



## **DECISION**

**IN THE MATTER OF an Application dated January 8, 2002 by New Brunswick Power Corporation in connection with a proposal to refurbish its generating facility at Point Lepreau.**

**NEW BRUNSWICK**

**BOARD OF COMMISSIONERS OF PUBLIC UTILITIES**

## INTRODUCTION

The New Brunswick Power Corporation (NB Power) filed its application on January 8, 2002 to the New Brunswick Board of Commissioners of Public Utilities (the Board), to hold a public hearing on the refurbishment of the Point Lepreau nuclear generating facility. The pre-filed evidence was submitted on February 25, 2002 and the pre-hearing conference was held March 12, 2002. The hearing commenced May 27, 2002. Final argument was heard June 18 and June 19, 2002.

NB Power convened two panels:

Panel A – Technical

Mr. Rod White  
Ms. Jeanie McKibbon  
Mr. Bill Pilkington  
Mr. Stuart Groom  
Mr. Rod Eagles

Panel B – Financial

Ms. Sharon MacFarlane  
Mr. Bill Marshall

Intervenors who led cross-examination were:

Canadian Unitarians for Social Justice  
Conservation Council of New Brunswick  
Mr. Neil Craik  
Energy Probe  
Mr. Rodney J. Gillis  
J.D. Irving, Limited  
Mr. Daniel Leblanc  
Province of New Brunswick

Saint John Citizens Coalition for Clean Air  
Saint John Energy

Intervenors who submitted evidence were:

Atomic Energy of Canada Limited (AECL)  
Energy Probe  
Union of New Brunswick Indians

Informal intervenors were:

International Brotherhood of Electrical Workers (IBEW Dist.1 and Local 37)  
Canadian Nuclear Workers Council

## **JURISDICTION**

This application was filed with the Board pursuant to subsection 40.1(1.1) of the *Public Utilities Act* (the Act). Effective June 14, 2002, the Act was amended, *inter alia*, removing a conflict between section 36 and subsection 40.1(1.1), which prohibited the Board from making recommendations with respect to NB Power's facilities. In addition, sections 8.3 to 8.9 were added. Section 36 of the Act, as amended, provides as follows:

“ 36. Subject to sections 40.1, nothing in this Act shall be construed so as to authorize the Board to regulate the affairs of the New Brunswick Power Corporation, to recommend or approve its borrowing, its maintenance or reconstruction of existing facilities, or its contracts for the sale to or the purchase from entities outside the Province.”

The Board must take into account all relevant legislation when considering an application. The Board has concluded that it is necessary to look at the whole of the Act to determine what standard or test should

be applied in assessing the evidence and making its recommendation(s). The Board also considered it appropriate that it take into account the provisions of the *Electric Power Act*, in particular section 2, subsection 3(7) and section 20.

Section 35 lists those sections of the *Public Utilities Act* that the Board may utilize in considering an application. Sections 7.1, 8.3 and 8.4 of the Act are relevant to the determination of the test or standard to be used. Each of these sections authorizes the Board to apply a “public interest” standard. In particular, subsection 8.3(2) provides that the Board may include in any Order “...such terms and conditions, as the Board considers necessary in the public interest.”

The Board has concluded, therefore, that it will apply a public interest standard to its assessment of the evidence and in making its recommendation in response to the present Application. As well, upon review of the appropriate sections of the Act, the Board concluded that it is not limited to making a simple recommendation for or against the project.

## **NB POWER METHODOLOGY**

NB Power models its generation expansion alternatives using PROVIEW, a detailed power system planning program. The program provides a net present value (NPV) of the cost associated with each expansion plan.

The NPV is the amount required in 2001 dollars to pay all of the costs, including capital and operating costs, associated with the plan. The NPV method allows plans with different costs over different years to be compared from a total cost perspective. PROVIEW is also able to perform sensitivity analyses for key variables.

Application of the program produced numerous projects to replace the forecast generation deficiency of 428 MW by 2011. This deficiency was

based on planned retirements of generating facilities, including that of Point Lepreau. The three projects with the lowest total cost identified by PROVIEW were: Point Lepreau refurbishment (NPV \$6,541 million), construction of a new Orimulsion® unit (NPV \$6,609 million) and construction of a natural gas combined cycle plant (NPV \$6,775 million). These comparisons were referred to as the “Base Case”. All NPV figures are expressed in 2001 dollars.

NB Power removed the Orimulsion® unit from consideration based on their concern for future CO<sub>2</sub> emissions. The difference in NPV between the refurbishment of Point Lepreau and the natural gas combined cycle plant (gas option) as presented by NB Power was \$234 million.

Numerous issues were raised by the intervenors during the hearing. The Board has reviewed each relevant issue and has taken the comments of the intervenors into consideration in arriving at its decision. The Board’s comments on the issues are as follows:

## **CAPACITY FACTOR**

Capacity factor is a term used to indicate the percentage of energy that a generating facility produces in relation to the total energy that it could produce in any period of time. For example, the capacity factor for Point Lepreau was 90% for 1992, which means that the plant produced 90% of the total energy that it could have produced in 1992.

Capacity factor is a critical element in considering the refurbishment of Point Lepreau. As the capacity factor increases the amount of energy produced increases, and the net present value advantage of Point Lepreau over the other options improves. Similarly, a lower capacity factor reduces the NPV advantage of Point Lepreau.

NB Power’s evidence predicts an average capacity factor of 89% over the 25-year life of the refurbished facility. The average capacity factor for

the 19-year period, 1983–2002, of operation of the existing plant has been 83% and the estimate for the 23-year period, 1983–2006, is 82%. NB Power has stated that production beyond 2006 may not be economical. For the purposes of comparison, the average capacity factor for the 25-year period 1983–2008 would be 75.4%, if there were no production beyond 2006.

The actual and estimated capacity factor for the existing facility, over the various time periods discussed above, ranges from 75.4% to 83%. The proposed agreement between NB Power and AECL uses a capacity factor of 80% as the benchmark for determining payments by either party for the first 15 years and 75% for the last 10 years.

The Board, after reviewing all of the above, considers that a capacity factor of 80% should be used in the net present value analysis of the refurbishment. Applying the 80% capacity factor results in an increase to the Point Lepreau NPV of \$108 million.

## **COST OF CAPITAL**

A company's capital structure consists of debt and equity, each of which has a cost. The weighted average cost of debt and equity is called the cost of capital. When the cost of capital is used to discount the cash flows associated with a project, it is referred to as the discount rate. NB Power used a discount rate of 7.15% to calculate the NPVs.

NB Power performed a sensitivity analysis with respect to changes in the discount rate. One such analysis used a discount rate of 9.33% which is the rate for Nova Scotia Power, a privately owned corporation.

The Government's plan to restructure NB Power was announced during the course of the hearing, including its intention to require each new company to operate as a privately owned corporation. Although the exact capital structure of the new corporations is yet to be determined,

the Board considers that it is reasonable that the appropriate discount rate would be at least as high as that of Nova Scotia Power. A discount rate of 9.33% increases the Point Lepreau NPV by \$98 million.

## **EFFECT OF ADJUSTMENTS**

The \$98 million increase in NPV which results from a change in the discount rate, combined with the \$108 million increase in NPV for the adjustment to capacity factor provides an adjusted NPV for Point Lepreau of \$6,747 million. The NPV for the gas option is \$6,775 million. The difference between the two options is only \$28 million, or less than one-half of one percent.

The Board considers a difference of less than one-half of one percent to be insignificant. The Board concludes that the decision must rest on a consideration of matters other than the comparison of net present values. These issues are discussed as follows.

## **CONTRACTS**

NB Power has concluded negotiations with AECL for the refurbishment of, and the ongoing operation and performance of the generating facility. The resulting contracts or agreements are as follows:

- A Retubing Contract, which has a value of \$309 million;
- A Refurbishment Contract, which has a value of \$141 million;
- A Plant Performance Agreement, which stipulates payments of bonuses or penalties related to plant performance throughout the operating life; and

- An Operation Support Service Agreement for the provision of ongoing technical support.

NB Power and AECL have agreed that the scope of the work to be performed under the contracts has been clearly defined as a result of an extensive condition assessment of the plant. AECL would be the general contractor and provide project management services under the contracts.

The Retubing Contract stipulates the conditions for payment of liquidated damages by AECL, in the amount of \$250,000 per day with a maximum payable of \$10 million over the life of the facility. Also included is a bonus clause requiring payment to AECL, in the amount of \$100,000 per day, if final completion is achieved earlier than stipulated in the project schedule. The contract includes a warranty of 24 months on materials, labour and design plus an additional 96-month warranty period on the welded feeder connections and fixed pressure tube spacers. There are no provisions for consequential damages, such as the cost of replacement power.

The Refurbishment Contract stipulates the conditions for payment of liquidated damages by AECL in the amount of \$75,000 per day with a maximum payable of \$5 million. A bonus clause is included, requiring payment to AECL in the amount of \$50,000 per day, if final completion is achieved earlier than stipulated in the project schedule. The warranty covers a period of 24 months for materials, labour and design after the date of final completion. The contract also has no provision for consequential damages.

NB Power argued that the contracts contained reasonable warranty provisions and avoided the substantial risk associated with cost plus arrangements. NB Power and AECL stated that the warranties meet or exceed industry standards. The liquidated damages are deemed by NB Power to be adequate.

Some intervenors argued strongly against the terms of the contract. They were concerned that there would be situations where the allowance for liquidated damages would be insufficient. The Board considers that the amounts available from the stipulated liquidated damages may not be sufficient.

## **AECL – GOVERNMENT OF CANADA AGENCY RELATIONSHIP**

A number of intervenors questioned the financial ability of AECL to meet the warranties contained in the contracts. AECL introduced evidence to show that the Government of Canada stood behind them. The intervenors questioned the degree to which the Government of Canada would be legally obligated to stand behind the AECL obligations.

The Board invited submissions from all parties on this matter. Upon review, the Board is satisfied that the contractual obligations incurred by AECL in its contracts with NB Power will be adequately supported by the Government of Canada due to the statutory principal-agent relationship created in the *Nuclear Energy Act*.

## **INSURANCE**

Several intervenors suggested that NB Power should purchase commercial insurance coverage to protect it against the risk of the occurrence of one or more of the various construction, financial and performance risks. The Board invited all parties to make a written submission outlining their opinion as to the appropriate cost of insurance. No submissions were made to the Board on this matter.

## CAPITAL COST

The final capital budget is \$845 million in 2001 dollars. Details of the total estimated cost were presented by NB Power. The Board has the following comments on issues related to the estimated total capital cost.

### Firm price

The Board is of the opinion that the firm price portion and the percentage it represents should be put into context. NB Power stated that 82% of the direct project costs are firm. The total of the firm price contracts is \$450 million and \$38 million has already been spent for a total of \$488 million. This represents 57% of the total project cost of \$845 million and is the percentage which the Board considers to be firm.

### Construction Schedule

The Retubing Contract sets the critical path for the construction schedule. NB Power argued that the schedule is for an 18-month shutdown but that the actual construction schedule anticipates completion in 17 months. This provides a one-month float, which NB Power said could compensate for any delays in construction.

NB Power agreed that a complete retubing of an operating CANDU reactor, as proposed for Point Lepreau, had never been undertaken before. Dr. Kugler, the AECL witness, stated that when considered as specific tasks, the work is not new because each task has been done before. Concerns were raised over the scope of work and possible problems that may be encountered during the retubing, all of which could impact the schedule. NB Power emphasized that there were compelling incentives for AECL to meet the contract schedule.

NB Power stated that a four-month delay in the in-service date of the plant would be estimated to increase the NPV by \$63 million in 2001 dollars. Also, NB Power stated that a delay in completion would increase the cost for interest during construction by \$5 million per month. As well, there would be a significant increase in cost for replacement energy.

The Board recognizes that an increase in the scope of work could delay the project resulting in an increase in the project cost. The Board considers the uncertainties involved to be a negative factor with respect to the refurbishment of Point Lepreau.

### Escalation

The project budget includes an escalation amount of \$65 million. The actual amount of escalation to be paid under the contracts will be principally determined using Statistics Canada published indices and formulas. The labour rate for engineering services from AECL has already been escalated by 17%. This rate increase was explained to be a result of competition for the highly skilled AECL workforce. The Board notes that the escalation elements of the agreement are at the risk of NB Power and not AECL.

The Board recognizes that there is a risk of cost escalation for the gas option as well. However, the capital cost for the gas option is significantly lower than that for the refurbishment of Point Lepreau. Also, the Board considers that escalation in the cost of labour is more likely for Point Lepreau than for the gas option, given the nature of the workforces involved. Although the potential for the escalation amount to increase beyond that which NB Power has budgeted cannot be quantified, the Board is of the opinion that this has a negative influence on the refurbishment project relative to the gas option.

### Interest during construction

The amount of \$146 million described as “Interest during construction & overheads” also appears in the project budget. NB Power provided a breakdown of this amount as being \$144.2 million of interest during construction and overhead of \$2.1 million. NB Power stated that the interest rate used was 7.15%, including the provincial guarantee fee. Deviations in the cost of construction and the time taken to complete the work, and/or increases in interest rates, would affect the amount of interest during construction.

### Contingency

NB Power estimates that the total cost of the Retubing and Refurbishment contracts, including escalation, will be \$515 million of the \$845 million. Of the remaining \$330 million, the contingency amounts to \$35 million or approximately 11%.

NB Power disclosed 24 items that were referred to as low probability, high cost risks and provided the estimated costs for each. If one or more of these risks were to materialize, it is clear that the contingency of \$35 million could be inadequate. Dr. Kugler indicated that NB Power would be responsible for any additional costs arising from the occurrence of any of the 24 key risk items. The Board considers that the amount set aside for contingencies may not be adequate.

### **CAPITAL COST – SUMMARY**

There are uncertainties related to the construction schedule, the costs for the escalation clauses of the firm contracts with AECL, interest during construction and the 24 risks. For these reasons, the Board is concerned that the project estimate of \$845 million may be exceeded, possibly by a significant amount.

## **REPLACEMENT ENERGY**

NB Power provided an estimate of the cost for replacement energy during the outage of Point Lepreau of approximately \$300 million. The issue of replacement power arises because, if NB Power were to carry out the refurbishment of Point Lepreau as planned, the station would be out of commission for an estimated period of 18 months. During this time, in order to meet its provincial power supply requirements, NB Power would have to replace the energy lost from Point Lepreau either by dispatching other generating stations or by purchases of power. The cost of fuel for the other generating stations and of purchased power would be subject to market fluctuations and may be higher than forecast. Also, if the refurbishment takes longer than expected, the cost of replacement power may well be higher. It is noted that little or no replacement power would be required if other options were pursued.

## **BASE CASE COMPARISON – ADDITIONAL ENERGY**

The amount of energy available from operating the gas option is less than that available from Point Lepreau. The capacity provided by the Point Lepreau facility would be over 50% greater than that provided by the gas option. The cost of the additional energy to make the total energy from the gas option equal to Point Lepreau is identified as Replacement Energy and increases the NPV for the gas option by \$820 million.

A refurbished Point Lepreau would provide energy in excess of what is needed for in-province requirements. If, as a result of future developments, all of the in-province energy requirements could be supplied by the gas option then it would not be necessary to obtain any additional energy. In this case, no Replacement Energy costs would need to be added to the gas option. Rather, it would be necessary to calculate a “value” for the extra energy available from Point Lepreau refurbishment option. This value may be higher, lower or the same as the amount

shown for Replacement Energy. It was not possible for the Board to quantify this value but the Board considers it to be an element of risk associated with the refurbishment of Point Lepreau.

## **REGULATORY RISK**

NB Power submitted a licencing framework document to the staff of the Canadian Nuclear Safety Commission, which included a description of the Point Lepreau refurbishment process. NB Power assumed that there would not be a requirement to make changes so as to meet all current standards applicable to new construction. The staff responded to NB Power indicating general concurrence with the approach. The Board notes that this response reflects the position of the staff and not necessarily that of the Canadian Nuclear Safety Commission.

The Board is concerned that the Commission may require changes to the proposed refurbishment project. Any such changes could impose considerably higher costs. Therefore, the Board considers this to be a risk with respect to the refurbishment of Point Lepreau.

## **NUCLEAR FUEL**

Nuclear fuel is a low cost fuel and represents less than 15% of the operation, maintenance and administration costs of operating Point Lepreau. It is clear that the Point Lepreau NPV advantage comes from the significant savings in fuel costs. The Board is aware of the variability in the cost of natural gas and the difficulty in obtaining a long-term supply. From this perspective, the Board agrees that the refurbishment of the nuclear plant is positive.

## CO<sub>2</sub>

NB Power used a value of \$15/tonne in its analysis of the costs that it may be required to pay, in the future, for its CO<sub>2</sub> emissions. The Board, as an economic regulator, has not examined the issue in any detail because consideration of such externalities is outside the Board's mandate. The Board considers that it can only review the costs of complying with currently established standards. It is the opinion of the Board that air emissions should be regulated by an appropriate agency of the provincial government. The Board appreciates that this issue is of significant concern to the Province and accepts that refurbishment of Point Lepreau would reduce CO<sub>2</sub> emissions.

## FILING OF FINANCIAL INFORMATION

In March 2001, NB Power published a document entitled "Business Plan and Financial Projection 2001/02 - 2008/09" which provided projections of the income statement, the balance sheet and cash flow. No rate increases were incorporated in the projections.

The Coleson Cove evidence, filed in July, 2001, included the Business Plan and also updated financial projections for the years 2002/03 to 2008/09. The update included the impact of the decision to begin the project one year earlier.

In January 2002, NB Power filed the evidence in support of the present application. The financial information presented at the Coleson Cove hearing was further updated. However, a 2.1% increase in rates, scheduled for April 1, 2002, was not included in the projected results.

On May 27, 2002, the Board requested an updated version of the financial projection, to reflect the estimates for 2001/02 including any

significant changes in key variables for 2002/03 to 2008/09. NB Power responded by filing a document which included a summarized actual statement of income for March 31, 2002 and a summarized budgeted statement of income for the year ending March 31, 2003. NB Power did not provide any further updates to the financial projections for the period 2003/04 to 2008/09.

There was a further significant deficiency in NB Power's projections. The Business Plan indicated that the projected retained earnings ("equity") at March 31, 2001 would be \$46 million. NB Power's audited balance sheet showed actual equity to be \$8 million, a difference of \$38 million. In spite of preparing two updates to the financial projections, this difference was never corrected.

In the year ended March 31, 2002, in conformity with an amended standard of the Canadian Institute of Chartered Accountants, NB Power retroactively adopted a change in its accounting policy for foreign exchange translation. As a result of this change, the equity as at March 31, 2001, was reduced by \$172 million. This adjustment and the related future positive adjustments to income were not included in the financial projections.

The Board believes that financial information, including the effect of known rate increases and significant changes, such as described above, could have, and should have, been prepared by NB Power. It is the view of the Board that NB Power did not file properly updated financial information in this application.

## **CONCLUSION**

The Board is an economic regulator and has conducted its review from that perspective. In the absence of a clear mandate, it is the opinion of the Board that any assessments, other than economic, must be conducted

by government. The Board, in assessing the evidence, has applied the standard of public interest.

The Board, as a result of its review of the evidence in relation to the capacity factor and the cost of capital, finds that there is no significant economic advantage to the proposed refurbishment project. In addition, the Board considers that there are other significant aspects of the refurbishment option for which the economic impact is uncertain. These aspects create additional economic risk which leads the Board to conclude that the refurbishment of Point Lepreau, as outlined in the evidence, is not in the public interest. The Board, therefore, will recommend to the Board of Directors of NB Power that it not proceed with the refurbishment of Point Lepreau.

