CANADA

National Energy Board

Reasons for Decision

The New Brunswick Electric Power Commission

EW-1-90 / EW-2-90

January 1991

Exports of Electricity

National Energy Board

Reasons for Decision

In the Matter of

The New Brunswick Electric Power Commission

for Exports of Electricity

to

Eastern Maine Electric Cooperative, Inc.
Houlton Water Company
Main Electric Power Company
Maine Public Service Company
Massachusetts Municipal Wholesale Electric Company

EW-1-90 / EW-2-90

January 1991

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Table of Contents

List of Appendices

Abbreviations

Units of Measurement

BTU	British thermal unit	
GW.h	gigawatt hour	1,000,000 kilowatt hours
kg/ha/yr	kilogram/hectare/year	(1 hectare = 10,000 m^2)
kV kilovolt	1,000 volts	
MW	megawatt	1,000 kilowatts
µg/m^3	microgram/m^3	0.000 001 gram/m^3
tonne		1,000 kilograms

Chemical Symbols

CO_2	Carbon dioxide
NO_2	Nitrogen dioxide
NO_x	All nitrogen oxides
SO^2	Sulphur dioxide

Names

the Act	*National Energy Board Act*
BHE	Bangor Hydro-Electric Company
the Board	National Energy Board
CMP	Central Maine Power Company
Concerned Citizens	Concerned Citizens of Saint John
the Concord study	Air Quality Impacts of the Export Component of Emissions from the New Brunswick Thermal Generating Stations - a report prepared by Concord Scientific Corporation
the Council	Conservation Council of New Brunswick
DMA&E	Department of Municipal Affairs and Environment (of New Brunswick)
EMEC	Eastern Maine Electric Cooperative, Inc.

HWC	Houlton Water Company
Maritime Electric	Maritime Electric Company, Limited
Memorandum of Guidance	The National Energy Board's Memorandum of Guidance to Interested Parties Concerning Full Implementation of the September 1988 Canadian Electricity Policy, dated 22 June 1990
MEPCO	Maine Electric Power Company
MMWEC	Massachusetts Municipal Wholesale Electric Company
MPS	Maine Public Service Company
NB Power) The Applicant)	The New Brunswick Electric Power Commission
NEPOOL	New England Power Pool
the Society	The Sussex Society of Public Interest
the SO_2 Control Program	NB Power's Sulphur Dioxide Emission Control Program
U.S.	The United States of America

Recital and Intervenors

IN THE MATTER of the *National Energy Board Act* and the Regulations made thereunder; and

IN THE MATTER of an application dated 15 February 1990 by The New Brunswick Electric Power Commission for authorizations to export electricity under Part VI of the said Act. Filed with the Board under File Number 6200-N3-2; and

IN THE MATTER OF a second application dated 10 July 1990 by The New Brunswick Electric Power Commission for authorizations to export electricity under Part VI of the said Act. Filed with the Board under File Number 6200-N3-3.

EXAMINED by means of written submissions.

BEFORE:

C. Bélanger	Presiding Member
R. B. Horner, Q.C.	Member
A. Côté-Verhaaf	Member

INTERVENORS:

* Concerned Citizens of Saint John

* Conservation Council of New Brunswick

New Brunswick Voice of Women

People Against Lepreau 2

* The Sussex Society of Public Interest

* Maritime Electric Company, Limited

* Ontario Hydro

Anne Marie Dupuis

Stanton T. Friedman

Julie Galbraith

R.A. Gray

Wayne Schecler

Alan M. Sinclair

Jeffrey B. Sochasky

* Craig Summers

David H. Thompson

Lin Tremblay

* R.E. Tweeddale, P.Eng.

Drs. J. Zwicky and D. McKay

*Intervenors who presented submissions.

Chapter 1
Preamble

This report describes the information examined by the National Energy Board ("the Board") and the conclusions reached in its review of the applications by The New Brunswick Electric Power Commission ("NB Power" or "the Applicant") dated 15 February 1990 and 10 July 1990 requesting the authorization of various exports of electricity. The purpose of the review was to determine whether to issue permits granting the requested authorizations, without a public hearing, or to recommend to the Minister that the Governor in Council designate the applications for licensing, which would necessitate a public hearing.

1.1 Procedures Followed in Reviewing the Applications

Although NB Power's first application, dated 15 February 1990, was filed with the Board before the coming into force, on 1 June 1990, of Bill C-23, An Act to amend the *National Energy Board Act and to repeal certain enactments in consequence thereof*, the Board considered this application and ruled on it after the *National Energy Board Act* ("the Act") had been amended to implement the *Canadian Electricity Policy* and after the issuance by the Board of its 22 June 1990 Memorandum of Guidance to Interested Parties Concerning Full Implementation of the September 1988 Canadian Electricity Policy ("Memorandum of Guidance").

The Board is of the view that the provisions of Bill C-23 must be given effect as of their coming into force on 1 June 1990, in accordance with the general principles of statutory interpretation and that NB Power's applications must be dealt with under the new provisions of the Act concerning electricity exports.

Board Order EW-1-90, establishing the procedure applicable to NB Power's 15 February 1990 application, was issued on 12 July 1990. Order EW-2-90, establishing the procedure applicable to the 10 July 1990 application, was issued on 29 August 1990. They reflected the amended provisions of the Act. Furthermore, NB Power submitted to the Board, in support of its applications, all the information set out in the Memorandum of Guidance.

The Board is satisfied that the process it adopted for its examination of NB Power's applications, the information it considered and the statutory rules it applied are consistent with the law applicable after the coming into force of Bill C-23.

In its review of the applications, the Board ensured that its information requirements, set out in section 119.03 of the Act and the draft Electricity Regulations attached as Appendix I to the Memorandum of Guidance, were met and that all applicable federal guidelines and regulations would be observed in the production of the electricity for export.

In conducting the review, the Board sought to avoid duplication of measures taken by the Applicant and by the government of New Brunswick and had regard to all considerations that appeared to it to be relevant. These considerations included:

a) the effect of the exports on provinces other than New Brunswick;

b) the impact of the exports on the environment; and

c) whether the Applicant has
   (i) informed those who have declared an interest in buying electricity for consumption in Canada of the quantities and classes of service available for sale, and

   (ii) given an opportunity to purchase electricity on terms and conditions as favourable as the terms and conditions specified in the applications to those who, within a reasonable time after being so informed, demonstrate an intention to buy electricity for consumption in Canada. The process described in paragraph (c) is referred to hereafter as providing fair market access.

As part of its review, the Board sought the views of interested parties, including the general public, which it considered, along with the applications, other information that the Board required the Applicant to furnish and the Applicant's responses to the submissions received from interested parties.

1.2 Environmental Screening of the Proposed Exports

The Board's consideration of the environmental impact of NB Power's export proposals, under subsection 119.06(2) of its Act, was carried out in a manner consistent with the provisions of the *Environmental Assessment and Review Process Guidelines Order*. The Board has also had regard to the public concerns expressed about NB Power's export proposals.

Chapter 2
Background

2.1. The Applicant

NB Power operates under the *Electric Power Act*, R.S.N.B. 1973, c.E-5, as a Crown agent of the government of New Brunswick. NB Power's mandate is to provide a continuous supply of electricity adequate for the needs and future development of New Brunswick and to promote economy and efficiency in the generation, distribution, supply, sale and use of electricity. NB Power supplies electricity throughout New Brunswick, serving 264,500 customers directly and 39,081 customers indirectly, through sales to municipal utilities in the cities of Saint John and Edmunston.

Within Canada, NB Power sells electricity to Hydro-Québec, the Nova Scotia Power Corporation and Maritime Electric Company, Limited ("Maritime Electric"). It exports electricity to Massachusetts Municipal Wholesale Electric Company ("MMWEC"), Maine Electric Power Company ("MEPCO"), Eastern Maine Electric Cooperative, Inc. ("EMEC"), Maine Public Service Company ("MPS"), Central Maine Power Company ("CMP"), Bangor Hydro-Electric Company ("BHE"), Boston Edison and Commonwealth Electric.

NB Power has installed generating capacity amounting to 3,190 MW, approximately 93.7 percent of the total installed capacity in New Brunswick. The gross electrical energy generated and purchased by NB Power during its fiscal year ended 31 March 1989 was 19,300 GW.h, of which 40.9 percent was thermal generation, 29.8 percent was nuclear generation, 11.9 percent was hydraulic generation, and 17.4 percent was purchased.

NB Power maintains sufficient generating capacity, on its own system and through a firm capacity and energy agreement with Hydro-Québec, to meet all of its in-province and firm sales requirements.

Energy from outside New Brunswick is only purchased when it is available at prices below NB Power's own cost of generation. NB Power's interconnections with neighbouring provinces and with the State of Maine provide it with access to a total of 2,310 MW of capacity from generation outside the province.

2.2 The Export Customers

MMWEC is a Massachusetts public corporation responsible for planning the development of a bulk power supply and acquiring an optimum combination of base, intermediate and peak capacity at the lowest possible cost for its members which are municipal utilities. It has purchased electricity from NB Power which it receives via the system of the New England Power Pool ("NEPOOL"), which oversees the scheduling and coordination of the bulk power supply of New England utilities. MMWEC does not supply any customers directly.

MEPC0 is a company established by utilities in New England to construct, own and operate the 345 kV transmission line, completed in 1971, which interconnects NB Power with NEPOOL. The owners of MEPCO are CMP (78 percent), BHE (14 percent) and MPS (8 percent). NB Power's transactions with MEPCO are arranged through NEPOOL.

MPS is an investor-owned utility located in Aroostook County and a small part of Penobscot County in northern Maine. Within its service area, which has a population of approximately 100,000, it provides retail service to sixty communities and wholesale service to four communities. MPS has no direct transmission interconnections with utilities in New England. Consequently, it relies on NB Power to provide it with access to electricity purchased from NEPOOL to supply part of its load.

EMEC is a cooperative which generates or purchases electricity and distributes it to its members. It serves an area of Maine along the Canadian border of approximately 4,000 square miles. In 1987, EMEC had 7,000 residential customers and 1,900 small commercial or industrial customers. EMEC is interconnected with the Georgia Pacific Corporation, a large paper mill, where an exchange of power takes place. Surplus power from New Brunswick is sold to this mill. NB Power provides EMEC with access to power purchased in the United States of America ("U.S.") to supply part of its load, as it does for MPS.

Houlton Water Company ("**HWC**") is a municipally-owned utility which provides electricity, water and sewer services to the town of Houlton, Maine. It is a wholesale customer of MPS and has had no previous transactions with NB Power.

A map showing the location of NB Power's major facilities and the areas served by EMEC and MPS is provided in Appendix I.

Chapter 3
Requested Authorizations

NB Power sought six export authorizations in its 15 February 1990 application and two additional authorizations in its 10 July 1990 application. All of the requested authorizations involve the continuation of currently licensed transactions with the exception of the carrier transfer for HWC which is a new transaction required due to changes in contractual arrangements associated with the supply of the electricity involved. The requested authorizations are described in sections 3.1 to 3.3 and listed by application in Appendix II.

3.1 Exports of Firm Electricity

In the early 1980's, NB Power entered into four Unit Participation Agreements for the export of firm electricity, totalling 230 MW, from its Point Lepreau nuclear generating station.

One of these agreements, as amended, provided for the export of 100 MW of electricity to MMWEC until 31 October 1991. A further amendment dated 26 October 1988 extended the transaction for three years. As a result, NB Power sought an authorization to export firm electricity to MMWEC, with an upper limit of 100 MW from 1 November 1991 to 31 October 1993, and 50 MW from 1 November 1993 to 31 October 1994.

Another of these agreements involved the sale of 5 MW of firm power to EMEC. Because EMEC wishes to reduce this purchase gradually and replace it by increased purchases from NB Power's system in order to diversify its electricity supply, NB Power requested an authorization to export firm electricity from Point Lepreau to EMEC, at an upper limit of 3 MW from 1 November 1990 to 31 October 1993, and 1.5 MW from 1 November 1993 to 31 October 1994, along with firm electricity from its oil and coal-fired generation with an upper limit of 20 MW, increased from the previous value of 10 MW, from 1 November 1990 to 31 October 1994.

3.2 Exports of Interruptible Electricity

NB Power has been exporting interruptible electricity to MEPCO since 1971, when MEPCO's 345 kV interconnection with NEPOOL was completed. NB Power requested an authorization to continue such exports from 1 November 1990 to 31 October 2000, with an upper limit of 6,482.4 GW.h in any consecutive 12-month period.

NB Power has also been exporting interruptible electricity to MPS since 1956 and to EMEC since 1958. It requested authorizations to continue these exports from 1 November 1990 to 31 October 2000, with upper limits, in any consecutive 12-month period, of 400 GW.h to MPS and 179 GW.h to EMEC.

3.3 Carrier Transfers

NB Power has been providing carrier transfers of electricity, purchased by MPS and EMEC from sources in the U.S., through its system since 1973. In the 15 February 1990 application, NB Power requested an authorization to continue these carrier transfers from 1 November 1990 to 31 July 2002,

at upper limits of 200 MW and 1,752 GW.h in any consecutive 12-month period. These values were subsequently reduced to 196.6 MW and 1,722.2 GW.h to take account of the carrier transfer for HWC, for which a separate authorization was requested in the 10 July 1990 application. This separate authorization was required because, as of 1 October 1990, HWC intended to purchase the 3.4 MW involved directly from the source rather than MPS. The carrier transfer for HWC would extend to 31 October 2002 and would have upper limits of 3.4 MW and 29.8 GW.h in any consecutive 12-month period.

Also, NB Power has taken advantage of its interconnections with MPS to transmit firm electricity through that system to be returned for consumption in another part of New Brunswick. NB Power requested an authorization to continue this carrier transfer from 1 November 1990 to 31 July 2002, at an upper limit of 50 MW and 250 GW.h in any consecutive 12-month period.[1]

[1] In order to provide sufficient time to complete its review of the applications and so as not to prejudice NB Power's contractual arrangements with its export customers, the Board amended the termination date of existing licences to 31 January 1991. The Board also issued a permit authorizing the carrier transfer to HWC for the period 1 October 1990 to 31 January 1991.

Chapter 4
Information Supplied by the Applicant

4.1 Early Public Notification

In compliance with the Board's draft Memorandum of Guidance regarding Early Public Notification of Proposed Applications dated 6 September 1989, NB Power carried out a public notification program. It held public meetings in Grand Falls, Fredericton, Saint John, Bathurst and Moncton, between 20 March and 28 March 1989. The public was notified of the meetings through newspaper advertisements. News releases were also sent to all television and radio stations and newspapers in the province. Although attendance at the meetings was low, those who attended expressed concerns about the potential environmental impact of the proposed exports.

4.2 Provincial and U.S. Approvals Related to the Exports

Under the *Electric Power Act*, NB Power is required to obtain the approval of the Lieutenant Governor in Council for exports of electricity only in instances where it enters into a contract with an agent of a foreign state or country. To demonstrate its compliance with this requirement, NB Power submitted a copy of an Order in Council approving the sale to MMWEC, the only government agency to which it proposes to export electricity under the applied-for authorizations.

In the U.S., federal and state approvals are generally required to import electricity. To demonstrate the status of the requisite import authorizations, the Applicant submitted copies of letters from EMEC, MEPCO, MPS and MMWEC. EMEC, MPS and MEPCO stated that they had obtained all the necessary approvals. MMWEC, because it is a public corporation, stated that it did not require any state or federal approvals to import. However, since MMWEC is not interconnected with NB Power, the electricity from New Brunswick sources must be wheeled through intervening U.S. systems. NB Power did not foresee any difficulties arising from the fact that MMWEC had not yet completed all the necessary wheeling arrangements.

4.3 Environmental Standards and Guidelines Applicable to NB Power's Generation

NB Power submitted information showing that all of its generation must meet the same environmental standards and guidelines whether or not it is producing electricity for export.

For nuclear generation, acceptable levels of radio-logical emissions and procedures for the handling and storage of spent fuel at Point Lepreau have been developed by the Atomic Energy Control Board.

Existing thermal generation must meet the requirements of the *Clean Air Act* and the *Clean Environment Act* of New Brunswick regarding ambient air quality and the disposal of waste products. The Air Quality Regulations under the *Clean Air Act*" establish maximum permissible 1-hour, 24-hour and annual ground-level concentrations for sulphur dioxide ("SO_2"), nitrogen oxides ("NO_x"), the most common of which is nitrogen dioxide ("NO_2"), and particulates. These concentrations correspond to the desirable levels indicated under the Ambient Air Quality Objectives pursuant to the *Canadian*

Environmental Protection Act. Each plant operates under a Certificate of Approval from the New Brunswick Department of Municipal Affairs and Environment ("DMA&E"). This Certificate deals with site-specific considerations, including maximum permissible ground level concentrations of pollutants. The disposal of liquid and solid wastes produced by each plant must also be carried out in accordance with the provisions in its Certificate of Approval. In addition, NB Power stated that all new installations will be designed in accordance with the Environmental Codes of Practice for Steam Electric Power Generation issued by Environment Canada.

For new thermal generation, the New Source Emission Guidelines pursuant to the *Canadian Environmental Protection Act* specify desirable rates of emission of pollutants. NB Power stated that these guidelines will be applied to new generation scheduled for construction during the term of the requested authorizations. To obtain permission for the addition of a new generating unit, NB Power is required to submit an Environmental Impact Assessment for approval by the DMA&E. For Belledune Unit #1, to be in operation by 1993, the assessment was reviewed by provincial as well as revelant federal agencies because certain aspects of the project came under federal jurisdiction. Public meetings were held in Belledune as part of this review. This coal-fired plant was approved on the condition that it meet the New Source Emission Guidelines for $S0_2$. To satisfy this condition, the installation of flue gas desulphurization equipment, commonly known as scrubbers, will be required.

The Ambient Air Quality Objectives and New Source Emission Guidelines for SO_2 under the *Canadian Environmental Protection Act* are given in Appendix III.

Over and above these considerations regarding air quality, the Governments of Canada and New Brunswick entered into the Canada/New Brunswick Agreement Respecting A Sulphur Dioxide Reduction Program in October 1987 which set an annual limit of 185,000 tonnes on SO_2 emissions for the province, of which 130,000 tonnes were allotted to NB Power. To meet this limit, which comes into effect in 1994, NB Power has developed a Sulphur Dioxide Emission Control Program ("SO_2 Control Program") and incorporated it into its long-term generation expansion program. This Program is described in Appendix IV.

When it is implemented, the SO_2 Control Program will also result in a reduction in wet sulphate deposition, a major component of acid rain. According to the Canadian Acid Rain Control Program, a wet sulphate deposition level no higher than 20 kg SO_4/ha/yr is considered adequate to ensure no damage to moderately sensitive aquatic systems. For the protection of most sensitive soils, a wet sulphate deposition level of 14 kg SO_4/ha/yr is considered adequate.

4.4 Monitoring and Control of Plant Emissions

For the Point Lepreau nuclear plant, radiological emissions are monitored by NB Power and the Atomic Energy Control Board. NB Power indicated that these emissions are well within acceptable safety levels.

For thermal generation, NB Power has developed a network for monitoring and control of emissions from its plants. NB Power's operation of this system is monitored by the DMA&E to ensure that the applicable standards are met. The system utilizes a province-wide ambient air quality network, the outputs of which are used as a basis for initiating any control action required. The network includes:

i) The Dalhousie Air-Quality Network which consists of monitoring stations in Québec and New Brunswick for ground-level concentrations of SO_2 and particulates.

ii) The Grand Lake Air-Quality Network which monitors ambient ground-level SO_2 concentrations, wind speed and temperature. According to the Applicant, improved particulate monitoring will soon be installed and additional SO_2 monitoring stations will be added when Grand Lake Unit #9 is installed in 1994.

iii) The Saint John Air-Quality Network which monitors SO_2, particulates, ozone, NO_x, carbon monoxide, hydrogen sulphide and wind speed. The data from these monitors are transmitted to the DMA&E and to several industries in Saint John, including NB Power's Courtenay Bay plant.

DMA&E's Water Resource Planning Branch has a weather office in Fredericton which provides NB Power with a weather forecast each morning, as well as current and forecast surface and upper level atmospheric conditions. The weather office automatically receives NB Power's hourly air-quality and meteorological data from individual sites and these are used, along with the other data, to prepare hourly site-specific forecasts required by NB Power's computerized supplementary control system. This computer model is used to calculate atmospheric stability, mixing height, plume rise, and predicted maximum ground-level concentrations of pollutants on an hourly basis. If these concentrations approach or exceed permissible limits, emissions can be reduced by lowering generation or switching to a lower sulphur fuel, thereby assisting NB Power to control air quality impacts from its plants.

NB Power submitted that it has the responsibility to conduct its operation to meet environmental requirements. Consequently, it will take corrective action on its own initiative in response to any environmental problem which it detects. However, in airsheds with multiple emitters, such as Saint John, the DMA&E, which has emission and operational data available from all sources, may initiate control action itself or require further action to be taken by the emitters.

In addition, the Applicant observed that each thermal plant's Certificate of Approval contains conditions that require the reporting to the DMA&E of compliance tests, and the submission of monthly and annual operational summaries. DMA&E staff may inspect NB Power's facilities at any time and monitor compliance testing procedures carried out by NB Power staff.

4.5 The Impact of the Exports on The Environment

4.5.1 Sources of the Electricity for Export

The applied-for firm exports, which would terminate in 1994, would be generated in large part from NB Power's Point Lepreau nuclear plant with the remainder coming from thermal generation fuelled by oil and coal. The proposed interruptible exports, which would extend to 2000 or 2002, would be produced entirely by this thermal generation. The major thermal plants initially involved will be the Dalhousie plant in the north of the province and the Courtenay Bay and Coleson Cove plants near Saint John in the south. New coal-fired generating units will be installed at Belledune in 1993 and Grand Lake in 1994 and a third unit, as yet uncommitted, is planned for 1997.

4.5.2 Environmental Impact of the Exports

Because most of the proposed exports would come from the Applicant's thermal generation, the information submitted concentrated on the environmental impact resulting from that generation. Regarding the environmental impact of that part of the proposed exports to be produced by the Point Lepreau plant, the Applicant stated that the plant would be operated at the same output whether or not exports were taking place. As a result, radio-logical emissions would be the same with or without exports.

To demonstrate the effect of the proposed exports on air quality and acid rain, NB Power submitted a study entitled Air Quality Impacts of the Export Component of Emissions from the New Brunswick Power Thermal Generating Stations, prepared by the Concord Scientific Corporation ("the Concord study").

The Concord study examined the effect of exporting energy at 7,061 GW.h per year which is the total of the limits of the requested interruptible authorizations, as well as the maximum amount which NB Power can transmit over its existing international power lines to New England. However, given projected economic conditions, NB Power expects its total exports will range from 4,000 to 5,000 GW.h per year during the term of the requested authorizations.

The Concord study assumed that all the electricity for export would come from NB Power's thermal generation and that exports would occur at the requested upper limits. Therefore, the conditions which would yield the greatest possible environmental impact were examined. The study assumed that most of the exports would be produced by the Dalhousie, Belledune, Coleson Cove and Courtenay Bay plants. Because NB Power's other plants were assumed to produce only 411 GW.h, or about 6 percent of the maximum export, and since these plants would contribute less than 2 percent of the SO_2 emissions attributable to the exports, they were not included in the study. The study incorporated NB Power's SO_2 Control Program.

Two study areas were defined: the North Study Area which included the Dalhousie and Belledune plants, and the South Study Area which included Saint John and the Coleson Cove and Courtenay Bay plants. In each of these areas, estimated annual concentrations of SO_2, NO_2 and total suspended particulates as well as annual levels of wet sulphate deposition were examined to establish the potential for air quality impact. Conditions were examined for two 12-month periods within the term of the proposed interruptible exports: 1991/1992, containing the highest level of SO_2 emissions due to exports, and 1999/2000, containing the highest level of SO_2 emissions attributable to the proposed Belledune plant.

The study concluded that the maximum ground level concentrations of SO_2, NO_2 and total suspended particulates due to all of the NB Power's emissions in both study areas would be well within provincial air quality standards and Environment Canada's Ambient Air Quality Objectives.

The study also demonstrated that there would be a significant decrease in the production of emissions in the Saint John area when NB Power's SO_2 Control Program went into effect in 1994. SO_2 production would be reduced by approximately one-third, NO_2 by one-fifth and particulates by almost one-half.

To further demonstrate the effect of the SO_2 Control Program, NB Power provided information showing that the expected total annual emission of SO_2 will, under normal conditions, be approximately 90,000 tonnes after the program comes into force in 1994, assuming exports ranging from 4,000 to 5,000 GW.h per year. According to NB Power, targeting for this level should ensure that its annual limit of 130,000 tonnes will not be exceeded if demands on its generation are higher than currently expected.

The Concord study estimated that, after the SO_2 Control Program comes into effect, annual SO_2 production associated with the generation required to meet NB Power's load in Canada would range from 54,000 to 64,000 tonnes per year and SO_2 production associated with exports of 7,061 GW.h per year would be 54,000 tonnes per year.

With respect to wet sulphate deposition, the component associated with exports is predicted to be a maximum of 1.4 kg SO_4/ha/yr in the north study area and 1.5 kg SO_4/ha/yr in the south. The total wet depositions in both study areas are below the level considered adequate to ensure no damage to moderately sensitive aquatic systems when these values are added to the background deposition levels, which are due primarily to long range transport of acid precipitation from outside the province and emissions from electricity generation for local requirements.

Wet sulphate deposition levels in the south, however, are predicted to exceed the level considered adequate for the protection of most sensitive soils when high background deposition levels are added to NB Power's contributions related to the exports. However, according to the study, NB Power's contributions are small in areas of the province with most sensitive soils. Moreover, the planned reduction in NB Power's SO_2 emissions, as well as anticipated reductions from other Canadian and U.S. sources, over the term of the requested authorizations are projected to result in wet sulphate deposition levels that will protect most sensitive soils.

With respect to the disposal of liquid and solid wastes from thermal plants, the Applicant stated that there would be net increases in waste water effluent flow, ash, gypsum (from scrubbers at Belledune) and cooling water thermal discharges when a plant is generating electricity for export. As its waste disposal facilities are designed for continuous operation of each plant at full load, NB Power indicated that any additional waste products attributable to the proposed exports would be within the capabilities of the various disposal systems. NB Power asserted that disposal would be carried out in an environmentally-sound manner.

The proposed exports would be carried over NB Power's existing transmission system within the province and exported over existing international power lines. Consequently, NB Power indicated that there would be no incremental environmental impact from the continued use of these facilities to carry out the proposed exports.

Considering the environmental impact of the proposed exports on the buyers' systems, in particular the effect of not generating an amount of energy equivalent to the purchase quantities, NB Power claimed no expert knowledge. However, on the basis of its knowledge of the purchasers' alternatives obtained through discussions with them and a review of their annual reports, it was NB Power's opinion that the net effect of NB Power not generating the energy involved and the U.S. purchasers generating it to meet their requirements would be insignificant. These alternatives consist of increasing their own generation, which is predominantly thermal, or increasing their purchases from neighbouring utilities, whose generation is also mostly thermal. The resultant increase in emissions, given the quantities of

energy involved, was estimated to be insignificant as a percentage of total emissions from generation by these systems.

Turning to the net environmental impact due to the increased generation by NB Power and the reductions in generation on the systems purchasing firm and interruptible electricity, NB Power estimated that the cumulative effect of the proposed exports would be an increment in SO_2 emissions in the range of 4,000 to 16,000 tonnes per year over the period of the proposed exports. It compared this increment to total SO_2 emissions to meet NEPOOL requirements which range from 450,000 to 700,000 tonnes per year.

Regarding the question of social effects directly related to the environmental impact of the proposed exports, NB Power took the position that any negative social effects in New Brunswick would be insignificant. Measures already in place would ensure that local air quality standards are not exceeded by NB Power operations. In addition, its SO_2 Control Program and similar programs in adjoining jurisdictions would reduce SO_2 emissions to 50 percent of the level reached in 1980, causing a reduction in wet sulphate deposition even with exports at the level considered in the Concord study. Furthermore, NB Power considered that any social effects related to new plant construction are not attributable to the proposed exports because electricity generated at such plants for export would be interruptible. Revenue from the exports would result in lower electricity rates in New Brunswick than would otherwise occur, having a positive social effect. Regarding social effects in the U.S., NB Power projected no significant social effects related to the SO_2 emissions estimated for equivalent thermal generation in the buyers' systems. In addition, since the proposed exports are for the most part interruptible, they would have no effect on the buyers' plans to install new generation.

4.6 The Effect of the Exports on Provinces Other Than New Brunswick

NB Power stated that the only negative impact on neighbouring provinces caused by the generation of the electricity for export would be the additional atmospheric loading of pollutants in areas adjacent to New Brunswick. In the Concord study, the atmospheric loading for the small portion of Québec which was within the North Study Area was predicted to increase by 5 percent at the level of exports examined, which NB Power considered to be negligible. Neither Nova Scotia nor Prince Edward Island was within either study area. However the increased atmospheric loading within these provinces, determined by extrapolating from the results within the study area closest to them, was considered to be insignificant by NB Power.

4.7 Fair Market Access

NB Power sent letters to Hydro-Québec, Nova Scotia Power Corporation and Maritime Electric offering for sale the electricity associated with the firm exports to MMWEC and EMEC under the condition that the price would be adjusted to take into account any difference in the cost of delivery. NB Power undertook to continue to offer quantities of interruptible electricity, which would otherwise be exported, to economically accessible Canadian utilities on the same terms and conditions, including price, whenever such quantities became available. NB Power also advised these utilities that it intended to continue the carrier transfers to MPS and EMEC and to undertake the carrier transfer to HWC.

Hydro-Québec and Nova Scotia Power Corporation refused the offers but Maritime Electric expressed an interest in taking up the offer associated with the sale to MMWEC. Subsequently, a sale of 20 MW of electricity from Point Lepreau was arranged with Maritime Electric on conditions no less favourable than those of the proposed export to MMWEC. NB Power stated that this sale to Maritime Electric would not affect the proposed export.

NB Power submitted that the letters of offer and the responses demonstrated that it had adhered to the concept of providing fair market access to the electricity proposed for export.

Chapter 5
Interventions, Submissions and the Applicant's Responses

5.1 Interventions

The Board received 19 interventions in respect of the 15 February 1990 application. Of the 17 interventions from environmental groups and private citizens, 15 were generally opposed to the exports and/or requested that a public hearing be held; the other two interventions were in support of the application. Two neighbouring Canadian utilities intervened, raising specific concerns regarding fair market access and the Board's jurisdiction over wheeling electricity for U.S. purchasers.

Seven of the intervenors presented submissions, including Craig Summers who requested that his intervention be considered as a submission.

No interventions were received in respect of the 10 July 1990 application.

5.2 Submissions and Responses

5.2.1 Concerned Citizens of Saint John ("*Concerned Citizens*")

The Concerned Citizens stated that production of electricity for export aggravates the ambient air quality in the Saint John area, especially in the summer. They cited two episodes in particular, the summers of 1980 and 1990, during which air pollution levels had posed a health hazard.

In their submission, the Concerned Citizens described the health effects of air pollution and explained how the geography and weather patterns around Saint John exacerbate the effects of the emissions from NB Power's plants. They felt that NB Power was insensitive to the problem because it continued to generate at high levels without regard to these conditions and had no plans to improve the situation.

The Concerned Citizens requested that the Board cancel all of NB Power's export permits to relieve the summer air pollution problems. Alternatively, they requested that NB Power be required to install scrubbers on its Coleson Cove and Courtenay Bay plants. In the event that the Board was unable to take either step, they requested that a full public environmental assessment be carried out.

In reply, NB Power described steps taken to lower ash emissions from its plants in order to reduce the soot deposited in the surrounding area and improvements to its ability to respond to deteriorating air quality conditions through earlier implementation of supplementary control measures. NB Power expressed the belief that these and other initiatives implemented at the Courtenay Bay and Coleson Cove plants, together with its SO_2 Control Program, address the concerns raised by the Concerned Citizens.

With respect to the 1980 air quality incident, NB Power acknowledged that the Courtenay Bay plant did have to operate at high loads during the summer and did contribute to the air quality incident. Because of a transformer failure, Coleson Cove was unable to supply electricity to Saint John and the

Courtenay Bay plant had to be used to provide the city with a secure supply of electricity. According to the Applicant, this incident was an unusual event and its response was carried out in consultation with the provincial government. No explanation was given for the 1990 incident.

In a second submission, the Concerned Citizens said that the proportion of summer air pollution caused by exports would be higher than the results presented by NB Power, which were calculated on an annual basis. They also noted that sulphate deposition from Coleson Cove was quite significant, as demonstrated in the information presented by NB Power, and was the cause of the environmental effects to which they objected. Furthermore, they indicated that NB Power burns high sulphur oil during much of the summer period when Saint John is subject to air pollution episodes and that low sulphur oil is burned only for short periods. They also expressed concern about particulate deposition levels and the effect of toxic heavy metals and other metallic components from these oil-burning plants.

In response to the points raised in this second submission, NB Power noted that air emissions from thermal generating plants are normally at their minimum levels during the summer because scheduled maintenance of generating units is carried out in the interval between April and November. Also, NB Power gave predicted values for sulphate deposition from Coleson Cove ranging from near zero to a maximum of 1.02 kg SO_2/ha/yr prior to the commencement of operation of Belledune in 1994 and from near zero to 0.63 kg SO_4/ha/yr after 1994. It considered these values to be insignificant. NB Power pointed out that it normally burns a medium-sulphur oil in its plants near Saint John and switches to oil with lower sulphur content for air-quality management when required. Furthermore, the burning of oil with still lower sulphur content is part of its SO_2 Control Program. NB Power acknowledged that to address some of the concerns raised by the Concerned Citizens required more on its part than meeting environmental regulations but asserted that it had undertaken programs to respond to these concerns. However, time was required to design, construct, install, commission and test systems to reduce emissions from existing power plants.

With respect to the concerns about particulate and heavy metal emissions, NB Power stated that such emissions have been reduced by returning to service the precipitators at Coleson Cove. It expects to reduce emissions further by optimizing precipitator performance and installing more efficient burner atomizers.

5.2.2 Conservation Council of New Brunswick ("The Council")

The Council objected to the proposed exports of interruptible energy on the grounds that continued exports of fossil fuel-fired electricity could result in substantial SO_2 emissions, thereby contributing to acid rain and constraining the development of new industry in the province. This constraint would result from the disproportionate allocation to NB Power of 130,000 tonnes of the annual limit of 185,000 tonnes of SO_2 emissions established by the Canada-New Brunswick Agreement. The Council also pointed out that the level of SO_2 emissions in New Brunswick was well within the limit of 185,000 tonnes in 1987, when the agreement was signed but that by, 1989, NB Power's emissions alone had risen to 176,900 tonnes. This was far above its 130,000 tonne limit.

The Council considered that the requested authorizations would result in undesirable increases in the output of NO_x, which would make it more difficult for New Brunswick to do its part in ensuring that Canada's emissions of NO_x are limited to 1987 levels by 1994, as required by international agreement. Additional particulates would be released. As a result of carbon dioxide ("CO_2") emissions associated

with the exports, New Brunswick would also be hard pressed to play its role in ensuring that Canada's CO_2 emissions are frozen at the 1990 level by 2000, as targeted by international agreement.

The Council also stated that, as recently as 1987, NB Power's Dalhousie plant had operated in violation of the Air Quality Regulations and that the Grand Lake plant has historically operated without a Certificate of Approval and, therefore, had no legally enforceable standards to meet.

Finally, the Council indicated that the Applicant had not demonstrated that the financial benefits to be derived from the exports would exceed the increased social and environmental costs associated with the exports.

In response, the Applicant stated that, as a result of its SO_2 Control Program, it would meet its limit of 130,000 tonnes by 1994 when that limit comes into force. NB Power considered that it was incorrect to state that its 1989 emissions had exceeded this limit because it was not then in effect. Furthermore, because a high proportion of the acid precipitation falling on the province comes from outside, the significance of the SO_2 emissions associated with the proposed exports is questionable and will, in any case, be reduced after 1994.

Regarding other emissions, NB Power took the position that NO_2 emissions associated with the export would have no effect on Canada's ability to meet any potential international agreements. Furthermore, the modest particulate emissions associated with the exports would have no effect. It indicated that it bad followed with interest the current debate about global warming. In view of the scientific uncertainty surrounding this debate, it considered that the best course of action at present was to implement a policy of improved energy efficiency and conservation. In that regard, existing programs are being enhanced and new programs developed.

Regarding the Council's statement that NB Power's Dalhousie plant had violated the Air Quality Regulations as recently as 1987, NB Power provided information showing that the violations mentioned by the Council consisted of infrequent, incidents of short duration during which the hourly air quality objectives for $S0_2$ in those Regulations were exceeded. These consisted of 0.0425 percent of observations above the desirable level of Environment Canada's Ambient Air Quality Objectives and 0.0081 percent of observations above the acceptable level and the provincial standard. Nonetheless, the monitoring system in the area had been improved and stocks of low-sulphur coal obtained to improve air quality control in the area.

NB Power indicated that it does, in fact, have a Certificate of Approval for its Grand Lake plant. It pointed out that the *Clean Environment Act* and Air Quality Regulations would apply whether or not it had such a certificate. Certificates of Approval contain conditions addressing situations not covered in the Air Quality Regulations an/or conditions more stringent than those contained in the Regulations.

Regarding the Council's statement that reduction in NB Power's SO_2 emissions would leave more room for other industry to develop without breaching the total provincial limit, NB Power referred to its assessment of the benefits which would be derived from the exports. While it had not compared these benefits to those created by other industries, it considered them to be significant and did not believe that distinctions should be made based on the source of emissions. Finally NB Power stated that the effect of exports on in-province power rates varied from year to year depending on factors such as available generation, the requirements of other systems and fuel costs and could rise or fall as these factors changed.

5.2.3 *The Sussex Society of Public Interest ("the Society")*

The Society opposed the export of electricity on the grounds that it caused unacceptable environmental degradation in the province and beyond. It thought that the correlation between environmental degradation caused by generation of electricity for export and the economic costs and financial losses to local agriculture and forestry had not been satisfactorily explored by the Applicant. In addition, because NB Power did not have to meet environmental standards as stringent as those to which the U.S. buyers are subjected in their respective jurisdictions, the Society was of the view that New Brunswick was being asked to accept environmental risks and costs judged to be unacceptable in those jurisdictions.

The Society also objected to the Board's process of review on the grounds that no funding was available for public interest groups. It also considered that public hearings should be mandatory.

In response, NB Power noted that its plants meet the environmental standards which are established within the Province of New Brunswick to provide an acceptable level of environmental protection. Further, NB Power must comply with any standards evolving from bilateral agreements such as the agreement between New Brunswick and the federal government to limit SO_2 emissions. NB Power reiterated its view that there would be no environmental degradation caused by the generation of energy for the proposed exports.

5.2.4 *R.E. Tweeddale, P. Eng.*

R. E. Tweeddale supported the application, primarily because the proposed exports would provide funds to finance the equipment needed to reduce the emissions from NB Power's plants. In addition, there would be no detrimental effects on neighbouring Canadian utilities which had been given the opportunity to express any concerns about the proposed exports before NB Power presented its application to the Board. Mr. Tweeddale was of the view that benefits would be available to these utilities from NB Power's transmission ties to New England by providing potential market opportunities as well as improved reliability of service and reduction in the cost of capacity reserves. The sale of electricity from generators during such times as they are not required to supply in-province loads would provide the utility a return on its capital investment and a considerable amortization of capital invested, to the long term benefit of the seller.

NB Power supported the points made by Mr. Tweeddale.

5.2.5 *Craig Summers*

Craig Summers objected to the proposed export to MMWEC from the Point Lepreau plant on the grounds that nuclear waste is an environmental problem, nuclear plants are dangerous due to the possibility of accidents or terrorist attack, and some of the materials used in nuclear power can be used in nuclear weapons.

NB Power did not respond to this submission.

5.2.6 Maritime Electric

Maritime Electric stated that if its concerns relating to clauses (a) and (c) of s. 119.06 (2) of the Act, which deal with the effect of the exports on other provinces and fair market access, were addressed and no other relevant factors warranted designation of the proposed exports for licensing, permits ought to be issued authorizing the proposed exports.

Maritime Electric expressed concern about the provision of fair market access to future interruptible exports to MEPCO. As proposed by NB Power, the exports to MEPCO would take place in accordance with the NB Power-CMP Interconnection Agreement and the power purchase agreements with CMP and BHE. The power purchase agreements expire on 31 October 1991 but may be extended to October 1995. However, the requested authorization for interruptible exports to MEPCO would extend to 31 October 2000. Maritime Electric was concerned about fair market access to transactions which might take place under the power purchase agreements after 31 October 1991.

To ensure that fair market access would be provided under any extensions of the power purchase agreements, Maritime Electric proposed that a separate permit or permits be issued for exports to CMP and BHE for a one-year term to coincide with the current expiry date of the power purchase agreements. Alternatively, if issued for a longer term, the permit or permits should contain a fair market access condition that would apply in the event the agreements were renewed.

Maritime Electric also suggested that all permits for exports under interconnection agreements be subject to a condition which will ensure that fair market access is provided. Because the applied-for exports would be interruptible in nature and would occur when conditions make them feasible, Maritime Electric argued that NB Power could not make the case that it had afforded fair market access to such future transactions. Maritime Electric questioned the suitability of the "first offer" mechanism[1] as a measure of fair market access. It considered that a first offer condition might not be as effective as a fair market access condition because, in some cases, exporters might not give prospective purchasers enough time to assess the offer properly, or some of the terms and conditions applicable to the export might not be suitable to a prospective Canadian purchaser. Maritime Electric stated that it would not object to a first offer condition in any permit issued to NB Power but proposed that it would be more appropriate to include a condition embodying the criteria by which the Board would judge whether fair market access has been provided. Maritime Electric also proposed that NB Power should be required to demonstrate compliance on an annual basis with whatever fair market access condition might be imposed.

Maritime Electric described its negotiations with NB Power subsequent to its expression of interest in the offer of the firm export to MMWEC as the kind of flexible process that the fair market access approach should facilitate. This flexibility, according to Maritime Electric, was demonstrated by NB Power’s willingness to modify two existing NB Power - Maritime Electric contracts to accommodate the new transaction.

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[1] The "first offer" mechanism, which predates the coming into force of Bill C-23, involved the offering of electricity to he exported to economically accessible Canadian utilities on terms and conditions, including price, as favourable as those which would apply to the proposed export prior to making the export.

In its response, NB Power opposed the separation of transactions under the power purchase agreements with CMP and BHE from transactions under the interconnection agreement with CMP/ MEPCO. It stated that exports of interruptible energy to CMP and BHE are scheduled by NEPOOL over the MEPCO line. Since they are a form of economy energy covered by the Interconnection Agreement with MEPCO, that agreement would apply as well. It suggested that putting longer term agreements for economy-type transactions outside the scope of the Interconnection Agreement would limit its ability to continue to conduct business with U.S. utilities.

NB Power pointed out that it was prepared to accept a first offer condition in any authorization issued by the Board and considered the type of condition proposed by Maritime Electric to be unnecessary because a first offer condition provides fair market access as required by the Act. Finally, it submitted that annual demonstration of its compliance with a fair market access or first offer condition was unnecessary.

5.2.7 Ontario Hydro

Ontario Hydro supported the 15 February 1990 application and indicated that it should not be subject to a public hearing. It contended, however, that the issuance of an authorization for the carrier transfer of electricity for MPS and EMEC is beyond the Board’s jurisdiction because the electricity involved would not be generated in Canada.

Ontario Hydro took the position that the electricity involved would be transferred to NB Power from one utility in the U.S. and simultaneously transferred by NB Power to a second utility in the U.S. Both buyer and seller would be U.S. utilities with NB Power only acting as a conduit between them. Section 119.02 of the Act provides that no person shall export electricity except under and in accordance with a permit or licence issued by the Board. Paragraph (a) of the definition of "export" in section 2 of the Act refers to the sending from Canada of "electricity produced in Canada". The carrier transfer of electricity to MPS and EMEC would not constitute an export for which a permit or licence would be required under the Act.

Ontario Hydro contended that the absence of a licence or permit for such transactions would not prejudice the interest of neighbouring utilities. Any utility that is negatively affected by such transactions would have recourse to the Board under section 21 of the Act which allows the Board to review, rescind, change, alter or vary any order or decision made by it. Such concerns could be addressed by applying appropriate conditions to NB Power’s international power line certificates or permits.

NB Power concurred with Ontario Hydro that carrier transfers are simply a simultaneous transfer of electricity into and out of Canada (with adjustments for transmission losses) with no net effect in Canada, other than the economic benefit to Canada for providing the service. NB Power was of the view that requiring a permit for such a business transaction would be inappropriate and excessive and that this was evidenced by the fact that many of the information requirements for obtaining a permit did not apply to such a transaction or were difficult for Canadian utilities to assess because the source of the electricity being wheeled, the related emissions from that source, and the load to be supplied were in the U.S.

Chapter 6
Views of the Board

The Board has given consideration to all the information submitted by NB Power and to the submissions presented to it and has reached the following conclusions:

6.1 Regulation of the Proposed Transactions to Wheel Electricity for U.S. Purchasers

Three of the transactions for which NB Power originally sought authorizations are carrier transfers of electricity for MPS, EMEC and HWC. Electricity generated in the U.S. and purchased by MPS, EMEC and HWC would be wheeled through the system of NB Power and delivered back to the U.S.

As fully set out at section 5.2.7 of these Reasons for Decision, Ontario Hydro submitted that such a carrier transfer of electricity does not constitute an export for which a permit or licence would be required under the Act. NB Power supported this view and submitted further reasons why the Board should not regulate wheeling transactions involving electricity generated outside Canada and merely wheeled through its system.

Having reviewed the submission of Ontario Hydro and the comments of the Applicant, the Board has decided that it is not necessary to regulate carrier transfers of electricity produced outside Canada, simply wheeled through the circuits of a Canadian utility and ultimately delivered and consumed outside Canada.

The provisions of the Act, introduced by the coming into force of Bill C-23 on 1 June 1990, require that the Board, in determining whether to recommend to the Minister that an application be designated by Governor in Council for licensing, shall have regard to all relevant considerations, including the effect of the proposed exportation on other provinces, its impact on the environment and fair market access.

The Board has considered the nature and characteristics of the wheeling arrangements of U.S. generated electricity by NB Power for MPS, EMEC and HWC and has concluded that the regulatory scheme of the Act applicable to the exportation of electricity cannot usefully be applied to such carrier transfers of electricity not produced in Canada.

Fair market access is meant to afford to Canadian purchasers who have demonstrated an intention to buy electricity for consumption in Canada an opportunity to purchase electricity on terms and conditions as favourable as those offered to an export customer. The Board is of the view that fair market access applies to the electricity itself and not to a carrier transfer service being offered by a Canadian utility to U.S. customers. In the wheeling arrangements proposed by NB Power, the electricity delivered to the U.S. purchasers will be received by the Applicant from U.S. sources. Such electricity, however will disperse itself into the Canadian utility's system and become commingled with electricity produced in Canada to serve domestic loads. It is impossible to determine with certainty that the electricity delivered back to the U.S. purchasers will not contain some electricity generated in Canada. The Board is prepared, however, to deem all of the electricity being wheeled

back to the U.S. to have been produced in the U.S. and to consider therefore that there will be no net energy sales to which a Canadian purchaser could claim fair market access.

With respect to the environmental impact of the carrier transfers proposed by NB Power, it would be limited to the operation of the power lines required by the Canadian utility to effect the wheeling. Neither the generation nor the end use of the electricity in the U.S. would in effect be caused by the carrier transfers proposed by NB Power. The Applicant would be a mere conduit by which existing loads outside Canada are supplied by electricity that would otherwise be produced outside Canada. Furthermore any environmental impact resulting from the operation of an international power line in Canada, for carrier transfers or any other types of transfers, could be addressed by the Board through appropriate regulation of the facilities under Part III. 1 of the Act.

The Board has determined that the same is true for the effects of the proposed carrier transfers on provinces other than New Brunswick. Any reliability effect caused by the wheeling of electricity from U.S. sources to U.S. purchasers could effectively be dealt with by attaching the necessary terms and conditions to the certificates or permits issued under Part III.1 of the Act with respect to the facilities used for wheeling purposes.

The Board will therefore not issue permits to NB Power to wheel through its system electricity produced in the U.S. for delivery to MPS, EMEC and HWC having determined that the nature and circumstances of such carrier transfers need not be subject to the Board's current export regulation. The Board is of the view that NB Power should nevertheless keep the Board informed of such wheeling transactions.

The Board is of the opinion however that carrier transfer arrangements by which electricity generated by a Canadian utility is wheeled through the U.S. and returned to Canada should continue to be regulated under Part VI of the Act. Wheeling transactions of this nature may have extra-provincial and environmental effects to which the Board must have regard. NB PoWer's request for an authorization to enter into a carrier transfer arrangement with MPS to transmit firm electricity through its system in the U.S. to be returned for consumption in another part of New Brunswick has been reviewed by the Board and dealt with in these Reasons for Decision.

6.2 Early Public Notification

The Board notes NB Power's efforts to provide early public notification of its export applications by holding public information meetings in five major centres and is satisfied that these meetings provided an opportunity for timely public input.

6.3 Provincial and U.S. Approvals Related to the Exports

NB Power is required to obtain provincial government approval for export contracts entered into with government agencies in the U.S. MMWEC is the only such buyer and NB Power demonstrated that it has received the necessary approval for this export. The Board considers, therefore, that NB Power has obtained the provincial approvals necessary to effect the proposed exports.

The Board accepts the information supplied by NB Power that all the relevant federal and state approvals required to import electricity into the U.S. have been obtained by the purchasers. It is satisfied with the assurance supplied by NB Power that the wheeling arrangements with intervening

U.S. utilities required to provide access to the electricity from NB Power to MMWEC will be available when required.

6.4 The Impact of the Exports on the Environment

The Board has examined the nature of the environmental impact resulting from the Applicant's proposed exports and the steps which would be taken by NB Power to mitigate any impact. As a part of its examination, the Board also analyzed NB Power's compliance with applicable federal regulations and guidelines and federal/provincial agreements.

With respect to generation from Point Lepreau, the Board accepts that the plant would be operated at the same output level to supply other loads if no exports were to take place. Consequently, radiological emissions and radioactive wastes would occur at the same level with or without the proposed exports. The Board notes that electricity production from Point Lepreau, including the portion for which NB Power has sought export authorization, is subject to stringent controls by the Atomic Energy Control Board of Canada.

The Board observes that NB Power's production of electricity from its oil-fired and coal-fired generation will cause an increase in emissions of air contaminants and in the production of liquid and solid wastes above the levels which would exist if no exports were made. Generation from thermal sources will also increase to offset the dedication of a portion of production from Point Lepreau to the export market. The Board finds that the approach taken in the Concord study, that is, basing the analysis of air quality impacts on the assumption that all electricity for export will be thermally generated, takes this into account.

With respect to thermal generation and its effect on ambient air quality, the Board is satisfied that NB Power will operate its existing and new thermal plants in such a manner that ground level concentrations of pollutants are not likely to exceed the desirable level of Environment Canada's Ambient Air Quality Objectives at any time. In addition, all new generation to come into service during the term of the requested authorizations will meet the emission limits specified in Environment Canada's New Source Guidelines.

The Board has reviewed the Applicant's SO_2 Control Program and examined its effect on the production of SO_2 and the associated wet sulphate deposition under maximum export conditions. The Board notes the environmental benefits resulting from its implementation and accepts that, with this control program in place, total emissions of SO_2 by NB Power would likely remain below its allotted annual limit of 130,000 tonnes, imposed by the New Brunswick government as a result of its October 1987 agreement with the Government of Canada.

Furthermore, the Board is satisfied that, with the SO_2 Control Program, the deposition of wet sulphate resulting from the generation of electricity for both domestic load and exports in place would be below the levels considered adequate under the Canadian Acid Rain Control Program to ensure that there would be no damage to moderately sensitive aquatic surroundings as well as the most sensitive soils.

With respect to the special air quality problems in the Saint John area, the Board notes the efforts undertaken by NB Power to reduce the emissions due to its generation, the additional measures it has under study and the further relief which will result from the implementation of the SO_2 Control

Program in 1994, when the Coleson Cove and Courtenay Bay plants will be fuelled by 2.00 percent sulphur oil instead of 2.75 percent sulphur oil.

The Board accepts that NB Power's system for monitoring and controlling plant emissions is capable of ensuring that ground level concentrations of pollutants meet all applicable federal guidelines and regulations. However, to assure itself that NB Power will continue to meet federal requirements, the Board will condition any permit it may issue so that the generation of electricity for the proposed exports shall not contravene applicable federal environmental standards and guidelines.

Furthermore, in considering the effect of the proposed exports on air quality, the Board notes that the electricity proposed for export would replace electricity that would otherwise be, for the most part, produced by fossil-fuelled generation in New England with similar impact. While the generation of the proposed exports in New Brunswick would produce approximately 54,000 tonnes of SO_2 per year following implementation of the SO_2 Control Program, NB Power estimated that the associated reduction in generation in New England would offset most of this output, resulting in a net increase in the production of $S0_2$ in the range of 4,000 to 16,000 tonnes per year. The Board considers this increment a small proportion of the total amount of SO_2 to be produced by thermal generation in New Brunswick, estimated to range from 108,000 to 116,000 tonnes per year, and the amount to be produced by generation in New England, ranging from 450,000 to 700,000 tonnes per year. The Board, therefore, is of the view that the net environmental impact of increased SO_2 emissions and the related social effects from the generation of the electricity for the proposed exports would be insignificant.

Regarding the disposal of the increased quantities of liquid and solid plant wastes attributable to the proposed exports, the Board expects that it would be carried out in an environmentally sound manner.

The Board agrees with NB Power that there would not be any incremental environmental impact from the continued use of the portion of NB Power's transmission system and the international power lines and the U.S. power lines which would be involved in transmitting the proposed exports.

On the basis of its assessment of the impact of the exports on the environment, as required under the provisions of the Act, and the results of environmental screening of the export proposals, the Board finds that any potentially adverse environmental effects, including any social effects directly related to these environmental effects, in respect of generation at Point Lepreau would be adequately mitigated through monitoring and enforcement of regulations of the Atomic Energy Control Board. With respect to the electricity for export which would be generated at thermal plants, the Board concludes that any potentially adverse environmental effects, and directly related social effects, would be insignificant or mitigable with known technology.

6.5 The Effect of the Exports on Provinces Other Than New Brunswick

The proposed exports could, in theory, affect neighbouring provinces in two ways. They could affect the reliability and security of the operation of their power systems and air pollutants from the generation of the electricity for export could be transported across provincial boundaries with resultant environmental impact.

Although NB Power did not address the first of these possible effects, the Board notes that the proposed exports involve the continuation of existing transactions. Since these transactions have been

taking place for a number of years without adverse effects on the adjacent power systems, the Board is satisfied that there would be no reliability or security problems associated with their continuation for those systems. Furthermore, the Board notes that no objections to the proposed exports were received from neighbouring provincial utilities on this ground.

With respect to the potential environmental impact, the Board concurs with the Applicant's conclusions that the impact on the neighbouring provinces would be negligible.

6.6 Fair Market Access

The Board considers that NB Power has provided fair market access to the proposed firm power exports to MMWEC and EMEC through the manner in which it applied the first offer mechanism.

The Board is of the opinion that fair market access is not applicable to the proposed carrier transfer through MPS as there would be no sale of electricity involved.

Turning to the points raised by Maritime Electric regarding fair market access to future interruptible exports to MEPCO, the Board considers that it would be unnecessary to issue separate permits for transactions under NB Power's interconnection agreement with CMP and for transactions under its power purchase agreements with CMP and BHE.

The Board does, however, agree with Maritime Electric that NB Power has not yet provided fair market access to any interruptible energy which might be sold under extensions to the power purchase contracts with CMP and BHE, or any future contracts which might replace those contracts, within the term of the requested authorization. Therefore the Board will ensure that any permit it may issue in respect of exports of interruptible energy to MEPCO will require NB Power to provide fair market access to any energy which would otherwise be exported under extensions or replacements of the power purchase contracts to potential Canadian purchasers. The Board will also require any such extensions or replacement contracts to be submitted for its approval. Furthermore, the Board is of the view that NB Power has not yet provided fair market access to the proposed exports of interruptible energy to MPS and EMEC and will include similar conditions in any permits it may issue to authorize these transactions.

The Board also considers that NB Power would satisfy such a fair market access condition by continuing its current practice of first offering such energy to potential Canadian purchasers on terms and conditions as favourable as the terms and conditions in the applicable export agreements.

Chapter 7
Disposition

After considering the information provided by the Applicant and the interventions and submissions of interested parties, the Board is of the view that a public hearing is not required or necessary and has decided not to recommend to the Minister that the Governor in Council designate NB Power's applications for licensing as it has not identified any issues which would benefit from further public review.

The Board, having satisfied itself that the effect of the exports on provinces other than New Brunswick would be negligible, that the impact of the exports on the environment would be insignificant or mitigable with known technology, that the Applicant has provided, or will provide, fair market access to the exports, and having had regard to all considerations that appear to it to be relevant is prepared to issue to NB Power permits granting the requested authorizations, with the exception of the carrier transfers to MPS, EMEC and HWC over which it will not assert jurisdiction. Terms and conditions applicable to each permit are set out in Appendices V through X. In addition to meeting these terms and conditions, NB Power is required, in accordance with Section 18 of the National Energy Board Part VI Regulations, to supply to the Board, no later than the 15th day after the end of each month during the term of these permits, a report setting forth the quantities of power and energy exported and the resulting revenue.

The foregoing constitutes our Reasons for Decision in the matter of the present applications of NB Power pursuant to Part VI of the *National Energy Board Act*.

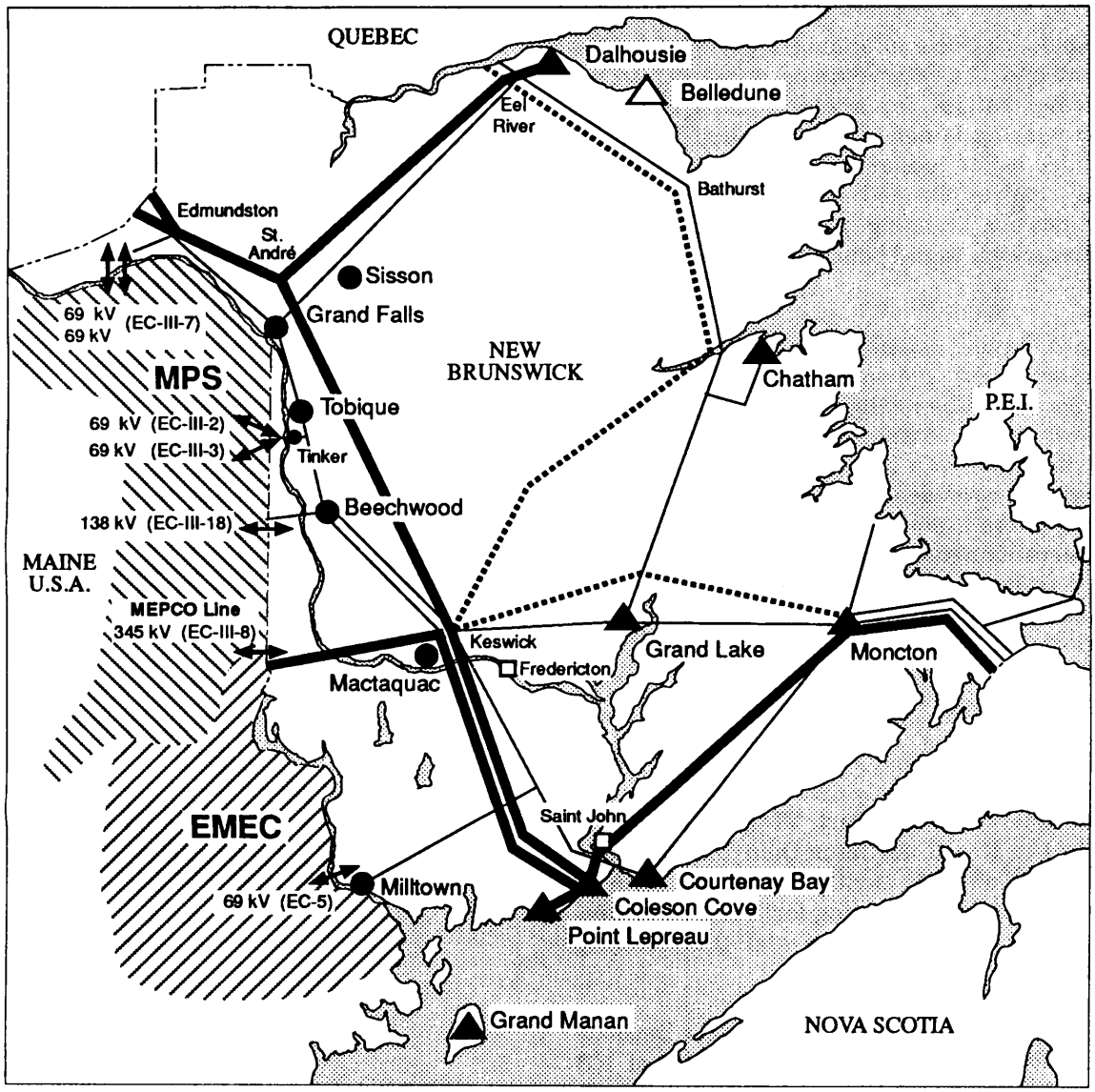
C. Bélanger
Presiding Member

R.B. Horner, Q.C.
Member

A. Côté-Verhaaf
Member

Appendix I

The New Brunswick Electric Power Commission
Major Facilities



Generating Stations

- Hydraulic
- Thermal (including nuclear)
- Thermal Under Construction

Transmission Lines

- 138 kV
- 230 kV
- 345 kV

Appendix II
Requested Authorizations

Table a2-1

1. The 15 February 1990 Application

Proposed Export	Purchaser	Term	Limits Requested: Power	Limits Requested: Energy (in any consecutive 12-month period)	Associated Agreements
a) Firm electricity (Replaces Licence EL-137)	MMWEC	1 November 1991 to 31 October 1993	100 MW	876 GW.h	NB Power-MMWEC Unit Participation Agreement, as amended
		1 November 1993 to 31 October 1994	50 MW	438 GW.h	
b) Interruptible electricity (Replaces Licence EL-140)	MEPCO	1 November 1990 to 31 Octobe 2000	-	6,482.4 GW.h (less any firm energy exported over MEPCO line)	NB Power-CMP Interconnection Agreement and associated Operating Agreements, NB Power-CMP Power Purchase Agreement NB Power-BHE Power Purchase Agreement
c) Carrier transfer (Replaces Licence EL-141)	MPS/EMEC	1 November 1990 to 31 July 2000	196.6 MW	1722.2 GW.h	NB Power-MPS Transmission Agreement NB Power-EMEC Transmission Agreement
d) Interruptible electricity (Replaces Licence EL-143)	MPS	1 November 1990 to 31 October 2002	-	400 GW.h	NB Power-MPS Interconnection Agreement and associated Operating Committee Agreements
e) Carrier transfer (Replaces Licence EL-144)	Through MPS	1 November 1990 to 31 October 2002	50 MW	250 GW.h	
f) Interruptible electricity (Replaces Licence EL-145)	EMEC	1 November 1990 to 31 July 2002	-	179 GW.h	NB Power-EMEC Interconnection Agreement

2. The 13 July 1990 Application

aa) Firm electricity (Replaces Licence EL-139)	EMEC	1 November 1990 to 31 October 1993	3.0 MW from Point Lepreau and 20 MW from NB Power System	201.48 GW.h	NB Power-EMEC Unit Participation Agreement, as amended, and NB Power-EMEC Capacity Agreement
		1 November 1993 to 31 October 1994	1.5 MW from Point Lepreau and 20 MW from NB Power System	188.34 GW.h	
bb) Carrier transfer (new transaction)	HWC	1 October 1990 to 31 October 2002	3.4 MW	29.8 GW.h	NB Power-HWC Transmission Agreement

Appendix III
Ambient Air Quality Objectives and New Source Emission Guidelines for Sulphur Dioxide

a) Ambient Air Quality objectives

The *Canadian Environmental Protection Act* specifies the following ground-level concentrations:

Ground-Level Concentrations
(in µg/m^3)

Maximum Level	Emission	1 hour[1]	24 hours[2]	1 year[3]
Desirable Range[4]	SO_2	450	150	30
	NO_x	n/a	n/a	60
	Particulars	n/a	n/a	60
Acceptable Range[5]	SO_2	900	300	60
	NO_x	400	200	100
	Particulars	n/a	100	70
Tolerable Range [6]	SO_2	n/a	800	n/a
	NO_x	1000	n/a	n/a
	Particulars	n/a	400	n/a

1. Average concentration over a one hour period.
2. Average concentration over a continuous 24-hour period.
3. Annual arithmetic mean.
4. Maximum desirable level is the long-term goal, providing a basis for an antidegradation policy for unpolluted parts of the country and for continuing development of pollution control technology.
5. Maximum acceptable level is intended to provide adequate protection against effects on soil, water, vegetation, materials, animals, visibility, personal comfort, and well-being.
6. Maximum tolerable level denotes time-based concentrations beyond which, due to a diminishing margin of safety, appropriate action is required without delay to protect the health of the general population.

b) National Guidelines for New Stationary Sources ("New Source Emission Guidelines")for Sulphur Dioxide

The *Canadian Environmental Protection Act* also specifies that the hourly mean rate of discharge of sulphur dioxide into the ambient air from new fossil-fired utility steam generating units emitting more than 0.6 lbs. of SO_2 per 10^6 BTU of heat input, when uncontrolled, should not exceed the following values when determined over successive averaging periods of 720 operating hours:

i) Those units emitting SO_2 at rates between 0.6 lbs/10^6 BTU and 6.0 lbs/10^6 BTU of heat input should be controlled so that the final emission does not exceed 0.6 lbs/10^6 BTU.

ii) Those units emitting more SO_2 than 6.0 lbs/10^6 BTU should be controlled so that a minimum of 90% of the uncontrolled emission is captured.

Appendix IV
NB Power's Sulphur Dioxide Emission Control Program

The program being undertaken by NB Power to meet its annual emission limit of 130,000 tonnes of SO_2, which becomes effective in 1994, will be integrated with its long-term development plan. The actual measures may vary as conditions change but the current program consists of the following:[1]

i) Installation of a 450 MW coal-fired unit at Belledune in 1993 with SO_2 control capability to a level of 0.6 lb/10^6 BTU of fuel consumed (conforms to Environment Canada's New Source Guidelines for emissions).

ii) Utilization of lower sulphur oil (possibly 2 percent) in existing oil-fired units.

iii) Installation of a 150/200 MW coal-fired unit at Grand Lake in 1994 with 90 percent SO_2 removal capability which will burn New Brunswick coal. (conforms to Environment Canada's New Source Guidelines for emissions).

iv) Dalhousie #2 unit fuel changed from indigenous New Brunswick coal to lower sulphur coal in 1994.

v) An additional 450 MW generator will be added not later than 1997 or 1998. This unit, if thermal, will be equipped with SO_2 control capability to a level of 0.6 lb/10^6 BTU of fuel consumed.

vi) New Brunswick coal utilization maintained at no more than 500,000 tonnes per year.

vii) Annual export sales of 4,000 GW.h in 1994 increasing to 5,000 GW.h by 2000.

Estimated total SO_2 emissions are shown in the following table:

NB POWER'S TOTAL SO_2 EMISSIONS[2]

Year	Tonnes
1993	147,000
1994	113,000
1995	90,000
1996	90,000
1997	90,000
1998	85,000
1999	90,000
2000	91,000

[1] NB Power report Sulphur Dioxide Emission Control Program, 1990 - 2000, p. 8.

[2] Ibid., Figure II, "So_2 Control Program", p. 9.

At these levels, sufficient margin exists so that the annual limit of 130,000 tonnes should not be exceeded in the event of currently unforeseen demands on NB Power’s generation.

Appendix V
Terms amd Conditions of Export Permit EPE-14 - Sale of Firm Power and Energy to MMWEC

1. The term of this permit shall commence on 1 February 1991 and shall end on 31 October 1994.

2. The class of transfer authorized hereunder shall be the sale transfer of firm power and energy.

3. The power and energy to be exported hereunder shall be transmitted over the international power line for which the Board has issued Certificate of Public Convenience and Necessity No EC-III-8.

4. The exports made hereunder shall be in accordance with the Point Lepreau Unit Participation Agreement dated 24 October 1980 between NB Power and Massachusetts Municipal Wholesale Electric Company as amended on 22 March 1984, 25 August 1986 and 26 October 1988.

5. Any amendment or addition to, termination or substitution of the agreement referred to in Condition 4 shall not be effective until approved by the Board.

6. The quantity of power that may be exported hereunder shall not exceed:

   (a) 100 MW during the period of 1 February 1991 to 31 October 1993.

   (b) 50 MW during the period of 1 November 1993 to 31 October 1994.

7. The quantity of energy that may be exported hereunder during any 12-month period shall not exceed:

   (a) 876 GW.h during the period of 1 February 1991 to 31 October 1993.

   (b) 438 GW.h during the period of 1 November 1993 to 31 October 1994.

8. The generation of energy to be exported hereunder shall not contravene applicable federal environmental standards or guidelines.

Appendix VI
Terms amd Conditions of Export Permit EPE-15 - Sale of Interruptible Energy to MEPCO

1. The term of this permit shall commence on 1 February 1991 and shall end on 31 October 2000.

2. The class of transfer authorized hereunder shall be the sale transfer of interruptible energy.

3. The energy to be exported hereunder shall be transmitted over the international power line for which the Board has issued Certificate of Public Convenience and Necessity No EC-III-8.

4. The exports made hereunder shall be in accordance with:

   (a) the Interconnection Agreement dated 31 July 1969 between NB Power and Central Maine Power Company assigned to Maine Electric Power Company, as amended by the Operating Committee Agreements dated 22 May 1987, 6 July 1987 and 17 February 1988; or

   (b) the Power Purchase Agreement dated 21 January 1983 between NB Power and Central Maine Power Company, as amended on 27 April 1984; or

   (c) the Power Purchase Agreement dated 27 April 1984 between NB Power and Bangor Hydro-Electric Company.

5. Any amendment or addition to, termination or substitution of, agreements referred to in condition 4 shall not be effective until approved by the Board.

6. The quantity of energy that may be exported hereunder in any consecutive 12-month period shall not exceed 6 482.4 GW.h less any amounts of energy exported pursuant to Permit EPE-14, Licence EL-150 and any other permit or licence issued by the Board under which energy is transmitted over the international power line authorized by Certificate of Public Convenience and Necessity No. EC-III-8.

7. NB Power shall not export energy hereunder without providing fair market access to the proposed exports, including any part thereof, to Canadian purchasers who have declared an interest in buying electricity for consumption in Canada, on terms and conditions as favourable as the terms and conditions specified in the agreements referred to in Condition 4.

8. The generation of energy to be exported hereunder shall not contravene applicable federal environmental standards or guidelines.

Appendix VII
Terms and Conditions of Export Permit EPE-16 - Sale of Interruptible Energy to MPS

1. The term of this permit shall commence on 1 February 1991 and shall end on 31 October 2000.

2. The class of transfer authorized hereunder shall be the sale transfer of interruptible energy.

3. The energy to be exported hereunder may be transmitted over any international power line for which the Board has issued a certificate of public convenience and necessity.

4. The exports made hereunder shall be in accordance with the Interconnection Agreement dated 4 February 1957 between NB Power and Maine Public Service Company, as amended on 3 December 1980 and 5 December 1983.

5. Any amendment or addition to, termination or substitution of the agreement referred to in Condition 4 shall not be effective until approved by the Board.

6. The quantity of energy that may be exported hereunder in any consecutive 12-month period shall not exceed 400 GW.h.

7. NB Power shale not export energy hereunder without providing fair market access to the proposed exports, including any part thereof, to Canadian purchasers who have declared an interest in buying electricity for consumption in Canada, on terms and conditions as favourable as the terms and conditions specified in the agreements referred to in Condition 4.

8. The generation of energy to be exported hereunder shall not contravene applicable federal environmental standards or guidelines.

Appendix VIII
Terms and Conditions of Export Permit EPE-17 - Carrier Transfer of Firm Power and Energy Through MPS

1. The term of this permit shall commence on 1 February 1991 and shall end on 31 July 2002.

2. The class of transfer authorized hereunder is a carrier transfer of firm power and energy for wheeling through the United States and simultaneous return to New Brunswick.

3. The power and energy to be exported hereunder may be transmitted over any international power line for which the Board has issued a certificate of public convenience and necessity.

4. The quantity of power that may be exported hereunder shall not exceed 50 MW.

5. The quantity of energy that may be exported hereunder in any consecutive 12-month period shall not exceed 250 GW.h.

6. The generation of energy to be exported hereunder shall not contravene applicable federal environmental standards or guidelines.

Appendix IX
Terms and Conditions of Export Permit EPE-18 - Sale of Interruptible Energy to EMEC

1. The term of this permit shall commence on 1 February 1991 and shall end on 31 October 2000.

2. The class of transfer authorized hereunder shall be the sale transfer of interruptible energy.

3. The energy to be exported hereunder may be transmitted over any international power line for which the Board has issued a certificate of public convenience and necessity.

4. All exports of energy made hereunder shall be in accordance with the Interconnection Agreement dated 4 August 1981 between NB Power and Eastern Maine Electric Cooperative, Incorporated, as amended by the Operating Committee Agreement dated 16 September 1982.

5. Any amendment or addition to, termination or substitution of the agreement referred to in Condition 4 shall not be effective until approved by the Board.

6. The quantity of energy that may be exported hereunder in any consecutive 12-month period shall not exceed 179 GW.h.

7. NB Power shall not export energy hereunder without providing fair market access to the proposed exports, including any part thereof, to Canadian purchasers who have declared an interest in buying electricity for consumption in Canada, on terms and conditions as favourable as the terms and conditions specified in the agreements referred to in Condition 4.

8. The generation of energy to be exported hereunder shall not contravene applicable federal environmental standards or guidelines.

Appendix X
Terms and Conditions of Export Permit EPE-19 - Sale of Firm Power and Energy to EMEC

1. The term of this permit shall commence on 1 February 1991 and shall end on 31 October 1994.

2. The class of transfer authorized hereunder shall be the sale transfer of firm power and energy.

3. The power and energy to be exported hereunder may be transmitted over any international power line for which the Board has issued a certificate of public convenience and necessity.

4. The exports made hereunder shall be in accordance with:

   (a) the Point Lepreau Unit Participation Agreement dated 4 August 1981 between NB Power and Eastern Maine Electric Cooperative, Incorporated, as amended on 13 October 1983, 16 September 1986 and 13 June 1990, and

   (b) the Capacity Agreement dated 4 August 1981 between NB Power and Eastern Maine Electric Cooperative, Incorporated, as amended on 22 March 1984 and 13 June 1990.

5. Any amendment or addition to, termination or substitution of the agreements referred to in Condition 4 shall not be effective until approved by the Board.

6. The quantity of power that may be exported hereunder shall not exceed:

   (a) 23 MW from 1 February 1991 to 31 October 1993.

   (b) 21.5 MW from 1 November 1993 to 31 October 1994.

7. The quantity of energy that may be exported hereunder in any consecutive 12-month period shall not exceed:

   (a) 201.48 GW.h from 1 February 1991 to 31 October 1993.

   (b) 188.34 GW.h from 1 November 1993 to 31 October 1994.

8. The generation of energy to be exported hereunder shall not contravene applicable federal environmental standards or guidelines.