

# Record of Proceedings, Including Reasons for Decision

In the Matter of

Applicant New Brunswick Power Corporation

Subject Application for an Amendment to the Waste  
Facility Operating Licences for the Point  
Lepreau Solid Radioactive Waste Management  
Facility

Date January 13, 2004



## 1. Introduction

New Brunswick Power Corporation (NB Power), Fredericton, New Brunswick, has applied, on behalf of itself and New Brunswick Power Nuclear Corporation<sup>1</sup>, to the Canadian Nuclear Safety Commission<sup>2</sup> for an amendment of its operating licences for the Solid Radioactive Waste Management Facility (SRWMF), located at Point Lepreau, New Brunswick. The proposed amendment would allow for the construction of additional radioactive waste storage structures. The additional waste storage structures would be required as a result of the proposed refurbishment of the Point Lepreau Nuclear Generating Station (NGS) and the continued operation of the reactor for a projected additional 25 to 30 years. The proposed refurbishment of the Point Lepreau NGS would be the subject of separate CNSC approvals.

The Point Lepreau SRWMF is located within the exclusion zone of the Point Lepreau NGS, approximately 1,200 meters northeast of the Point Lepreau NGS Reactor Building. The Point Lepreau NGS property is located along the western shore of the Bay of Fundy, approximately 40 km southwest of the City of Saint John, New Brunswick. The SRWMF occupies a total area of about 8.5 hectares.

The proposed modifications to the SRWMF would involve:

- the construction of additional structures for low-level waste storage (Phase I Extension) and spent fuel (Phase II Extension), similar to those currently licensed at the SRWMF; and
- the construction of structures in a new storage area (Phase III) that would be used to store refurbishment waste and other radioactive waste such as retube waste that might be generated over the life of the Point Lepreau NGS.

### Issues

In considering the application, the Commission was required to decide, pursuant to subsection 24(4) of the *Nuclear Safety and Control Act*, if:

- a) NB Power is qualified to carry on the activity that the licence amendments would authorize; and

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<sup>1</sup> In anticipation of the creation of New Brunswick Power Nuclear Corporation following the enactment of the *Electricity Act* in the Province of New Brunswick, the Canadian Nuclear Safety Commission, following a public hearing on the matter held on March 26, 2003, issued to New Brunswick Power Nuclear Corporation an operating licence for the Point Lepreau SRWMF with the same terms and conditions as the licence held by New Brunswick Power Corporation (refer to the *Record of Proceedings, Including Reasons for Decision* dated April 28, 2003). The licence will come into effect at the time that New Brunswick Power Nuclear Corporation is formally created and the agreements and arrangements specified in Part III of the licence are in place. If New Brunswick Power Nuclear Corporation is not formally created prior to April 1, 2004, the licence will terminate. For the purpose of brevity in this *Record of Proceedings*, both licensees are referred to as NB Power.

<sup>2</sup> In this *Record of Proceedings*, the *Canadian Nuclear Safety Commission* is referred to as the “CNSC” when referring to the organization and its staff in general, and as the “Commission” when referring to the tribunal component.

- b) if, in carrying on that activity, NB Power would make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed.

### Public Hearing

The Commission, in making its decision, considered information presented for a two-day public hearing held on September 25, 2003 and November 26, 2003 in Ottawa, Ontario. The public hearing was conducted in accordance with the *Canadian Nuclear Safety Commission Rules of Procedure*. During the public hearing, the Commission received written submissions and heard oral presentations from NB Power (CMD 03-H31.1 and CMD 03-H31.1A), CNSC staff (CMD 03-H31 and CMD 03-H31.A) and intervenors. See Appendix A for a detailed list of interventions.

## **2. Decision**

Based on its consideration of the matter, as described in more detail in the following sections of this *Record of Proceedings*, the Commission concluded that NB Power is qualified to carry on the activity that the amended licences will authorize. The Commission also determined that NB Power, in carrying on that activity, will make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed. Therefore,

the Commission, pursuant to section 24 of the *Nuclear Safety and Control Act*, amends the Waste Facility Operating Licences WFOL-W4-318.01/2009 held by New Brunswick Power Corporation, Fredericton, New Brunswick, and WFOL-W4-318.01/2009 held by New Brunswick Power Nuclear Corporation, Lepreau, New Brunswick, to permit the construction of additional waste storage structures at the SRWMF.

The Commission includes in the amended licences (WFOL-W4-318.02/2009) the conditions recommended by CNSC staff in the attachment to CMD 03-H31.

## **3. Issues and Commission Findings**

In making its licensing decision under section 24 of the *Nuclear Safety and Control Act*, the Commission considered a number of issues relating to NB Power's qualifications to carry out the proposed activities, and the adequacy of the proposed measures for protecting the environment, the health and safety of persons, national security and international obligations to which Canada has agreed. The Commission's findings on these issues are summarized below.

The Commission notes that many of the issues examined are interdependent. For example, determining the adequacy of performance in a specific safety area often requires an examination of the licensee's past and current performance in that area, together with the relevant aspects of

performance assurance and design adequacy that will affect future performance. As such, the findings of the Commission presented below are based on the Commission's consideration of all of the information and submissions available for reference on the record for the hearing.

### **3.1 Radiation Protection**

As part of its evaluation of the adequacy of provisions for protecting the health and safety of persons, the Commission considered the past performance and future plans of NB Power in the area of radiation protection at the SRWMF.

CNSC staff reported that the projected dose to workers during the construction campaign is expected to be significantly lower than the annual limit for members of the public. This was confirmed during previous construction campaigns at the Phase II area. CNSC staff added that NB Power has, in its Environmental Assessment Study Report and its Safety Report for the facility, acknowledged the imperative to ensure doses to workers and the public remain below the regulatory limits.

#### Contamination on Trucks

In response to a question from the Commission about the procedures for decontaminating trucks before they leave the site as a means of preventing radiation doses to workers and the public, NB Power stated that the waste transfer flasks are checked and cleaned before they are loaded in the trucks, and that the trucks are also monitored for contamination whenever they are coming to or from the waste facility.

#### Concrete Vaults and Dry Spent Fuel Canisters

CNSC staff reported that despite the fact that the radiation shielding design specifications for the vaults and canisters differ (a maximum of 25  $\mu\text{Sv/h}$  on contact for the canisters and a maximum of 25  $\mu\text{Sv/h}$  at one metre from the vaults), both types of storage structure were, and are proposed to be constructed to meet the more restrictive criterion of 25  $\mu\text{Sv/h}$  on contact. This is reflected in the Safety Report for the facility.

In response to a question from the Commission about the rationale for the difference in the original design specifications, CNSC staff stated that there are no technical or regulatory bases for the different criteria. CNSC staff added that actual on-contact dose rate measurements at existing operating structures are well below the 25  $\mu\text{Sv/h}$  level.

In response to further questioning from the Commission on what would happen if the 25  $\mu\text{Sv/h}$  on-contact dose limit were exceeded, CNSC staff stated that because the structures are built using highly conservative design calculations and the waste inside is carefully managed, such an occurrence is extremely unlikely. Consequently, CNSC staff is of the view that a response plan for such an event is not warranted.

### Conclusion on Radiation Protection

Based on this information, the Commission concludes that NB Power has made, and will continue to make, adequate provision for the protection of persons from radiation at the expanded SRWMF.

### **3.2 Environmental Protection**

To determine whether NB Power will make adequate provisions to protect the environment while carrying out the proposed activities at the SRWMF, the Commission considered the potential for the facility construction and operations to adversely affect the environment.

CNSC staff reported that it has reviewed and commented on NB Power's *Construction Environmental Protection Program* (CEPP). CNSC staff has informed NB Power that it expects to receive an acceptable final version of the CEPP prior to the scheduled start of the construction activities (currently spring of 2005). To ensure this occurs, CNSC staff recommended that the Commission add a condition to the amended licences.

The Commission questioned why a final CEPP was not submitted as part of the application for this hearing. CNSC staff explained that, although the review of the document is not finalized, CNSC staff is of the opinion that the issues left to be addressed are not of a nature that should impede the amendment of the licences. An acceptable CEPP document, however, will need to be in place prior to the start of construction. CNSC staff stated that it is satisfied it can assess and verify the details in the document at a later time prior to construction. The Commission finds this approach acceptable.

NB Power informed the Commission that, as part of the environmental assessment (EA) follow-up program<sup>3</sup>, it will update environmental baseline information and use internal assessments and/or audits in order to ensure that health, safety and environmental programs are effective.

### Response to Detected Environmental Contamination

In answer to a question from the Commission about what actions would be taken if contamination above an acceptable level were detected in the environment, NB Power stated that, because the waste is dry, there would be adequate time to contain and clean up spills or leaks before they pose a risk to the environment, and specifically the Bay of Fundy without the need for holding ponds or similar installations in the surface drainage system.

NB Power noted that the daily and weekly monitoring frequencies are adequate given that events that might lead to contamination of the environment at this facility would occur over a very long period of time. CNSC staff stated its agreement with NB Power's assessment in this regard.

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<sup>3</sup> The Commission accepted the results of a screening EA of the project following a public hearing held on June 27, 2003 (*Records of Proceedings, including Reasons for Decision*, dated August 25, 2003). A framework for the follow-up program was accepted as part of that EA decision.

In response to a follow-up question from the Commission on whether the sampling and response times would be adequate in the event of a sudden release of a liquid contaminant, such as from the rupture of a vehicle fuel tank, NB Power stated that the facility is sufficiently distant from the Bay of Fundy and that NB Power's emergency response team would respond immediately. NB Power submitted that effective confinement and clean up of such a spill would therefore occur before it posed any risks to the Bay of Fundy.

### Monitoring Wells

The Commission questioned why groundwater monitoring wells are located only in the immediate area and not also down-gradient in the surrounding area. In response, CNSC staff stated that the current array of monitoring wells is adequate to detect any migration of contaminants from the storage structures to the groundwater system. CNSC staff added that in the unlikely event that contaminants are detected in the existing wells, it may be necessary to expand the array of monitoring wells to ensure any migration of contaminants from the site via groundwater is monitored.

While the Commission is satisfied that the measurement of contamination using the existing monitoring wells is adequate at this time, the Commission requests that CNSC staff re-evaluate, for the purpose of the mid-term report to the Commission (due in approximately June 2006), whether supplementary monitoring wells in the down-gradient groundwater zone would be a prudent precautionary measure.

### Conclusion on Environmental Protection

Based on this information, the Commission concludes that NB Power has made, and will continue to make, adequate provision for the protection of the environment during the licence period. The Commission also accepts CNSC staff's recommendation to add a licence condition requiring NB Power to submit a final Construction Environmental Protection Program (CEPP) acceptable to CNSC staff before the start of the construction activities.

### **3.3 Operating Procedures and Protocols**

To assure itself that the provisions for protecting the health and safety of persons are adequate, the Commission examined the adequacy of the operating procedures and protocols that are, or will be in place, at the SRWMF facility.

NB Power stated that, before it seeks authorization to operate the proposed Phase III structures, the following actions will be taken to the satisfaction of CNSC staff in order to ensure that operating performance continues to be of high quality:

- the issuance of a revised Operating Plan and Procedures;
- the issuance/revision of the necessary operating documentation; and
- the completion of appropriate training.

The Commission asked if there were any anticipated safety and training issues for people involved in the transportation of the wastes. NB Power answered that workers are experienced with the type of waste transfers that will be conducted and that NB Power has incorporated human factors into the design of the canisters. Therefore, NB Power does not anticipate any significant safety challenges in carrying out the waste transfers.

With respect to training, the Commission asked if NB Power had any specific safety training protocols for permanent and contract employees on site. NB Power answered that it has protocols in place as part of normal training activities for contract and permanent employees. CNSC staff added that it has looked at, and is satisfied with, the preliminary documentation submitted thus far on the project-specific training.

Further, with respect to safety procedures and practices at the facility, a number of intervenors, including Ms. Janice MacLean, Neil and Gunter Ltd. and the New Brunswick Building and Construction Trades Council, attested to the quality of the operating program documentation and, in their view, the responsible and rigorous adherence of NB Power staff to those documents.

With regard to fire safety and emergency preparedness in particular, Mr. Wayne Pollock, Fire Chief of the Musquash Fire Department, and Mr. Lyman Spear, Chief Warden for the New Brunswick Emergency Measures Organization, indicated that they consider the Point Lepreau NGS to be safe.

Based on the above information and considerations, the Commission concludes that NB Power has developed, or is in the process of developing for CNSC staff approval, operating procedures and protocols that will provide for the safe and environmentally acceptable operation of the expanded facility.

### **3.4 Quality Assurance**

With respect to quality assurance, CNSC staff stated that it has found the design verification plan and the procedure on design calculations for this project to be adequate. CNSC staff added that quality assurance through the construction phase will be provided through the implementation of a *Construction Verification Plan (CVP)*. CNSC staff recommended that the Commission require NB Power, by way of a licence condition (condition 7.1 in the draft licences attached to CMD 03-H31), to produce a CVP, acceptable to a CNSC staff Designated Officer, prior to the commencement of construction activities.

The Commission questioned why a CVP was not submitted as part of the application for this hearing. CNSC staff explained that the elements in the CVP are standard and common to most construction projects and therefore are not needed at the application stage; they do, however, need to be in place prior to actual construction. CNSC staff expressed the view that there is currently enough information in the existing version of the CVP in order to make a decision on the proposed amendment to the licences. CNSC staff also considers that the final decision on the acceptability of the CVP could be made by the CNSC staff Designated Officer.



Based on this information, the Commission concludes that NB Power will have an adequate quality assurance program in place to support the proposed licence amendments for the SRWMF. The Commission accepts the recommendation to add the proposed licence condition requiring NB Power to have a CVP acceptable to a CNSC staff Designated Officer before beginning construction of the Phase III structures.

### **3.5 Design Adequacy**

Many of the provisions for protecting the environment and the health and safety of persons relevant to a licensing decision are inherent in the design of a facility. The Commission therefore examined factors related to the design of the planned facility expansion.

CNSC staff reported that it has reviewed the information presented in the Geotechnical Investigation Report and the Construction Implementation Plan and found both documents to be acceptable with respect to demonstrating the adequacy of the proposed waste storage structure designs.

In response to a question from the Commission as to whether the proposed new type of canisters (retube canisters) has been used at other sites in Canada, NB Power answered that the proposed design represents an evolution of a similar design used in Canada, and that the specific design is new to this location.

The Commission asked if there were any modelling tests performed in order to demonstrate that the high density arrangement of canisters on the site would not be prone to damage from strong winds. NB Power answered that the design more than compensates for the maximum potential wind loads. CNSC staff expressed its agreement with this assessment.

In response to a question from the Commission about inspections of the existing canisters, NB Power stated that its staff performs frequent general verifications of the canisters, and that formal more detailed inspections are conducted twice a year. CNSC staff also inspects the whole facility one to four times per year.

#### Safety Analysis

Concerning the safety analysis report for the facility, NB Power stated that it would provide CNSC staff with a revision of the safety analysis report before it would request operation of the new waste management structures.

Given their design features, the retube canisters are not expected to experience deterioration over time. CNSC staff indicated that the structures for the vaults and the dry spent fuel and retube canisters have a minimum design life of approximately fifty years. If hairline cracks develop, CNSC staff will monitor them closely to ensure that they do not affect design performance.

To confirm the resistance of the canister design to surface cracking and deterioration, CNSC staff requested NB Power to perform a transient heat transfer analysis, taking into account day-

night temperature differences and the effect of the sun on the structure. The analysis was finalized by NB Power and CNSC staff was able to verify that the design was adequate.

### Conclusions on Design Adequacy

On the basis of this information, the Commission concludes that the design of the proposed waste management structures at the licensed SRWMF is adequate.

### **3.6 Security**

CNSC staff reported that it reviewed the proposed security strategy for the SRWMF and found it to be acceptable. NB Power added that it would issue, for CNSC staff approval, a revised Security Plan before the construction of the new Phase III structures begins.

In response to a question from the Commission about the redundancy of the power supply to the security systems in case of a blackout, NB Power indicated that it has procedures in place that go into effect to provide alternate monitoring of the site. CNSC staff added that there are also contingency plans in place with the security department so that security personnel would be dispatched at any time if needed to provide continuous site security monitoring.

Based on this information, the Commission is satisfied that NB Power has made, and will continue to make, adequate provision for maintaining the physical security of the SRWMF.

### **3.7 Non-Proliferation and Safeguards**

CNSC staff reported that it finds the safeguards provisions envisaged for the Phase II Extension Dry Spent Fuel Canisters to be adequate since those structures are similar in design to those in the existing acceptable Phase II area. Similar requirements do not apply to the Phase I and Phase III components of the project. CNSC staff added that there is nothing associated with the requested licence amendments that would impair Canada's ability to meet international obligations.

Based on this information, the Commission is satisfied that NB Power has made, and will continue to make, adequate provisions in the areas of safeguards and non-proliferation at the expanded SRWMF that are necessary for maintaining national security and measures necessary for implementing international agreements to which Canada has agreed.

### **3.8 Financial Guarantees**

CNSC staff indicated that NB Power will be required to review and revise the Decommissioning Cost Study and Preliminary Decommissioning Plan for the facility to reflect the modified facility to the satisfaction of the CNSC staff Designated Officer. NB Power will also be required to satisfy the CNSC staff Designated Officer that the financial guarantee is sufficient for decommissioning the modified facility. CNSC staff recommended that the Commission include in the licences, conditions that will require NB Power to maintain a financial guarantee that is valid and in effect, and that meets the decommissioning needs of the facility.

Based on this information, the Commission concludes that appropriate measures are being taken to establish financial guarantees for the future decommissioning of the SRWMF. The Commission also agrees with the related licence conditions proposed by CNSC staff.

### **3.9 Public Information Program**

CNSC staff noted that it reviewed NB Power's Public Information and Community Program and its community and stakeholder consultation and communications plan. CNSC staff stated that it is satisfied that NB Power's public information program meets the applicable regulatory requirements.

NB Power added that its public consultation program fulfills part of the EA follow-up requirements.

In his intervention, Mr. J. Baird indicated that he attended public information sessions held by NB Power concerning the construction of the proposed expanded waste facility and that he feels very well informed on the project and confident that NB Power will construct and operate the waste facility in a safe manner.

Based on the information provided, the Commission concludes that NB Power has an adequate public information program in place for the SRWMF.

### **3.10 Canadian Environmental Assessment Act**

Before making a licensing decision, the Commission must be satisfied that all applicable requirements of the *Canadian Environmental Assessment Act* (CEAA) have been fulfilled.

An environmental assessment (EA), in the form of a Screening Report, was required with respect to this application. The results of the Screening Report were presented at a public hearing of the Commission on June 27, 2003. The report concluded that there would be no significant effects as a result of the project, taking into account the planned appropriate mitigation measures. The Commission agreed with the conclusions of the screening report, as detailed in the *Records of Proceedings, including Reasons for Decisions, Environmental Assessment Screening Report – Proposed Modifications to the SRWMF*, published on August 25, 2003.

The screening report includes the requirement for a follow-up program in order to verify the effectiveness of the mitigation measures and whether the conclusions of the environmental assessment are being met during and after construction. CNSC staff recommended that the Commission include a condition in the licences requiring NB Power to implement the follow-up program.

In response to a question from the Commission about when the details of the follow-up program will be available, CNSC staff stated that it has requested NB Power to have this program ready and accepted prior to the start of the construction activities. CNSC staff noted that this is specified in the recommended licence condition.

The Commission concludes that no further environmental assessment of the proposed modification of the SRWMF is required pursuant to the CEAA. The Commission also accepts the licence condition proposed by CNSC staff with respect to the EA follow-up program.

#### **4. Conclusion**

The Commission has considered the information and submissions of the applicant and CNSC staff as presented in the material available for reference on the record, as well as the oral and written submissions provided at the public hearing.

The Commission concludes that NB Power is qualified to carry out the activities that will be permitted under the proposed amended licences. The Commission further concludes that in carrying out those activities, NB Power will make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed.

The Commission therefore amends, pursuant to section 24 of the *Nuclear Safety and Control Act*, Waste Facility Operating Licences WFOL-W4-318.01/2009 held by New Brunswick Power Corporation, Fredericton, New Brunswick, and WFOL-W4-318.01/2009 held by New Brunswick Power Nuclear Corporation, Lepreau, New Brunswick, to permit the construction of additional waste storage structures at the licensed SRWMF following the acceptable completion of specific prerequisites to be verified by the CNSC Designated Officer. The two versions of the amended licence (WFOL-W4-318.02/2009) apply to the same licensed activities at the SRWMF and have the same conditions. As noted in footnote (1), the version of the licence issued to New Brunswick Power Nuclear Corporation will come into effect at the time that New Brunswick Power Nuclear Corporation is formally created and the agreements and arrangements specified in Part III of the licence are in place. If New Brunswick Power Nuclear Corporation is not created prior to April 1, 2004, that version of the licence will terminate.

The Commission adds to the licences the conditions recommended by CNSC staff in the attachment to CMD 03-H31.

Marc A. Leblanc  
Secretary,  
Canadian Nuclear Safety Commission

Date of decision: November 26, 2003

Date of release of Reasons for Decision: January 13, 2004

## Appendix A – Interventions

Intervenors	Document Number
Musquash Fire Department, represented by W. Pollock	CMD 03-H31.2
Canadian Nuclear Association, represented by P. Guimond	CMD 03-H31.3
Neill and Gunter Limited, represented by J. Stevens	CMD 03-H31.4
Lyman Spear	CMD 03-H31.5
Elsie E. Wayne, M.P, Saint John	CMD 03-H31.6
New Brunswick Society of Certified Engineering Technicians and Technologists	CMD 03-H31.7
Stan Jones	CMD 03-H31.8
Carol and Russell Arbeau	CMD 03-H31.9
Janice L. M <sup>ac</sup> Lean	CMD 03-H31.10
Atlantic Nuclear Services Ltd	CMD 03-H31.11
Victor Aucoin	CMD 03-H31.12
North American Young Generation in Nuclear	CMD 03-H31.13
Association of Professional Engineers and Geoscientists of New Brunswick	CMD 03-H31.14
Greg Thompson, M.P., New Brunswick Southwest	CMD 03-H31.15
Joey Baird	CMD 03-H31.16
Town of Grand Bay-Westfield	CMD 03-H31.17
Saint John Board of Trade	CMD 03-H31.18
Saint John Construction Association Inc	CMD 03-H31.19
New Brunswick Building and Construction Trades Council	CMD 03-H31.20