Environmental Assessment: Challenges And Opportunities

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Abstract

As part of a $4.5 billion investment, Bruce Power is refurbishing Bruce A Units 1 and 2, having successfully completed an environmental assessment to return these units to service after a lay-up of almost 10 years. The project includes implementing a series of refurbishments and upgrades which will enhance safety, increase electricity generation capacity and improve reliability for the 30-year extended life of the units. This paper describes four challenges that were successfully managed during the extensive environmental assessment: (i) defining the scope of the Project; (ii) understanding the EA trigger under the *Canadian Environmental Assessment Act*; (iii) maintaining an effective relationship with the regulatory agencies; and (iv) managing stakeholder communications.

1. Introduction

In December 2005, an environmental assessment (EA) was completed for the Bruce A Refurbishment for Life Extension and Continued Operations Project (the Bruce A Refurbishment Project) as proposed by Bruce Power LP (Bruce Power) [1]. The Bruce A Refurbishment Project comprises the return of Units 1 and 2 at the Bruce A nuclear generating station (Bruce A) to service (i.e., to operational status for an extended period through the end of a potential Bruce Power lease extension to 2043), potentially refurbishing Bruce A Units 3 and 4 to enable these units to produce power until 2043, and the potential use of low void reactivity fuel (LVRF), also referred to as New Fuel, in all four units at Bruce A. Progress on the refurbishment can be reviewed on Bruce Power's website (www.brucepower.com).

Bruce Power's proposal to return Bruce A Units 1 and 2 to service from their temporary lay-up required implementing a series of refurbishments, upgrades, and enhancements at Bruce A. In this regard, Bruce Power's proposal had three main goals:

1. Enhance the safety and reliability of the Bruce A station;
2. Increase Bruce A's capacity to generate electricity; and
3. Ensure the station remains safe and fit-for-service through the end of a potential Bruce Power lease extension, i.e., through 2043.

Following a public hearing held on May 19, 2006, the Canadian Nuclear Safety Commission (CNSC) announced its conclusion that Bruce Power's proposed project for the return to service of Units 1 and 2, the refurbishment for life extension of Bruce A, and the potential use of New Fuel in all four units at Bruce A, taking into account identified mitigation measures, is **not likely to cause significant adverse environmental effects** [2]. The CNSC's decision was based on its

consideration of an EA of the project that was prepared in accordance with the requirements of the *Canadian Environmental Assessment Act* (CEAA). The Commission was then in a position, under the *Nuclear Safety and Control Act* (NSCA), to consider a licence amendment for the proposed project and Bruce Power was authorized to proceed with the refurbishment.

During the extensive EA process, challenges arose that were successfully managed. Among these challenges were: defining the scope of the project; understanding the EA triggers under the CEAA; maintaining an effective relationship with the regulatory agencies; and managing stakeholder communications. This paper discusses each of these challenges as they relate to the EA for the Bruce A Refurbishment Project.

2. EA schedule

The EA schedule for the Bruce A Refurbishment Project is shown in Table 1. The EA process began with the submission of the draft project description to the CNSC and ended with the CNSC decision on the EA for a total duration of 21 months. Although the implementation of mitigation and a follow-up is defined as a phase of EA under CEAA, it has not been included in the EA schedule presented in Table 1.

Table 1: Bruce A Refurbishment EA Schedule

Schedule Item	Date
Draft Project Description submitted to CNSC	October 2004
Final Project Description submitted to CNSC	December 2004
Draft EA Guidelines (Scope of Project and Assessment) issued by CNSC	December 2004
Commission Hearing on the Draft EA Guidelines	May 2005
Final EA Guidelines (Scope of Project and Assessment) issued by CNSC	July 2005
Draft EA Study Report issued by Bruce Power	August 2005
Final EA Study Report issued by Bruce Power	December 2005
Draft Screening Report issued by CNSC	January 2006
Final Screening Report issued by CNSC	March 2006
Commission Hearing on the Screening Report	May 2006
Announcement of CNSC Decision on EA	July 2006

3. Defining the scope of the project

Defining the project scope is an essential element in managing a project. The project scope sets the boundaries for the assessment, ensures that the EA focuses on the correct issues, identifies exactly what is being assessed (i.e., defines what is included or excluded in the EA), and establishes the environmental effects that should be considered in an EA. The scope of the project should consider the life-cycle of the project (e.g., site preparation, construction, operations, maintenance, modifications, etc.), malfunctions and accidents, normal operations,

and input from stakeholders. Scoping is one of the most critical and challenging aspects of an EA.

In determining the project scope for an EA under the CEAA, the proponent (or delegate) must first determine the physical works involved in the project and the specific activities to be carried out. Most often, these details are provided in a project description, which is submitted to the responsible authority. Under the CEAA, the responsible authority must "determine the scope of the project for the purposes of EA; ensure that all proposed undertakings for a project (e.g., construction, operation, decommissioning, etc.) are included in the EA; ensure consideration of the factors outlined in the Act (e.g., environmental effects, significance, public comments, etc.); and determine the scope of factors to be considered" [3].

For the Bruce A Refurbishment Project, defining the project scope was the joint responsibility of Bruce Power and Golder Associates Ltd. (Golder). Defining the project scope included:

1. Completing a draft project description;
2. Facilitating comments from the CNSC (the only responsible authority identified for the EA); and
3. Completing a final project description.

The scope of the project included a refurbishment phase and an operations phase. The refurbishment phase accounted for site preparation, refurbishment works and activities including upgrades, refurbishment waste management, associated employment, and malfunctions and accidents during refurbishment (radiological and conventional). The operations phase accounted for the normal operations of plant systems, maintenance, waste management, and malfunctions and accidents during operations (conventional, nuclear and criticality events). The assessment scenarios were defined to include some overlap (double accounting) for conservatism. Using conservatism is a wise strategy in EA, since it is likely that the effects identified in the EA as resulting from the project will be greater in magnitude than those experienced during the actual project undertaking. It also allows for additional flexibility in the project schedule.

It is important to ensure agreement between the scope of the project as understood by the proponent and the scope as identified by the responsible authority. Although the project description for the Bruce A Refurbishment Project explicitly stated what work could not be done without the EA being completed, the scoping document issued by the CNSC did not explicitly state this. Based on this decision that the EA scope superseded the existing licence, no work associated with the EA could be initiated until the EA was approved. Accordingly, activities permitted under the existing power reactor operating licence were captured in the EA and therefore could not take place until the EA was completed. This represented a significant challenge to Bruce Power in maintaining the refurbishment schedule since the company had assumed some "pre-project" activities could take place, although at financial risk in the event the EA for the Bruce A Refurbishment Project was not approved. CNSC staff concerns related to the fact that, should they permit Bruce Power to proceed with work related to refurbishment without an approved EA, they could be seen as pre-empting the Commission's decision regarding the EA and the requirement that the EA be approved before a licensing decision is made. The CNSC ultimately decided that, while no major refurbishment work could take place

until the EA was successfully completed, some planning and preparation for refurbishment could be undertaken at Bruce Power's financial risk. It is notable that the EA must be completed and approved before the responsible authority can give permit, licence, or licence amendment for the project activities to take place.

The project description for the Bruce A Refurbishment Project benefited from extensive discussions with the CNSC in the form of weekly teleconferences, which allowed for discussions in advance of preparing the project description. Weekly EA team conferences were also beneficial.

In order to improve the defining of the project scope for future nuclear EA projects, a proponent should:

- Ensure that the EA guidelines (scoping document issued by the responsible authority) are consistent with the proponent's project description (documented consistency is key);
- Explicitly recognize existing licence conditions to maintain activities permitted under the licence;
- Understand that the EA guidelines approved by the Commission supersede the project description accepted by CNSC staff;
- Recognize that the scope allowed by the current licence may be undertaken "at owner's risk"; and
- Define what works may be undertaken before the EA is approved by the responsible authority.

4. Understanding the EA triggers under the CEAA

For an EA to be required under the CEAA, it must be determined whether the project triggers the legal requirement for a federal EA. Figure 1 shows the decision process for determining whether an EA is required under the CEAA [3].

As shown in Figure 1, there are four questions to answer to determine whether an EA is required under the CEAA [3]:

1. Does the project meet the CEAA definition of a "project"?
2. Is the project excluded from having to undergo an EA?
3. Does the project require a federal authority[1] decision or action?
4. Is the federal authority obligated (triggered) to ensure that an EA is conducted as a result of the federal decision?

The federal environmental assessment process is triggered whenever a federal authority (FA):

[1] Under the CEAA, a "federal authority" is a federal agency or department that has expertise or a mandate relevant to the project and includes federal departments, agencies and ministers of the Canadian government.

- Proposes a project;
- Provides financial assistance to a proponent to enable a project to be carried out;
- Sells, leases, or otherwise transfers control or administration of federal land to enable a project to be carried out; or
- Provides a licence, permit or an approval that is listed in the *Law List Regulations* that enables a project to be carried out.

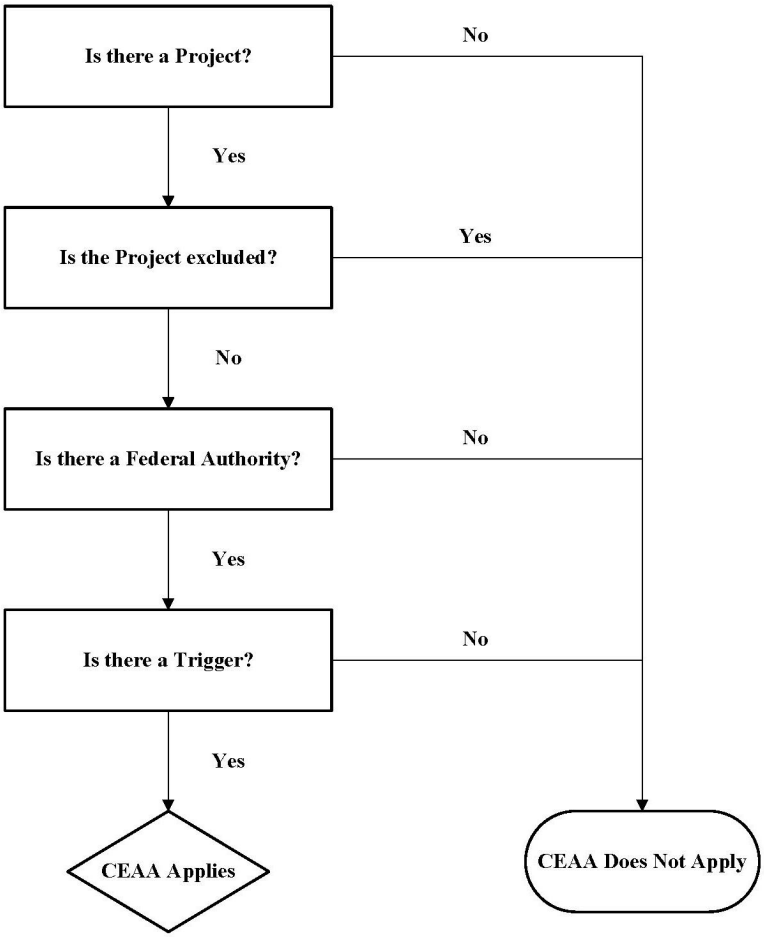

Figure 1: CEAA EA Determination Process

Implementing the Bruce A Refurbishment Project required licensing decisions and amendments to the existing Bruce A power reactor operating licence issued by the CNSC. The CNSC determined that a federal EA was required under paragraph 5(1)(d) of the CEAA before the existing power reactor operating licence could be amended to give Bruce Power the authorization to restart Bruce A Units 1 and 2. (The CNSC determined that, under the NSCA, an amendment of the operating licence for the Bruce A station is a 'trigger' for the CEAA under the *Law List Regulations*). It was determined that there were no other CEAA triggers, such as being a proponent, funding, or disposing of a land interest to support the project, that involved the CNSC.

It is currently the position of the CNSC that in order to amend an operating licence, an EA is required under the CEAA paragraph 5(1)(d) as follows: "*An environmental assessment of a project is required before a federal authority exercises one of the following powers or performs one of the following duties or functions in respect of a project, namely, where a federal authority*[:] *(d) under a provision prescribed pursuant to paragraph 59(f), issues a permit or licence, grants an approval or takes any other action for the purpose of enabling the project to be carried out in whole or in part.*" However, this raises the question of whether an EA is required for each and every operating licence amendment that meets the first three EA requirements as outlined in Figure 1, above.

Under subsection 24(1) of the CEAA, "*where a proponent proposes to carry out, in whole or in part, a project for which an environmental assessment was previously conducted and (a) the project did not proceed after the assessment was completed, (b) in the case of a project that is in relation to a physical work, the proponent proposes an undertaking in relation to that work different from that proposed when the assessment was conducted, (c) the manner in which the project is to be carried out has subsequently changed, or (d) the renewal of a licence, permit, approval or other action under a prescribed provision is sought, the responsible authority shall use that assessment and the report thereon to whatever extent is appropriate for the purpose of complying with section 18 or 21.*" With the completion of the Bruce A Refurbishment EA [1], Bruce Power has completed EAs for the Bruce A station and the Bruce B station [5]. Accordingly, there are existing EAs for the Bruce Power facilities; therefore, under subsection 24(1) of the CEAA, future amendments to the Bruce A and Bruce B operating licences should use these EAs to the extent that is appropriate.

Under subsection 24(2) of the CEAA, "*where a responsible authority uses an environmental assessment and the report thereon pursuant to subsection (1), the responsible authority shall ensure that any adjustments are made to the report that are necessary to take into account any significant changes in the environment and in the circumstances of the project and any significant new information relating to the environmental effects of the project.*" Therefore, if Bruce Power proposes a project in the future, which involves either of the Bruce A or Bruce B stations, and the project works and activities identified in the proposal differ from those identified in the completed EA, an amendment in the form of an addendum could be prepared to satisfy all of the responsible authority's requirements.

This proposed addendum would first identify the new project works and activities under the new proposal and compare them to those from the previously completed EA. Next, a screening of measurable change would be conducted wherein the measurable changes in likely effects between the new proposal and the completed EA are identified in order to focus the assessment on areas where the environmental effects differ. (Measurable changes identified as beneficial are not advanced for further assessment.) A comparison of residual adverse effects would then be conducted on the activities resulting in a measurable change in effects, and a screening recommendation would be made regarding the effects of the project. Where the residual adverse effects of the proposal have been identified as being likely different from the completed EA, the effects would be advanced for an assessment of significance. A recommendation could be made based on the assessment completed in the addendum. The addendum could be submitted to the responsible authority who would be responsible for a formal decision regarding the significance.

It is important to state in the addendum that the reader should be familiar with the previously completed EA in order to avoid any confusion.

5. Relationship with regulatory agencies

For the Bruce A Refurbishment Project EA, the CNSC was identified as the only responsible authority under the CEAA; however, other federal regulatory agencies were contacted and asked to determine if their role in the EA was that of a responsible authority or an expert federal authority (FA). In addition, the Ontario Ministry of the Environment was contacted to determine their role in the EA. In consideration of the CEAA 'Federal Co-ordination Regulations', the following federal departments were identified as federal authorities for the purpose of providing expert assistance during the assessment: Health Canada, Environment Canada, Natural Resources Canada, and Fisheries and Oceans Canada. There were no provincial EA requirements under the *Ontario Environmental Assessment Act* that were applicable to the project. Once the EA was underway, the Ontario Ministry of Natural Resources was provided with information on the various EA studies.

Expert federal authorities have specialist knowledge that can be applied to a project. The expertise of an FA can be used during any stage of an EA, but most often the FAs are called upon to review the EA and provide their input on the validity of the assessment. If a proponent (or delegate) has a good relationship with the FAs, it is likely that they can predict the issues that a FA would find most relevant, and address these issues accordingly in the EA. A good relationship with the FAs enables the proponent to discuss issues with the FAs directly, thereby expediting the comment disposition process.

Golder has working relationships with the EA and project officers at the CNSC, and staff at Environment Canada and Fisheries and Oceans Canada, which have been built through many years of working in cooperation on federal nuclear EAs under the CEAA. These relationships allowed for open communication between Golder and the agencies, providing confidence that the EA studies and the EA Study Report could meet agency expectations.

In order to create or maintain relationships with regulatory agencies for future nuclear EA projects, a proponent should open lines of communication via federal and provincial regulator workshops. These workshops could focus on past EAs conducted for projects on the proponent's site(s), implementation of these projects demonstrating good environmental performance and diligence, lessons learned from past EAs, and proponent operating performance.

6. Managing stakeholder communications

Public participation is not mandatory for screening EAs conducted under the CEAA. It is the responsibility of the responsible authority to determine if public consultation is appropriate. The decision on public consultation may depend on the level of public interest in the project, the potential of the project to cause environmental effects, the potential for gaining local or traditional knowledge, and whether the project is perceived as controversial.

The purpose of public participation is to share information with the public and gather local knowledge and input on public concerns, ultimately improving the EA and promoting good decision making on the part of the responsible authority. For the purposes of EA, the public may be defined as local residents, community groups, local businesses, provincial and municipal governments, non-governmental organizations (NGOs), local aboriginal groups, etc., which could be potentially affected by the project.

The EA guidelines approved by the CNSC as the FA, and issued for the Bruce A Refurbishment Project [4] required that the EA include notification of, and consultation with, potentially affected stakeholders including the local public. As part of the EA, Bruce Power carried out community and stakeholder consultation activities, which were significantly more extensive than those required by the CEAA or the Canadian Environmental Assessment Agency. Public and stakeholder consultation activities carried out during the EA process included:

- Notification letters for upcoming events such as workshops and open houses;
- Newsletters detailing the progress of the EA;
- Community updates;
- Radio and newspaper advertising for open houses;
- Open houses comprising display panels, information handouts, and presentations;
- Stakeholder briefings and presentations targeting specific stakeholder groups;
- An EA consultation workshop;
- Consultation with government agencies including a workshop and meeting;
- Public library repositories containing EA information and materials;
- Project website containing EA information and materials;
- E-mail consultation comprising email addresses set up for the public to contact Bruce Power about the project, and submit questions and comments;
- A toll-free information line; and
- Bruce Power employee communications through internal publications and displays.

The local First Nations and Métis communities were contacted to determine their desire to participate in the EA process. Information was provided in the form of letters detailing the EA process, invitations to open houses and workshops, and a presentation to the Joint Council.

The open houses held in the smaller communities lend to the sense of community ownership. Through the experience with the EA for the Bruce A Refurbishment Project, it was determined that in order to improve the management of stakeholder communications for future nuclear EA projects, a proponent should:

- Continue to hold open houses in smaller communities to maintain the community sense of ownership;
- Better identify key groups in each of the surrounding communities;
- Solicit invitations from community groups and organizations to hold information sessions;
- Participate in existing community events or co-ordinate open houses with other community events to take advantage of public attendance;

- Develop a First Nations communication plan in co-ordination with the First Nations to improve engagement;
- Develop an NGO communication plan and hold an NGO workshop to improve engagement;
- Avoid over-saturating the public with information, which can lead to lower open house attendance;
- Delay conducting radio interviews until after open houses to encourage the public to attend the open houses instead of only obtaining their information from a radio broadcast;
- Develop publicly accessible project displays to be shown for the duration of the EA or project; and
- Potentially bring EA/project information into local schools.

In some recent EAs, the CNSC staff have themselves conducted some consultation activities in the local community in addition to monitoring the proponent's activities. This move to greater participation in consultation by the CNSC provides the opportunity for enhancing the overall consultation on the project.

The current approach to consultation often results in a process that is too focused on the proponent as advocate of the project and fails to acknowledge that conduct of the EA, though delegated to the proponent as allowed under Section 17(1) of the CEAA, remains the responsibility of the CNSC as responsible authority. CNSC staff approves the proponent's consultation and communication plan at the outset of the EA process and monitors consultation throughout the EA (including attending open houses) but generally plays a minor role in the consultation itself.

Recently, CNSC staff has been directed by the CNSC tribunal to conduct open houses during the EA guidelines review process and prior to the CNSC tribunal decision hearing. At best, these open house events have been limited in terms of participation and input from the community, likely because of the extent of public communications carried out by the proponent within the same time frames. The goal of this independent CNSC consultation appears to be to confirm that the proponent's consultation process has been fair and credible. This two-tiered approach to consultation has come about because of the desire for CNSC staff to remain independent from the proponent, despite the fact that they remain responsible for making recommendations to the CNSC tribunal regarding the decision on the project.

Communication and consultation throughout the EA process could be significantly improved through a stronger community-based focus by the CNSC in partnership with the proponent. Since the EA studies have been delegated to the proponent and the EA guidelines are issued by the CNSC, it is reasonable that CNSC staff participate fully in the communication and consultation of progress of the EA and results of the EA studies.

Specific measures to improve communication and consultation could include:

- Joint design and implementation by the CNSC and proponent of all community communication and consultation events;
- Demonstration, through shared communication activities such as newsletters and project updates, that the CNSC and the proponent are working toward a common goal (i.e., completion of an EA that fully meets the requirements of the EA guidelines) and are not involved in an adversarial process; and
- Enhancement of community accessibility and user friendliness by more extensive use of high-end web sites which provide easy access to information and coming events. The proponents often have highly developed communication vehicles available, know the community that they work in, and know how to communicate effectively with stakeholders. These vehicles should be adapted for joint use by the CNSC and proponent.

Community focused consultation, conducted jointly by the CNSC and the proponent, would ensure that information on the EA process and EA studies is made available to the community. Joint participation explicitly recognises that the proponent best knows the community and that both regulator and proponent are focused on ensuring a transparent EA involving the community throughout. Finally, it would remove the public perception of an adversarial process and favour consensus.

7. References

[1] Bruce Power LP. *Bruce A Refurbishment for Life Extension and Continued Operations Environmental Assessment Study Report*. December 7, 2005.

[2] Canadian Nuclear Safety Commission (CNSC). *Record of Proceedings, Including Reasons for Decision*. July 5, 2006.

[3] Canadian Environmental Assessment Agency. *Screenings under the Canadian Environmental Assessment Act – Participant Manual*. 2006.

[4] Canadian Nuclear Safety Commission (CNSC). *Screening Report on Environmental Assessment of the Bruce A Refurbishment for Life Extension and Continued Operations project, Bruce A Nuclear Generating Station, Kincardine, Ontario*. March 2006.

[5] Bruce Power LP. *New Fuel Project for Bruce B Environmental Assessment Study Report*. October 22, 2004.