the manufacture and sale of replacement components. In addition, there is no known third-party that provides repair services for defective modules. Therefore continued utilization of this equipment poses a risk of failure and hence loss of communications required for the protection and control of the power system and to provide uninterrupted service to customers.

Future Plans:

None.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Microwave Site Refurbishing
Location: Bay d'Espoir Hill and Blue Grass Hill
Division: Production
Category: Information Systems & Telecommunications
Type: Pooled
Classification: Normal

Project Description:

This project involves the refurbishing of two West Coast microwave sites located at Blue Grass Hill and Bay d'Espoir Hill, including:

- galvanizing and structural member replacement;
- guy wire replacement; and,
- building foundation replacement.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	0.0	0.0	0.0	0.0
Labour	21.3	0.0	0.0	21.3
Consultant	19.0	0.0	0.0	19.0
Contract Work	283.8	0.0	0.0	283.8
Other Direct Costs	5.4	0.0	0.0	5.4
O/H, AFUDC & Escalation	44.9	0.0	0.0	44.9
Contingency	32.9	0.0	0.0	32.9
Total	**407.3**	**0.0**	**0.0**	**407.3**

Operating Experience:

These microwave sites have been in operation since 1979 with no major refurbishing done and minor maintenance completed annually. The towers and guy wires are showing signs of rusting and oxidation. The buildings are experiencing shifting foundations and other similar indications of deterioration.

The microwave system is a part of Hydro's critical infrastructure, supporting power system protection signaling, as well as other functions related to the monitoring and control of the Corporation's generation, transmission and distribution assets. The microwave system is critical to Hydro in order to operate the power system and provide least cost and reliable power to customers. This program will extend the useful life of these sites.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Microwave Site Refurbishing **(cont'd.)**

Project Justification:

These microwave sites are major components of the power system and are required to provide the reliable generation and transmission of electricity across the Province. Without refurbishing, these microwave sites will deteriorate to a level where catastrophic structural failure would happen. This would result in direct loss of control of the grid for the Energy Control Center (ECC) and therefore extended power outages. As well, the loss of teleprotection on the transmission lines could cause severe damage to equipment and extend outages even longer.

To ensure that this project will be completed at the lowest possible cost, Hydro will solicit competitive bids for all materials and external labour.

Future Plans:

This project is part of an IS&T program to refurbish the West Coast Microwave site infrastructure. Other locations will be submitted as identified through inspection.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Battery System
Location: Multiple Sites
Division: Production
Category: Information Systems & Telecommunications
Type: Pooled
Classification: Normal

Project Description:

This project proposes: the replacement of DC battery systems at Daniel's Harbour Terminal Station, Hawke's Bay Terminal Station, St. Anthony Airport Terminal Station and St. Anthony Diesel Plant; the replacement of DC power plants at two sites: Deer Lake Terminal Station and Hinds Lake Generating Station; and the replacement of both battery and power plant at the Burnt Dam and Godaleich Hill Microwave sites.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	155.7	0.0	0.0	155.7
Labour	154.3	0.0	0.0	154.3
Consultant	0.0	0.0	0.0	0.0
Contract Work	10.0	0.0	0.0	10.0
Other Direct Costs	6.0	0.0	0.0	6.0
O/H, AFUDC & Escalation	45.0	0.0	0.0	45.0
Contingency	32.6	0.0	0.0	32.6
Total	**403.6**	**0.0**	**0.0**	**403.6**

Operating Experience:

This project is a continuation of a program to replace aging stationary battery systems and DC power plants. The decision to replace a battery system is based on a combination of age, observation and testing. The accepted guideline for the replacement of stationary battery system is to replace when the capacity falls below 80%. Based on our experience, the battery systems are at the end of their useful life. The DC power plants being replaced are all more than 20 years old and have reached the end of their useful lives.

The flooded cell battery bank being proposed for replacement was installed in 1983. The Valve Regulated Lead Acid (VRLA) battery banks being proposed for replacement are ten or more years old. Yearly capacity and conductive tests confirm the natural, expected degradation with time for these types of batteries.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Battery System **(cont'd.)**

Project Justification:

This replacement is necessary to provide emergency power to equipment required for the remote control and monitoring of Hydro's transmission and generation system and to provide reliable power to customers. Failure to replace this equipment is likely to result in a battery bank failure or reduced reliability which could cause or extend customer outages. The flooded battery has exceeded the 20-year design life which is the industry standard life expectancy of large stationary batteries of the flooded cell type. A failure is likely after the battery design life is exceeded.

The VRLA battery will be ten years old in 2005. Non-flooded batteries have demonstrated service life in the range of seven - eight years depending on the conditions in which the battery operates.

To ensure that this project will be completed at the lowest possible cost, Hydro will solicit competitive bids for all materials and external labour.

Future Plans:

None for this phase.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Remote Terminal Units
Location: Various Sites
Division: Production
Category: Information Systems & Telecommunications
Type: Pooled
Classification: Normal

This project proposes the replacement of four Remote Terminal Units (RTUs) at the Holyrood Generating Station, Stephenville Terminal Station, Come-by-Chance Terminal Station and Roddickton Terminal Station. This is phase seven of a nine-phase plan to replace all obsolete RTUs. The spares salvaged will be used to extend the life of the remaining units.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	175.7	0.0	0.0	175.7
Labour	60.3	0.0	0.0	60.3
Consultant	0.0	0.0	0.0	0.0
Contract Work	0.0	0.0	0.0	0.0
Other Direct Costs	45.0	0.0	0.0	45.0
O/H, AFUDC & Escalation	41.8	0.0	0.0	41.8
Contingency	28.1	0.0	0.0	28.1
Total	**350.9**	**0.0**	**0.0**	**350.9**

Operating Experience:

The RTUs being replaced are 18 - 20 years old. Each location has had parts replaced in the past due to failures. This is a continuation of a program to replace obsolete Remote Terminal Units (RTUs). The RTUs have been manufacturer discontinued and spare parts and repair services are no longer available. RTUs are critical assets used in conjunction with the Energy Management System (EMS) to control the delivery of power to our customers.

Project Justification:

Failure to replace this equipment may result in an impact on service to our customers. This may result in reduced reliability or extended customer outages. The RTUs being replaced are critical to the operation of the provincial power grid. The Holyrood Generating Station generates 32% of the

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Remote Terminal Units **(cont'd.)**

Project Justification: (cont'd.)

Island system's total power and is critical to the reliable supply of power on the Avalon Peninsula. Come-by-Chance Terminal Station supplies North Atlantic Refining Ltd., one of Newfoundland and Labrador Hydro's largest industrial customers, which is highly sensitive to outages. As well, the RTU at Come-by-Chance implements an auto restoration process that allows for automated recovery from certain outages on part of the eastern transmission system. The Stephenville Terminal Station RTU provides control and monitoring capability of terminal station facilities at Abitibi Consolidated's Paper Mill. The Roddickton RTU provides monitoring and control and for part of the Great Northern Peninsula.

Future Plans:

None.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: West Coast Communications Study

Location: West Coast

Division: Production

Category: Information Systems & Telecommunications

Type: Other

Classification: Normal

Project Description:

This project consists of a study to evaluate all viable communications options including but not limited to, microwave radio, fibre optic cable, leased services, or other technologies that may be suitable for collection and transmission of data gathered at the West Coast 230 kV substations for support of operations, administration and maintenance. A communications plan will be produced and a preliminary engineering design will be prepared on the most cost effective option.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	0.0	0.0	0.0	0.0
Labour	35.3	0.0	0.0	35.3
Consultant	100.7	0.0	0.0	100.7
Contract Work	0.0	0.0	0.0	0.0
Other Direct Costs	4.9	0.0	0.0	4.9
O/H, AFUDC & Escalation	20.1	0.0	0.0	20.1
Contingency	14.1	0.0	0.0	14.1
Total	**175.1**	**0.0**	**0.0**	**175.1**

Operating Experience:

Telecommunication service to Hydro's West Coast terminal stations (Massey Drive, Bottom Brook, and Stephenville) is presently achieved using Power Line Carrier (PLC) and dial backup facilities. The PLC provides teleprotection, low bandwidth data for Remote Terminal Unit (RTU) communications, and limited voice service. This technology will not be capable of supporting future data requirements for system performance and system operations applications.

Project Justification:

This cost benefit analysis and preliminary engineering design will provide Hydro with the most viable communications solution for the West Coast and ongoing support for core business such as teleprotection, real time system operations and operational voice for the provincial Energy Control Center. It is anticipated that operational data obtained would be used to improve system planning, maintenance and operation of the provincial electrical system to reduce costs and extend the life of the core electrical system assets.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: West Coast Communications Study **(cont'd.)**

Project Justification: (cont'd.)

To ensure that this project will be completed at the lowest possible cost, Newfoundland and Labrador Hydro will solicit competitive bids for all services.

Future Plans:

Based on the results of this communications plan, Hydro may submit a future capital budget proposal for an improved West Coast Communications System in 2008.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Telephone Isolation Equipment

Location: Happy Valley

Division: Production

Category: Information Systems & Telecommunications

Type: Other

Classification: Mandatory

Project Description:

This project involves the replacement of the existing telephone isolation equipment at the Happy Valley Terminal Station with a fibre optic cable.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	0.0	0.0	0.0	0.0
Labour	11.3	0.0	0.0	11.3
Consultant	0.0	0.0	0.0	0.0
Contract Work	31.7	0.0	0.0	31.7
Other Direct Costs	3.0	0.0	0.0	3.0
O/H, AFUDC & Escalation	6.7	0.0	0.0	6.7
Contingency	4.6	0.0	0.0	4.6
Total	**57.3**	**0.0**	**0.0**	**57.3**

Operating Experience:

The existing telephone isolation equipment which was made by Positron will be over 10 years old in 2006. In March 2000, six cards in the Positron shelf required replacement. Of the six cards, four needed to be returned to Positron for modifications and two cards were not working (no dial tone).

Project Justification:

The current installation of the telephone isolation equipment does not meet the distance clearances, as determined by the station's zone of influence, required for safety. A fibre optic system will meet safety requirements and provide improved communications reliability in support of Hydro's bulk transmission terminal stations. This will also provide enhanced protection for personnel and equipment against lightning and power surges.

Isolation equipment is required to be connected to telecommunications cables entering a generating station or terminal station in order to protect the workers outside the station who may be working on this cable when a fault occurs at the station.

Future Plans:

None.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Communications Network Technology
Location: Various Locations
Division: Production
Category: Information Systems & Telecommunications
Type: Pooled
Classification: Normal

Project Description:

This project proposes to replace 8 obsolete telecommunication network components as well as provide additional capacity on other network components. In addition, the project includes the installation of facilities required in the future to extend network access and voice connectivity as well as upgrade technology due to unforeseen circumstances. This network technology is used by staff throughout Hydro to obtain access to various applications and operational data, thereby increasing productivity and improving service to our customers.

The communications network is the connected devices and telecommunication facilities that allows employees to perform administrative activities and to connect to required Energy Management System data.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	60.1	0.0	0.0	60.1
Labour	17.5	0.0	0.0	17.5
Consultant	0.0	0.0	0.0	0.0
Contract Work	0.0	0.0	0.0	0.0
Other Direct Costs	0.0	0.0	0.0	0.0
O/H, AFUDC & Escalation	11.3	0.0	0.0	11.3
Contingency	7.8	0.0	0.0	7.8
Total	**96.7**	**0.0**	**0.0**	**96.7**

Operating Experience:

The network components being replaced under this project have reached the end of their useful life and are now obsolete. As well, the devices are not able to support desired expanded functionality including security and performance. The switches to be upgraded do not have the capacity to service the ongoing bandwidth enhancement requirements of the business.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Communications Network Technology **(cont'd.)**

Project Justification:

Hydro's refresh life cycle for network devices is eight years. These networking devices are obsolete and do not meet the functionality requirements of the business. The replacement equipment will correct network performance problems and allow traffic management to improve performance without requiring additional operating costs for leased services.

Future Plans:

None.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Vehicles

Location: Various Locations

Division: Transmission & Rural Operations

Category: Administration

Type: Pooled

Classification: Normal

Project Description:

This project involves replacing 37 light vehicles (cars, pick-ups and vans) and three medium/heavy vehicles (line trucks and boom trucks).

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	1,525.7	0.0	0.0	1,525.7
Labour	0.0	0.0	0.0	0.0
Consultant	0.0	0.0	0.0	0.0
Contract Work	0.0	0.0	0.0	0.0
Other Direct Costs	0.0	0.0	0.0	0.0
O/H, AFUDC & Escalation	54.8	0.0	0.0	54.8
Contingency	152.5	0.0	0.0	152.5
Total	**1,733.0**	**0.0**	**0.0**	**1,733.0**

Operating Experience:

It has been Hydro's experience that vehicles experience increased downtime and decreased reliability as they reach the replacement criteria outlined below.

REPLACEMENT CRITERIA

VEHICLES

Category	**Description**	**REPLACEMENT CRITERIA**	
		Age	**Other**
1000	Cars/Mini-vans	5-7 yrs.	>150,000 kms, maintenance cost, condition
2000	Pick-ups/Service Vans	5-7 yrs.	>150,000 kms, maintenance cost, condition
3000	Light Trucks	6-8 yrs.	>180,000 kms, maintenance cost, condition
4000	Medium/Heavy Trucks	7-9 yrs.	>200,000 kms, maintenance cost, condition

Category 1000 and 2000 vehicles being replaced will generally have an average age of six years and 190,000 km, while category 4000 will have an average age of nine years and 198,000 km.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Vehicles - 2006 **(cont'd.)**

Project Justification:

New vehicle replacements are required in order to ensure maximum reliability with minimum equipment downtime. Having work crews equipped with reliable and technologically current work vehicles, ensures their safety while at the same time enhancing efficient delivery of services. Operating vehicles beyond their economical life cycle will result in delays for work crews and have a negative impact on customer service.

Vehicles are screened against the replacement criteria before being identified for replacement. When a unit has met the age or kilometer criteria, the unit is further evaluated for its condition and maintenance history.

The budget allocations for each class of vehicle is shown below.

Vehicle Class	**Budget Amount**
1000 (Cars/Mini-vans)	$ 232,000
2000 (Pick-up/ Service Vans)	791,500
3000 (Light Trucks)	0
4000 (Medium/Heavy Trucks)	557,000
Contingency	152,500
Total	**1,733,000**

New vehicles are acquired through competitive tendering with a lease/purchase analysis used to determine the least cost alternative.

Future Plans:

None.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Construct New Warehouse
Location: Port Saunders
Division: General Properties
Category: Administration
Type: Other
Classification: Normal

Project Description:

The project consists of the construction of a 280 square meter pre-engineered metal building, one story in height and equipped with shelving and laydown areas suitable for inventory storage, materials handling for operating and capital work projects for the Northern regional operations.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	0.0	0.0	0.0	0.0
Labour	52.0	0.0	0.0	52.0
Consultant	0.0	0.0	0.0	0.0
Contract Work	301.0	0.0	0.0	301.0
Other Direct Costs	0.0	0.0	0.0	0.0
O/H, AFUDC & Escalation	42.6	0.0	0.0	42.6
Contingency	35.3	0.0	0.0	35.3
Total	**430.9**	**0.0**	**0.0**	**430.9**

Operating Experience:

Prior to the interconnection of the Great Northern Peninsula in 1996, Hydro's operations on the Northern Peninsula and Southern Labrador was centered in two regional offices, at Port Saunders and in St. Anthony. The St. Anthony office was responsible for all diesel and associated distribution operations from St. Anthony to Norman Bay in Labrador. The majority of this activity was related to diesel plant systems, particularly the main plant at St. Anthony. The Port Saunders office was responsible for distribution operations from Deer Lake to Bear Cove and Roddickton, Main Brook and Englee. The Stephenville regional office was responsible for all transmission systems on the peninsula. This resulted in a limited sized inventory and materials handling facility at Port Saunders for distribution materials, only. At St. Anthony, the main materials handling requirements centered around the required inventory for diesel plants, particularly the St. Anthony plant. All transmission materials for the peninsula were processed through regional operations in Stephenville and Bishop Falls.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Construct New Warehouse **(cont'd.)**

Operating Experience: (cont'd.)
The interconnection of the GNP in 1996, provided Hydro with the opportunity to restructure its operations on the Northern Peninsula and in Southern Labrador. The interconnection resulted in the St Anthony diesel plant being changed to stand by status, and thus a downsizing in operational requirements for that part of the region. At the same time, the responsibilities for the transmission systems were transferred to the Port Saunders region. Overall, across Hydro, the six regional offices were reduced to three and the operational center for the Northern Peninsula and Southern Labrador was more appropriately relocated to Port Saunders.

As these structural reorganizations were underway, Hydro was also reviewing and modifying its Goods and Services and Work Execution processes. These modifications took the form of reducing inventory levels and entering into long-term partnerships with suppliers. For the work execution process, materials would be 'kitted' for preplanned work one - two weeks in advance, rather than having trades people requisitioning materials for projects as they were assigned. These revisions to the business processes, changed the nature and space requirements of the materials handling facilities. The Port Saunders site, is now the central control point for the regional operations and for the materials distribution throughout the Northern regional operations area.

Project Justification:
The size of the existing warehouse at Port Saunders is 150 square meters. This space was sufficient for the limited requirements of distribution materials management which was the limit of the operations previously performed by the Port Saunders office. Since the interconnection of the GNP, the corporate reorganizations and the revisions to the Goods and Services process, this facility is no longer adequate. Port Saunders is now the operational center for Hydro operations from Deer Lake on the Island to Norman Bay on the Labrador coast. The focus now is on both transmission and distribution operations from this site. This requires that all materials for diesel, distribution and transmission work be processed, handled and transhipped from Port Saunders.

The nature and quantity of the materials being processed requires an increase in space to approximately 280 square meters. As the existing space at Port Saunders is an open bay area at

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Construct New Warehouse **(cont'd.)**

Project Justification: (cont'd.)

the end of the office space an extension of this space to the required 280 square meters was not deemed practical. It is proposed to construct a separate building to house the materials management operation. The existing space in the office building will be used for line maintenance personnel and their tools and equipment that require indoor storage. As well, the space will be used for the pre-assembly of hardware and laydown area needed for planned activities.

To ensure that this project will be completed at the lowest possible cost, Hydro will solicit competitive bids for all materials and external labour.

Future Plans

None.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Storage Ramps
Location: Bishop's Falls
Division: Human Resources & Legal
Category: Administration
Type: Other
Classification: Normal

Project Description:

The project consists of the replacement of storage ramps, No. 66, No. 67 and No. 116 at the Bishops Falls Control Stores facility. The new ramps will be constructed of steel posts, with supporting steel beams and decked with treated timber platforms. Ramp No. 116 will be strengthened by the addition of mid span beams.

Project Cost: *($ x1,000)*	**2006**	**2007**	**Beyond**	**Total**
Material Supply	65.0	0.0	0.0	65.0
Labour	65.0	0.0	0.0	65.0
Consultant	0.0	0.0	0.0	0.0
Contract Work	0.0	0.0	0.0	0.0
Other Direct Costs	0.0	0.0	0.0	0.0
O/H, AFUDC & Escalation	15.9	0.0	0.0	15.9
Contingency	13.0	0.0	0.0	13.0
Total	**158.9**	**0.0**	**0.0**	**158.9**

Operating Experience:

These ramps are located in the Bishop's Falls Central Stores yard and used for the outside storage of transformers and related distribution and transmission hardware. In August 2004, Storage Ramp No. 65 collapsed while distribution transformers were being removed by a forklift. The potential for serious injury to employees and major loss to stored equipment was extremely high.

A subsequent condition assessment of the storage ramps identified design shortcomings and recommended replacement of all identically constructed ramps. The five ramps identified were No. 64, No. 65, No. 66, No. 67 and No. 72. Ramp No. 64 and No. 65 are being replaced in 2005. and ramps No. 66 and No. 67 are proposed for replacement in 2006 while the replacement of ramp No. 72 will be proposed in Hydro's 2007 Capital Budget.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Project Title: Replace Storage Ramps **(cont'd.)**

Project Justification:

The existing ramps are approximately 20 to 25 years old and in a deteriorated condition. A condition assessment recommended these ramps be replaced. Materials stored on these ramps are both heavy and expensive to replace. Given the deteriorated condition, there are concerns for personal safety and the protection of stored assets.

Future Plans:

Ramp No. 72 will be proposed in the 2007 Capital Budget.

MULTI-YEAR PROJECTS

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Multi-Year Projects

The following projects are multi-year projects and have been reviewed by the Board at previous Capital Budget Applications. The projects are underway and have not had a material change in either scope, nature or forecast cost of the project from that contained in the original approval (as defined on Page 7 of the Provisional Capital Budget Application Guidelines - June 2, 2005).

1. **Replace Penstock - Snook's Arm Generating Station**

   This project was included in Hydro's 2005 Capital Application, (please refer to Section B, page B-13) and received the Board's approval in Order No. P.U. 53 (2004). The most recent cost estimate to completion is $2,110,000 as compared to $1,930,000 in Hydro's 2005 Capital Budget Application. An updated economic analysis (attached) indicates a net present value benefit of $1,161,092 to $1,398,735 at the end of a 30-year analysis with a pay back in 10 to 11 years. The analysis reviewed as part of the 2005 Capital Budget Application indicated a pay back in 13 years.

2. **Replace Unit No. 1 Governor Controls - Cat Arm**

   This project was included in an application filed with the Board on May 2, 2005 and which the Board approved in Order No. P.U. 14 (2005). The project is on schedule with no change in scope or forecast costs, with the installation planned during a scheduled outage in 2006.

3. **Upgrade Control System - Holyrood**

   This project was included in Hydro's 2005 Capital Budget Application (please refer to Section B, page B-16) and received the Board's approval in Order No. P.U. 53 (2004). The most recent forecast cost to completion is $2,831,469 as compared to $2,586,700 in Hydro's 2005 Capital Budget Application. Units No. 1 and No. 2 were completed in 2004 and Unit No. 3 was planned for 2005. However the plant station service portion could not proceed as system conditions and the ongoing asbestos abatement project would not permit an extended plant outage as was required. This portion of the project is now planned for completion during 2006.

4. **Addition of Disconnecting Means to 600 Volt MCC Branch Feeders**

   This project was included in an application filed with the Board on May 2, 2005 and which the Board approved in Order No. P.U. 14 (2005). This project is proceeding as planned with no change in scope, nature or forecast cost.

2006 CAPITAL PROJECTS OVER $50,000
EXPLANATIONS

Multi-Year Projects (cont'd.)

5. **Replace Energy Management System - Energy Control Centre**

   This project was included in Hydro's 2005 Budget Application (please refer to Section B, page B-114) and received the Board's approval in Order No. P.U. 53 (2004). The most recent forecast cost to completion is $10,238,000 as compared to $12,278,100 in Hydro's 2005 Capital Budget Application. This revision resulted from a higher Canadian dollar exchange rate with the US dollar and a decision to manage some of the work internally rather than to contract to an outside party.

6. **Replace VHF Mobile Radio System**

   This project was included in Hydro's 2005 Budget Application (please refer to Section B, page B-137) and received the Board's approval in Order No. P.U. 53 (2004). This project is proceeding as planned with no change in scope, nature or forecast. Currently Hydro is in the process of tendering the system. The current estimate for the contribution of the Department of Transportation and Works to this project is $3,592,000.

Newfoundland and Labrador Hydro

Report Addendum

Snook's Arm Wood Stave Penstock

Update of Economic Analysis

July 14, 2005

Introduction

As part of its 2005 Capital Budget, Hydro submitted and the Board approved a proposal to "Replace Penstock – Snook's Arm Generation Station". Final engineering commenced in 2005 with the bulk of the construction activities planned for completion in 2006. Due to a worldwide increase in the price of steel, the overall project estimate has increased from $1.93 million to $2.11 million. The following presents an update to the analysis of the economic viability of the proposed project.

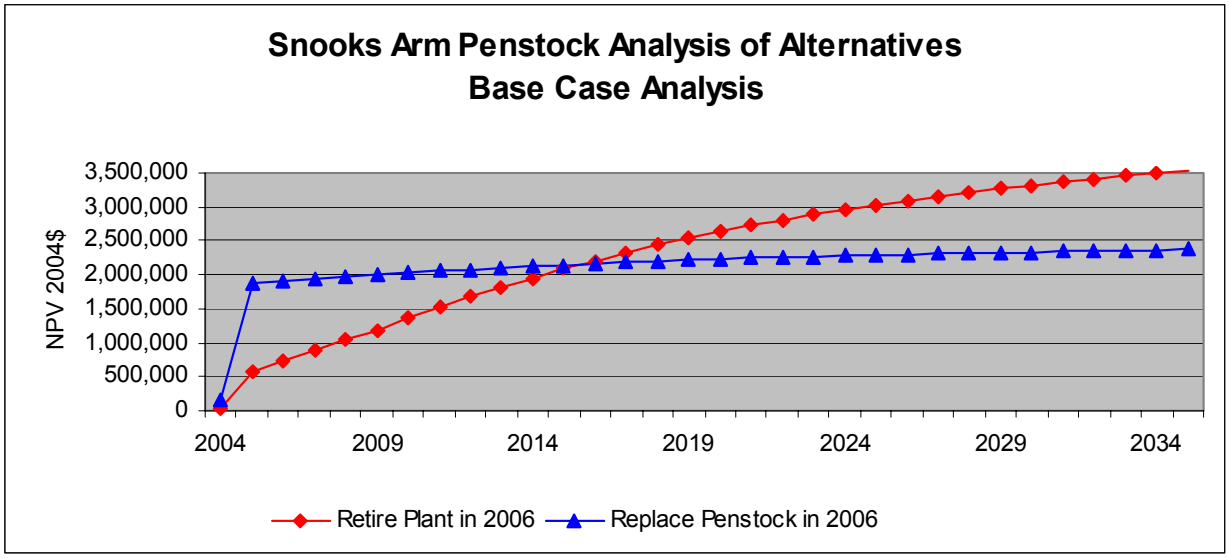
Summary

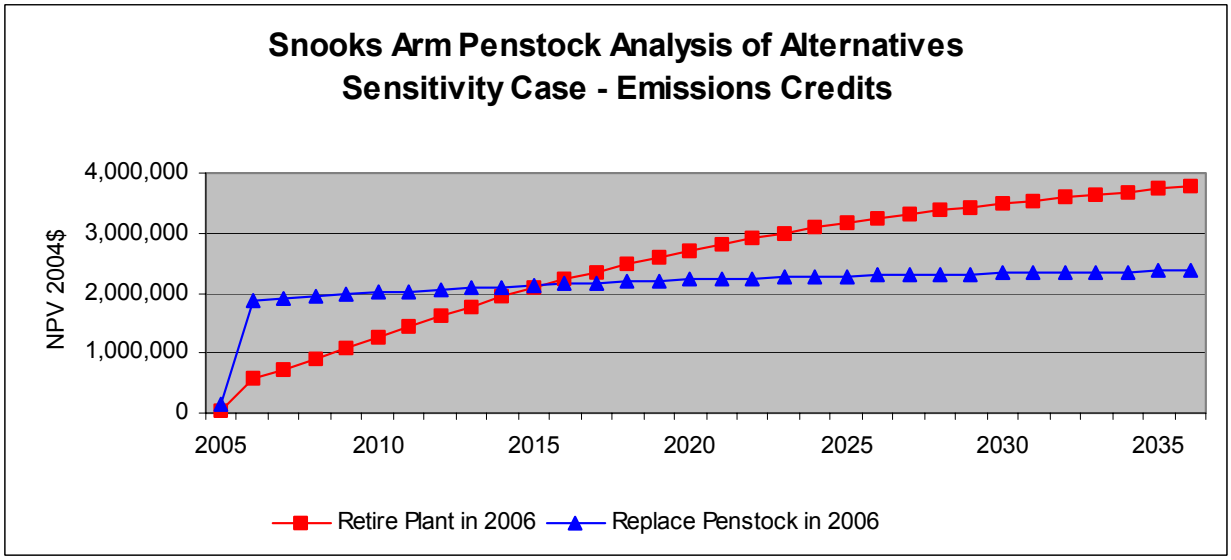
In addition to the increase in the estimated capital cost of the project, a number of other analysis inputs have also changed since the original report was filed with the Board in 2004. All changes are summarized below:

- Capital cost changed to $2,110,000
- Holyrood conversion efficiency changed to 630 kWh/bbl
- Holyrood variable O&M has been changed to 1.16 mills/kWh (2004$); and
- Forecast of fuel prices at Holyrood have been updated to reflect Hydro's latest estimates.

A summary of the detailed economic analysis (attached) is presented in the following table and graphs. Note that while the capital cost has increased, there has been a significant increase in the value of avoided fuel at Holyrood that has the overall effect of increasing the economic viability of the penstock replacement project.

Snook's Arm Penstock Replacement Comparison of Alternatives		
	CPW Preference Against Plant Retirement Alternative	
	CPW (2004$)	Payback Period
Base Case: Full Replacement in 2006	$1,161,092	11 Years
Sensitivity Case – Emissions Costs: Full Replacement in 2006	$1,398,735	10 Years





Snooks Arm Penstock Replacement

Option 1 - Full Replacement in 2005/6

Assumptions				
Annual Escalation:	2.0%		Engineering (2005):	117,600
Discount Rate:	8.4%		Construction (2006):	1,992,400
Installed Capacity:	590	kW		
Annual Energy:	3,500,000	kWh		
Holyrood Conversion:	630	kWH/BBL	Operator + O&M (2003$):	40,000
Holyrood Var O&M:	1.16	mills/kWh 2004$	Runner Maintenance (2003$):	7,500
Fuel Forecast:	Spring 2005	mills/kWh	Upper Penstock Maintenance (2003$)	20,000
Capacity Value (CT equiv.):	100	$/kW/yr 2004$	Retire Plant in 2006:	500,000

	Replace Penstock in 2006					Retire Plant in 2006							Difference	
Year	Capital Cost	Plant O&M	Runner & Penstock Maint.	Sub-total Current$	Sub-total CPW 2004$	Capital Cost	Operator	Capacity	Holyrood Var O&M	Holyrood Fuel	Sub-total Current$	Sub-total CPW 2004$	TOTAL Current$	TOTAL CPW 2004$
2004														
2005	117,600	41,616		159,216	146,878		41,616				41,616	38,391	117,600	108,487
2006	1,992,400	42,448		2,034,848	1,878,582	530,604	21,224		2,112	89,444	643,385	585,926	1,391,464	1,292,655
2007		43,297		43,297	1,912,573				4,309	189,722	194,031	738,255	-150,733	1,174,318
2008		44,163		44,163	1,944,558				4,395	211,667	216,061	894,736	-171,898	1,049,822
2009		45,046		45,046	1,974,654				4,483	221,667	226,149	1,045,830	-181,103	928,824
2010		45,947	8,615	54,563	2,008,284				4,572	230,000	234,572	1,190,408	-180,010	817,876
2011		46,866		46,866	2,034,931			45,895	4,664	243,333	293,892	1,357,510	-247,026	677,421
2012		47,804		47,804	2,060,006			45,895	4,757	254,444	305,096	1,517,541	-257,293	542,465
2013		48,760		48,760	2,083,599			45,895	4,852	265,694	316,441	1,670,660	-267,682	412,939
2014		49,735		49,735	2,105,800			45,895	4,949	276,944	327,789	1,816,979	-278,054	288,821
2015		50,730		50,730	2,126,690			45,895	5,048	287,778	338,721	1,956,462	-287,991	170,228
2016		51,744		51,744	2,146,347			45,895	5,149	293,750	344,794	2,087,443	-293,050	58,904
2017		52,779		52,779	2,164,843			45,895	5,252	299,722	350,869	2,210,403	-298,090	-45,560
2018		53,835		53,835	2,182,247			45,895	5,357	305,833	357,085	2,325,845	-303,251	-143,597
2019		54,911		54,911	2,198,624			45,895	5,464	312,083	363,443	2,434,236	-308,531	-235,613
2020		56,010	10,502	66,511	2,216,923			45,895	5,574	318,472	369,941	2,536,017	-303,429	-319,094
2021		57,130		57,130	2,231,423			45,895	5,685	325,000	376,580	2,631,595	-319,450	-400,172
2022		58,272		58,272	2,245,067			45,895	5,799	331,806	383,499	2,721,387	-325,227	-476,320
2023		59,438		59,438	2,257,905			45,895	5,915	338,611	390,421	2,805,716	-330,983	-547,811
2024		60,627		60,627	2,269,985			45,895	6,033	345,417	397,345	2,884,890	-336,718	-614,904
2025		61,839		61,839	2,281,352			45,895	6,154	352,500	404,549	2,959,252	-342,709	-677,900
2026		63,076		63,076	2,292,048			45,895	6,277	359,722	411,894	3,029,098	-348,818	-737,050
2027		64,337		64,337	2,302,113			45,895	6,402	367,083	419,381	3,094,703	-355,043	-792,590
2028		65,624		65,624	2,311,583			45,895	6,530	374,722	427,147	3,156,345	-361,523	-844,762
2029		66,937		66,937	2,320,494			45,895	6,661	382,361	434,917	3,214,244	-367,980	-893,750
2030		68,275	12,802	81,077	2,330,451			45,895	6,794	390,139	442,828	3,268,629	-361,751	-938,177
2031		69,641		69,641	2,338,341			45,895	6,930	398,194	451,019	3,319,727	-381,378	-981,385
2032		71,034		71,034	2,345,765			45,895	7,069	406,389	459,352	3,367,736	-388,319	-1,021,971
2033		72,454		72,454	2,352,751			45,895	7,210	414,583	467,688	3,412,829	-395,234	-1,060,078
2034		73,904		73,904	2,359,324			45,895	7,354	423,194	476,444	3,455,206	-402,540	-1,095,882
2035		75,382		75,382	2,365,510			45,895	7,501	431,806	485,202	3,495,018	-409,820	-1,129,508
2036		76,889		76,889	2,371,330			45,895	7,651	440,592	494,138	3,532,422	-417,249	-1,161,092

Snooks Arm Penstock Replacement

Option 1 - Full Replacement in 2005/6 + Emissions Credits

Assumptions			
Annual Escalation:	2.0%	Engineering (2005):	117,600
Discount Rate:	8.4%	Construction (2006):	1,992,400
Installed Capacity:	590 kW		
Annual Energy:	3,500,000 kWh		
Holyrood Conversion:	630 kWH/BBL	Operator + O&M (2003$):	40,000
Holyrood Var O&M:	1.16 mills/kWh 2004$	Runner Maintenance (2003$):	7,500
Fuel Forecast:	Spring 2005 mills/kWh	Upper Penstock Maintenance (2003$)	20,000
Capacity Value (CT equiv.):	100 $/kW/yr 2004$	Retire Plant in 2006:	500,000

	Replace Penstock in 2006					Retire Plant in 2006								Difference	
Year	Capital Cost	Plant O&M	Runner & Penstock Maint.	Sub-total Current$	Sub-total CPW 2004$	Capital Cost	Operator	Capacity	CO_2 Emissions**	Holyrood Var O&M	Holyrood Fuel	Sub-total Current$	Sub-total CPW 2004$	TOTAL Current$	TOTAL CPW 2004$
2004															
2005	117,600	41,616		159,216	146,878		41,616					41,616	38,391	117,600	108,487
2006	1,992,400	42,448		2,034,848	1,878,582	530,604	21,224			2,112	89,444	643,385	585,926	1,391,464	1,292,655
2007		43,297		43,297	1,912,573					4,309	189,722	194,031	738,255	-150,733	1,174,318
2008		44,163		44,163	1,944,558				28,140	4,395	211,667	244,201	915,116	-200,038	1,029,442
2009		45,046		45,046	1,974,654				28,140	4,483	221,667	254,289	1,085,011	-209,243	889,643
2010		45,947	8,615	54,563	2,008,284				28,140	4,572	230,000	262,712	1,246,933	-208,150	761,351
2011		46,866		46,866	2,034,931			45,895	28,140	4,664	243,333	322,032	1,430,035	-275,166	604,896
2012		47,804		47,804	2,060,006			45,895	28,140	4,757	254,444	333,236	1,604,826	-285,433	455,180
2013		48,760		48,760	2,083,599			45,895	28,140	4,852	265,694	344,581	1,771,562	-295,822	312,038
2014		49,735		49,735	2,105,800			45,895	28,140	4,949	276,944	355,929	1,930,442	-306,194	175,358
2015		50,730		50,730	2,126,690			45,895	28,140	5,048	287,778	366,861	2,081,512	-316,131	45,178
2016		51,744		51,744	2,146,347			45,895	28,140	5,149	293,750	372,934	2,223,183	-321,190	-76,836
2017		52,779		52,779	2,164,843			45,895	28,140	5,252	299,722	379,009	2,356,005	-326,230	-191,162
2018		53,835		53,835	2,182,247			45,895	28,140	5,357	305,833	385,225	2,480,544	-331,391	-298,296
2019		54,911		54,911	2,198,624			45,895	28,140	5,464	312,083	391,583	2,597,328	-336,671	-398,704
2020		56,010	10,502	66,511	2,216,923			45,895	28,140	5,574	318,472	398,081	2,706,850	-331,569	-489,927
2021		57,130		57,130	2,231,423			45,895	28,140	5,685	325,000	404,720	2,809,571	-347,590	-578,148
2022		58,272		58,272	2,245,067			45,895	28,140	5,799	331,806	411,639	2,905,951	-353,367	-660,885
2023		59,438		59,438	2,257,905			45,895	28,140	5,915	338,611	418,561	2,996,358	-359,123	-738,453
2024		60,627		60,627	2,269,985			45,895	28,140	6,033	345,417	425,485	3,081,139	-364,858	-811,154
2025		61,839		61,839	2,281,352			45,895	28,140	6,154	352,500	432,689	3,160,675	-370,849	-879,322
2026		63,076		63,076	2,292,048			45,895	28,140	6,277	359,722	440,034	3,235,292	-376,958	-943,244
2027		64,337		64,337	2,302,113			45,895	28,140	6,402	367,083	447,521	3,305,299	-383,183	-1,003,186
2028		65,624		65,624	2,311,583			45,895	28,140	6,530	374,722	455,287	3,371,002	-389,663	-1,059,419
2029		66,937		66,937	2,320,494			45,895	28,140	6,661	382,361	463,057	3,432,647	-396,120	-1,112,153
2030		68,275	12,802	81,077	2,330,451			45,895	28,140	6,794	390,139	470,968	3,490,487	-389,891	-1,160,036
2031		69,641		69,641	2,338,341			45,895	28,140	6,930	398,194	479,159	3,544,774	-409,518	-1,206,432
2032		71,034		71,034	2,345,765			45,895	28,140	7,069	406,389	487,492	3,595,724	-416,459	-1,249,959
2033		72,454		72,454	2,352,751			45,895	28,140	7,210	414,583	495,828	3,643,530	-423,374	-1,290,779
2034		73,904		73,904	2,359,324			45,895	28,140	7,354	423,194	504,584	3,688,410	-430,680	-1,329,086
2035		75,382		75,382	2,365,510			45,895	28,140	7,501	431,806	513,342	3,730,531	-437,960	-1,365,022
2036		76,889		76,889	2,371,330			45,895	28,140	7,651	440,592	522,278	3,770,065	-445,389	-1,398,735

** Assumes value associated with reduction of 2814 tonnes CO_2 @ $10/tonne annually