

**New Nuclear Power and
Environmental Assessment Requirements in Ontario**

by

Timothy Huyer

Queen's University
Kingston, Ontario, Canada
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Introduction

The Province of Ontario is trying to find solutions to its growing energy crisis. The government has estimated that over the next 20 years 25,000 MW of generation, 80% of current capacity, will need to be rebuilt, replaced or conserved.¹ The Ontario Power Authority (“OPA”)² is developing in consultation with stakeholders an integrated power system plan that will develop supply mix recommendations to the Minister of Energy, expected to be completed in August 2006.³ Nuclear power is receiving serious attention as part of that supply mix, and the OPA’s preliminary recommendations include that Ontario should “initiate approvals and permitting for new nuclear of up to 3,000 MW.”⁴ The government has publicly stated that new nuclear stations would be considered if the OPA recommends doing so.⁵

However, a recommendation by the OPA, even if adopted by the government, would only be a first step in a long process before a new nuclear power station is built. Major decisions would still have to be made, such as which technology to use, where the station would be located, who would own and/or operate the station, who would deal with the nuclear waste and decommissioning responsibility and how the project would be financed. Also and no less important, the project would need to receive approval from relevant regulatory authorities, including the completion of an environmental assessment.

¹ Ministry of Energy, “McGuinty government unveils bold plan to restructure electricity system” (15 June 2004), online: http://www.energy.gov.on.ca/index.cfm?fuseaction=english.news&body=yes&news_id=63.

² The Ontario Power Authority was established under Part II.1 of the *Electricity Act*, 1998, S.O. 1998, c. 15, Sched. A [*Electricity Act*].

³ Ontario Power Authority, online:

http://www.powerauthority.on.ca/Page.asp?PageID=122&ContentID=834&SiteNodeID=126&BL_ExpandID=>.

⁴ Ontario Power Authority, “Supply Mix Advice Report”, (December 2005), Vol. 1, p. 54, online:

http://www.powerauthority.on.ca/Report_Static/1140.htm [OPA Supply Mix Report].

⁵ See e.g., “Remarks by Dalton McGuinty, Premier of Ontario, to the Ontario Energy Association Annual General Meeting” (14 September 2005), online:

http://www.premier.gov.on.ca/english/news/NiagaraTunnel091405_speech.asp.

This paper proposes to look at the environmental assessment (“EA”) process that would need to be followed in order to permit a new nuclear power station in Ontario. In particular, the focus of the paper is to look at the current requirements under provincial and federal statutes. The paper also considers how some possible variations in those requirements could affect the EA process. An exhaustive look at all the issues, decisions and approvals that would be required is beyond the scope of this paper. The reader should be aware that a new nuclear power project would be subject to additional regulatory and other requirements, including, for instance, approval by the Ontario Energy Board.

The first part of the paper reviews the federal approval requirements, including licensing requirements. Requirements under the *Canadian Environmental Assessment Act* are also considered.⁶ In particular, questions regarding the scope and nature of the public consultation process are analyzed. The paper then looks at whether an EA would be required under the Ontario *Environmental Assessment Act*, including the potential for harmonization and how related plans could be subject to a provincial EA.⁷

Requirements under Federal Legislation

Nuclear power falls under federal jurisdiction by virtue of the Peace, Order and Good Governance clause of the constitution.⁸ As a result, a new nuclear power project would need to receive approval from the relevant federal authorities before it could proceed. The requirements of the federal nuclear regulator and the requirements under the federal environmental assessment process are considered.

⁶ *Canadian Environmental Assessment Act*, S.C. 1992, c. 37, s. 12(4) [CEAA].

⁷ *Environmental Assessment Act*, R.S.O. 1990, c. E.18 [Environmental Assessment Act].

⁸ *Constitution Act, 1867*, (U.K., 30 & 31 Vict., c. 3, reprinted in R.S.C. 1985, App. II, No. 5, s. 91 [Constitution Act, 1867].

Nuclear Safety and Control Act

In order to construct a nuclear power plant, the proponent needs a licence from the Canadian Nuclear Safety Commission (“CNSC”). The CNSC issues licences in accordance with the *Nuclear Safety and Control Act*.⁹ Separate licences are required to:

- Prepare the site
- Construct the nuclear power station
- Operate the station
- Decommission the station at the end of its operating life
- Abandon the site once decommissioning is complete

The *NSCA* requires that the licence can only be issued if, in the opinion of the CNSC, “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.”¹⁰

Regulations prescribe many of the requirements that a proponent must provide in order to obtain the licences.¹¹ In addition, the CNSC holds a hearing on licensing matters, usually on two separate days, about 60 days apart. These hearings are open to the public and information filed in support of the hearing is also generally available to the public, although security information and certain commercially sensitive information may be considered by the CNSC in camera. Intervenor can file documents or make presentations to the CNSC on the second of the two

⁹ *Nuclear Safety and Control Act*, S.C. 1997, c. 9 [NSCA].

¹⁰ *Ibid.*, s. 24(4)(b).

¹¹ *Class I Nuclear Facilities Regulations*, S.O.R./2000-204 ss. 3-8.

hearing days. The CNSC's decision, including the reasons for its decision, are similarly made publicly available.¹²

Federal Environmental Assessment

Before the CNSC can issue a licence, a nuclear power plant must undergo a comprehensive EA process under *CEAA*.¹³ The CNSC, along with its predecessor, the Atomic Energy Control Board, has had significant experience as the responsible authority for EAs under *CEAA*.¹⁴ Some of these EAs, involving the restart of shut-down nuclear reactors, could provide guidance on how a new nuclear power project would be assessed.¹⁵ The CNSC also has experience as the responsible authority for several comprehensive EAs.¹⁶

Nevertheless, it is reasonable to expect a substantial amount of public concern and likely significant opposition to a proposal to build a new nuclear power station.¹⁷ Thus, the project (or, at least the first project if multiple nuclear power plants are proposed) may warrant a review panel. The proponent may even wish to request a review panel from the outset in order to prevent the risk of a delay that might otherwise arise if a comprehensive assessment was subsequently elevated to a review panel.

¹² Canada, "Getting involved! The public hearing process" Canadian Nuclear Safety Commission, online: <http://www.nuclearsafety.gc.ca/eng/publications/CNSC_0747/CNSC_0747_01.cfm>.

¹³ SOR/94-638, s. 19(d).

¹⁴ The Atomic Energy Control Board existed under the *Atomic Energy Control Act*, R.S.C. 1985, c. A-16. When it was proclaimed into force on May 31, 2000, the *NSCA*, *supra* note 9 repealed the *Atomic Energy Control Act*, dissolved the Atomic Energy Control Board and provided that the CNSC assume the Board's licensing functions.

¹⁵ FEAI 18822 (Pickering A Restart), online <http://www.ceaa-acee.gc.ca/cgi-bin/prs/report_e.cfm?FeaiNo=18822>; 29271 (Restart of Bruce NGS-A Units 3 and 4), online: <http://www.ceaa-acee.gc.ca/cgi-bin/PRS/report_e.cfm?FeaiNo=29271>; and 04-01-8081 (Proposed Bruce A Refurbishment for Life Extension and Continued Operation (Bruce Power)), online: <http://www.ceaa-acee.gc.ca/050/Viewer_e.cfm?SrchPg=1&CEAR_ID=8292>. Note that these EAs were screening level assessments and thus the scope of these assessments would likely not be as broad as the comprehensive study or panel review EA for a new nuclear power project.

¹⁶ See e.g., FEAI 18738 Cluff Lake Decommissioning, online: <http://www.ceaa-acee.gc.ca/cgi-bin/prs/report_e.cfm?FeaiNo=18738>.

¹⁷ See e.g., "Greenpeace calls for public debate on nuclear power" (October 14, 2005) online: <http://action.web.ca/home/gpc/alerts.shtml?x=82223&AA_EX_Session=0d9c0d504d6ae6c1b4fdd022a22e0993>

Timing and Timeline for Review

An EA is required “as early as is practicable in the planning stages of the project and before irrevocable decisions are made”.¹⁸ It has been estimated that the EA and related licensing process would take three to four years using CANDU technology and longer using foreign technology.¹⁹ This estimate may be optimistic, at least for the first new nuclear power plant.

One factor that may extend the duration of the EA is an elevation to a panel review. If the scope of the review or extent of consultations is dramatically changed once the project is elevated, it may take significant time to redo major elements of the EA study to meet the modified assessment criteria. In essence, the risk is that, after having done a comprehensive EA study, a substantially new study would be required. Should the proponent think that there is a reasonable likelihood that the project would be elevated to a panel review (quite possible given the controversy of nuclear power), the proponent may wish to request a panel review from the outset. That way, the proponent would only have to do one EA study, albeit one that meets the scope and consultation requirements set for the panel review (which may exceed what would have been required for a comprehensive review).

Another risk that could extend the duration of the EA is the possibility of any complications arising out of the extent, if any, of a provincial EA. This risk will be considered below.

Engineering Work during EA Process

It is expected that engineering work would be done concurrent with the EA and licensing process. From the proponent’s perspective, this would keep the timeline for the project to its

¹⁸ CEAA, *supra* note 6, s. 11(1).

¹⁹ Atomic Energy of Canada Limited, “Maintaining flexibility: Ontario’s electricity supply gap and implications for the supply mix” (26 August 2005), online: <<http://www.aecl.ca/index.asp?layid=3&csid=468&menuid=806>> at p. 19 [AECL Submission]. The CANDU (“Canadian Deuterium Uranium”) reactor is a pressurized heavy water reactor developed by AECL.

shortest possible duration and allow the proponent to be ready to proceed to construction as soon as licensing approval is granted.²⁰ From the public/regulatory perspective, this approach has positive and negative implications. On the one hand, the EA might benefit from anything that is learned during the course of the additional engineering work. On the other hand, the commitment of a significant amount of money towards engineering work gives the impression, if not (at least in part) in fact, a commitment on the part of the proponent to proceed and a prejudged expectation that the EA will be approved.

Another issue that arises from an early EA process is that the final engineering designs may differ significantly from the initial project description. As engineering work is done, the project would evolve from a more conceptual design to a detailed plan. Elements of the design that had appeared to make sense on a conceptual basis may be discarded for different designs as a result. The question that follows is to what extent must the EA study be modified and re-analyzed in light of the changes in design.

From a policy perspective, this issue raises considerations on both sides. If the EA is initiated before a design is finalized, the proponent can use what is learned from the EA process, including public consultations, to guide the development of the design. Thus, the final design could beneficially evolve as a result of the EA process by becoming less likely to have serious adverse environmental effects. If the proponent is required to re-run assessments and analyses for each minor variation from the initial project description, the process may become unnecessarily cumbersome. Worse, the proponent may attempt to minimize any changes to the design, regardless of their benefit, in order to prevent costly repeated analyses, thereby defeating

²⁰ Note that the Pickering Review Panel criticized OPG for adopting a “minimum spend” policy during the EA process out of uncertainty about the result. Instead, the Panel felt OPG should have used the “window of opportunity ... to ensure that critical activities such as design engineering were completed.” Pickering Review Panel, “Report of the Pickering ‘A’ Review Panel” (December 2003), online: http://www.energy.gov.on.ca/english/pdf/pickering_report_dec2003_en.pdf at p. 6 [Pickering Review Panel].

the purpose of the EA. On the other hand, at some point, the design has changed sufficiently that the initial analysis on the obsolete conceptual design may no longer be valid.

Scope of Review

As the responsible authority for a number of EAs, the CNSC has released a guide to proponents.²¹ However, this guide primarily focuses on the requirements and process for a screening assessment. The scope and requirements for a panel review can be much larger and would ultimately be determined by the Minister for Environment Canada.²² As has been noted above, there may be valid reasons to expect that at least the first new nuclear power project would be subject to a panel review. Three major questions for the scope of the review is the need for (and alternatives to) the project, the extent to which nuclear waste management would be included and the extent to which accidents and malfunctions would be considered.

Need for Project and Alternatives

Whether the need for a new nuclear power project should be considered in the EA is a decision of the responsible authority (in the case of a comprehensive study) or the Minister of Environment Canada (in the case of a review panel).²³ In its screening level EAs of projects to restart laid-up nuclear reactors, the CNSC has not considered the need for the project, using the argument that areas such as energy policy are not part of the CNSC's mandate.²⁴ Nevertheless, one may expect that because of the controversy of a new nuclear power plant, some consideration of the need for and any alternatives to the project may be warranted.

²¹ Canadian Nuclear Safety Commission: Guidelines for Environmental Assessment pursuant to the requirements of the *Canadian Environmental Assessment Act* (December 2004), online: http://www.nuclearsafety.gc.ca/eng/assessments/pdf/ceaa_requirements.pdf

²² CEAA, *supra* note 6, s. 15(1)(b).

²³ *Ibid.*, s. 16(1)(e).

²⁴ See especially Canadian Nuclear Safety Commission, "Record of Proceedings, including Reasons for Decision in the matter of Environmental Assessment under the *Canadian Environmental Assessment Act* of the proposed return to service of the Pickering 'A' Nuclear Generating Station" (16 February 2001), online: http://www.nuclearsafety.gc.ca/eng/commission/pdf/pickea_e.pdf, p. 10 [Pickering A Decision].

The OPA's work would presumably provide a basis for determining whether a new nuclear power plant is needed. The OPA recommended that nuclear power continue to make up roughly the same share of Ontario's capacity and electricity production as it does today.²⁵ The government is soliciting public comments on this five-volume report,²⁶ and has promised more.²⁷ As noted below, this additional review could include a provincial EA on the OPA's forthcoming integrated power system plan.

Advocates argue that there are no viable alternatives to nuclear power.²⁸ Many renewables, particularly wind and solar, are intermittent and arguably uneconomic. They are thus not able to meet baseload electricity demand. Of the baseload generation, hydroelectric development is limited, coal power has been rejected by the Ontario government due to its air emissions and natural gas is increasingly more expensive and also a source of air pollution.²⁹

Nevertheless, the OPA's analysis is far from conclusive. The OPA declined to include in its Supply Mix Report a target for conservation and instead assumed only modest gains in energy efficiency (1,500 MW reduction in peak demand) would be achieved beyond already planned reductions.³⁰ In addition, the OPA acknowledges that new nuclear power will only "be needed if other options do not materialize or if load growth is higher than 0.9% per year."³¹ Thus, strong

²⁵ OPA Supply Mix Report, supra note 4, p. 1.

²⁶ Ontario, Environmental Bill of Rights Registry No. PO05E0001, online:

<<http://www.ene.gov.on.ca/envregistry/026852ep.htm>>.

²⁷ Steve Erwin, "Nuclear power if necessary, Ontario Premier says" *Globe and Mail* (15 December 2005), online: <<http://www.theglobeandmail.com/servlet/story/RTGAM.20051214.wontnuke1214/BNStory/National/>>.

²⁸ This argument has convinced a number of environmentalists. See e.g., James Lovelock, "Our nuclear lifeline", (March 2005) online: <<http://cna.ca/english/Articles/Lovelock%20Nuclear.pdf>>.

²⁹ The OPA recommends against using natural gas for baseload generation "since this use results in higher exposure to natural gas price risks" (OPA Supply Mix Report, supra note 4, p. 54).

³⁰ OPA Supply Mix Report, supra note 4, p. 16.

³¹ *Ibid.*, p. 54.

arguments could be made that if greater investments in conservation and renewable energy were made, new nuclear power plants would not be needed.³²

Given the lack of clear, compelling evidence that new nuclear power plants are needed, the EA would likely require additional information be obtained on this point should the EA's scope include the need for the project.³³ This would presumably include a thorough review of the OPA's forthcoming integrated power system plan. However, the province would likely be very unwilling to have a federal review of the integrated power system plan on the argument that this is too much federal intrusion into an area of provincial responsibility.³⁴ Another concern for the province would be the time required for a federal EA for new nuclear power. The province may not be willing to wait three to four years to implement the integrated power system plan.

One option for addressing the question of the need for the project would be to rely on a provincial EA on the integrated power system plan to inform the federal EA for a new nuclear power project. Thus, approval of the new nuclear power project would be conditional on a provincial EA conclusion that supports new nuclear power. The federal EA's scope would then not include considering the need for the project. The success of this option may depend on the thoroughness of the provincial EA.

Different Reactor Technologies

It is one thing to decide that a new nuclear power plant should be built. It is another thing to decide what technology to use. This is particularly difficult today as new technology, so-called Generation III reactors, is being developed but may not be ready for a few years. A

³² Note that the OPA estimates that \$19 - \$33 billion should be spent on conservation and renewables, compared to \$30 - \$40 billion on nuclear power, including refurbishment (*Ibid.*, p. 50).

³³ This is particularly true for a Review Panel. See *CEAA*, *supra* note 6, s. 34(a) and *Alberta Wilderness Assn. v. Cardinal River Coals Ltd.*, [1999] F.C.J. No. 441, (1998) 15 Admin. L.R. (3d) 25 (project approval overturned on judicial review, in part because review panel failed to gather all required information).

³⁴ *Constitution Act, 1867*, *supra* note 8, s. 92A(1)(c).

proponent would need to decide, therefore, whether to proceed today with an existing proven technology (a Generation II reactor) or an unproven new technology. Within those technologies are a number of additional dilemmas, such as whether to proceed with the CANDU reactor design (all existing Canadian nuclear power reactors are CANDUs) or a competing design.

The risk of a new and/or unfamiliar design is that it will take longer to assess the environmental effects and safety risks of that design. Thus, the project would likely experience a longer EA and licensing approval process, delaying the date when construction could begin. Existing, familiar technology would have the benefit of being a more known quantity, but would likely lack some of the safety and performance improvements of the newer and/or less familiar technologies.

Certainly, during the EA process, different designs can be assessed.³⁵ The proponent may be able to put forward a number of designs without pre-committing to any one particular technology. The decision in *Inverhuron & District Ratepayers' Assn. v. Canada (Minister of the Environment)* showed that as long as each design is adequately assessed (the assessment of some designs can be in comparison to a reference design), there would be no need to undertake a new EA once the proponent settles on a particular design.³⁶

However, there are likely limits to how far the *Inverhuron* decision can go. The *Inverhuron* decision dealt with different technologies for the storage of used nuclear fuel. The technologies were substantially less complicated than a nuclear reactor design. At some point, the distinction between one reactor technology and another may be too great to simply be able to assess one in reference to another. Similarly, the complexity of the different reactor designs

³⁵ In fact, the EA may require some consideration of alternative technologies as part of the scope of the EA under CEAA, *supra* note 6, ss. 16(1)(e) and 16(2)(b). See the discussion under Need for Project and Alternatives above.

³⁶ *Inverhuron & District Ratepayers' Assn. v. Canada (Minister of the Environment)*, [2001] F.C.J. No. 1008, 2001 FCA 203 [*Inverhuron*].

means that significant work would need to be done to adequately assess the risks and environmental effects of each one. Particularly in the case of the unproven Generation III technologies, this may require a large investment in engineering and other design work in order to have sufficient knowledge about how the new reactor would operate.

Thus, except to the extent that the EA may require different technologies to be compared, the proponent would most likely select one preferred technology for the approach. The ultimate choice as to which technology should be chosen would primarily be done for financial reasons. However, an expectation for how the EA would proceed may also affect the choice of technology. If the EA for an unproven or unfamiliar technology was expected to take substantially longer than an EA for a proven familiar technology, the proponent may opt for the reactor subject to less regulatory risk, even if the choice was more expensive and less safe. On the other hand, the EA requirements could bias the proponent towards the newer technology by requiring, for instance, that any reactor proposal be compared to the expected safety standards the Generation III design would be expected to achieve.

Nuclear Waste Management

Another key question the Minister or responsible authority would need to decide is the extent, if any, to include the management of nuclear waste in the environmental assessment's scope. Nuclear waste falls within the realm of cumulative environmental effects that would need to be considered.³⁷ Nuclear waste is an inevitable byproduct of nuclear power and, if not appropriately managed, has the potential for significant adverse environmental effects. Many arguments against nuclear power raise the point that new projects should not be considered until a solution can be found for waste management.

³⁷ CEAA, *supra* note 7, s. 16(1)(a). See also *Friends of the West Country Assn. v. Canada (Ministry of Fisheries & Oceans)*, [1999] F.C.J. No. 1515, 248 N.R. 25, leave to appeal ref'd [1999] S.C.C.A. No. 585 (project approval overturned on judicial review for failing to consider cumulative environmental effects).

These issues can be divided into how the station itself will be decommissioned at the end of its life and how the radioactive wastes arising from the station will be managed. The former issue may be relatively easy to address. There is some experience internationally with the decommissioning of nuclear power stations, and, more frequently research reactors. For example, in the United States, the Maine Yankee reactor was successfully decommissioned “to a significantly higher radiological cleanup standard than federal regulations require.”³⁸ In Canada, nuclear power plant operators have submitted preliminary decommissioning plans to the CNSC for approval in accordance with regulatory guidelines.³⁹ It would appear that the site of the nuclear power plant can be successfully rehabilitated to acceptable standards.⁴⁰

The latter issue may be more problematic for proponents. No permanent solution exists for the long-term management of radioactive waste in Canada. Waste is stored on an interim measure, either on-site (especially in the case of used nuclear fuel) or at a centralized facility (in the case of low and intermediate level radioactive waste). Although these storage facilities are regulated and considered safe, they are not considered to be a permanent solution.

OPG has a licensed interim storage facility in operation and an agreement with a potential host community for a permanent low and intermediate level waste disposal facility.⁴¹ Both facilities would be able to manage waste from both the current fleet of nuclear reactors and new reactors in Ontario. However, since OPG would be the owner and operator of both facilities, OPG’s consent would be required to store or dispose of waste produced by other nuclear power

³⁸ “US Nuclear Regulatory Commission amends Maine Yankee license approving decommissioning” (Oct. 3, 2005) online: <<http://www.maine-yankee.com/>>

³⁹ Canadian Nuclear Safety Commission “Decommissioning Planning for Licensed Activities” Regulatory Guide G-219 (June 2000), online: <http://www.nuclearsafety.gc.ca/pubs_catalogue/uploads/G219_e.pdf>

⁴⁰ See e.g., Whiteshell Decommissioning, FEAI 18737, online: <http://www.ceaa-acee.gc.ca/cgi-bin/prs/report_e.cfm?FeaiNo=18737>.

⁴¹ Hosting Agreement with Kincardine as of October 13, 2004, online: <<http://www.opg.com/ops/NwasteIAS12.asp>> [Hosting Agreement].

operators.⁴² Thus, OPG would need to be the proponent, a party to a consortium that is the proponent or otherwise enter into an agreement with a proponent to manage and dispose of the low and intermediate level radioactive waste.

The long-term management of used nuclear fuel (high level radioactive waste) is subject to a separate process. Under the *Nuclear Fuel Waste Act*,⁴³ the Nuclear Waste Management Organization (which is made up of the owners of nuclear power stations in Canada), was required to prepare a study on options for the long-term management of used nuclear fuel. That study, which was recently completed, does not identify a specific site for where fuel would be disposed and sets out a vague and extended timeline for the process.⁴⁴ Under the *NFW Act*, the Governor-in-Council is empowered to make a decision regarding which of the options considered should be Canada's strategy.⁴⁵ Once a strategy is adopted and a site found, the Nuclear Waste Management Organization would proceed to implementing that project. Regardless whether the proponent includes AECL or one of the existing nuclear energy corporations defined under the *NFW Act*, the selected long-term management strategy would include the proponent's used nuclear fuel.⁴⁶

Nevertheless, the problem about how to manage nuclear waste is far from solved. The proposed low and intermediate level waste facility is at a conceptual design phase. The project would require an EA and licensing approval from the CNSC before it could be built and operated. OPG anticipates that an EA would be completed by 2010 and the facility would

⁴² Ibid., s. 5.1. Note that expansions of the Western Waste Management Facility to store additional quantities of low and intermediate level waste may require licence amendments and screening level EAs.

⁴³ S.C. 2002 c. 23 [*NFW Act*].

⁴⁴ Nuclear Waste Management Organization, "Final Study: Choosing a way forward" (November 2005), online: <<http://www.nwmo.ca/Default.aspx?DN=1487,20,1,Documents>> [NWMO Study].

⁴⁵ *NFW Act*, supra note 43, s. 15.

⁴⁶ Ibid., s. 7. Note that if the proponent is not currently subject to the Act and becomes an owner of used nuclear fuel, the proponent would become a nuclear energy corporation and would have to, *inter alia*, become a member of the Nuclear Waste Management Organization and establish a trust fund as required under s. 9(1) of the Act.

receive a construction licence in 2013 to allow operation to commence in 2017.⁴⁷ Even if the project is approved, it may have limits in the volume of waste it can store. Note that if OPG is not a party to the project, the proponent would not even be able to rely on this conceptual design for how it plans to manage its nuclear waste.

Similarly, under the Nuclear Waste Management Organization's recommend option, adaptive phase management, used nuclear fuel would not be placed in a permanent disposal facility until more than 60 years from now.⁴⁸ This schedule assumes that the Governor in Council agrees to the concept, a site is found, an EA is conducted and all licensing approvals are obtained. The proposal is thus even less well developed than the low and intermediate level waste disposal facility, which at least has an approved conceptual design and an identified site. Given the long timeline, it is likely that the proposal may be revisited in the future, adding to the uncertainty. This is especially true given that the Advisory Council established under the *NFWA* "would be critical of ... any management approach that makes provision for more nuclear fuel waste than the present generating plants are expected to create."⁴⁹

While the plans for nuclear waste management are remarkably uncertain, it is unlikely that an EA for new nuclear power stations can address these inadequacies. The timelines noted above result primarily due to the difficulty in implementing an acceptable solution and not due to some unwillingness on the part of proponents to find a solution. The scope would thus more likely focus on whether adequate provisions can be made for the management of nuclear waste until such time as a permanent solution is implemented. This would presumably involve the

⁴⁷ Hosting Agreement, *supra* note 41, s. 4.1(3).

⁴⁸ NWMO Study, *supra* note 44, p. 316.

⁴⁹ *Ibid.*, p. 436. The Advisory Council was established under the *NFWA*, *supra* note 43, s. REFERENCE.

requirement for financial guarantees as well as some evidence that an interim storage plan is in place in addition to adequate progress being made towards a long term solution.⁵⁰

Certainly, any decision to proceed with new nuclear power before waste management solutions are implemented would be contentious. However, the very existence of nuclear waste from the current fleet of nuclear reactors may perversely justify the decision. The existing nuclear waste is a problem that needs to be solved regardless whether new nuclear power plants are built. Increasing the volume of waste does not necessarily make the problem significantly more difficult. Provided a suitable site can be found, a disposal facility could be enlarged to accommodate a greater volume of waste without materially increasing the risk of significant adverse environmental effects. Much of the engineering and other costs associated with nuclear waste disposal would similarly not be materially different.

Accidents

One area of concern regarding nuclear power is the possibility of an accident. Thus, any EA would have to consider both the likelihood of an accident occurring and the potential significant adverse environmental effects (including risk to human health and socio-economic effects) that could arise. The risks and consequences of accidents have thus been a major element of the EAs for the return to service of the laid-up units.⁵¹

Nuclear power proponents claim that new reactor designs (“Generation III”) are safer than earlier designs.⁵² Thus, any new nuclear reactor should be able to exceed the standards that are in place for existing nuclear reactors. In other words, given the fact that the CNSC has

⁵⁰ Note that the CNSC can impose licence conditions to require financial guarantees (*NSCA, supra* note 9, s. 24(5)). See also, Canadian Nuclear Safety Commission “Financial Guarantees for the Decommissioning of Licensed Activities” Regulatory Guide G-206 (June 2000), online: http://www.nuclearsafety.gc.ca/pubs_catalogue/uploads/G206_e.pdf.

⁵¹ See e.g., Pickering A Decision, *supra* note 24.

⁵² World Nuclear Association, “Advanced Nuclear Reactors” (December 2005), online: <http://world-nuclear.org/info/inf08.htm>

accepted, in licensing and EA processes, existing reactors as adequately safe, new nuclear reactors should have no difficulty demonstrating adequate safety.

That said, new nuclear power plants may be held to a higher standard than existing reactors. It is often more feasible to engineer additional safety features into a new nuclear power plant (before it is built) than to retrofit an existing power plant to incorporate those same features. Thus, the CNSC would likely insist that a new nuclear power plant achieve even higher safety standards. Similarly, the proponent would need to show during an EA why modifying the design (including adding additional safety features) would not make any significant difference to the safety of the reactor or would otherwise not be justified. A proponent, therefore, cannot simply rely on the fact that a new nuclear power plant can easily meet the same safety standards in place for an existing plant.

Conclusions: Federal Regulatory Process

It is very easy to see from the above that the federal EA will be a complicated process and likely quite contentious. At each issue, there will be demands to expand the scope of the EA from opponents and concerned stakeholders. The proponent, and to an extent the provincial government, however, may seek to limit the scope in order to ensure that the EA can be completed in a reasonably timely fashion. As some issues (such as nuclear waste management and the need for the project) may not be easily resolvable in the context of a federal EA, the proponent's side might prevail in setting the scope. Nevertheless, the proponent would need to accept the possibility that the scope of the EA may be much broader than desired.

Provincial Environmental Assessment

In addition to federal EA requirements, there is also the prospect of a provincial EA. This paper addresses three main points under the Provincial EA process. The first question is

whether the law as it stands today requires that a new nuclear power project would be subject to a provincial EA. The second question is, should a provincial EA happen, whether and how the provincial EA could be integrated into the federal EA and any resulting implications. The final question relates to how would the OPA's forthcoming integrated power system plan potentially fits into a proposal to build a new nuclear power plant.

Whether a Provincial EA is required

For a provincial EA to be required under the *Environmental Assessment Act*,⁵³ the project must be:

- Undertaken by the province, a public body or a municipality,
- Undertaken on behalf of the province, a public body or a municipality
- Prescribed under regulations, or
- Agreed to in writing by the proponent and the Minister of Environment to be subject to an EA.⁵⁴

As it is not immediately apparent that the project would fall under any of the above categories, a provincial EA would most likely not be required under the *Environmental Assessment Act*. Each of the above categories will be considered in turn.

Undertaken by the province, a public body or a municipality

Since no project has been proposed yet, it is uncertain who any proponent will be. Nevertheless, some expectations can be made. Possible proponents include provincially-owned Ontario Power Generation Inc. ("OPG"),⁵⁵ federally-owned Atomic Energy of Canada Limited ("AECL"), Bruce Power LP, other companies not owned by either level of government or combinations of the above. The OPA would also likely have a role in the provision of financing

⁵³ *Environmental Assessment Act*, R.S.O. 1990, c. E.18 [*Environmental Assessment Act*].

⁵⁴ *Environmental Assessment Act*, *supra* note 7, s. 3.

⁵⁵ OPG is a successor company to the former Ontario Hydro, see Part IV.1 of the *Electricity Act*, *supra* note 2.

or other contractual arrangements to support the project. Of the above, there are compelling reasons why OPG would likely be a party to the consortium. First, OPG is already the owner of the existing nuclear power stations in Ontario (Bruce Power LP leases the Bruce “A” and Bruce “B” Nuclear Generating Stations from OPG). Second, OPG already has financial and management practices in place for the management of nuclear waste and decommissioning of stations, including, for example, the Ontario Nuclear Funds Agreement and financial guarantees for decommissioning.⁵⁶

None of the above bodies, however, are public bodies prescribed under the *Environmental Assessment Act*.⁵⁷ Neither OPG nor the OPA are Crown agents.⁵⁸ Finally, none are the province directly or a municipality. It follows then, that a new nuclear power station would not be captured under the first category.

Undertaken on behalf of the province, a public body or a municipality

It would also appear that the project would likely not be found to be undertaken on behalf of a body caught by the Act.

Each of the above bodies has the power and capacity to develop the project on its own behalf. For example, OPG is incorporated under the *Business Corporations Act* and thus has all the powers of a natural person.⁵⁹ The OPA’s objects, which are set by statute, include engaging “in activities in support of the goal of ensuring adequate, reliable and secure electricity supply and resources in Ontario”.⁶⁰ The province has no statutory duty (although it is likely subject to political pressure) to provide or otherwise ensure a reliable supply of electricity. Instead, the

⁵⁶ Agreement between Her Majesty the Queen in Right of Ontario as represented by the Minister of Finance and Ontario Power Generation Inc. (“OPG”) and certain subsidiaries of OPG effective as of April 1, 1999, as amended, online: <http://www.opg.com/info/news/NewsNov18_05.asp> [Ontario Nuclear Funds Agreement].

⁵⁷ R.R.O. 1990, Reg. 334, s. 3.

⁵⁸ *Electricity Act*, *supra* note 2, ss. 25.3 and 53.1(2).

⁵⁹ *Business Corporations Act*, R.S.O. 1990, c. B. 16, s. 15 [OBCA].

⁶⁰ *Electricity Act*, *supra* note 2, s. 25.2(1)(c).

OPA itself has this responsibility.⁶¹ The province's historic role in this process (such as through the former Ontario Hydro) does not, in and of itself, make projects subject to the *Environmental Assessment Act*.⁶²

Whether Prescribed under Regulation

While regulation prescribes that the Act applies to many electricity projects, nuclear projects are not included.⁶³ Following the restructuring of the electricity market, the government changed the provincial EA process to apply equally to the private and public sector. Given the increased role that the private sector was expected to have in the electricity sector, the new regime reflects the belief that both private and public sector proponents should be on a level playing field.

Transmission lines related to the nuclear power plant may also be subject to a provincial EA under the regulation. A provincial EA is required for a new or upgraded high voltage transmission line (designed to operate at a nominal voltage of at least 115 kV) that is at least two km long.⁶⁴ However, as it seems likely that a new nuclear power plant would be sited near an existing nuclear power plant, new or upgraded transmission lines may not be needed.

Moreover, a provincial EA may be required for new transformer stations.⁶⁵ A new nuclear power plant would most likely include a switchyard, which steps up the voltage of the electricity generated from the nuclear power plant to the voltage required for the transmission grid (in the case of existing Ontario nuclear power stations, to 500 kV). The issue, then, is whether the switchyard would be functionally integral to the nuclear power plant.⁶⁶ If it is, the

⁶¹ *Ibid.*, Part II.2.

⁶² See e.g., *South Etobicoke Residents and Ratepayers Association Inc. v. Ontario Realty Corporation* (2004), 181 O.A.C. 303, 6 C.E.L.R. (3d) 224; *aff'd* (2005), 75 O.R. (3d) 641, 16 C.E.L.R. (3d) 32.

⁶³ Electricity Projects Regulation, O. Reg. 116/01.

⁶⁴ *Ibid.*, s. 3(1).

⁶⁵ *Ibid.*

⁶⁶ See e.g. *Westcoast Energy Inc. v. Canada (National Energy Board)*, [1998] 1 S.C.R. 322.

switchyard and the nuclear power plant could be considered one undertaking and therefore subject to federal regulation. Whether the switchyard is functionally integral to the nuclear power plant is a question of fact. Since the sole function of the switchyard would be to transform the voltage from the power plant to deliver it to the transmission grid, a case could be made that the switchyard is functionally integral.

A provincial EA may nevertheless be required if the transmission facility is found to be subject to both provincial and federal jurisdiction or if the transmission facility is not functionally integral to the nuclear power station. However, any provincial EA would likely be a class environmental assessment for minor transmission facilities.⁶⁷ Individual provincial EAs are required if the transmission line is greater than 50 km or if the transmission line or transformer station is designed to operate at more than 500 kV (in which case, the transmission line must also be at least 2 km long).⁶⁸

Thus, it would appear that a specific nuclear power project would not be subject to a provincial EA. At best, a provincial EA would only review nuclear power as part of a review of the strategic integrated power system plan prepared by the OPA (and only if that plan included generation and/or transmission options that were subject to a provincial EA). Even if transmission lines and facilities related to the nuclear power plant are subject to a provincial EA, that EA would not likely include the power plant itself.

⁶⁷ Ontario, OIC 1173/92.

⁶⁸ Ontario Ministry of the Environment, "Guide to Environmental Assessments for Electricity Projects" (March 2001), online: <<http://www.ene.gov.on.ca/envision/gp/4021e.pdf>> at A.5.2 [Guide].

Note that Hydro One Inc., which owns and operates 97% of Ontario's transmission capacity as measured by revenues, has no transmission assets (stations or lines) designed to operate at more than 500 kV. See Hydro One Inc. "Renewal Annual Information Form for the year ended December 31, 2004", online: <http://www.hydroone.com/en/investor_centre/pdf/2004_Annual_Information_Form.pdf>

Whether Agreement in Writing with Proponent

There is one other possible way by which a provincial EA may be required. The proponent may agree in writing with the Minister of Environment that the *Environmental Assessment Act* should apply or the government may amend the regulations so that the *Act* does apply.⁶⁹ This option requires a policy decision by the government. Also, the proponent may not be willing to agree to being subject to a provincial EA. In the case of some proponents such as OPG, a directive from the government, as shareholder, would overcome this problem.⁷⁰ In any event, the policy decision of the government would not be justiceable.

Conclusion: Provincial EA

Nuclear power plants fall through the provincial EA cracks. A reason for this could be that the Government of Ontario is satisfied in the federal environmental assessment and regulatory process. However, if this is true, then it would follow that the province would be content to exempt all electricity projects from a provincial EA provided that a federal environmental assessment was required. Nevertheless, many projects which require some form of federal approval and thus an environmental assessment, such as a hydroelectric project on a navigable waterway or fishery, continue to be subject to provincial EAs.

Implications if Provincial EA Done

Nothing prevents the government from amending an existing or passing a new regulation to require a provincial EA. While the decision to do so is a non-justiceable policy decision, the government may have compelling political reasons for making this decision. As was noted above, electricity is a matter of provincial jurisdiction. A provincial EA would be better able to consider the role of nuclear power in the context of the overall electricity supply mix and against

⁶⁹ *Environmental Assessment Act* (Ontario), *supra* note 7, ss. 3(b), 3(c) and 3.0.1.

⁷⁰ *OBCA*, *supra* note 59, s. 108(3).

some of the alternative supply options. As was discussed above, the federal EA process may not be able to adequately consider the need for the project or alternatives to it.

Should the government elect to require a provincial EA, it is reasonable to expect that the provincial EA would be harmonized with the federal EA.⁷¹ The province has significant latitude in how it harmonizes its requirements. First, the government has discretion in setting the terms of reference for the provincial EA requirements including accepting terms of reference other than those set out in s. 6.1(2) of the *Environmental Assessment Act*.⁷² Second, the Ontario Minister of the Environment can vary or dispense with requirements under the provincial act “in order to facilitate the effective operation of the requirements of both jurisdictions.”⁷³ The Minister need only give adequate public notice of the order, allow for public comment and provide written reasons for that order.⁷⁴ Given that the alternative would be to have no provincial EA at all, the Minister would likely be able to justify limiting the requirements under the provincial statute.

Certain consequences could arise, however, out of the harmonized EA. The provincial EA has a broader definition of “environment” which may result in a slightly more comprehensive review of the potential impact of the project.⁷⁵ The definition for “undertaking” under the provincial statute is also broader than the corresponding definition for “project” under the federal statute. Thus, the provincial government would likely want to take greater care in ensuring that the scope was sufficiently narrowed if it did not want the joint EA to consider, for example, the overall electricity supply policy for Ontario.

⁷¹ CEAA, *supra* note 6, s. 12(4); *Environmental Assessment Act*, *supra* note 7, s. 3.1(1).

⁷² *Sutcliffe v. Ontario (Minister of the Environment)* (2004), 72 O.R. (3d) 213, 20 Admin. L.R. (4th) 239.

⁷³ *Environmental Assessment Act*, *supra* note 7, s. 3.1(2).

⁷⁴ *Ibid.*, ss. 3.1(4), 3.1(5).

⁷⁵ Compare the definition of “environment” under the *Environmental Assessment Act*, *supra* note 7, s. 1(1) to the definitions for “environment” and “environmental effects” under CEAA, *supra* note 6, s. 2(1). It is difficult to determine how much, if any, of a real difference exists as a result of these definitions.

It should also be noted that the terms setting out how the harmonized EA would be carried out are enforceable.⁷⁶ Thus, the provincial and federal ministers should exercise care in drafting the terms for how the harmonized EA would be carried out. Otherwise, there is a risk that the scope of the EA could end up broader than the governments intended.

Implications of Integrated Power System Plan

As has been noted above, the OPA plans on releasing an integrated power system plan in August 2006. As a step towards this, the OPA has released the Supply Mix Advice Report in December 2005. These plans are, at a minimum, subject to some degree of review and public comment and may require a provincial EA.

Although the OPA has responsibility under statute to prepare the integrated power system plan, an argument could nevertheless be made that the plan is being made at the behest of the Crown and therefore subject to the *Environmental Assessment Act*. The plan must be “designed to assist ... the achievement by the Government of Ontario of” its goals to ensure, among other things, an adequate and reliable supply of electricity.⁷⁷ The Minister of Energy can also issue directives to the OPA which the OPA must follow in preparing the plan.⁷⁸ Thus, while the OPA is responsible for preparing the plan, it could be argued that it is doing so for the province.

In addition, the OPA’s plan would, as its name suggests, include plans for new generation or transmission facilities. Presumably, some of these proposed facilities could be subject to a provincial EA by virtue of O.Reg. 116/01. Since the definition of “undertaking” under the *Environmental Assessment Act* is broad, the integrated power system plan could be caught as part

⁷⁶ See *Labrador Inuit Assoc. v. Newfoundland (Min. of Environment and Labour)* (1997), 152 D.L.R. (4th) 50, 25 C.E.L.R. (N.S.) 232 (Nfld. C.A.).

⁷⁷ *Electricity Act*, *supra* note 2, s. 25.30(1).

⁷⁸ *Ibid.*, s. 25.30(2).

of the planning for a prescribed generation or transmission facility.⁷⁹ Such a broad approach is consistent with the purpose of the *Environmental Assessment Act*.⁸⁰ Note that this requirement would thus be in addition to the requirements under the *Electricity Act* that the Ontario Energy Board review and approve the integrated power system plan.⁸¹

As was discussed above, the province may have additional reasons for wanting a provincial EA done. A thorough review of the plan would obviate the need for a federal EA to consider the need for or alternatives to the nuclear power project. However, the province may wish to ensure that an EA for a new nuclear power project does not begin until after an EA on the integrated power system plan is completed. This would help limit a belief that the conclusions of the provincial EA had been prejudged.

Conclusions

How to assess a proposed new nuclear power plant raises almost as many questions as the assessment of a proposal would. Federal and provincial decision makers would need to work closely together to ensure that the review process is as comprehensive as possible without unnecessarily intruding into the other government's areas of expertise. This can include having a separate EA approval of the OPA's integrated power system plan in order to inform a nuclear EA as to the need for and alternatives to the project. In addition, the nuclear projects' EA scope would need to be carefully designed to ensure that a potentially better technology is not rejected simply because it would be more difficult to assess. The project's proponent would need to work carefully with the decision makers at each step to ensure that it understands and can deliver on

⁷⁹ *Environmental Assessment Act*, *supra* note 7, s. 1(1).

⁸⁰ *Ibid.*, s. 2.

⁸¹ *Electricity Act*, *supra* note 2, ss. 25.30(4) and 25.30(5).

each element of the EA scope. At the same time, the decision makers need to be seen as not biasing the outcome of the EA in favour of the project.