



Énergie NB Power

2004
ENVIRONMENTAL
PERFORMANCE
REPORT



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For information on the Canadian Electricity Association's Environmental Commitment and Responsibility Program, visit: www.canelect.ca

We want to know your views. Direct comments to: CorporateCommunications@nbpower.com or [click here](#).

The restructuring of New Brunswick Power Corporation took place in October 2004. For clarity purposes of this report all activities undertaken by the former business units will be attributed to the corresponding operating company. NB Power will be used throughout the document when referring to the group of companies as a whole.

HIGHLIGHTS



HOLDING

NB Power Holding Corporation (Holdco), through its subsidiaries, provides reliable, safe and economically-priced electricity generated at fifteen facilities, is delivered via power lines, substations and terminals to more than 360,000 direct and indirect customers within New Brunswick and surrounding markets.



- New Brunswick Power – a Crown Corporation vertically integrated with generation, transmission and distribution functions – was restructured into a holding company with separate operating companies.
 - Respect for the environment was instilled through its inclusion within each operating company's mission statements.
 - NB Power Holding Corporation, as the parent company, is a member of the Canadian Electricity Association.
-

GENERATION



NB Power Generation Corporation (Genco), a wholly-owned subsidiary of NB Power Holding Corporation, operates one of North America's most diverse generating systems, consisting of fourteen hydro, coal, oil, diesel and Orimulsion®-powered stations. This network of conventional generating stations produces safe, economical and dependable electricity and has a net load capacity of 3135 MW.

- Each generating station operates with approvals issued under New Brunswick's Department of Environment and Local Government's (NBDELG) *Clean Environment Act* and *Clean Air Act*.
- Courtenay Bay received renewed regulatory air quality approval to operate.
- Recycling of generation by-products has significantly reduced landfill requirements at Dalhousie, Coleson Cove, Courtenay Bay and Belledune generating stations.
- Regulatory approvals were renewed for the operation of domestic sewage systems at Coleson Cove, Courtenay Bay and Grand Lake.
- Belledune received an Approval to Operate for the Solid Waste Disposal Facility and an approval to construct the Phase III Disposal Cell #1.
- Annual Environmental Management System audits were conducted at Grand Lake, Belledune, Dalhousie, Coleson Cove, and Hydro Generating Stations.
- The Canadian Gypsum Company received more than 190,000 tonnes of gypsum, a by-product of the flue gas desulphurization units at Dalhousie and Belledune. Over 3,200 tonnes of flyash from Belledune was sold for use in concrete products. More than 1,600 tonnes of ash from Dalhousie and Coleson Cove was recycled for use by the steel industry.

NUCLEAR



NB Power Nuclear Corporation (Nuclearco), a wholly-owned subsidiary of NB Power Holding Corporation, owns and operates the Point Lepreau Generating Station (PLGS).

The Point Lepreau Generating Station is a CANDU 6 – 635 MWe unit, which supplies up to 30% of New Brunswick's energy requirements. The station is important to NB Power's environmental performance as it avoids significant carbon dioxide, sulphur dioxide, and nitrogen oxide emissions.

- Nuclear generation avoided emissions of approximately 57,000 tonnes of sulphur dioxide, 3.3 million tonnes of carbon dioxide, and 12,400 tonnes of nitrogen oxide.
- Health Physics Department performed analyses on samples of air, water, food, vegetation, soil, sediment and sea life.
- The Environmental Management System was re-registered to the International Standard ISO 14001 in October 2004.

TRANSMISSION



NB Power Transmission Corporation (Transco), a wholly-owned subsidiary of NB Power Holding Corporation, owns, operates and maintains 46 terminals and switchyards that are interconnected by over 6,700 km of transmission lines ranging in voltage from 69 kV to 345 kV, linked with neighbouring electrical systems including Québec, Maine, Nova Scotia and Prince Edward Island. Employees are responsible for transmitting electricity from the generating stations to in-province and point-to-point transmission customers.

- Work continued on the environmental management system to develop procedures, enhance management programs and formalize the Emergency Response Plan.
- Employees maintained brush on approximately 940 kilometres of transmission line rights-of-way by using manual and mechanical methods.
- An independent external EMS audit was conducted in March.
- An oil-filled equipment management program was developed based on an audit of all such apparatus.

DISTRIBUTION AND CUSTOMER SERVICE



NB Power Distribution and Customer Service Corporation (Disco) is a wholly-owned subsidiary of NB Power Holding Corporation serving residential, commercial and industrial customers across the province. Disco delivers safe, reliable and competitively-priced energy by way of its 20,000 km of distribution lines. It also provides valuable customer services through its regional operating offices, customer contact centres, account managers and energy advisors.

- A contract was awarded to Eastern Wind Power Inc. for the first commercial wind-powered generation in New Brunswick.
- Disco's energy advisors conducted home evaluations for more than a thousand customers through the Home Energy Check program.
- Consultation regarding proposed vegetation management programs was conducted with customers and community leaders in their communities.
- Sixteen thousand water heaters removed from residences were fully recycled.

FIVE PRINCIPLES GUIDE NB POWER'S ENVIRONMENTAL PERFORMANCE AND AFFIRM THE CORPORATION'S COMMITMENT TO ENVIRONMENTAL PROTECTION.

ENVIRONMENTAL POLICY

LEADERSHIP

NB Power maintains a leadership role in the investigation of new environmentally responsible technologies and methodologies through co-operative efforts with the public, industry, researchers and government.

ENVIRONMENTAL STANDARDS

NB Power complies with all applicable environmental legislation and other non-regulatory commitments at its facilities, from early planning through operation and, finally, decommissioning.

ENVIRONMENTAL AUDITS

NB Power is committed to periodic environmental audits of its facilities and associated monitoring programs to assess compliance with regulatory requirements and consistency with industry standards and internal procedures.

ENVIRONMENTAL PROTECTION

NB Power provides a framework for setting and reviewing objectives, targets and procedures to assist its employees in meeting the utility's commitment to environmental protection, prevention of pollution and improvement of its environmental management systems.

PARTNERSHIP

NB Power strives to ensure that all its partners, including contractors, consultants and suppliers of goods and services, respect its Environmental Policy.

Each operating company – Genco, Nuclearco, Transco and Disco – integrates the Environmental Policy with its operations. Environmental management systems and protection programs are in place and employees are expected to perform their work in an environmentally responsible manner.

To provide support, Corporate Environmental Services assists the operating companies and development projects to:

- integrate environmental management with operations and project planning
- acquire regulatory approvals for facilities and new construction
- monitor compliance with regulatory approvals and report to regulating agencies
- consult with external agencies and stakeholders on environmental issues
- provide environmental information to customers, staff, regulatory authorities and the public
- monitor and provide input on new and revised environmental standards and legislation

MESSAGE FROM THE PRESIDENT & CEO



There is no doubt that we will look back on 2004 as a year of significant change – I'm confident, that it will also be recognized as having provided a foundation for the Corporation's future growth, and a platform for our future success. Over our 85-year history, NB Power has been recognized as a leader in engineering, technology and for the strength of our people. Through the challenges that this year presented, a consistent redeeming quality has been the perseverance of our employees to pursue our goals in an environmentally sound manner.

Every company must confront the challenges between pursuing profitability and sustaining the environment. Like many North American utilities, we have been beset with fuel prices that seemingly have no ceiling. These cost pressures motivated a business excellence program that generated long-term cost savings. I'm impressed and thankful that employees throughout the group of companies remain committed to working in an environmentally responsible manner.

The year provided many milestones that will have an important impact on the Corporation's future. A few of the highlights are listed below.

- The provincial government proclaimed a new Electricity Act. The Act achieved three purposes:
 - It restructured NB Power into a holding company with four subsidiaries responsible for conventional generation, nuclear generation, transmission and distribution.
 - It opened the electricity market for large industrial and wholesale customers.
 - It created the New Brunswick System Operator and the New Brunswick Electric Finance Corporation.
- The refurbishment of the Coleson Cove Generating Station will allow NB Power Generation Corporation to meet stricter environmental requirements and produce reliable generation from the station until 2030. The station is now one of the most environmentally-advanced thermal generators in Canada. Moreover, we now have advanced environmental protection equipment at each major thermal station.
- NB Power Nuclear Corporation's environmental management system has been re-registered to ISO 14001 standard. Moreover, each operating company has implemented an ISO-consistent Environmental Management System.
- NB Power Distribution and Customer Service Corporation awarded a contract to Eastern Wind Power Inc. for the first commercial wind-powered generation in New Brunswick.

This year's activities continued to build upon our existing environmental infrastructure. We are proud that all major generating facilities boast state-of-the-art environmental protection equipment. Other operational results of note include:

- sulphur dioxide emissions are below regulated limits,
- particulate emissions are below federal levels for new station sources,
- tested wastewater effluents are below regulated annual limits,
- more than 200,000 tonnes of generation by-products are recycled each year,
- Courtenay Bay Generating Station received renewed regulatory air quality approval to operate, and
- generating stations at Coleson Cove, Courtenay Bay and Grand Lake received various regulatory approvals for wastewater treatment systems and/or domestic sewage systems.

The effect that the Kyoto Protocol will have on our operations will be monitored very closely. NB Power Generation Corporation has spearheaded the charge by establishing a greenhouse gas committee that spans the group of companies and leverages internal expertise to meet the requirements while protecting the ratepayers.



Despite the challenges of remaining cost-effective for our ratepayers and the uncertainty that the Kyoto Protocol and rising fuel prices engender, I remain confident in the ability of our group of companies to successfully navigate the uncertain seas ahead ensuring reliable electricity for a vibrant New Brunswick.

I trust you will find that the enhanced nature of our report provides a comprehensive overview of our year's activities and results.

On behalf of our employees, I thank you for your interest.

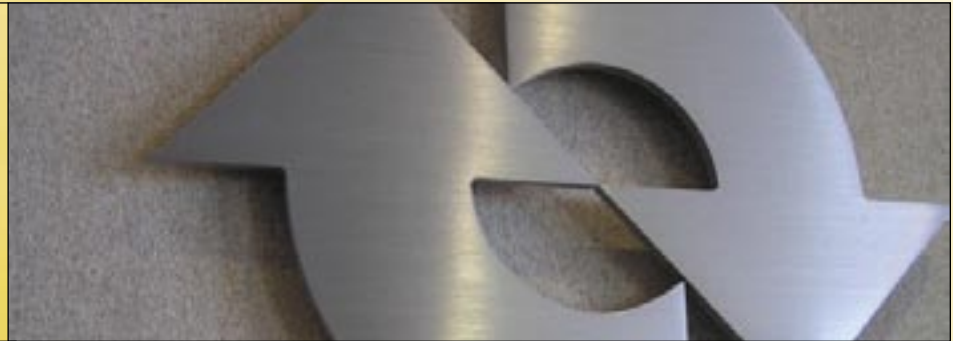
David D. Hay
June 17, 2005

NB POWER HOLDING CORPORATION



Énergie NB Power

Corporation Holding
de portefeuille Corporation



NB POWER HOLDING CORPORATION (HOLDCO), THROUGH ITS SUBSIDIARIES, PROVIDES RELIABLE, SAFE AND ECONOMICALLY-PRICED ELECTRICITY GENERATED AT FIFTEEN FACILITIES, IS DELIVERED VIA POWER LINES, SUBSTATIONS AND TERMINALS TO MORE THAN 360,000 DIRECT AND INDIRECT CUSTOMERS WITHIN NEW BRUNSWICK AND SURROUNDING MARKETS.

OVERVIEW

From the extensive analysis of the proposed Point Lepreau refurbishment to the completion of the Coleson Cove Refurbishment Project, environmental considerations remain high on the list of priorities for the corporation. The year was underscored by the opening of the provincial electricity market and punctuated by the restructuring of New Brunswick Power Corporation.

As a successor company, Holdco spearheaded an aggressive business excellence program that was both ambitious and far-reaching. Extending throughout the operating companies, the program aimed at increasing efficiencies and minimizing costs while ensuring that business objectives were attained. Meanwhile, through the environment council and the corporation's environmental management systems, a commitment to managing with respect for the environment was maintained.

RESTRUCTURING

With proclamation of the *Electricity Act*, on October 1, 2004, the Government of New Brunswick created a competitive market for wholesale and large industrial electricity consumers and expanded non-utility generation opportunities. Coincident to the market transformation, New Brunswick Power Corporation – a Crown Corporation vertically integrated with generation, transmission and distribution functions – was restructured into a holding company with separate operating companies.

The companies created by the *Electricity Act* are:

- **New Brunswick Power Holding Corporation**, which has generation (conventional and nuclear), transmission and distribution subsidiaries;
- **New Brunswick Power Generation Corporation**, which assumed the conventional generation business of NB Power;
- **New Brunswick Power Nuclear Corporation**, which assumed the operation of Point Lepreau Generation Station;
- **New Brunswick Power Transmission Corporation**, which assumed the transmission business of NB Power;
- **New Brunswick Power Distribution and Customer Service Corporation**, which assumed the distribution and customer service business of NB Power; and
- **New Brunswick Power Coleson Cove Corporation** which is a wholly-owned subsidiary of New Brunswick Power Generation Corporation.

With the exception of NB Power Holding Corporation and NB Power Coleson Cove Corporation, each of the new operating companies operated as a business unit within the integrated utility.

The restructuring resulted in a common Board of Directors, President & Chief Executive Officer (CEO) for Holdco and each operating company, mirror structures in operating companies to create separate legal entities, and revised financial structures for each of the companies.



This environment report presents an account for the 2004 calendar year. Although the restructuring took place in October, for clarity purposes of the report all activities undertaken by the former business units will be attributed to the corresponding operating company. NB Power will be used throughout the document when referring to the group of companies as a whole.

BUSINESS EXCELLENCE

In fall 2004, NB Power embarked on a Business Excellence Program, with an immediate focus on near-term and sustainable cost reductions. This program consists of the following four components: cost reduction, staff adjustment program, business planning and budgeting and Balanced Scorecard.

Environmental management practices were protected throughout the Business Excellence Program and respect for the environment was further indoctrinated through its inclusion within each companies mission statement.

NATIONAL BENCHMARKS

NB Power is a member of the Canadian Electricity Association and participates in the Environmental Commitment and Responsibility (ECR) program. In this industry-wide initiative, electric utilities report on specific measures and indicators to benchmark performance. The principles of the ECR program are to:

- Be more efficient in our use of resources;
- Reduce the adverse environmental impact of our business;
- Be accountable to our constituents; and
- Ensure that our employees understand the environmental implications of their actions and have the knowledge and skills to make the right decisions.

As part of the ECR Program, an independent verification audit was undertaken in June 2003 to ensure the indicator reports are accurate and that EMS implementation is consistent with ISO 14001 standard. The verification audit was successful and highlighted that the EMS programs are well maintained, communicated and supported by a robust auditing process. EMSs meet all requirements, cover all relevant areas of activity and continue to mature. In addition, ISO 14001 re-registration was obtained for the NB Power Nuclear Corporation.

ENVIRONMENTAL COUNCIL



To assist in communicating and maintaining the commitment to the Environmental Policy throughout the group of companies, a council with representatives from each operating company has been formed.

The purpose of the council is to:

- Ensure there is clear understanding of environmental responsibilities between the new operating companies and Environmental Services in order to fulfill environmental responsibilities;
- Develop a co-operative approach between council members to share knowledge and identify key resources;
- Review the status of environmental management systems;
- Communicate key environmental challenges facing the areas represented by council members; and
- Establish and maintain a database of environmental legislation appropriate to the operating companies and assign responsibility to track legislative changes so there will be appropriate communication to council members and operating personnel.

CASE STUDY

NB POWER NEWS *ONLINE*



Challenge

NB Power Corporate Communications publishes a monthly newsletter for employees and retirees called NB Power News. The corporation printed and distributed nearly four thousand (4,000) bilingual, tabloid-style newsletters which averaged 32 pages each month. It was costly and used a significant amount of paper.

Solution

In addition to communications objectives, the corporate communications' team identified fiscal and environmental goals as key factors to be addressed through the review process. Based on anecdotal evidence, the Corporation's internal audience seemed open to a new start for the monthly newsletter. Because of this opportunity, a number of options were considered including continuing with a print-based publication, using an exclusively electronic version, or a combination of both.

Through a postcard campaign with external recipients, the team was able to ascertain how many preferred print versus electronic copies. The campaign also discovered that 800 of 3,900 recipients no longer wished to receive the monthly newsletter. By removing these individuals from the mailing list, a significant saving could be achieved immediately.

Following the review, it was decided to proceed through the use of an online version with a limited number of printed copies. The intranet was chosen because of its extensive internal use. External readers were provided with access to the NB Power News *Online* issue via the Internet. Retirees are also notified via email when a new issue is online. The printed versions are output in black and white and are sent to employees and retirees who do not have internet access.

To further emphasize the environmental message, when a reader selects the online print option for an article, the user is brought to an environmental notice page with the following message:

Caring for the Environment

Before you print this article, please consider that a significant benefit of NB Power News Online is the environmentally-friendly way it allows us to communicate.

This aligns with NB Power's environmental objective to be as efficient as possible in the use of resources such as paper.

So please think before you print. Thank you.

Results

This initiative has reduced paper use by over 90%. Additionally, more than 70% of users decline printing when prompted. Through implementation of NB Power News *Online*, Corporate Communications has saved more than 1.3 million sheets of paper. These savings translate into an impressive environmental impact including saving more than 12 metric tonnes of paper, 204 trees, 36 cubic yards of landfill space and 48,000 kilowatts of energy.

NB POWER GENERATION CORPORATION



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Production Generation



NB POWER GENERATION CORPORATION (GENCO), A WHOLLY-OWNED SUBSIDIARY OF NB POWER HOLDING CORPORATION, OPERATES ONE OF NORTH AMERICA'S MOST DIVERSE GENERATING SYSTEMS CONSISTING OF FOURTEEN HYDRO, COAL, OIL, DIESEL AND ORIMULSION®-POWERED STATIONS. THIS NETWORK OF CONVENTIONAL GENERATING STATIONS PRODUCES SAFE, ECONOMICAL AND DEPENDABLE ELECTRICITY AND HAS A NET LOAD CAPACITY OF 3,135 MW.

OVERVIEW

NB Power Generation is committed to protecting the environment and producing economical and reliable energy for New Brunswickers. Installing advanced environmental protection equipment has effectively managed air emissions and wastewater discharges. Genco has also established a progressive waste management and minimization program. Each generating station operates with approvals issued under the New Brunswick Department of Environment and Local Government's (NBDELG) *Clean Environment Act* and *Clean Air Act*.

To ensure that its generating stations meet air emission standards, a major refurbishment of the three units at the Coleson Cove Generation Station was completed on November 30, 2004. A new stack was added along with the addition of a flue gas desulphurization system (called a scrubber), which significantly reduces sulphur dioxide (SO₂) emissions. The burner was replaced with a burner that was specifically designed to limit nitrogen oxide (NO_x) emissions. The refurbishment of the Coleson Cove Generating Station will allow Genco to meet stricter environmental requirements and produce reliable generation from the station until 2030.

The Grand Lake Generating Station has an electrostatic precipitator to control particulate emissions. The Dalhousie and Belledune Generating Stations each have an electrostatic precipitator and scrubber. In addition, the Belledune Generating Station has a specifically-designed burner to limit nitrogen oxide emissions.

Combustion turbines at Millbank and Ste.-Rose are equipped with high-efficiency water injection systems (using ultra-pure water produced from each station's water treatment plant) for controlling nitrogen oxide emissions. Millbank, Ste.-Rose and Grand Manan use a low-sulphur light fuel oil, which ensures low sulphur dioxide emissions.

Each thermal generating station and the Millbank Combustion Gas Turbine station has equipment to monitor air quality. The stations at Dalhousie, Belledune, Millbank, Grand Lake and Courtenay Bay receive sulphur dioxide data from monitors connected to local ambient air quality networks. This helps to ensure that regulated ambient air quality levels are being met. Belledune and Millbank also receive NO_x data from the ambient air quality monitoring sites in their network. Stations at Dalhousie, Belledune, Grand Lake and Coleson Cove also run an air-quality computer model that predicts ground level concentrations of sulphur dioxide. These stations also have continuous emissions monitoring systems and/or computer software systems to measure sulphur dioxide and nitrogen oxide emissions and opacity. As part of the refurbishment project, Coleson Cove also installed an ambient air quality monitoring network for sulphur dioxide and particulate matter. Additionally, employees are actively pursuing a market for gypsum at Coleson Cove.

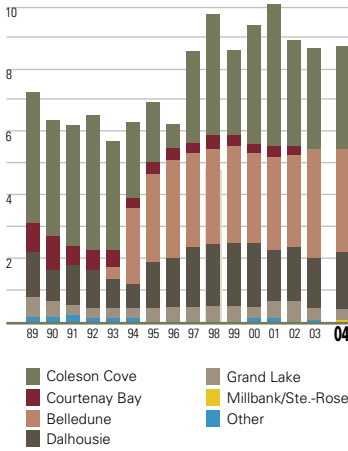


Recycling of generation by-products has significantly reduced landfill requirements. Dalhousie and Coleson Cove recycle bottom ash and fly ash for the extraction of vanadium for use in the steel industry. Courtenay Bay also recycles ash containing vanadium. Belledune recycles fly ash for use in concrete products and industrial operations, and gypsum is marketed for the production of wallboard. Gypsum is also marketed for the production of wallboard at Dalhousie. Any unmarketable ash, gypsum and wastewater treatment sludge from the generating stations are contained in engineered landfills that protect groundwater from contamination.

All thermal stations have wastewater treatment systems to monitor and control the quality of effluent. At the Grand Lake and Belledune Generating Stations, coal pile runoff is also collected and treated. As part of the Coleson Cove Refurbishment Project, a new wastewater treatment plant was designed and constructed due to the increased amount of effluent from the plant and scrubber.

Hydroelectricity is a renewable energy source that does not emit the by-products of thermal generators. Genco operates six hydro generating facilities on the St. John, Tobique and St. Croix Rivers. The primary impact of hydro stations is on the rivers that power them and Genco has mitigating measures in place to reduce that impact. An agreement with Fisheries and Oceans Canada and the New Brunswick Department of Natural Resources ensures that there is enough water above and below the dams on the Tobique River headwaters for fish habitat. Additionally, hydro stations at Mactaquac, Tobique, Beechwood and Milltown have facilities enabling fish to make their way upstream.

CARBON DIOXIDE EMISSIONS (CO₂)
megatonnes



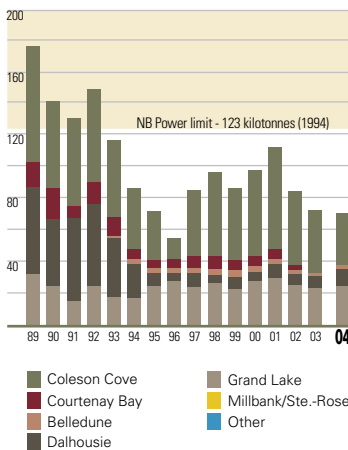
AIR QUALITY

Renewed regulatory air quality approval to operate Unit #4 was received for Courtenay Bay during 2004.

As required by the Approval to Operate for the Grand Lake Generating Station, an *Emissions Reduction — Management Plan for the Grand Lake Generating Station* was submitted to the New Brunswick Department of Environment and Local Government, in September 2004. The Plan presented the results of investigations into the future of the station including its remaining useful life and potential for repowering of Unit #8; feasibility of burning lower sulphur fuels; feasibility of installing and operating air pollution control devices for sulphur dioxide (SO₂), mercury and nitrogen oxides (NO_x); and other related matters. The Plan also outlined an operating strategy based on the elements above for the remaining useful life of the facility.



SULPHUR DIOXIDE EMISSIONS (SO₂)
kilotonnes

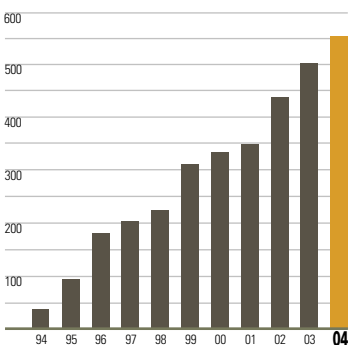


Genco and NBDELG jointly operate the New Brunswick Precipitation Monitoring Network. The precipitation monitoring program provides weekly information on the chemistry of precipitation at selected locations throughout the province. Biannual audits of all sites were conducted during 2004, ensuring proper procedures were followed in collecting samples and recording information. This program has shown that as much as 85% of the acid rain falling on New Brunswick is transported by weather systems from other parts of Canada and the United States. Information from the program is shared with Environment Canada’s Meteorological Service of Canada and is included in the National Atmospheric Chemistry Database (NAtChem). This database, which was set up in 1987 as a Canadian central database and analysis facility, collects data from Canadian federal and provincial monitoring networks and major US networks. Its main purpose is to determine the chemistry of regional-scale precipitation in Canada and the US.

During 2004, carbon dioxide emissions increased slightly to 8.78 megatonnes from 8.62 megatonnes in the previous year.

NB Power’s sulphur dioxide emissions control program has reduced emissions from over 176 kilotonnes in 1989 to 70 kilotonnes in 2004. During 2004, sulphur dioxide emissions were lower than those in 2003 because of increased hydro generation and lower fossil fuel generation.

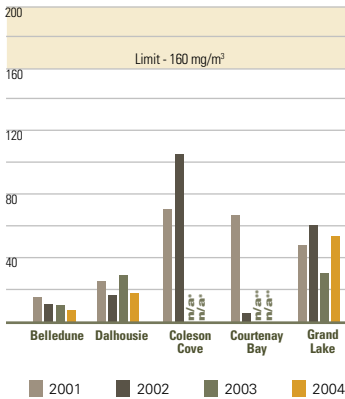
ACCUMULATED SULPHUR DIOXIDE EMISSIONS BELOW LIMIT
kilotonnes



In 1994, the annual limit for sulphur dioxide emissions was set at 123 kilotonnes. For the past ten years, Genco has consistently been below this limit. Cumulatively, the emissions have been 555 kilotonnes below the annual limit. This reduction is primarily due to emissions control equipment installed at the Belledune and Dalhousie Generating Stations.

PARTICULATE EMISSIONS

mg/m³



* No testing due to refurbishment.
 ** Unit #4 did not operate.

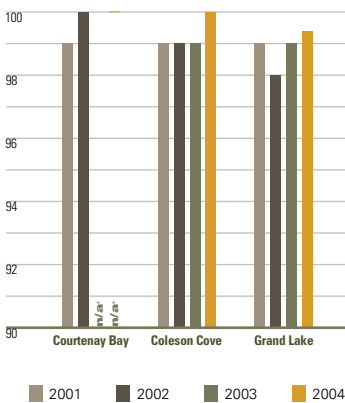
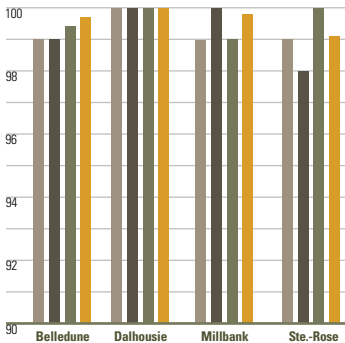
Annual particulate emission tests at Belledune, Dalhousie, and Grand Lake demonstrated success in keeping particulate emissions below 160 mg/m³, which is Environment Canada’s guideline for new stationary sources. There are no significant particulate emissions from the Millbank and Ste.-Rose combustion turbines. Particulate testing was not conducted at Courtenay Bay as Genco did not operate Unit #4 in 2004, nor at Coleson Cove due to the then ongoing refurbishment project.

As part of the Canadian Electrical Association’s (CEA) Mercury Program, Genco conducted mercury emissions testing at the Belledune Generating Station in August and September, 2004. Mercury testing was performed in accordance with: *The Canadian Uniform Data Collection Program (UDCP) for Mercury from Coal-fired Electric Power Generation “Appendix F: Measurement of Speciated Mercury Emissions In Stack Gas From Coal-fired Electric Power Generating Stations: The Ontario Hydro Method”* prepared for the Canadian UDCP by Curtis Environmental Consulting dated January 2003. Results of the testing showed emissions of 17 kilograms for the year. The results were reported to the New Brunswick Department of Environment and Local Government.

WATER QUALITY

WASTEWATER

% of analysis within approval limits



* Data is being reported by Bayside Power.

During 2004, Coleson Cove, Courtenay Bay and Grand Lake each received, under the *Clean Environment Act*, a renewed regulatory Approval to Operate for their wastewater treatment systems. In addition, Belledune received an Approval to Operate for the Solid Waste Disposal Facility as well as an Approval to Construct the Phase III Disposal Cell #1.

Analyses were performed on wastewater effluent according to each generating station’s regulatory Approval to Operate. During the year, over 99% of wastewater effluent analyses were found to be within approval limits.



A Fish Entrainment and Impingement

Monitoring Study, which began in 2003, at the Belledune Generating Station continued through 2004. Genco committed to this study as part of the Environmental Impact Assessment conducted for the Belledune Generating Station project in the early 1990s. It will determine the accuracy of predictions made regarding the effects of the water cooling system on the entrainment and impingement of marine species. Monitoring, data collection, and field work have been completed and a final report is expected to be available during the spring of 2005.

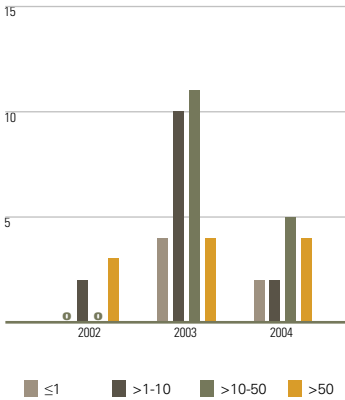
WASTE MANAGEMENT

NB Power Generation has found creative ways to use generation by-products to reduce landfills. The Canadian Gypsum Company received over 245,368 metric tonnes (MT) of gypsum, a by-product of the flue gas desulphurization units at Dalhousie and Belledune, for processing into wallboard. All the gypsum produced was sent for processing.



Genco has partnered with American-based Separation Technologies Incorporated (STI) to process fly ash, which is a by-product from burning a solid combustible fuel, at the Belledune Generating Station. Through its partnership with STI, approximately 120,000 MT of fly ash will be diverted from landfill annually through either sale or reburn. To date over 16,032 MT of fly ash from Belledune was sold for use in concrete products. Approximately 1,536 MT of ash from Dalhousie and Coleson Cove were recycled for the extraction of vanadium, used in the steel industry. Again, this reduced the materials sent to landfill.

RELEASES OF PETROLEUM PRODUCTS
number of spills (litres)



Genco participates in the National Pollution Reduction Inventory (NPRI) program. The NPRI is a national, legislated (CEPA1999), publicly-accessible inventory that tracks: on-site releases of pollutants to air, water, land and underground; off-site transfers for disposal; and off-site transfers for recovery, reuse, recycling and energy recovery. In Canada, facilities must submit an annual NPRI report for the substances listed if the facility meets specific criteria or requirements. The report for 2003 was submitted during 2004, and the report for 2004 is due by June 1, 2005.

Genco is required to report all petroleum product spills. In 2004, there were 13 spills compared to 29 the previous year – 2 of these spills involved less than 1 litre, 2 involved less ten litres, 5 involved from ten to fifty litres, while 4 spills were more than fifty litres. There were no spills involving PCB contaminated oil. Cleanup and reporting of the spill to the appropriate regulatory authorities were done in all cases.

ENVIRONMENTAL MANAGEMENT SYSTEM

The Environmental Management System (EMS) is a voluntary program implemented to manage environmental impacts of business activities. EMSs consistent with the ISO 14001 standard are in place at Coleson Cove, Grand Lake, Dalhousie, Belledune, Millbank, Ste.-Rose, Grand Manan and within the Hydro Region. The stations' staff maintain their management systems by monitoring performance, training employees, and reviewing the adequacy of procedures and emergency response plans.

Each generating station has an emergency response plan as part of its EMS. In 2003, the Environmental Emergency Regulation, developed under section 200 of the *Canadian Environmental Protection Act*, came into effect. This new regulation requires that each of Genco's generating stations has emergency response plans in place to deal with spills or releases of various substances that may pose a danger to public safety or the environment. The existing plans will be revised as required to ensure consistency with the new regulation.

As part of Dalhousie's Orimulsion® Spill Response plan, one "booming" exercise was completed at the east end of the wharf in August 2004.



Annual EMS audits were conducted at Grand Lake, Belledune, Dalhousie, Coleson Cove, and Hydro Generating Stations. Each of the five audits focused on the activities, products and services that were managed by the particular EMS. In all cases, the ISO 14001 standard and each station's policies, procedures and programs were used as the audit criteria.

No major non-conformances were raised in 2004, and the number of minor non-conformances had reduced substantially from the previous year. Most non-conformances were related to minor issues related to documentation, document control, and training. The nature of the non-conformances is indicative of maturing environmental management systems and an increase in the experience of the EMS coordinators.

The tables on the following pages offer a complete list of objectives and targets established as part of the EMS program.

HYDRO - GENERATING STATIONS EMS		
Objective	Target	Performance
Mactaquac Oil Management Program	Create Change Process & Approval to develop plans for Centrifuge Storage Area	Target achieved
Beechwood and Tobique Oil Management Program	Governor Oil Level Gauges: <ul style="list-style-type: none"> Change lighting in the accumulator tank tunnel at Beechwood and around the tanks at Tobique Develop procedure on taking governor oil volumes Develop graphs for governor oil volumes Check what is available for appropriate sight glasses for accumulators and sumps and change out sight glasses Review shutdown settings for governor oil pumps Prepare recommendations for dyke improvements and splash curtains for accumulator tanks Install metal dykes and splash curtains around governors	Target not achieved. Lighting fixtures are on site Target not achieved. Need to review Target not achieved. Need to review Target not achieved. Waiting for new sight glasses Target not achieved. Finish date set as 06/09/30 Target achieved Target achieved
Grand Falls and Sisson Oil Management Program	Install metal dykes and splash curtains around governor sumps #1 to #4	Target achieved
Milltown Oil Management Program	Install reliable timers for pumping turbine bearing grease on Units 5, 6, & 7 Write procedures for tracking petroleum products entering and leaving plant Install external circulating pump for guide bearing on Unit 2	Units 6 & 7 completed Target achieved Target achieved
Musquash Oil Management Program	Develop EMS check sheet and procedure	Target achieved

SOUTHERN REGION - GENERATING STATIONS EMS		
Objective	Target	Performance
Coleson Cove EMS Improvement Program <ul style="list-style-type: none"> The changes brought about by the refurbishment project necessitates changes to the EMS. The EMS program needed to be reviewed to align the EMS with key business objectives. 	Add new activities, products and services associated with refurbishment Review the activities, products and services and using new criteria, score the significance of the associated aspects Develop a new list of Significant Environmental Aspects Management review and approval of new SEA Develop a process flowchart to chart the inputs and outputs of Coleson's operation related to the new SEA. This will be used as a training tool Develop Management Programs for new SEA Develop a new front end for viewing and walking through the EMS	Target achieved Target achieved Target achieved Target achieved Target achieved Target achieved Target date set for April 1, 2005
Grand Lake Spill Management Program <ul style="list-style-type: none"> To comply with E2 Environmental Legislation Wastewater Management Program <ul style="list-style-type: none"> To effectively operate the ash lagoon through to decommissioning stage. 	Identify and report to Environment Manager-Generation the quantities of chemical requiring E2 response plans Contract local contractor to remove grey ash from ash lagoon as required Investigate possibility of hydroseeding the ash lagoon to reduce fugitive dust Initiate De-commissioning packages for Coal Pile and Ash Lagoon	Target achieved Target achieved Target achieved Target achieved

NORTHERN REGION GENERATING STATIONS EMS (Dalhousie – **DH**, Belledune – **BD**, Millbank – **MB** and Ste.-Rose – **SteR**)

Objective	Target	Performance
<p>Spill Management Program</p> <ul style="list-style-type: none"> Reduce potential for spills that may cause a significant impact on the environment 	<p>BD Clean coal sedimentation lagoon</p> <p>BD Improve Continuous Ship Unloader cradle pad on wharf to prevent possible coal/water spill on wharf</p> <p>BD Clean gypsum pad sump</p> <p>MB Install second capacitance probe in Oil and Water Separator</p> <p>MB Replace gasket on all outside glycol piping and coolers</p> <p>DH Maintain number of reportable spills (target of 1)</p> <p>DH Continue development of lube oil program</p> <p>DH Test one Orimulsion® spill plan</p> <p>DH Clean and inspect one Orimulsion® fuel oil tank</p> <p>DH Repair fuel delivery pipeline supports</p> <p>DH Change motors on sea truck from two-cycle to four-cycle</p>	<p>Target achieved</p> <p>Target achieved</p> <p>Target achieved</p> <p>Target achieved</p> <p>Target achieved</p> <p>Target not achieved. There were 3 spills during 2004</p> <p>Target achieved</p> <p>Target achieved</p> <p>Roofs of all 5 fuel tanks were inspected</p> <p>Target achieved</p> <p>Target not achieved. One motor replaced, second will be replaced in 2005</p>
<p>Waste Management Program</p> <ul style="list-style-type: none"> Reduce waste (garbage and flyash) sent to landfill 	<p>BD Identify options for recycling of air filters</p> <p>BD Promote recycling by tracking waste disposal</p> <p>BD Installation of fly ash processing plant to allow increased fly ash sales into Ready Mix industry</p> <p>DH Increase the amount of paper and cardboard recycled</p> <p>DH Maintain the amount of ash and gypsum recycled</p> <p>DH Reduce the amount of unprocessed ash sludge (i.e. flyash from precipitator hoppers) disposed of to landfill by determining tonnage of ash dumped at wastewater treatment plant</p> <p>DH Continue tracking paper and cardboard recycling</p> <p>DH Continue tracking gypsum and ash recycling</p> <p>DH Determine ways to reduce amount of paper used</p>	<p>Target achieved</p> <p>Target achieved</p> <p>Target achieved</p> <p>17,191 lbs. recycled. Target of 12,000 was exceeded</p> <p>100% recycled. Target achieved</p> <p>On going all year to establish baseline</p> <p>Target achieved</p> <p>Target achieved</p> <p>Target achieved</p>
<p>Air Quality Improvement Program</p> <ul style="list-style-type: none"> Reduce the number of reportable air quality exceedences in the long term 	<p>BD Improve operation of dry fly ash chute</p> <p>BD Carry out ash transport lines inspection program</p> <p>BD Install hi-vol monitor on west side of property</p> <p>BD Pave a section of site road</p> <p>DH Update employees on an on-going basis</p> <p>DH Improve the reliability of the Air Quality Monitoring System by completing four projects:</p> <ol style="list-style-type: none"> Report on air quality situations such as the plume visibility issue, testing programs, and new technology by providing monthly updates Replacement of opacity meter Replacement of current limit reactors for wet electrostatic precipitator Replacement of ground level SO₂ meter 	<p>Target achieved</p> <p>Target achieved</p> <p>Target achieved</p> <p>Target achieved</p> <p>Quarterly meetings held and EMS Awareness Training sessions</p> <p>Three completed and one carried over to 2005</p> <p>Various tests were reported on throughout the year</p> <p>Project continued into 2005 as meter not purchased in 2004</p> <p>Replacement completed but not operating to specifications</p> <p>Purchased new calibrator so will not be replacing SO₂ meter</p>
<p>Water Use Management Program</p> <ul style="list-style-type: none"> Reduce freshwater consumption 	<p>DH Maximize use of recycled water</p> <p>DH Divert spring water to FGD make-up</p> <p>DH Ensure that firewater consumption does not exceed target</p> <p>DH Reduce boiler make-up consumption during operation</p> <p>DH Clean piping system for wastewater discharge</p> <p>DH Determine possibility of re-routing other sources of groundwater to FGD or other uses instead of wastewater</p> <p>DH Continue efforts to determine alternate fresh water sources for Dalhousie Station</p> <p>DH Eliminate use of firewater of Unit 1 boiler feed pump coolers</p> <p>DH Determine economics of collecting gland water from Unit 1 boiler feed pumps and diverting it back to the condensate system</p>	<p>An average of 26.9% of treated wastewater was recycled per month. Target was 30%</p> <p>6,307,000 USG diverted. Target of 2,500,000 exceeded</p> <p>2,000,000 USG less firewater used per month than targeted</p> <p>Further investigation revealed an overhaul of U1 boiler feed pump is required</p> <p>Partial cleaning completed. Flow increased from 42g/m to 160g/m</p> <p>Ground water from turbine room sump to be re-routed to FGD clear water sump</p> <p>Target not achieved – on-going</p> <p>Target achieved</p> <p>Target achieved</p>
<p>EMS Improvement Program</p> <ul style="list-style-type: none"> To ensure continual improvement of the EMS system 	<p>BD Continue the EMS training program for Belledune staff</p> <p>BD Develop records management process for fuel handling and associated byproducts</p> <p>BD Ensure compliance with International Ship and Port Security Code adopted by the Marine Transportation Security Regulation</p> <p>BD Ensure compliance with the Environmental Emergency Regulation</p> <p>MB Expand on the Millbank EMS Awareness Course to include Belledune employees</p> <p>SteR Expand on the Ste.-Rose Awareness Course to include Belledune employees</p>	<p>Target achieved</p> <p>Target achieved</p> <p>Target not achieved – developing internal security procedures</p> <p>Target achieved</p> <p>Target not achieved – to be completed in 2005</p> <p>Target not achieved – to be completed in 2005</p>

FUTURE ISSUES

Local, regional and global responses to environmental issues have an influence on Genco's operations and system development because the licensing of existing or new generating stations must satisfy current or emerging regulatory requirements for environmental performance.

Climate Change

On May 9, 1992, Canada was one of 150 world governments to adopt the United Nations Framework Convention on Climate Change. Building upon the climate change convention, in 1997, the world governments adopted the Kyoto Protocol with its legally-binding constraints on greenhouse gas (GHG) emissions. Canada has ratified the Kyoto Protocol on climate change with a commitment to reduce greenhouse gas emissions by 6% of 1990 levels during the period between 2008 and 2012. Russia ratified the Kyoto Protocol in December, 2004, and it came into effect February 16, 2005.

While New Brunswick accounts for 3% of Canada's GHG, all jurisdictions will be called upon to address climate change. Approximately 90% of New Brunswick's 20 million tonnes of carbon dioxide emissions come from the combustion of fossil fuels with electricity generation accounting for 47% or nine million tonnes.



New Brunswick's economy is largely natural resource based and the manufacturing industries are energy intensive and export driven. This presents the challenge of linking GHG emission reduction strategies to energy costs and economic competitiveness.

In 2002, the Canadian Government outlined its plans regarding the Kyoto Protocol in its *Climate Change Plan for Canada*. This plan outlines steps Canada will take to meet its target under the Kyoto Protocol. Actions proposed in the plan are:

- Large Final Emitter (LFE) Program,
- Targeted reduction measures,
- Agriculture and forestry carbon sinks, and
- Clean energy export credits and/or international offset credits.

The LFE program, which includes companies in the energy sector, oil and gas, mining and manufacturing, will have the greatest bearing on Genco's preparations regarding the greenhouse gas reductions.

The Large Final Emitter Program proposes:

- An emission-trading program for large industry — based on Natural Resources Canada's Business As Usual (BAU) forecast — encompassing efficiency gains as well as additional reductions for LFEs and allocations through separate industry covenants;
- Each industry would be allocated an emission intensity factor of carbon dioxide per unit of output (e.g. Mte of CO₂/GWh); and
- Each industry would meet the intensity factor or purchase offset credits. The LFE can generate surplus credits for sale only if it operated below the intensity rate.

The impact of the LFE Program on Genco's future activities will be clarified through further definitions of the mechanics of the trading program by the federal government. As of yet, no specific method of allocation by province or region has been finalized. Only the principal that an egalitarian approach to regional disparity is required, has been agreed upon. Genco has been working with other Maritime area utilities as well as the provincial and federal government in an effort to achieve an equitable allocation.

In April 2005, the Canadian Government published *Moving Forward on Climate Change: a Plan for Honouring our Kyoto Commitment*. The federal government's revised climate change plan increases its reduction targets from 238 MT to 270 MT. Within the plan, the target for Large Final Emitters has been reduced from 55 MT to 45 MT.



In addition to the Kyoto Protocol, the New England Governors and Eastern Canadian Premiers agreed in 2001 to a Climate Change Action Plan to reduce regional GHG in a manner that is cost effective while maintaining reliable energy supplies. That plan set regional reduction targets:

- Reduce regional GHG emissions to 1990 emission levels by 2010;
- Reduce regional GHG emissions by at least 10% below 1990 emissions by 2020 and establish a five-year process in 2005 to adjust or establish future emissions reductions goals; and
- Reduce regional rate of emissions by 20% per MWh by 2025 from 2000 rate.

The provincial government is developing a Climate Change Action Plan for New Brunswick. In early 2003, a consultation process included discussion of emissions reduction targets, sequestration measures and the economic impact of mitigation and adaptation actions.

Since options to substantially change the generation mix in the short-term to address GHGs are limited, the refurbishment of the Point Lepreau Generating Station is key to NB Power's strategy to mitigate carbon dioxide emissions and meet projected limits. On an annual basis, the Station reduces carbon dioxide emissions by about two million tonnes compared to other generation alternatives, particularly natural gas, but its value relative to emission intensity requirements in the LFE trading program is uncertain.

Replacement of fossil generation with emission-free sources such as wind and biomass are also part of NB Power's current strategy. A target of 100 MW of wind equivalent has been set for 2010. NB Power is also monitoring the development and acquisition of offset credits from emission reduction projects such as landfill gas capture, improved agricultural practices and forestry sequestration.

Greenhouse Gas Committee

In late 2004, a Greenhouse Gas Committee was established by Genco and is comprised of representatives from each operating company and Holdco. The committee was formed to address the challenge of reducing emissions starting in 2008, while striving to minimize the cost to meet the required reductions given NB Power's status as a Large Final Emitter. The committee's mandate is, "To ensure compliance with the impending climate change regulations in such a way as to minimize the impact to the rate payers of New Brunswick." The objectives of the committee are:

- Ensure the NB Power group of companies has a voice in the on-going development of climate change rules and regulation(s);
- Establish dialogue with the appropriate provincial departments who are currently developing the Provincial Climate Change Action Plan;
- Provide a forum for resolving intra-company issues relating to climate change;
- Stay abreast of developments in other jurisdictions (federal and provincial) and industry sectors;
- Ensure senior management is informed on key issues and developments;
- Make informed recommendations to senior management; and
- Develop and implement an overall compliance strategy for the NB Power group of companies.

Nitrogen Oxide

Nitrogen oxide emissions are regulated by federal government point source emission guidelines applied as generating units are constructed or upgraded. In addition, the New England Governors and Eastern Canadian Premiers have targeted a 30% reduction in nitrogen oxide emissions by 2007. The Coleson Cove Generating Station currently contributes about 60% of NB Power's nitrogen oxide emissions. The refurbishment project at the station includes control technology that enables nitrogen oxide emissions to be reduced.

Sulphur Dioxide

The Government of Canada and the New England Governors and Eastern Canadian Premiers are working to achieve regional and national reductions in sulphur dioxide emissions. The New Brunswick Department of Environment and Local Government has indicated it favours a two-phase



reduction of NB Power's existing annual sulphur dioxide limit of 123,000 tonnes:

- Phase 1 – a 30% reduction by 2005 (86,100 tonnes limit)
- Phase 2 – a 50% reduction by 2010 (61,500 tonnes limit)

NB Power's *Sulphur Dioxide Emissions Reduction Program – January 2001* outlined specific actions to satisfy the emission constraints. The Coleson Cove Generating Station Refurbishment Project, described below, will enable NB Power to meet emerging sulphur dioxide emissions reduction targets.

Particulate Matter and Ozone

In 2000, federal, provincial and territorial governments signed the Canada Wide Standards (CWS) for particulate matter (PM) and ozone. These standards commit governments to significantly reduce PM and ground-level ozone by 2010. By 2010, scientific, technical and economic analyses will be completed to reduce information gaps and establish, if appropriate, revised targets for PM and ozone CWS for the year 2015 and beyond.

Mercury



Canada Wide Standards for mercury emissions from coal-fired electric power generation are being developed, with a decision expected in 2005 when information from the CEA Mercury Program will be available. At that time, similar policy direction will also be available from the United States on the development of control strategies for climate change, particulate matter and ozone.

Genco joined forces with other coal-fired power generation companies in Canada to develop and implement the CEA Mercury Program. The program is designed to improve the information base around the measurement and control of mercury emissions from coal-fired generation facilities. The key components to the program are a laboratory round robin, research and development, and a mercury sampling and analysis program. During 2003 and 2004, mercury sampling and analyses were conducted at the Belledune Generating Station, with results reported to the CEA. The findings of this program will provide critical information for establishing and reviewing a mercury standard for Canada, and finding cost-effective and efficient management options for mercury emissions over the long-term. Further information is available at www.ceamercuryprogram.ca.

The New England Governors and Eastern Canadian Premiers are developing an implementation plan for reductions in mercury emissions. Their current recommendations for annual total mass-basis mercury emissions in the coal-fired electric utility sector call for a 20-50% reduction by January 2005 (base year 1995) and a 60-90% reduction by January 2010.

Genco's mercury emissions account for 1.7% of the total from northeastern North America and are mostly due to use of indigenous coal. The Belledune Generating Station stopped using indigenous coal in 2002 thereby significantly reducing its mercury emissions. Following the retirement of the Grand Lake Generating Station, system emissions should be reduced by 85% from the base year.

Federal Emissions Guidelines

Genco participated in consultations with the federal government on *Thermal Power Generation Emissions — National Guidelines for New Stationary Sources* issued under the *Canadian Environmental Protection Act*. Revisions enacted in early 2003 apply to new generating units including a generating unit that replaces an existing unit.

By undertaking a provincial environmental impact assessment and meeting significant emission reductions for the Coleson Cove Refurbishment Project, these new national guidelines were satisfied.

Dalhousie Generating Station Future Issue

All thermal generating stations require a secure supply of fresh water, and the fresh water for the Dalhousie Generating Station is supplied via the reservoir associated with the Eel River Dam. The dam was originally constructed in the late 1960s to supply fresh water for the Town of Dalhousie and other local industrial and commercial users.

In 2004, the Department of Supply and Services made application to the Department of Environment and Local Government through the Environmental Impact Assessment (EIA) regulation to remove the dam and restore the Eel River estuary to its pre-existing conditions. The EIA is expected to be finished in 2006. As removal of the dam will result in Dalhousie losing its fresh water supply, Genco is currently evaluating various options to replace the Eel River supply.

IN THE COMMUNITY

In August of 2004, permission was granted to the Department of Natural Resources to access Genco property for the purpose of sampling butternut trees that were possibly infected with a butternut canker. Butternut is listed by the *Committee on the Status of Endangered Wildlife in Canada* as endangered and at risk of extinction.

The Atlantic Salmon Federation, with the support of Fisheries and Oceans Canada and Genco, continues to examine salmon management in the St. John River Basin. Discussions with stakeholders have provided a forum on issues such as the operation of the Mactaquac Fish Hatchery, salmon stocking and salmon support programs.



The spring thaw brings high water and potential ice jams to New Brunswick rivers. With the provincial Emergency Measures Organization and the River Forecasting Centre, Genco monitors water and ice levels. In addition, Genco clears driftwood and debris that accumulate in headponds above the dams.

Wood removal and clean-up programs at several hydro facilities continue to be successful in making the shoreline and headpond cleaner and safer for recreational activities. During 2004, 755 truckloads of wood were removed.

Genco also continues to collect wood debris from the area around the dams at the Grand Falls and Beechwood Stations. The debris was ground to produce a course mixture of wood which was delivered to power stations in northern Maine for use as fuel. This innovative activity reduced both the waste destined for landfills and fossil fuel consumption.

The Beechwood site offers an arboretum where visitors can enjoy native trees, flowers, shrubs and a nine-metre flower clock. The Milltown site is used by members of the community for walking, biking, picnics and sports as well as the annual New Brunswick Day Lumberjack Competition.



The Coleson Cove Community Environmental Liaison Committee, formed in 2002 as part of the Refurbishment Project, continued to meet monthly during 2004. During the year, the committee toured the station and regularly discussed items of interest to the community. Of note were the committee discussions about: fuel delivery options; traffic through Lorneville; continuous emissions monitoring; ambient air quality monitoring; the filtercake storage facility; gypsum and limestone handling; and the renewal of the Coleson Cove Generating Station's Certificate of Approval to Operate. At the end of the year, the committee agreed that it would stay active and continue to meet on a monthly basis at least until commissioning is complete.

Staff at the Belledune Generating Station contributed to a local school by providing manpower to build an environmentally-friendly playground. Staff at Belledune, also participate in the Belledune Regional Environmental Association, an Association dedicated to protecting the local environment.

The Grand Lake Generating Station continues to support Minlak, a community-recycling depot.

Site tours continue to be offered to the public, providing information both on operations of the stations and environmental controls.

CASE STUDY

COLESON COVE GENERATING STATION REFURBISHMENT



Challenge

NB Power built the 1000 MW Coleson Cove Generating Station in the 1970s with environmental protection equipment appropriate for that period. Production beyond 2005 required investment to meet more stringent environmental standards.

Actions Taken

New environmental standards required NB Power to lower air emissions. A refurbished Coleson Cove Generating Station would reduce sulphur dioxide emissions by 77%, nitrogen oxide emissions by 70% and particulate emissions by 55%. Other planned measures would help NB Power satisfy carbon dioxide emission reduction requirements. Following Board approval to proceed, the following timeline ensued:

Milestone	Date Completed
Need to refurbish identified	Spring 2001
Environmental studies	Spring 2001 – Spring 2002
Public consultation	Spring 2001 – Fall 2004
Application filed with PUB	July 2001
Registration for initial EA	July 2001
PUB hearing	November 2001
PUB recommendation	January 2002
EIA filed with NBDELG	June 2002
NBDELG public review	Summer 2002
NBDELG decision	Fall 2002
Construction	Fall 2002 – Fall 2004

Original intentions were to convert the station’s fuel to Orimulsion® but in February 2004 construction of the fuel delivery system was halted as the fuel supply agreement became the subject of legal action. However, the refurbishment continued and the station continued to burn heavy fuel oil. The Construction Environmental Protection Plan (EPP) played a key role in managing the environmental aspect of construction. Some of the challenging areas were sedimentation and erosion control during site preparation activities. The EPP laid out requirements for the good condition of equipment; proper work procedures; spill avoidance; reduction of gas; diesel and other material on the job; recycling; proper waste disposal and clean work areas. The EPP was updated quarterly and reviewed by the regulator. Additionally, an environmental compliance officer was

assigned by NBDELG and played an active role on site. All project contractors received environmental awareness training upon arrival at site and contract supervisors were provided training and an environmental handbook related to their responsibilities.

The \$750 million refurbishment of the Coleson Cove Generating Station, underway since 2002, reached a major milestone on November 30th, 2004, when the station produced a full load of 1050 MW with the flue gas from one of the refurbished boiler units passing through the flue gas desulphurization (scrubber) system, and out the new stack.

Results

Project construction lasted two years and employed more than 1,600 workers at peak. During construction the station continued to operate, as each of the three units was refurbished separately, thus ensuring reliable power generation for the people of New Brunswick.

The project was completed in December and was required to meet new environmental regulations by July 2005. The station underwent a commissioning process which involved the verification and fine tuning of all equipment to ensure the specifications of the intended design performance and guarantees were met. Commissioning, with the associated tests and adjustments necessary to optimize performance, took several months to complete.

NB POWER NUCLEAR CORPORATION



Énergie NB Power

Nucléaire Nuclear



NB POWER NUCLEAR CORPORATION (NUCLEARCO), A WHOLLY-OWNED SUBSIDIARY OF NB POWER HOLDING CORPORATION, OWNS AND OPERATES THE POINT LEPREAU GENERATING STATION (PLGS).

THE POINT LEPREAU GENERATING STATION IS A CANDU 6 – 635 MWE UNIT, WHICH SUPPLIES UP TO 30% OF NEW BRUNSWICK’S ENERGY REQUIREMENTS. THE STATION IS IMPORTANT TO NB POWER’S ENVIRONMENTAL PERFORMANCE AS IT AVOIDS SIGNIFICANT CARBON DIOXIDE, SULPHUR DIOXIDE, AND NITROGEN OXIDE EMISSIONS.

OVERVIEW

Compared with other thermal sources of electricity generation, nuclear generation’s airborne emissions are insignificant. PLGS operates under approvals from the Canadian Nuclear Safety Commission (CNSC), the federal regulator of nuclear facilities, which maintains an on-site office. PLGS also has Approvals to Operate for non-nuclear systems at the station (wastewater treatment, domestic waste water, and diesel generators), which are issued by the New Brunswick Department of Environment and Local Government (NBDELG) under the *Clean Environment Act* and the *Clean Air Act*.

All activities at PLGS are managed in a fashion that reflects the unique nature of the station. From the transportation of fuel to the site, through station operations to the storage of used fuel, processes and procedures are in place to ensure compliance with all environmental regulations. Radioactive liquid and airborne effluents are controlled, monitored and subsequently verified through the operation of an Environmental Radiation Monitoring Program. Results from the program are reported to the CNSC each year, and are shared with the local communities through the Liaison Committee.

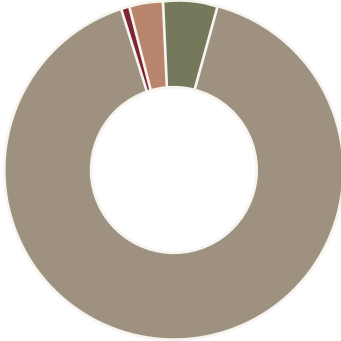
CLIMATE CHANGE

Nuclearco plays an important role in NB Power’s climate change and sulphur dioxide management initiatives. For example, in 2004, nuclear generation avoided emissions of approximately 57,000 tonnes of sulphur dioxide, 3.3 million tonnes of carbon dioxide, and 12,400 tonnes of nitrogen oxide.

Although Canada’s recently released national climate change strategy does not qualify nuclear power as a climate friendly energy source, the operation of the existing fleet of nuclear reactors is key to avoiding an increase in carbon emissions, as the viable alternatives to nuclear power all have carbon emissions. The refurbishment of PLGS is a key element in NB Power’s strategy to mitigate carbon dioxide emissions and to help the province meet its objectives.

RADIATION SOURCES

µSv/yr



- Actual emissions from Point Lepreau - < 1 µSv/yr
- Emission target from Point Lepreau - 50 µSv/yr
- Dose from a single chest X-ray - about 70 µSv/yr
- Natural background radiation - 3,000 µSv/yr



FOR FURTHER INFORMATION:



Point Lepreau Generating Station – Environmental Radiation Monitoring Data
Radiation04.pdf



RADIATION MONITORING

The PLGS effluent monitoring program measures radioactive airborne emissions from the station. Emissions are well below the operational target, which itself is approximately one-fiftieth (2%) of the radiation level occurring naturally in the environment.

Nuclearco’s Environmental Radiation Monitoring Program objectives are to:

- Provide data confirming the station’s compliance with applicable guidelines and regulations;
- Establish and maintain the capability for monitoring so that an effective response can be made to emergency conditions; and
- Maintain a database of results to help with the detection of trends.

Since 1976, the Health Physics Department has analysed more than 30,000 samples to define background radiation from natural and human sources. The program is reviewed annually to ensure that collected samples, collection frequency and analytical techniques are appropriate.

During 2004, analyses were performed on samples of air, water, food, vegetation, soil, sediment and sea life. In order to assess local environmental radiation, samples were collected from around the station and from remote locations. These analyses verified that the public radiation dose from PLGS emissions was about 0.5 microsieverts (µSv) for the year. The legal public dose limit is 1,000 µSv per year and the operational target is 50 µSv per year.

ENVIRONMENTAL MANAGEMENT SYSTEM

Nuclearco’s Environmental Management System (EMS) has been ISO 14001 registered since October 2001. In October 2004, an audit was conducted to reassess the station’s performance in accordance with key EMS procedures, programs and standards. The audit concluded that PLGS continues to maintain a good system for managing its environmental aspects. The EMS was re-registered to the international standard ISO 14001 in October 2004.



The auditors did identify opportunities for improving the EMS and noted minor non-conformances related to employee awareness training, document control and records management. Subsequently, a corrective action plan was developed to address non-conformances raised by the auditors. The staff is also preparing for a maintenance audit which will be conducted in 2005.

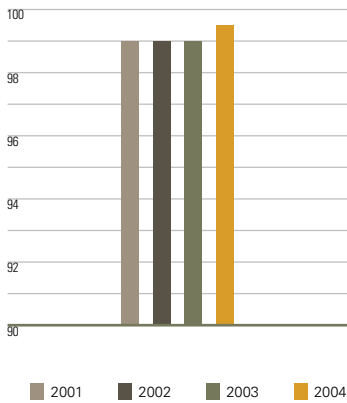
POINT LEPREAU GENERATING STATION EMS ¹		
Objective	Target	Performance
Air Emissions - Conventional		
Replace the station's chillers with units using a low level or negligible Ozone Depleting Potential (ODP) refrigerant.	Design and prepare procurement of replacement chillers	On target
Spent Radioactive Waste Management Facility (SRWMF) - Waste Reclamation		
Reduce the amount of inactive waste.	Reclaim > 70 m ³ waste during fiscal year 2004 - 2005	Target achieved
Integration of Refurbishment Activities to Station Level EMS		
To fully integrate Refurbishment Project Activities into the Station EMS.	To have the required monitoring completed and documentation issued to enable integration to Point Lepreau's EMS	On target
Effluent From Inactive Lagoons		
To minimize the number of wastewater exceedences.	To decrease the number of out of spec lagoon effluent releases to less than 5 per year	On target

1 - In accordance with the budget and work management processes, the objectives and targets are tracked on a fiscal year basis.

WATER, SPILLS AND AIR QUALITY MANAGEMENT

WASTEWATER

% of analysis within approval limits



The sewage treatment system has been significantly modified to improve compliance with effluent parameters such as pH, dissolved oxygen, and turbidity.

More than 99% of the analyses performed on conventional wastewater effluent produced results within the approved limits.

Nuclearco is required to report all spills of hazardous materials including petroleum products to the appropriate regulatory authority. A total of five spills were reported during 2004, none of which involved PCB contaminated oil. One spill was less than one litre, and the other four involved greater than 50 litres. All spills were contained, cleaned up and reported.

Renewed regulatory air quality approval was received for PLGS during 2004. This approval covers the non-nuclear auxiliary boiler.

WASTE MANAGEMENT

At PLGS, used nuclear fuel is stored in an on-site, water-filled fuel bay for seven years. This spent fuel is then removed from the bay, dried, sealed in special flasks, and moved to the on-site, above-ground, dry fuel storage canisters. These canisters, which are made of concrete and steel, provide safe and reliable storage of used fuel, with regular monitoring by staff and regulators.

Addressing broader used fuel management issues, Canadian nuclear utilities have established the Nuclear Waste Management Organization (NWMO) to meet the stipulations of the *Nuclear Fuel Waste Act*, which came into force on November 15, 2002. This act requires that nuclear utilities identify and implement a long-term management approach for spent nuclear fuel in Canada.

The NWMO must complete its research and public consultations and submit the findings to the Government of Canada by November 15, 2005.

During 2003, the NWMO published its first major discussion paper entitled *Asking the Right Questions? Future Management of Canada's Used Nuclear Fuel*. The discussion paper provided a background on used nuclear fuel and sought input from the public in developing a long-term management approach that is socially acceptable, technically sound, environmentally responsible and economically feasible.

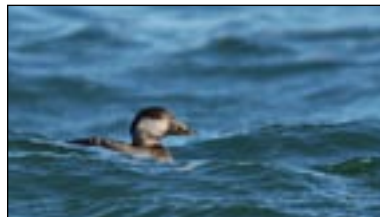
A second discussion paper was published in 2004 entitled, *Understanding the Choices — the Future Management of Canada's Used Nuclear Fuel*, which reports what the NWMO has learned from citizens and experts thus far. It describes what the management options being studied might look like, outlines how the framework to assess them has evolved, and presents a preliminary assessment of the approaches for public discussion. Both discussion papers are available on the website www.nwmo.ca.

PLGS REFURBISHMENT

Nuclearco is proposing to refurbish the Point Lepreau Generating Station during an 18-month outage, which is expected to begin in April 2008.

The major activity during the outage would be replacement of all 380 fuel channel and calandria tube assemblies and other reactor components. Other equipment replacements, inspections and upgrades would also be completed during the outage. Successfully completing the project would allow the station to operate for an additional 25 to 30 years. A final decision on the refurbishment project is pending.

COMMUNITY INVOLVEMENT



PLGS employees have been good neighbours by playing an active role in the community. In past years, staff have celebrated such events as Earth Day and Fundy Fisherman's Day. They have participated in several activities with local schools, fire departments, and the RCMP.

With the cooperation of Nuclearco, the Saint John Naturalists' Club Inc. established a bird observatory at the tip of Point Lepreau in 1995. The observatory has allowed the Naturalist's Club to study the migration of the Black Scoter. In an effort to increase public awareness of the importance of New Brunswick's coasts to the health of the black scoter, Nuclearco supported the making of a video, *Mystery Migration: Secret of the Black Scoter*, produced by the Saint John Naturalists' Club.

A community relations committee, composed of PLGS employees and local residents, continues to meet regularly to share information about the operation of the station and to answer any questions from community members. Besides regular meetings, this committee also publishes a newsletter and website information.

Station visits and workshops are offered to school groups, university students, organizations and the public.

Station staff work closely with local, provincial, federal and international agencies on emergency planning activities through various exercises and drills. These are undertaken with the New Brunswick Emergency Measures Organization and include participation from local fire departments, hospitals, and the RCMP, as well as volunteers from the community.

CASE STUDY

AMENDMENT TO THE SOLID RADIOACTIVE WASTE MANAGEMENT FACILITY



Challenge

The decision around whether or not to refurbish the Point Lepreau Generating Station presents challenges regarding what type of activities can judiciously be undertaken in the interim.

Planning for the management of solid radioactive waste, in the short and long-term, presented a challenge for Nuclearco. The Corporation needed additional storage, however the needs

would vary based on the refurbishment decision. The approach to solid radioactive waste could be different for decommissioning versus refurbishment and additional 25-year operational life.

Opportunity

In August 2003, NB Power received a positive decision from the Canadian Nuclear Safety Commission (CNSC) on the Environmental Assessment Screening Report. In January 2004, approval was given by the CNSC to amend the Waste Facility Operating License required to support the Refurbishment Project. The amendments permit the construction of additional radioactive waste storage structures at the Solid Radioactive Waste Management Facility (SRWMF), to store the radioactive material being removed from the reactor as part of the Refurbishment Project activity. Additional vaults would also be constructed to house the low-level radioactive wastes that would be generated over the extended plant life. The land within the waste management area will be prepared for additional fuel storage canisters that would be constructed later, on an as needed basis, to house the used fuel generated over the extended operating period.

Following the positive decision on the Environmental Assessment, Nuclearco prepared a document to identify what activities will be undertaken as part of the Follow-up Program. Consistent with its commitment to consultation, this document (the Environmental Assessment Follow-up Program) was made available for public review and comment in 2004, before being finalised and submitted to both the federal and provincial regulators.

Results

The Follow-up Program builds directly on Section 11 of the Environmental Assessment Study Report prepared by Jacques Whitford Environment Ltd. and includes the following:

1. Internal assessments of Health, Safety and Environmental programs;
2. Expansion of NB Power's existing Operational Environmental Radiation Monitoring Program;
3. Implementation of baseline, non-radiological monitoring;
4. Implementation of a Construction Environmental Protection Program; and
5. Continuing public consultation.

Information on the results of the Follow-up Program will be made available to the public in the future.

NB POWER TRANSMISSION CORPORATION



Énergie NB Power

Transport Transmission



NB POWER TRANSMISSION CORPORATION (TRANSCO), A WHOLLY-OWNED SUBSIDIARY OF NB POWER HOLDING CORPORATION, OWNS, OPERATES AND MAINTAINS 46 TERMINALS AND SWITCHYARDS THAT ARE INTERCONNECTED BY OVER 6,700 KM OF TRANSMISSION LINES RANGING IN VOLTAGE FROM 69 kV TO 345 kV, LINKED WITH NEIGHBOURING ELECTRICAL SYSTEMS INCLUDING QUÉBEC, MAINE, NOVA SCOTIA AND PRINCE EDWARD ISLAND. EMPLOYEES ARE RESPONSIBLE FOR TRANSMITTING ELECTRICITY FROM THE GENERATING STATIONS TO IN-PROVINCE AND POINT-TO-POINT TRANSMISSION CUSTOMERS.

TRANSCO ALSO PROVIDES TECHNICAL AND MAINTENANCE SUPPORT TO OTHER NB POWER COMPANIES, PRIMARILY NB POWER DISTRIBUTION AND CUSTOMER SERVICE CORPORATION AND NB POWER GENERATION CORPORATION. THESE ACTIVITIES INCLUDE MAINTENANCE AND VEGETATION MANAGEMENT AT SUBSTATIONS AND TERMINALS LOCATED ON GENERATING STATIONS' PROPERTY.

OVERVIEW

NB Power Transmission Corporation is responsible for transmitting electricity from the generating stations to the distribution system and point-to-point transmission customers as well as the interconnections to adjoining customers. Transco works diligently to curtail any negative effects its activities may cause. These activities include the construction, operation and maintenance of power lines, rights-of-way, terminals and telecommunication sites.

Transco's activities are subject to provincial and federal environmental legislation. The construction, maintenance and dismantling of transmission lines require approval under the *Clean Environment Act*. Work that could affect waterways is performed in accordance with the *Clean Water Act*, and work conducted during the fire season requires approval from the Department of Natural Resources. Transco adheres to the *Pesticide Control Act* when using pesticides.

MAINTENANCE AND VEGETATION MANAGEMENT

An asset management program is in place to ensure the reliability of the transmission system and extend the life of an aging and deteriorating infrastructure. In 2004, work was conducted along 120 km of transmission lines. Transco's work included replacing insulators, cross-arms and poles on older lines to minimize the impact of weather conditions such as wind and snow.

Uncontrolled vegetation growth can often create fire or safety hazards, hinder routine line maintenance and cause interruptions in electric service when trees grow onto or fall on power lines. In order to avoid the interruptions in electric service that overgrown or fallen vegetation can cause, Transco controls the growth of trees and brush along transmission lines through its Vegetation Management Program. In 2004, employees maintained brush on approximately 940 km of

transmission line rights-of-way by using manual and mechanical methods. Herbicides are used to control weeds located inside the yards of substations, terminals and remote radio sites, dam sites, and fuel tank farms at the generating stations. Trained crews respect a code of practice for the application of herbicides, which includes acceptable conditions for use and the need for appropriate Pesticide Application Permits from the Department of Environment and Local Government (NBDELG).

As part of the Vegetation Management Program, employees and contractors receive directions on the protection of migratory birds and their nests as well as watercourse protection. During training sessions, employees are instructed to identify and mark nests during clearing activities so they can be avoided until after the nesting period.

ENVIRONMENTAL MANAGEMENT SYSTEM

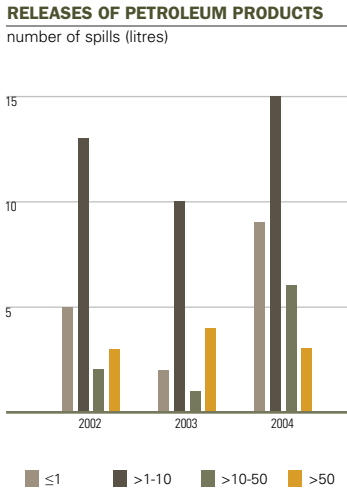


An Environmental Management System (EMS) consistent with the ISO 14001 standard has been implemented within NB Power Transmission. Over the last three years the EMS has matured and continues to be refined to improve environmental performance. During the year, Transco continued to meet its EMS requirements by:

- Training employees in a number of areas including:
 - Certification of maintenance employees to apply pesticides to the tops and bottoms of poles to prevent decay and insect infestations. This course also covered pesticide safety.
 - Employees and contractors were trained for the Environmental Protection Plan. This plan involves minimizing the environmental impact of route selection, design, construction and maintenance of transmission lines.
 - Two employees successfully completed the Watercourse Alteration Certification course. The course provides a better understanding of the importance of environmental protection and of the *Fisheries Act* to those involved in vegetation management activities. It also improves the level of compliance with existing watercourse alteration regulations.
- Reviewing the environmental aspects and impacts associated with operations, such as hazardous waste, petroleum products and watercourse crossings.
- Preparing, revising, and updating procedures to improve operational controls.
- Tracking environmental objectives, targets and management programs.

An independent, external EMS audit was conducted in March 2004 to determine whether the appropriate procedures, processes and plans were in place to meet the established objectives, targets and policy commitments, as well as to assess if the EMS was properly implemented and maintained by staff. Although the audit found the EMS to be consistent with the ISO 14001 standard, a number of non-conformances were identified which related to document control, records management and emergency preparedness. Plans have been developed to address these non-conformances.

During the year, four compliance audits were conducted as crews worked on transmission lines. Subsequently, action plans were implemented to address issues raised by the audits.



From 2003 to 2004, the number of reported releases of petroleum products involving Transco increased from 17 to 33. Twenty-nine spills involved less than 50 litres. As part of the EMS, Transco employees responsible for the management of petroleum-related activities receive on-going training. Training and awareness among employees has led to a better understanding of the procedures and reporting requirements associated with such spills. Therefore, an increase in the number of spills can be directly attributed to the improved reporting process. It is expected that over time, the number of spills will level out and start decreasing due to on-going training, maintenance and equipment inspections. Following a 6,000-litre spill at a substation site near Chipman in November 2003, an assessment and remedial work was conducted at the property. Monitoring wells examined the groundwater and the assessment determined no major waterways were contaminated. A summary of the remedial activities was completed and submitted to the NBDELG.

An oil-filled equipment management program is being developed based on an audit of all such apparatus. The program provides a tool for assessment based on environmental sensitivity, need for cleanup, type of work required and a determination of the type of mitigation activities that needs to be undertaken. Potential risks were identified and any equipment leaks were then prioritized based on potential severity of the situation.

WASTE MANAGEMENT

NB Power Transmission boasts several successful reuse and recycling programs. During the decommissioning of existing lines, hardware such as conductors, insulators, cross-arms and poles are removed and transported off-site for reuse or recycling. If reuse or recycling opportunities are not available, the hardware is disposed of at approved facilities.



A waste segregation roadmap was developed to provide staff with direction on how to properly segregate various products such as oily rags, barrels, waste oil and metal. These products can be recycled or disposed of at proper facilities.

RECYCLING PROGRAMS		
Material	Quantity	Handling
Street lights, dusk-to-dawn lights and floodlights	1059	▶ Refurbished for reuse
	7 tonnes	▶ Sold to scrap dealer for recycling
Insulating oil from low-voltage electrical apparatus	121,619 litres	▶ Recycled at Marysville Service Centre and returned to inventory
	0 litres	▶ Recycled during field operations and reused
	0 litres	▶ Sold to contractor for energy recovery
	139,860 litres	▶ Recycled by a third party for use other than in electrical equipment (ie. Chain saw oil, lubricating oil, asphalt)
PCB contaminated oil	0 litres	▶ Sent for disposal by a hazardous waste contractor
Transformers	334	▶ Test and repaired for reuse
	1431	▶ Sold to scrap dealers for recycling
	49	▶ Rewound by a third party and returned to inventory for reuse
Scrap metal	27 tonnes	▶ Sold to scrap dealer for recycling
Aluminium	78 tonnes	▶ Sold to scrap dealer for recycling
Copper	22 tonnes	▶ Sold to scrap dealer for recycling

IN THE COMMUNITY

NB Power Transmission’s communication programs ensure communities and individuals understand the technical, economical and environmental aspects of new construction and maintenance work of transmission facilities for those who live near substations, terminals and transmission lines. Public activities for projects in Edmundston, Fredericton, and St. Stephen have included meetings with community residents, property owners and elected representatives.

NB Power Transmission has committed to increasing awareness surrounding acceptable right-of-way use by off-road vehicles, landowner rights and environmental responsibility when riding. In 2003, discussions began with the New Brunswick Federation of Snowmobile Clubs and the New Brunswick All-Terrain Vehicle Federation to identify ways to minimize environmental impacts on the transmission system. Through consultations with the federations and provincial government stakeholders, a joint program will be developed to communicate environmentally sensitive riding habits.

Regular patrols of transmission lines during 2004 discovered 20 new osprey nests, bringing the total number of nests on the transmission system to 335. Employees routinely trim these nests to preserve the osprey habitat and prevent contact with electrical conductors.

Employees participated in Arbor Day celebrations by planting trees and shrubs at several schools and work locations throughout the province.

INTERNATIONAL POWER LINE PROJECT

Greater transmission access in the region will be enhanced with the construction of a second New England interconnection. The 345 kV transmission line and interconnection with Maine would increase opportunities to import and export power, improve overall system reliability and enhance transmission efficiency.



NB Power Corporation applied to the National Energy Board (NEB) in May 2001 for approval to construct a 345 kV International Power Line (IPL) that would run from the existing transmission terminal at Point Lepreau to a point on the New Brunswick - Maine border. The NEB process included an environmental assessment under the *Canadian Environmental Assessment Act* that was prepared and submitted to the Canadian Environmental Assessment Agency and NBDELG for review, public consultation and a Ministerial decision.

Following a one-day public hearing on March 24, 2003 in Saint John, the Board issued a decision stating that it was satisfied from the evidence that the proposed International Power Line was required by the present and future public convenience and necessity. Since the decision, Transco has been conducting further studies to refine the engineering line design and to comply with the conditions of approval. In addition, staff are developing manuals required by regulators prior to the commencement of clearing activities.

Transco is proceeding with the approval of the 50 m right-of-way. Discussions are ongoing with affected landowners. A detailed route hearing was held on May 9, 2005 by the NEB in response to written statements of opposition concerning portions of the detailed route. Landowners attended the Hearing and provided information on the detailed route and the most appropriate methods and timing of construction. A decision is expected from the NEB by mid-July, 2005.

In February 2004, a session was initiated with the Liaison Committee for the project to outline the mandate and terms of reference for future meetings. Advertisements were placed in local newspapers inviting local community members to participate on the Committee. Six individuals expressed an interest. Regular meetings will be scheduled as the International Power Line project continues.

A joint-development agreement with Bangor Hydro-Electric Company (Bangor Hydro), an EMERA Inc. company, was reached to proceed with the acquisition of state and federal permits for the construction of the United States portion of the transmission line. In September, Bangor Hydro announced the "Consolidated Corridors Route" as the preferred route for the US portion of the International Power Line. One of five route options under consideration since September 2003, the Consolidated Corridors Route was chosen based on a matrix of nearly 70 criteria developed with feedback from state and federal environmental review agencies, major landowners and interest groups. Bangor Hydro is currently conducting public consultation and performing the necessary studies to satisfy the environmental regulatory requirements in Maine. Clearing on the Canadian side is to begin in the fall of 2005.

CASE STUDY

WASTE SEGREGATION ROAD MAP



Challenge

NB Power Transmission employees generate a variety of types of waste while doing their work. Waste that is a by-product of work includes rags, various hardware, cylinders, paint cans, cardboard and crates. As a result of increased environmental awareness employees have increasingly questioned where waste materials should be discarded. Additionally, efforts to implement a waste management strategy can be quite challenging when most of the employees spend the majority of their time in the field.

Opportunity

To properly address the waste management question, Transco was faced with a few challenges. First, there was a need to identify the waste streams. Secondly, it was important to recognize the best use for each waste stream. Was it possible to reduce the amount of waste generated? Could it be reused? Do recycling markets exist for the materials? Once the preferred method of disposal was identified for each waste stream, the challenge for the company was to identify an easy way to readily communicate the waste sorting process. To address the challenge, Transco developed and distributed a waste segregation roadmap.

The purpose of the roadmap was to clearly identify waste streams associated with the construction, operation and maintenance of transmission facilities and to reference applicable waste management requirements, thereby preventing pollution, improving environmental performance and promoting more efficient use of resources.

Results

Awareness training was provided to staff explaining the importance of properly disposing or recycling used material. The roadmap has increased employee awareness and facilitated waste segregation, both at the operation centres and in the field. Employees are aware of the roadmap and use it as a reference due to its ease of use and because it is updated as new waste streams are identified.



**FOR FURTHER
INFORMATION:**



**Transmission Waste
Segregation Road Map**
Wasteroadmap.pdf

NB POWER DISTRIBUTION AND CUSTOMER SERVICE CORPORATION



NB POWER DISTRIBUTION AND CUSTOMER SERVICE CORPORATION (Disco) IS A WHOLLY-OWNED SUBSIDIARY OF NB POWER HOLDING CORPORATION SERVING RESIDENTIAL, COMMERCIAL AND INDUSTRIAL CUSTOMERS ACROSS THE PROVINCE. DISCO DELIVERS SAFE, RELIABLE AND COMPETITIVELY-PRICED ENERGY BY WAY OF ITS 20,000 KM OF DISTRIBUTION LINES. IT ALSO PROVIDES VALUABLE CUSTOMER SERVICES THROUGH ITS REGIONAL OPERATING OFFICES, CUSTOMER CONTACT CENTRES, ACCOUNT MANAGERS AND ENERGY ADVISORS.

OVERVIEW

NB Power Distribution and Customer Service Corporation is responsible for the delivery of electricity from the transmission system to NB Power customers. Environmental efforts are focused on minimizing impacts related to the construction, operation and maintenance of the distribution system, rights-of-way and substations. To this end, the company has implemented an Environmental Management System (EMS) consistent with the ISO 14001 standard. Disco is also involved in awareness programs with homeowners encouraging efficient energy use and R-2000 construction practices. As well, customers are advised on acceptable limits when planting trees and recommended safe practices when working near power lines.

VEGETATION MANAGEMENT

The vegetation management program continues to evolve with noticeable improvements in reliability. These improvements have been due to changes in rural cutting standards and increased danger tree identification and removal. This has contributed to reducing the number of outages caused by tree contacts.

Disco's approach to tree trimming has dual benefits: it ensures reliability of the distribution system and improves safety both in the short and long term. First, it maintains proper clearance from trees for its distribution lines. Selective pruning helps maintain service during wind and ice storms when trees or branches can come in contact with power lines. The trimming program also improves public and employee safety by eliminating hazards. Secondly, through its "right tree, right place" education program, Disco is increasing awareness of the types of trees and shrubs that can be planted near power lines. Over the long term, this will potentially decrease the number of outages in residential areas, therefore contributing to increased reliability.

One initiative under the vegetation management program is to improve communications with customers and community leaders by informing them of proposed vegetation programs in their communities. The results of these meetings include a better understanding of the tree trimming program, and the possibility of cost sharing an integrated vegetation management plan.



Additionally, Disco has been working closely with its vegetation contractors, to ensure consistent fulfillment of cutting standards and adherence to vehicle inspection programs, safety programs and environmental awareness training. These efforts have resulted in more consistent quality throughout the vegetation management program. The end effect has been fewer hydraulic fluid spills, higher quality tree planting and improved reliability.

Herbicides are not used to control vegetation along the rights-of-way of distribution lines but are used to control weeds inside the yards of substations, terminals and remote radio sites. Trained staff from NB Power Transmission performs this work for Disco with the appropriate pesticide application permits.

ENVIRONMENTAL MANAGEMENT SYSTEM

Disco has an Environmental Management System (EMS) consistent with ISO 14001 standard. This provides a structured and systematic approach to managing environmental issues. The program focuses on continual improvement through planning, implementation, auditing, corrective actions and management review. It ensures common environmental goals with defined accountabilities and performance measures. While improved environmental performance is the primary objective of the programs, other benefits include better relationships with communities and regulatory agencies.

The Disco EMS was first developed in the fall of 2002 and became operational in 2003. First-year efforts were directed at founding regional EMS teams, completing an audit of the EMS program, auditing the transformer rebuild centre, and addressing deficiencies found as a result of those audits.

In 2004, the EMS team focused its attention on reviewing its day-to-day activities. The goal was to review field operations and to provide feedback and corrective actions for all issues identified at the operational level.

Through environmental field audits, contractor safety inspections and field visits, it was determined that soil exposure during pole planting and roadside vegetation management was an issue requiring formal operating guidelines. This resulted in work to ensure operating procedures were in alignment with existing and evolving environmental legislation. Operating guidelines were expanded to include *Pole Placement Along a Watercourse*, *Pole Disposal Guideline*, and *Environmental Guidelines for Pole and Line Contractors*.



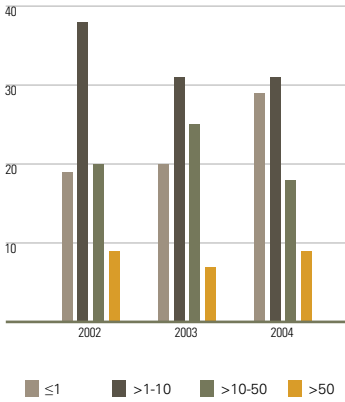
The long-term objective of these procedures is to ensure that new power lines are sited to minimize disturbances to wetlands and watercourses, that poles are properly recycled or disposed of when removed, and that soil disturbance is minimized when installing poles or trimming trees.

The ISO 14001 EMS program has yielded numerous successes as a result of increased environmental awareness, including:

- Installation of vegetable oil transformers at municipal drinking water well fields in McAdam and Rothesay. The use of vegetable oil in these transformers is potentially less damaging to groundwater aquifers if a spill should occur.
- Identification of pole-top transformers in saltwater locations. Analysis has shown that transformers in saltwater locations are more susceptible to premature failure due to corrosion. As a result, Disco is replacing these transformers with stainless steel models to prevent leaks.
- Numerous marsh crossings were protected by modifications to plans that moved the proposed lines out of the marsh, or significantly reduced the impact to the marsh. In many cases, simply conducting the work during the winter can eliminate any damage to the site and still accomplish the work.
- Changes to the "Streetlight Maintenance Program," resulted in reduced damage to nesting birds in light standards, which are now maintained after the nesting season.

WASTE MANAGEMENT

RELEASES OF PETROLEUM PRODUCTS
number of spills (litres)



In 2004, there were 87 oil spills reported of which 33% involved 1 litre or less. There were two spills involving a combined 36.3 litres of PCB-contaminated oil. All field audits indicate hydraulic fluid and transformer oil spills are consistently managed as per environmental regulations. In 2004, all spills were contained, cleaned up, and reported to the appropriate regulatory authority, and cleaned up to the satisfaction of Department of Environment and Local Government.

A successful hydraulic oil spill management program is continuing with results indicating that the volume of hydraulic oil spilled has decreased along with the number of spills caused by ruptured hydraulic hoses. The program involves replacing worn hoses on vehicles, improving maintenance programs, conducting inspections and training staff. Contractors are required to adhere to the program.

NB Power Distribution and Customer Service Corporation has developed and implemented several successful programs to reuse or recycle materials. For example, Disco manages one of the most successful water heater rental programs in the country, with 85 percent of residential customers renting units. This success translates to a need to manage the environmentally-friendly disposal of 16,000 units annually. Units that are less than five years old are returned to the manufacturer for reprocessing while units that are older than five years are sent to a smelter to ensure they are fully recycled thereby avoiding requirement for landfill.

IN THE COMMUNITY

Disco has joined Natural Resources Canada’s office of Energy Efficiency’s “Switch and Save” campaign to encourage the purchase of energy-efficient fluorescent lights. Through its customer bill, website and energy advisors, Disco has been providing information on the benefits



of compact fluorescent lights. The lights have significantly improved over the years, delivering the same light but using up to 75 percent less energy.

Disco employees marked Arbor Day by participating in school events and making presentations on planting trees away from power lines. These fun events allow employees to share their vegetation management expertise with children by answering a variety of environmental questions.

On occasion, Disco crews will venture far outside their community to help with environmental disasters. This was the case in September, when ten line crews were sent to Florida to assist in the recovery from Hurricane Frances. The crews were drawn from all over the province and worked in the Daytona area on system reconstruction.

FOR FURTHER INFORMATION:

Planting Near Overhead Lines
Planting.pdf

GREEN ENERGY



In June 2004, a contract was awarded to Eastern Wind Power Inc. to develop, own and operate the first commercial wind-powered generation in New Brunswick. The wind farm will be located at Dark Harbour on the western coast of Grand Manan and will have

11 turbines, each 78 metres high, with three blades, each 39 metres long. NB Power Distribution and Customer Service Corporation will purchase the output of 20 MW of EcoLogo certified renewable energy and the accompanying environmental attributes through a twenty-year power purchase agreement. The wind farm is expected to be generating electricity by the spring of 2006 and producing zero-emission energy.

This is the first phase of NB Power's long-term objective, anticipating 100 MW from renewable energy projects by 2010. The approach to energy development — involving the private sector and giving priority to renewable resources — aligns with the new *Electricity Act* and the provincial government's energy policy orientation as outlined in the White Paper in 2001.

Continuing to demonstrate a commitment both to the environment and to supporting renewable technologies, Disco is also in the process of developing policies for net metering and embedded generation; these policies will allow independently owned generation to be purchased by Disco.

Disco's energy advisors conducted home evaluations for more than a thousand customers through the Home Energy Check program. Through their recommendations, customers are informed of potential energy conservation opportunities within their home. Additionally, Disco's new electric water heaters will meet the new energy loss standard.

CASE STUDY**STAINLESS STEEL TRANSFORMERS REPLACEMENT PROGRAM IN SALT WATER ENVIRONMENTS****Challenge**

The premature corrosion of pole top transformers in coastal locations.

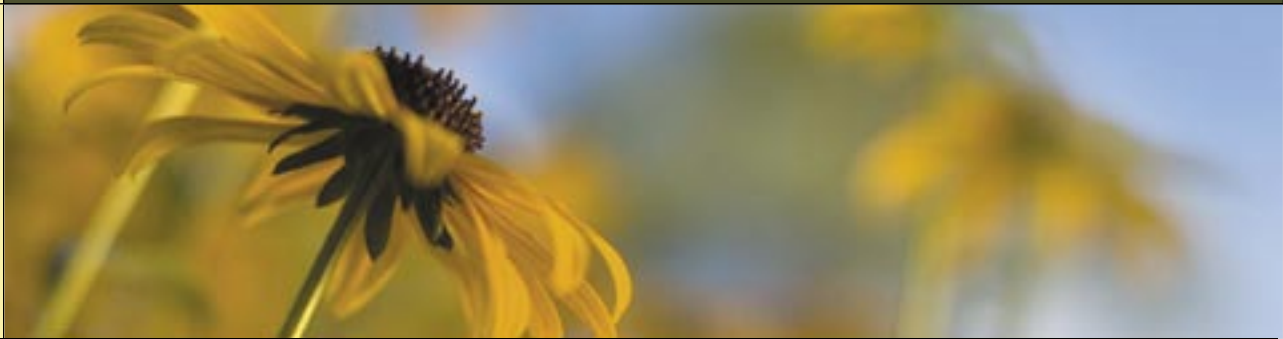
Solution

NB Power as part of its regular line patrols in coastal areas, identifies the condition of transformers in terms of visible corrosion. This program has been active for several years along our North-eastern and Southern coastal areas. To date, in all NB Power regions, approximately 30 regular transformers have been replaced with stainless steel units, with another 90 units identified for replacement in 2005.

Results

This program will reduce the number of oil spills in coastal areas, along with the associated spill cleanup costs. The long term benefit of this initiative supports NB Power's commitment to demonstrate respect for the environment while providing safe and reliable electricity.

MILESTONES



<p>JANUARY</p> <p>Approval was given to Nuclearco by the CNSC to amend the solid radioactive waste management facility operating license for the Point Lepreau Generating Station.</p>	<p>FEBRUARY</p> <p>Grand Lake Generating Station received renewed regulatory approval under the <i>Clean Water Act</i> to operate the waste water treatment system.</p>	<p>MARCH</p> <p>Transco's independent external EMS audit was conducted.</p>	<p>APRIL</p> <p>Point Lepreau Generating Station received an Approval to Operate pursuant to the <i>Clean Air Act</i> for the operation of the auxiliary boiler.</p>
<p>MAY</p> <p>NB Power News <i>Online</i> was launched, the online distribution of the internal newsletter dramatically reduced the need for printed copies.</p>	 <p>JUNE</p> <p>Disco and Eastern Wind Power Inc. began wind energy project.</p>	<p>JULY</p> <p>Belledune received an Approval to Operate for the Solid Waste Disposal Facility as well as an Approval to Construct the Phase III Disposal Cell #1.</p>	<p>AUGUST</p> <p>A "booming" exercise was completed as part of Dalhousie's Orimulsion® Spill Response Plan.</p>
<p>SEPTEMBER</p> <p>NB Power joined national "Switch and Save" program. Disco line crews went to Florida to provide emergency response following Hurricane Frances.</p>	<p>OCTOBER</p> <p>Nuclearco's EMS was re-registered to the International Standard ISO 14001. The <i>Electricity Act</i> was proclaimed.</p>	 <p>NOVEMBER</p> <p>Genco reached a major milestone with the commissioning of Coleson Cove, which will assist the Corporation to reach emission limits.</p>	<p>DECEMBER</p> <p>Russia ratified the Kyoto Protocol, which meant that the protocol would come into effect.</p>
			

GOVERNANCE

With the proclamation of the *Electricity Act* and coincident restructuring of New Brunswick Power Corporation, 2004 was an exceptional year concerning corporate governance. The following outlines governance practices before and after the restructuring of the Corporation.

Before the proclamation of the *Electricity Act*, NB Power was a Crown Corporation with vertically integrated generation, transmission and distribution functions. The Environment Committee, a committee of the board, reviewed the environmental performance of the Corporation and reported its results to the Board of Directors. The reviews encompassed environmental policies and protection programs.

The mandate of the Environment Committee was:

- to examine the suitability of NB Power's Environmental Policy Statement,
- evaluate the effectiveness of corporate environmental programs, and
- review environmental operating activities and results of environmental audits.

Five areas the committee focused its attention on were:

- environment management systems implementation,
- environmental compliance audits,
- provincial environmental issues, facility re-licensing and environmental events,
- changes to environmental legislation and emerging development issues, and
- environmental aspects of capital projects.

Members of the committee prior to restructuring were: Philippe DesRosiers (Chair), Roger Clinch, Jean-Marc Violette and Leon Furlong. Roger Clinch's term expired in March.

Pursuant to the proclamation of the *Electricity Act*, NB Power was restructured into five successor corporations, New Brunswick Power Holding Corporation and four subsidiary companies:

- New Brunswick Power Generation Corporation
- New Brunswick Power Nuclear Corporation
- New Brunswick Power Transmission Corporation
- New Brunswick Power Distribution and Customer Service Corporation



Roger Clinch, Philippe DesRosiers, Jean-Marc Violette and Leon Furlong

Additionally, New Brunswick Power Generation Corporation has two wholly-owned subsidiaries, New Brunswick Power Coleson Cove Corporation and NB Coal Limited.

Each company shares a common Chair and President & CEO. As well, the same individuals sit as directors for each Board. The Board of Directors is responsible for directing the affairs of each of the Corporations, including New Brunswick Power Coleson Cove Corporation, consistent with the *Business Corporation Act* and the *Electricity Act*.

With the exception of the nuclear company, each Corporation has three Board committees including an Environment Committee. In addition to the three Board committees, New Brunswick Power Nuclear Corporation has a Nuclear Oversight Committee.

The Environment Committee exists to assist the board in establishing and maintaining appropriate board policies that guide the companies in respect to the outcomes to be achieved in meeting or exceeding their environmental obligations.

Accordingly, the committee will review:

- the scope of company operations and the environmental regulatory requirements under which the company(ies) operate,
- the environmental expectations of the shareholders and of New Brunswick citizens, and
- the economic impact of environmental options on the company.

The committee will also:

- monitor environmental trends and significant changes in related environmental technology,
- assess the impact of emerging environmental issues as the companies change their operations in pursuit of the strategic vision or as regulatory requirements and/or society's expectations shift, and
- prepare a range of well-researched policy options and the implications of each for board deliberation, debate and decision.

The members of the Environment Committee of the Board are: Bernard Cyr (Chair), Lise Bastarache, and David D. Hay (ex-officio).



Bernard Cyr, David D. Hay and Lise Bastarache



SYSTEM MAP

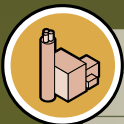
STATION CAPACITY UNITS FIRST SERVICE FUEL ENVIRONMENTAL PROTECTION

THERMAL



Belledune	458	1	1993	Coal	Scrubber, electrostatic precipitators, wastewater treatment, emissions monitoring, low NO _x burners, gypsum recycling
Dalhousie	300	2	1994	Orimulsion®	Scrubber, electrostatic precipitators, wastewater treatment, emissions monitoring, gypsum recycling, ash recycling
Coleson Cove	978	3	1976	Oil	Scrubber, electrostatic precipitators, wastewater treatment, emissions monitoring, ash recycling
Grand Lake	57	1	1963	Coal	Electrostatic precipitators, wastewater treatment, air quality monitoring
Courtenay Bay	109	3	1961-1967	Oil	Wastewater treatment, emissions monitoring, ash recycling

COMBUSTION TURBINES



Millbank	199	2	1991	Diesel	Wastewater control, NO _x control
Ste.-Rose	100	1	1991	Diesel	Wastewater control, NO _x control
Grand Manan	28	1	1989	Diesel	Noise control

HYDRO



Mactaquac	672	6	1968-1980	Water	NB Power operates six hydro dams on the St. John, Tobique, and St. Croix Rivers. Each station operates its reservoir with consideration for recreational users. Mactaquac, Beechwood, Tobique and Milltown have fish passage facilities.
Beechwood	113	3	1957-1962	Water	
Grand Falls	66	4	1928-1931	Water	
Tobique	20	2	1953	Water	
Sisson	9	1	1965	Water	
Milltown	4	7	1928-1969	Water	

NUCLEAR



Point Lepreau	635	1	1983	Uranium	Point Lepreau operates with approval from the Canadian Nuclear Safety Commission, the federal regulator of nuclear facilities, and the New Brunswick Department of Environment and Local Government under the <i>Clean Environment Act</i> and <i>Clean Air Act</i> . Point Lepreau monitors all radioactive liquid effluent and gaseous effluent. Station activities are managed, regulated and monitored from the transportation of the fuel to the site, through station operation, to the storage of used fuel.
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