

Environmental Law Developments in Nuclear Energy*

by Stanley David Berger**

Climate change, the world's unquenchable thirst for power and the geopolitical tensions and price instability associated with oil have combined to spark a renewed interest in nuclear energy. None of these factors would mean much if the nuclear industry had been plagued with significant safety concerns, but it has been 28 years since the Three Mile Island incident and 21 years since Chernobyl. In the interim, nuclear energy has provided a reliable source of base-load electricity to the United States, the United Kingdom and Canada.¹ As of July 2007, over three-quarters of the operating nuclear reactor units in the U.S. have renewed or are seeking renewal of their operating licences for extended periods of up to 20 years.² There are 19 separate locations at existing plants in the south eastern and north eastern United States, as well as Texas, which are currently considering constructing new nuclear reactors.³ In late May 2007, Tennessee Valley Authority brought back into operation on time

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1. In 2005 the nuclear industry in the U.S. produced 782 billion kWh of electricity, which comprised 19.4% of the total U.S. energy mix. The capacity factor, a measure of the percentage of time that nuclear units are available to generate electricity, was 89.3%. See Ginsberg, Ellen C., "Industry and Regulatory Overview, 2007", paper presented to Canadian Bar Association National Environmental, Energy and Resources Law Summit, 27 April 2007. In the United Kingdom, nuclear energy provides about 18% of the total electricity mix. See U.K., Department of Trade and Industry, Consultation Paper, The Future of Nuclear Power: The Role of Nuclear Power in a Low Carbon UK Economy (May 2007), at p. 8, online at www.dti.gov.uk/ewp. In 2005 in Ontario, Canada's most populous province, Ontario's nuclear facilities produced approximately half of the province's electricity. The capacity factor for all the units was 78.59% for that year. Ontario Power Authority, "Discussion Paper 4: Supply Resources" (9 November 2006) at pp. 11, 61, Exhibit C-8-1 to the Integrated Power Supply Plan (29 August 2007), online at www.powerauthority.on.ca/ipsp.
2. U.S. Nuclear Regulatory Commission (NRC), Plant Applications for License Renewal, online at www.nrc.gov/reactors/operating/licensing/renewal/applications.html#-plant.
3. Ginsberg, *op. cit.*, footnote 1.

and on budget its Browns Ferry 1 reactor in Alabama after a two-decade shutdown.⁴ Similarly in Canada, recent applications have been brought to refurbish the reactor units at Point Lepreau in New Brunswick and the Bruce A and Pickering B units in Ontario. Applications to build new reactor units at the existing Bruce and Darlington units have also been filed with the regulator for the Canadian nuclear industry, the Canadian Nuclear Safety Commission (CNSC or the Commission).⁵ The World Nuclear Association reported at the end of 2006 that nations planned to build more than 220 power reactor units.⁶ Nuclear power accounted for 16% of the worldwide electricity supply in 2005 and to increase that share to 18% would require about 300 nuclear plants worldwide by 2030.⁷

This article canvasses some of the key environmental law developments in the nuclear energy industry in Canada, the United States and the United Kingdom from December 2006 until the end of 2007. The topics selected are of relevance in all three jurisdictions. Included, in the order they appear, are the following: public consultation, the procedural track of the environmental assessment, aspects of scoping nuclear generation projects and the inclusion and scope of environmental assessment factors. Finally, the article provides a brief update on nuclear liability and nuclear waste.

Consultation

On 15 February 2007, the High Court (Administrative Court), on a judicial review application by Greenpeace, granted a declaratory judgement that a decision made by the United Kingdom's Secretary for State for Trade and Industry was procedurally flawed and unlawful.⁸ The Secretary's decision supported nuclear new build as part of the U.K.'s future electricity-generating mix. The reasoning, drawing as it does on administrative law principles applicable throughout common law jurisdictions, offers useful guidance on consultation in environmental assessment, always bearing in mind the legislative context in any particular jurisdiction.

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4. U.S. Nuclear Energy Institute, *Nuclear Energy Insight*, June 2007, online at: www.nei.org/resourcesandstats/publicationsandmedia/newslettersandreports/insight. The restart took five years and a budget of USD 1.8 billion.
 5. For New Brunswick, the 29 July 2005 announcement of the provincial government is recorded in New Brunswick Power's hearing before the CNSC on 16 February 2006. The New Brunswick government announced on 1 August 2007 that it accepted a proposal by Team CANDU to conduct a feasibility study for the construction of a Generation III+ advanced CANDU Reactor (ACR-1000). The feasibility study will be funded by Team CANDU and is designed to evaluate the potential for an ACR-1000 to be constructed at the Point Lepreau Generating Station near Saint John, New Brunswick, and will examine the business case for private sector investment, identify prospective markets for this new source of power, and indicate the potential environmental and socio-economic impacts of this project. Team CANDU New Brunswick represents five of the world's leading nuclear technology and engineering companies – Atomic Energy of Canada Limited, Babcock & Wilcox Canada, GE-Hitachi Nuclear Energy Canada Inc., Hitachi Canada Ltd. And SNC- Lavalin Nuclear Limited. The ACR-1000 is an advanced CANDU reactor, building on the pedigree of the existing technology to deliver the same benefits at an even lower cost. If constructed at Point Lepreau, the ACR-1000 will have a projected output of 1,085 MW of electricity and a planned operating life of 60 years. Canadian Nuclear Safety Commission (CNSC), Environmental Assessments, online at www.nuclearsafety.gc.ca/eng/resource/environmental_assessments.
 6. U.S. Nuclear Energy Institute, *Nuclear Energy Insight*, January 2007.
 7. U.S. Nuclear Energy Institute, *Nuclear Energy Insight*, June 2007.
 8. *R. (Greenpeace Ltd.) v Secretary of State for Trade and Industry*, [2007] All E.R.(D) 192 [H.C. (Admin)].

The chronology of events leading up to the decision was as follows: In 2003 the U.K. Government's *Energy White Paper 2003: Our Energy Future – Creating a Low Carbon Economy*⁹ set out its goals and long-term framework for energy policy. The paper noted:

While nuclear power is currently an important source of carbon free electricity, the current economics of nuclear power make it an unattractive option for new generating capacity and there are also important issues for nuclear waste to be resolved. This white paper does not contain proposals for building new nuclear power stations. However, we do not rule out the possibility that at some point in the future new nuclear build might be necessary if we are to meet our carbon targets. Before any decision to proceed with the building of the new nuclear power stations, there would need to be the fullest public consultation and the publication of a white paper setting out the Government's proposals.¹⁰

In November 2005, a review of the 2003 Energy White Paper was announced by the Secretary of State to a Parliamentary committee. On 23 January 2006, the Government issued its consultation document, *Our Energy Challenge – Securing Clean, Affordable Energy for the Long Term*. The paper referenced the 2003 Energy White Paper's concerns with the economics of nuclear energy and the important issues of nuclear waste to be resolved. The Government proposed that the current review would examine whether changes in energy prices had changed that assessment, as well as reviewing the nuclear waste liabilities, including their management and financing and concluded by reiterating that there would be the fullest public consultation. In Annex A to the document, consultees were told that the Committee on Radioactive Waste Management (CORWM) "has confirmed that the waste from a new build programme could be technically accommodated by the options it is considering". The court regarded this statement as misleading¹¹ because while CORWM had so concluded about a month previously, they had added that consideration of future as opposed to existing waste "raise [s] different political and ethical issues". Finally, consultees were told that the closing date for responses to the consultation document was 24 April 2006, twelve weeks from the issuance of the consultation document. This was the minimum period suggested for written consultation in the Cabinet Office *Code of Practice on Consultation*.

9. U.K., Department of Trade and Industry, *Energy White Paper 2003: Our Energy Future – Creating a Low Carbon Economy* (February 2003), online at [ww.dti.gov.uk/energy/policy-strategy/energy-white-paper-2003/page21223.html](http://www.dti.gov.uk/energy/policy-strategy/energy-white-paper-2003/page21223.html).

10. *Ibid.*, at para. 4.68, quoted in *R. (Greenpeace Ltd.) v Secretary of State for Trade and Industry*, *supra*, footnote 8, at para. 9. Sullivan J. pointed out later at para. 49 that the U.K. government was a signatory to the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (the "Aarhus Convention"). The Convention provides that citizens have a right to live in an environment adequate to their health and well-being, a duty to protect and improve the environment for present and future generations and a right to access information, participate in decision-making and access to justice in environmental matters. Article 7 of the Convention provides, "To the extent appropriate, each Party shall endeavour to provide opportunities for public participation in the preparation of policies relating to the environment." Sullivan J., at para. 51 concluded, "Given the importance of the decision under challenge – whether new nuclear build should now be supported – it is difficult to see how a promise of anything less than *the fullest public consultation* would have been consistent with the Government's obligations under the Aarhus Convention" (emphasis added).

11. *R. (Greenpeace Ltd.) v Secretary of State for Trade and Industry*, *supra*, footnote 8, at paras. 102-105.

The Energy Challenge: Energy Review Report 2006,¹² the subject of the judicial review, was published on 11 July 2006, less than six months following the issuance of the consultation document. The Government concluded that “nuclear has a role to play in the future U.K. generating mix alongside other low carbon generation options”. At the end of July 2006, the CORWM published its draft recommendations, two weeks after the closing of the consultation process. The final report was issued three months later.

In granting the declaratory judgement, the High Court judge stated that the “consultation exercise was seriously flawed”.¹³ The January 2006 consultation paper would have been adequate for its ostensible purpose as an issues paper, followed by a further paper containing proposals on which the public would be able to make informed comment. As it was, the information given to consultees was wholly insufficient for any intelligent response on the two issues identified in 2003 as ones of critical importance – the economics of new nuclear build and nuclear waste disposal. Besides the misleading information provided on the CORWM, the cost-benefit analysis and the draft recommendations and final report for CORWM only emerged after the conclusion of the consultation period.

As Sullivan J. noted, “Elementary fairness required that consultees, who had been given so little information hitherto, should be given a proper opportunity to respond to the substantial amount of new material before any ‘in principle’ decision as to the role of new nuclear build was taken.”¹⁴ The court concluded that there could be no proper consultation, let alone “the fullest public consultation”, if the substance of the economic and nuclear waste issues was not consulted upon before a decision was made. He concluded by finding procedural unfairness and a breach of Greenpeace’s legitimate expectation that there would be the fullest public consultation before a decision was taken to support new nuclear build.¹⁵

Canadian law recognises the doctrine of legitimate expectation,¹⁶ at least with respect to procedural relief as opposed to substantive relief.¹⁷ Procedural relief was what was awarded by the United Kingdom court. Nevertheless, the U.K. decision must be considered in the context of the Canadian legislative framework for environmental assessment (EA). Under the Canadian Environmental Assessment Act (CEAA),¹⁸ the applicable assessment law for federal nuclear energy projects, assessments must be conducted “as early as is practicable in the planning stages of the project and before irrevocable decisions are made”. This, no doubt, has contributed to the CNSC further refining its informational base as part of the licensing process, even following the completion of an

12. U.K., Department of Trade and Industry (2006), *The Energy Challenge: Energy Review Report 2006*, online at www.dti.gov.uk/energy/review/page31995.html.

13. *R. (Greenpeace Ltd.) v Secretary of State for Trade and Industry*, *supra*, footnote 8, at para. 116.

14. *Supra*, at para. 117.

15. *Supra*.

16. *Do Rav Right Coalition v British Columbia (Environmental Assessment Officer)* (2006), 26 C.E.L.R. (3d) 16 at para. 39 (B.C.C.A.), leave to appeal to S.C.C. refused 6 September 2007.

17. *Mount Sinai Hospital Centre v Quebec (Minister of Health and Social Services)*, [2001] 2 S.C.R. 281, at paras. 22-38 per Binnie J. and McLachlin C.J.C., and *Baker v Canada (Minister of Citizenship and Immigration)*, [1999] 2 S.C.R. 817, at p. 839.

18. Canadian Environmental Assessment Act (CEAA), S.C. 1992, c. 37, s. 11(1).

environmental assessment.¹⁹ This position was accepted by the Federal Court of Appeal in *Inter-Church Uranium Committee Educational Co-operative v Canada (Atomic Energy Control Board)*.²⁰ The court stated:

[T]he ICUCEC points to several changes in the Project since 1993, including a change in the proponent and majority owner, design changes, the discovery of new environmental threats from arsenic, a scientific study indicating radioactive contaminant can migrate over long distances in groundwater faster than originally thought, a new regulatory climate with regard to water quality guidelines for arsenic, and the addition of radionuclides from uranium mills to the List of Toxic Substances in Schedule I to the *Canadian Environmental Protection Act, 1999*, S.C. 1999, c. 33. In my view, none of these changes transform the McClean Lake Project into a new proposal. The Panel recognized that changes in science and technology would occur over the life of the Project and acknowledged that it would be the Board's responsibility to evaluate the effects of these developments in the context of its licensing responsibilities.

The appropriate environmental assessment track – screening, comprehensive study or review panel?

The CEAA provides for three tracks of environmental assessment: a screen, a comprehensive study or a panel review. A screening can be the least demanding assessment in terms of both public consultation and the inclusion and scope of assessment factors.²¹ A screening applies by default when a project does not come within the comprehensive study list.²² A review panel may summon witnesses to appear to give evidence orally at a public hearing.²³ Its members are chosen by the Minister of Environment, and unlike a screen²⁴ or comprehensive study,²⁵ the assessment is not the responsibility of the responsible authority, but of the panel members.²⁶ As a result, the review panel has the potential to be the most rigorous form of assessment. CEAA empowers the CNSC to refer a project which is tracked for screening to the Minister for a panel review,²⁷ or to recommend to the Minister that a project within the comprehensive study list be referred to a panel following a public consultation with

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19. See e.g. CNSC, Member Document 00-H29, Pickering NGS – A Return to Service (5 September 2000), at p. 18.
 20. [2005] 1 F.C.R. 372 at para. 49 (C.A.), leave to appeal to S.C.C. refused [2005] 1 S.C.R. xi.
 21. CEAA, s. 18.
 22. For the conditions required to trigger a comprehensive study report, see the *Comprehensive Study List Regulations*, SOR/94-638, Schedule, s. 19.
 23. CEAA, s. 35(1)(a).
 24. CEAA, s. 18.
 25. CEAA, s. 21.1(1)(a).
 26. CEAA, s. 34(c). It should however be noted that the CNSC, as a federal agency with responsibilities with respect to the environmental effects of nuclear energy projects, could be included by the Minister of Environment in a joint review panel pursuant to CEAA, ss. 42 and 40(1)(c), or the Minister could substitute the CNSC's review process under the licence for environmental assessment by a review panel pursuant to CEAA, s. 43(1).
 27. This can be done at any time: CEAA, ss. 20(1), 25.

respect to the proposed scope of the project, the factors to be assessed, the scope of those factors and the ability of the comprehensive study to address issues relating to the project.²⁸

Over the past year the CNSC has issued three separate decisions dealing with nuclear waste, nuclear reactor refurbishment and new nuclear build which clarify the Commission's approach to proceeding to a full panel review as opposed to a screening or comprehensive study.

The first decision which recommended a panel review to the Minister concerned site preparation, construction and operation of a Deep Geologic Repository on the Bruce Nuclear Site in Kincardine, Ontario.²⁹ The purpose of the DGR would be for the long-term storage of low- and intermediate-level radioactive waste. This waste could include contaminated clothing, reactor components and reactor equipment, including pressure tubes, ion exchange resins and filters used to keep reactor water systems clean. The DGR was to be located approximately 1.5 km from the Lake Huron shoreline and would be constructed in sedimentary rock approximately 500-700 m below the ground surface. Since the proposed repository was to be used for the disposal of radioactive substances outside the boundaries of an existing nuclear facility, it initially fell within the *Comprehensive Study List Regulations*.

While CNSC staff had recommended that the project was adequately addressed through the comprehensive study assessment, the Commission disagreed. First, the Commission expressed concern with the uncertainties relating to potential adverse environmental effects. Lack of detail respecting the shale and limestone stratigraphy, potential subsurface fractures and proximity to one of the Great Lakes was a factor. The uncertainty regarding the mitigation measures described to eliminate or minimise potential adverse effects was also troublesome. Second, there were a number of identified public concerns that the Commission considered would best be dealt with through a full public hearing. These included the unprecedented nature of the project, its proximity to Lake Huron, the long-lived radioisotopes posing a risk for future generations, the suitability of the sedimentary rock for the DGR, the unpredictability of the subsurface water movement, the possibility of leak and the added stress on the Great Lakes. Third and related to public concerns, the Commission concluded that some of these concerns could best be addressed in a panel review. For example, transboundary effects would be better addressed because the full hearing process would facilitate a broader consultation with potential stakeholders and interested parties, including the International Joint Commission on the Great Lakes.³⁰ A review panel would further provide the public and First Nations with additional beneficial consultation opportunities that could address the perceived credibility and transparency of the assessment process.³¹ In this regard the Commission noted earlier in their reasons that Saugeen Ojibway Nation (SON) had submitted to them that the DGR could affect its vital interests throughout its traditional territory, including residential communities, places of cultural and spiritual significance and fisheries. The SON maintained that the project would not be acceptable until a high degree of certainty that harm to the environment would be avoided over many hundreds of years had been established.³² Finally, absent significant scientific and engineering data, the review panel would have

28. CEEA, s. 21(1), (2).

29. CNSC, *Environmental Assessment Track Report regarding Ontario Power Generation Inc.'s Proposal to Construct and Operate a Deep Geologic Repository within the Bruce Nuclear Site in Kincardine, Ontario* (decision 23 October 2006, reasons released 21 December 2006), CEA Registry No. 06-05-17520. The Federal Minister of the Environment announced on 29 June 2007 that the project was referred to a panel.

30. *Ibid.*, at para. 112.

31. *Ibid.*, at para. 116.

32. *Ibid.*, at para. 94.

the necessary access to international expertise independent of the licensee and Commission staff, particularly with respect to complex geological and hydrological issues raised by the project.³³

A second decision by the CNSC released early in 2007 rejected calls for a panel review for the environmental assessment of the proposed refurbishment of the Pickering B reactor units and life extension of the units for operation until 2060.³⁴ The Commission's decision to continue with the screening level assessment focused on the question of whether public concerns warranted the recommendation of a panel review pursuant to CEAA, s. 25. In this regard the Commission appeared to accept the criteria for judging the level of public concern proposed by their staff. These criteria were the following:

- whether questions or issues raised by members of the public and stakeholder can be thoroughly addressed in a screening EA;
- the nature of the concerns;
- whether a panel review would provide more meaningful opportunities for the public to communicate its concerns;
- whether negative concern expressed is coming from a large proportion of the population living in communities that would likely be affected by the project.³⁵

The proponent, Ontario Power Generation Inc., did state that the project was supported by local officials. The public concerns expressed by such groups as Lake Ontario Waterkeeper included the environmental effects on the lake of thermal plumes, water contamination and the indefinite temporary storage of nuclear waste. Joined by Greenpeace, Great Lakes United and the Council of Canadians Toronto Chapter, they further demanded the inclusion of other factors such as sustainable development, renewable resources and alternatives to the project. Greenpeace raised the issue of the project's capacity to sustain a catastrophic accident, in view of the proximity of the project to densely populated regions particularly affected to the west of the facility by any contamination to Lake Ontario, the source of drinking water. The effects of climate change on the nuclear facility and seismic activity were also raised as significant issues. The Commission qualified its decision by requiring its staff to keep the Commission informed in a timely manner of any public concerns or significant issues which might warrant further consideration of the need for a review panel.³⁶ Finally, due to the high level of interest in the project, the Commission was prepared to consider conducting a public hearing on the EA screening report in the Greater Toronto area.³⁷

33. *Ibid*, at para. 119.

34. CNSC, *Environmental Assessment Guidelines (Scope of Project and Assessment) for the Proposed Refurbishment and Continued Operation of Pickering B Reactors at the Pickering B Nuclear Generating Station* (decision 24 January 2007, reasons released 3 April 2007), CEA Registry No. 06-01-21226.

35. *Ibid*, at para. 16.

36. *Ibid*, at para. 17.

37. *Ibid*, at para. 81.

The third CNSC decision concerned Bruce Power's proposal to construct and operate a new nuclear power generating station in Kincardine, Ontario.³⁸ The proposal involved site preparation, construction and operation of up to four new nuclear reactors at the current Bruce nuclear site for the generation of an additional 4 000 MW of electrical generating capacity. Bruce Power was proposing various technologies of Canadian and foreign design. The project would normally fall within the Comprehensive Study List Regulations but the Commission, acting pursuant to CEEA, s. 25, requested the Minister to refer the project to a review panel. Significantly, Bruce Power, the project proponent, had requested that the Commission take this course of action, as did impacted First Nation communities.³⁹ The province conceded it had no mandate to bring nuclear facilities under the Ontario Environmental Assessment Act⁴⁰ and foresaw no possibility for triggering clause 7(1) of the Canada-Ontario Agreement for Environmental Assessment Cooperation.⁴¹ The Commission therefore decided against a joint EA with the province, but it did recommend that in light of the experience and expertise of its members, and its status as an independent quasi-judicial tribunal, the Commission itself could substitute for the review panel, or at least a joint review panel.⁴²

In recommending a panel review, the Commission found that following the posting of the project description on the registry there was an unusually high volume of request for documents, and that coupled with potential uncertainties relating to the proposed use of new technology and the concern with managing radioactive waste resulting from operations and decommissioning of new reactors, the public concern relating to the project would be significant.⁴³ Finally, the Commission concluded that a comprehensive study would not be able to address the proposed new complex technology as well as a review panel. The interactions between the proposed project and existing and potential future nuclear facilities and the proximity to Lake Huron were part of this determination, but perhaps of greater significance, "independent international expertise might be a benefit to the panel in order to consider the experience of facilities that use new reactor and reactor cooling technology".⁴⁴

By looking at those facts common to the three projects considered by the CNSC in the past year and those facts which distinguish the projects, a picture emerges of what kinds of projects the CNSC considers warrant referral to a review panel. Any project which will increase the longevity of nuclear energy provokes public interest and this factor alone, as is evident from the screening decision on the Pickering B refurbishment, will not be enough to tip the scales in favour of a review panel. The CNSC decision is consistent with the Federal Court's reasoning under similar provisions in the predecessor to CEEA, the Environmental Assessment and Review Process Guidelines Order (EARPGO).⁴⁵

38 CNSC, *Environmental Assessment Referral regarding Bruce Power Inc.'s Proposal to Construct and Operate a Nuclear Power Generating Station in Kincardine, Ontario* (reasons released 4 May 2007), CEA Registry No. 07-05-25738.

39. *Ibid*, at paras. 9, 34, 36.

40. Environmental Assessment Act, *R.S.O.* 1990, c. E.18.

41. CNSC, Bruce NGS referral, *op.cit.*, footnote 38, at para. 17.

42. *Ibid*, at paras. 41, and see footnote 26, *supra*.

43. *Ibid*, at paras. 26, 29.

44. *Ibid*, at paras. 31-33.

45. Environmental Assessment and Review Process Guidelines Order, SOR/84-467 (now repealed).

The Federal Court, Trial Division in *Community Before Cars Coalition v National Capital Commission*⁴⁶ upheld a refusal to refer the Champlain Bridge expansion project to a review panel. Applicants for a judicial review argued:

“This is a process that says, if there is still public concern after going through the EA process that the proponent has initiated, the initial stages, you should look at the issue of the public panel”.

The court rejected this submission, stating:

[T]he court rejects this submission. Accepting it would mean that as long as there exists a steadfast opposition to a proposal, a public review panel is the inevitable result. As the respondent’s counsel remarked, this would eliminate the need for a self-assessment process. Further, realistically there will always be opposition to some proposals, particularly in cases such as this one where the public is so starkly polarized: home property value and quiet neighbourhoods versus access to work. The staff’s conclusion is tied in with the bottom-line reason for not submitting the proposal for review: nothing new will be raised. The conclusion has to be a relevant factor. If the public had not been given adequate opportunity to express their concerns during the environmental process it would be very difficult to justify not sending a proposal for further public scrutiny.⁴⁷

What does distinguish the Pickering B refurbishment project from the two projects – deep geologic repository and new build – which were referred to review panels is that in the latter two projects the proposed technology was untested in Canada, and the Commission sought to open the assessment process to potentially wider international expertise which could be summoned independent of any experts chosen by the licensee, CNSC staff or even intervenors. As the CNSC had previously pointed out in rejecting a panel review for the Proposed Refurbishment of the Bruce A Nuclear Generating Station,⁴⁸ “there had been considerable experience within the Canadian nuclear industry

46. (1997), 135 F.T.R. 1 (T.D.).

47. *Supra*, at para. 131. Similar reasoning was applied in 1994 by the English Court of Queen’s Bench in *R. v Secretary of State for the Environment, ex parte Greenpeace Ltd.*, [1994] 4 All E.R. 352 (Q.B.), at pp. 381-2, in rejecting a judicial challenge brought to the Secretary of State’s decision not to refer to a public hearing a proposal to process spent nuclear fuel at Sellafield in the U.K. During the second round of consultations on the operation of the reprocessing plant, there were 42 500 responses. Of these, 12 300 people called for a public inquiry, 102 local authorities responded on the issue of whether a public inquiry should be held and 85 of those demanded one. The breakdown on the local authorities was interesting because it showed that opinion results depended upon the question posed, i.e. whether the plant should operate or whether there should be a public review. Also of interest was the weight to be given to particular respondents. Should host communities’ responses be given more weight than surrounding or further distanced communities? Of the local authorities who responded after being solicited, 4 were in favour of operation of the plant, including the local authority areas (Cumbria and Copeland Borough Councils) in which the project was located, while 23 were opposed. A further 22 expressed no opinion whether the processing facility should operate or not. Of the solicited responses from local authorities (49 in total), a full 39 local authorities requested a public inquiry (not however, the Cumbria and Copeland Borough Councils). There were a further 53 unsolicited responses from local authorities and 46 of those called for a public inquiry.

48. CNSC, *Environmental Assessment Guidelines for Bruce Power’s Proposed Refurbishment for Life Extension and Continued Operation of the Bruce A Nuclear Generating Station* (decision 19 May 2005, reasons released 14 July 2005), CEA Registry No. 04-01-8081.

and CNSC with many types of refurbishment, operating and waste management activities that would be required to complete the project”.

Scoping the project and the assessment factors

The responsible authority’s discretion in scoping the project defines the course of the environmental assessment. Since the mandatory and discretionary assessment factors in CEAA, s. 16 follow the project description and must apply to it, two of the most important considerations in framing the project scope are spatial and temporal boundaries. In the 2007 Pickering B Refurbishment EA Guidelines decision, the CNSC recognised the importance of including any of the impacted Great Lakes adjacent to the facility,⁴⁹ areas beyond the facility covered by the protective actions recommended to be taken in the Provincial Nuclear Emergency Response Plan,⁵⁰ and areas within the transportation route for any waste generated by the project and relocated off-site. However, spatial boundaries appear to stop at the door of other licensed facilities that have been the subject of a previous EA. In the Bruce A Refurbishment EA Guidelines decision in 2005,⁵¹ the Commission accepted that the subsequent storage of refurbishment waste at the adjacent Western Waste Management Facility (WWMF) operated by Ontario Power Generation Inc. would be captured by a consideration of any incremental effects which might occur at this facility in the context of cumulative effects of the refurbishment project. The narrower project scope thereby eliminated any consideration of such discretionary assessment factors as alternatives to the WWMF.

Temporal boundaries have been tentatively set for the Pickering B Refurbishment project at 2060, the time frame for the last refurbished reactor unit to complete its anticipated 30 years of operation.⁵² In the EA Track Report decision for the Deep Geologic Repository for Intermediate and Low Level Waste Project,⁵³ CNSC Regulatory Policy P-290, *Managing Radioactive Waste*,⁵⁴ figured as an important consideration in temporal scoping. This policy provides that managing radioactive waste should proceed in a manner that protects human health and the environment for current and

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49. CNSC, *Environmental Assessment Guidelines (Scope of Project and Assessment) for the Proposed Refurbishment and Continued Operation of Pickering B Reactors at the Pickering B Nuclear Generating Station* (decision 24 January 2007, reasons released 3 April 2007), CEA Registry No. 06-01-21226, at para. 55.
 50. *Ibid.*, at para. 51.
 51. CNSC, Bruce A Refurbishment guidelines, *op.cit.*, footnote 48, at p. 6. This decision is consistent with *Friends of the West Country Assn. v Canada (Minister of Fisheries and Oceans)*, [2000] 2 F.C. 263 (C.A.), leave to appeal to S.C.C. refused 262 N.R. 395n (“Sunpine” decision). This case and more recently *Prairie Acid Rain Coalition v Canada (Minister of Fisheries and Oceans)* (2006), 265 D.L.R. (4th) 154 (F.C.A.), leave to appeal to S.C.C. refused 266 D.L.R. (4th) vii, have confirmed the wide discretion given to responsible authorities in project scoping.
 52. CNSC, Pickering B Refurbishment guidelines, *op.cit.*, footnote 49, at paras. 52-5.
 53. CNSC, *Environmental Assessment Track Report regarding Ontario Power Generation Inc.’s Proposal to Construct and Operate a Deep Geologic Repository within the Bruce Nuclear Site in Kincardine, Ontario* (decision 23 October 2006, reasons released 21 December 2006), CEA Registry No. 06-05-17520, at para. 52.
 54. CNSC, Regulatory Policy P-290, *Managing Radioactive Waste* (July 2004), online at www.nuclearsafety.gc.ca/eng/resource/regulatory_docs/current_docs/index.cfm.

future generations. According to the Commission, this requires that an assessment be carried out until the predicted maximum impact.⁵⁵

Under project scoping in the EA Guidelines decision for the Pickering B Refurbishment Project,⁵⁶ the CNSC considered intervenors' request for the inclusion of alternatives to the project such as renewable resources. The CNSC, in exercising its discretion, refused to include these alternatives within the project scope, their staff having explained to the Commission that this was a matter of energy policy outside of the CNSC's mandate. The Commission was even more explicit on this point in its decision in 2001 on the EA Track Report for the Pickering A Return to Service Project.⁵⁷ The CNSC dealt with the issue as part of the scoping of the assessment factors, since the need for and alternatives to the project were and are specifically referred to under CEAA, s. 16(1)(e). The Commission recognised it had a discretion to consider these factors and conceded that information could be placed before the Commission at the scoping stage which would indicate such severe adverse environmental consequences resulting from the project that would prompt a proponent to consider alternatives. However, as no such information was brought before the Commission, the Commission, relying on the decision of the Federal Court of Appeal in *Sharp v Canada (Transportation Agency)*,⁵⁸ rejected inclusion of need and alternatives. The Sharp decision concerned an application by Canadian Pacific Railway (CPR) under the Canada Transportation Act⁵⁹ for approval to construct a 12.6 km rail line in Alberta between its own operations and those of Union Carbide. The appellant opposed the application on the basis of environmental safety and land use impacts. She argued that the line was unnecessary as CPR railcars could interchange over existing Canadian National (CN) rail lines at Red Deer and complete the journey in CN railcars to the Union Carbide facility. The Canadian Transportation Agency, as part of its discretion, decided to consider need and alternatives but decided to rely on CPR's conclusion that the project was necessary to meet market needs and business objectives and that alternatives were less desirable. The Court of Appeal upheld this conclusion, stating that CEAA, s. 16(1)(e)

...is not a back door means of reempowering the [responsible authority] with economic regulatory control... In cases in which it is able to determine that a project is environmentally acceptable, the [responsible authority] may not find it necessary to consider need and alternatives. However... [in] the case of a proposed project having... severe adverse environmental consequences... the [responsible authority] may consider it necessary to rigorously analyse the question of need and alternatives.⁶⁰

There is a provincial regulatory framework for evaluating the appropriate energy mix in the Province of Ontario over the next 20 years and beyond. Pursuant to s. 25.29(1) of the Electricity Act, 1998,⁶¹ the Ontario Power Authority (OPA) is required to make an assessment of the adequacy and reliability of electricity resources with respect to anticipated electricity supply, capacity, reliability

55. CNSC, Deep Geologic Repository track report, *op.cit.*, footnote 53, at para. 52.

56. CNSC, Pickering B Refurbishment guidelines, *op.cit.*, footnote 49, at paras. 36, 40.

57. CNSC, *Environmental Assessment Track Report regarding Ontario Power Generation's Proposed Return to Service of Pickering A Nuclear Generating Station* (reasons released 16 February 2001), FEA Index No. 18822, at pp. 9-10.

58. [1999] 4 F.C. 363 (C.A.), leave to appeal to S.C.C. refused 132 O.A.C. 377n.

59. Canada Transportation Act, S.C. 1996, c. 10.

60. Sharp, *supra*, footnote 58, at para. 28.

61. Electricity Act, 1998, S.O. 1998, c. 15, Sch. A.

and demand for assessment periods prescribed by the regulations. As part of such an assessment, s. 25.29(2) of the act requires the OPA to consider Ontario's generation and transmission capacities and technologies and conservation measures. Further, under the Integrated Power System Plan (IPSP),⁶² the OPA is to submit a plan to the Ontario Energy Board covering a 20-year period from the date of submission of the plan. On 29 August 2007 the OPA submitted the IPSP to the board. Four key elements of the 4 000-page submission are the following: (1) a doubling of the amount of renewable energy to the grid by 2025; (2) the phase out of coal-fired generation by the end of 2014; (3) the refurbishment or replacement of the province's baseload nuclear capacity; and (4) transmission upgrades to achieve the policy and operational objectives of the plan.⁶³

While it is beyond the scope of this paper to analyse and comment on the arguments for and against the need for and alternatives to nuclear energy, suffice it to say that there is no shortage of such studies on both sides of the issue.⁶⁴

In finalising the EA Guidelines for Pickering B Refurbishment, the CNSC accepted their staff recommendation that credible accidents and malfunctions which would need to be included within the scope of the assessment were those accidents having a probability of occurrence greater than one in a

62. Integrated Power System Plan, O. Reg. 424/04.

63. The full 4 000-page submission can be found online at www.powerauthority.on.ca/IPSP.

64. On 1 August 2007 the Pembina Institute released three papers on their website, www.pembina.org, entitled *Renewable is Doable: A Smarter Energy Plan for Ontario*. The authors present four separate scenarios to demonstrate that with conservation and demand management, renewable energy, combined heat and power opportunities (microturbines) in Ontario and hydro power purchases from adjacent provinces, future power needs in Ontario can be met without any new investment in new or refurbished nuclear capacity. In May 2007, the U.K. government, Department of Trade and Industry, issued its consultation document entitled *The Future of Nuclear Power: The Role of Nuclear Power in a Low Carbon UK Economy*. The government concluded that nuclear energy needed to be part of the future energy mix. At para. 32 of the Executive Summary, there is a recommendation that the decision on whether to allow energy companies to invest in new nuclear build needs to be taken now because of the long lead times to secure relevant regulatory and development consents and the long construction periods. With the opportunity for large-scale hydro being largely exhausted in the U.K., nuclear power was the only low-carbon form of base load generation proven on a commercial scale. Replacing existing nuclear capacity with wind power alone would require a jump of 23 GW. Assuming a turbine size of 2 MW this would mean 12 000 turbines. Each of the necessary 25 GW of wind power would cover around 10 000 hectares of land (para. 8.55). The U.K.'s ambitious goal is to reduce carbon emissions by 60% by 2050, and while its modelling showed that goal might be achieved without nuclear under certain assumptions, there was a significant risk to security of energy supply, particularly since nuclear facilities would be reaching their end of life and carbon capture and storage had yet to be proven on a commercial scale. "Profound behavioural changes" in energy use would be required, since demand for electricity would need to decline by 6% compared to current demand, when the economy was expected to grow to three times its current size. The U.S. Atomic Safety and Licensing Board, in a decision dated 28 July 2005, subsequently upheld by the U.S. Nuclear Regulatory Commission (NRC) on 12 December 2005, affirmed the Environmental Report prepared and submitted by Exelon in support of an early site plan for new unspecified nuclear reactor design potentially generating 2 180 MW of power in Clinton, Illinois. The board and the NRC rejected arguments that renewable resources such as solar and wind and combinations with natural gas or even fossil fuels were feasible alternatives, finding that assumptions about improvements in the efficiency of the technology were speculative and that solar was limited to daytime and wind was too variable to be reliable. An early site permit was issued by the U.S. NRC on 15 March 2007 for additional reactors with a capacity of up to 6 800 MW thermal. See online at www.nrc.gov/reactors/new-reactor-licensing.html.

million per year of operation.⁶⁵ To give some sense of this risk probability, consider that in the U.K.'s May 2007 paper on *The Future of Nuclear Power: The Role of Nuclear Power in a Low Carbon UK Economy*,⁶⁶ they refer to a European Commission study and conclude that the probability of a major accident such as a meltdown of the reactor core coincident with a failure to the containment structure is one in 2.4 million per reactor per year.

With heightened security concerns following the events of 11 September 2001, risk probability has become a topic of some interest in Canada, the U.K. and particularly the U.S.

Petitions in the U.S. were sparked particularly following the refusal of the Supreme Court to hear Pacific Gas and Electric's appeal in January 2007 in *San Luis Obispo Mothers for Peace v Nuclear Regulatory Commission*⁶⁷ (the "Diablo Canyon" decision). The Court of Appeals for the Ninth Circuit held that the U.S. Nuclear Regulatory Commission (NRC) could not categorically reject an environmental assessment of the effects of a range of terrorist scenarios on a proposed dry storage facility at Diablo Canyon for spent nuclear fuel simply on the basis that the scenarios were speculative and not quantifiable. The NRC's position was inconsistent with the administration's heightened security efforts after 9/11 and its licensing of their Design Basis Threats before 9/11. It was possible to conduct low-probability/high-consequence analysis without quantifying the precise probability of risk. Assessment should, according to the Ninth Circuit Court, include modes of attack, weapons and vulnerabilities of the facilities and the possibility of impact on the environment including various release scenarios.

Buoyed by the Diablo Canyon decision on 16 March 2007 the Attorney General for California filed a petition⁶⁸ requesting the NRC to rescind its codified Waste Confidence Decision,⁶⁹ which reflects the U.S. nuclear regulator's determination that spent nuclear fuel generated at any reactor can be stored safely and without significant environmental impacts for at least 30 years beyond the facility's licensed operating life. The Commission determined in the Waste Confidence Decision that a fire could only occur with a relatively sudden and substantial loss of coolant – a loss great enough to uncover all or most of the fuel, damaging enough to admit enough air to keep a large fire going and sudden enough to deny operators the time to restore the spent fuel pool to a safe condition. Such a severe loss of cooling water could only arise from an earthquake well beyond the conservatively estimated earthquake for which reactors were designed. The annual probability of such a major spent fuel pool failure was calculated at two chances in a million per year of reactor operation – "extremely rare".⁷⁰ The Commission went on to find that risks due to other accident scenarios – such as structural failure of the pool due to high-energy tornado or missiles, aircraft crashes and heavy load drops, inadvertent drainage of the pool and boil-down of the pool due to loss of spent fuel cooling or make-up water – are at least "an order of magnitude smaller".⁷¹ The California petition, like a previous one

65. CNSC, *Environmental Assessment Guidelines (Scope of Project and Assessment) for the Proposed Refurbishment and Continued Operation of Pickering B Reactors at the Pickering B Nuclear Generating Station* (decision 24 January 2007, reasons released 3 April 2007), CEA Registry No. 06-01-21226, at para. 57.

66. U.K., Department of Trade and Industry, *The Future of Nuclear Power*, op. cit., footnote 64, at p. 105.

67. 449 F.3d 1016 (9th Cir. 2006), cert. denied 127 S. Ct. 1124 (2007).

68. NRC Petition for Rulemaking No. PRM-51-12, 72 FR 27068 (21 March 2007).

69. NRC Waste Confidence Decision, 55 FR 38474 (1990), codified at 10 CFR 51.23.

70. *Ibid.*, at p. 38481.

71. *Ibid.*

filed in August 2006 by the Massachusetts Attorney General,⁷² alleges that there is new and significant information concerning the potential for spent fuel fires in connection with high-density spent nuclear fuel pool storage.⁷³

The Nuclear Regulatory Commission has basically ignored these arguments. In its supplemental environmental assessment for Diablo Canyon, issued on 31 August 2007,⁷⁴ the NRC staff determined that

...the construction, operation, and decommissioning of the Diablo Canyon ISFSI [Independent Spent Fuel Storage Installation], even when potential terrorist attacks on the facility are considered, will not result in a significant effect on the human environment. NRC security requirements, imposed through regulations and orders, and implemented through the licensee's security plans, in combination with the design requirements for dry cask storage systems, provide adequate protection against successful terrorist attacks on ISFSIs. Therefore, a terrorist attack that would result in a significant release of radiation affecting the public is not reasonably expected to occur.

The Nuclear Regulatory Commission has further refused to follow the Ninth Circuit Court of Appeals decision in Diablo Canyon in any of its licensing hearings outside the court's jurisdiction. On 26 February 2007 the NRC, in three separate licensing cases in New Jersey,⁷⁵ Michigan⁷⁶ and Mississippi,⁷⁷ decided that it would not consider the environmental consequence of hypothetical terrorist attacks on NRC facilities because these scenarios were considered far too removed from natural or expected consequences. In the reasons given in the Amergen Energy case,⁷⁸ the NRC challenged the Ninth Circuit Court of appeals ruling on the basis that it ignored two previous decisions from the U.S. Supreme Court.⁷⁹ According to the NRC, the court in those cases regarded the National Environmental Policy Act of 1969⁸⁰ (NEPA) as setting, as a precondition to the Commission's environmental oversight, a causation requirement analogous to the tort law concept of proximate

72. NRC Petition for Rulemaking No. PRM-51-10, 71 FR 64169 (25 August 2006).

73. The Nuclear Energy Institute has filed written submissions with the NRC opposing both petitions, on 19 March 2007 for Massachusetts and on 30 July 2007 for California.

74. NRC, Notice of Availability of Supplement to the Environmental Assessment and Final Finding of No Significant Impact for the Diablo Canyon Independent Spent Fuel Storage Installation, 72 FR 51687 (10 September 2007), at p. 51688.

75. NRC Order No. CLI-07-08 (26 February 2007), Amergen Energy Co. LLC (Licence renewal for Oyster Creek Generating Station). Commission documents are available online at www.nrc.gov/reading-rm/doc-collections/commission. On 21 September 2007, the New Jersey Department of Environmental Protection petitioned the U.S. Court of Appeals for the Third Circuit to reverse the NRC decision and require that an environmental impact study be completed of an air attack at the Oyster Creek facility: Court File No. 07-2271.

76. NRC Order No. CLI-07-09 (26 February 2007), Nuclear Management Co. LLC (Licence renewal for Palisades Generating Station).

77. NRC Order No. CLI-07-10 (26 February 2007), System Energy Resources Inc. (Early Site Permit for Grand Gulf Site).

78. NRC, Amergen Energy Co. order, *op.cit.*, footnote 75.

79. *Metropolitan Edison Co. v People Against Nuclear Energy*, 460 U.S. 766 (1983), at pp. 772-5; *Dept. of Transportation v Public Citizen*, 541 U.S. 752 (2004), at p. 767.

80. National Environmental Policy Act of 1969, 42 U.S.C. 4321 (2000).

cause. There was simply no proximate cause link between the NRC's licensing action and any altered risk of terrorist attack. Any such risk depended upon political, social and economic factors external to the licensing process.⁸¹

The NRC's position on proximity has implications for the implementation of the necessary mitigation measures to defend against terrorist attacks. Petitioners requested the NRC to amend its Design Basis Threat regulations to allow for a sufficient margin of safety to encompass the terrorist capabilities evidenced by the attacks of 11 September 2001. In particular, they requested a requirement for nuclear operators to construct shields known as "beamhenges" which would enable a nuclear power plant to withstand an air attack from a jumbo jet. The NRC rejected this request as well:

[F]irst, the NRC has determined that active protection against the airborne threat rests with other organizations of the Federal government, such as NORTHCOM and NORAD, TSA, and FAA. The NRC will continue to test these relationships through exercises. Second, licensees have been directed to implement certain mitigative measures to limit the effects of an aircraft strike. To the extent that commenters have suggested the imposition of specific physical security measures such as the "beamhenges" concept, the NRC has considered on the issue, but has rejected the concept because it believes that the mitigation measures in place are sufficient to ensure adequate protection of the public health and safety.⁸²

Recognising that the impact of a large commercial aircraft was a beyond design basis event, the majority of the members of the NRC recommended rejection of an expedited rulemaking proposed by the Commissioner Jaczko in February 2007 which would have amended the Code of Federal Regulations⁸³ to require applicants for new nuclear plant licences to demonstrate that their plant designs would withstand an aircraft impact "such that there would be no release of significant quantities of radioactive materials to the environment". Instead the majority recommended the amendment of the code to include a requirement that licence applicant include a description and evaluation of the design features, functional capabilities and strategies to avoid or mitigate the effects of the applicable beyond design basis aircraft impact. The assessment would include core cooling capability, containment integrity and spent fuel pool integrity. The application would describe how the design features, functional capabilities and strategies to the extent practicable "would avoid or mitigate the effects of the applicable aircraft impact with reduced reliance on operator actions".⁸⁴

81. NRC, Amergen Energy Co. order, *op.cit.*, footnote 75, at p. 9.

82. NRC Paper No. SECY-06-0291 (30 October 2006), Final Rulemaking to Revise 10 CFR 73.1 Design Basis Threat (DBT) Requirements, at pp. 22-3. The DBT rule was published on 19 March 2007 at 72 FR 12705. The State of New York filed a petition for review which was subsequently transferred and consolidated in the U.S. Court of Appeals for the Ninth Circuit with a petition filed by Public Citizen and San Luis Obispo Mothers for Peace on 11 May 2007. New York's Brief challenging the Final DBT Rule was filed on 24 October 2007.

83. 10 CFR Part 52.

84. NRC, Staff Requirements Memorandum, Staff Requirements – SECY-06-0204 – *Proposed Rulemaking – Security Assessment Requirements for New Nuclear Power Reactor Designs* (24 April 2007). On 3 October 2007 the NRC published a proposed rule on "Consideration of Aircraft Impacts for New Nuclear Power Reactor Designs" in the Federal Register at 72 FR 56287. Public comments were due on 17 December 2007.

Bill C-5, the Nuclear Liability and Compensation Act

On 26 October 2007, Bill C-5⁸⁵ received first reading and on 30 October, following second reading, it was referred to a committee of the House of Commons. On 27 November 2007 the House Standing Committee on Natural Resources heard from the nuclear and insurance industries, the Canadian Association of Nuclear Host Communities (CANHC) comprised of 10 municipalities located in Ontario, Quebec, Manitoba and New Brunswick, and Greenpeace. The Bill would replace an act which is over 30 years old and will increase the insured liability of nuclear operators from CAD 75 million⁸⁶ to CAD 650 million.⁸⁷ At the parliamentary committee hearing on 27 November 2007,⁸⁸ the CANHC sought a higher insured liability, particularly where a nuclear facility is located in a densely populated area. Greenpeace sought the complete removal of the liability cap. Both CANHC and Greenpeace expressed a preference for an American style industry pooling of liability. In the United States, pursuant to the portion of the Energy Policy Act of 2005 commonly referred to as the Price-Anderson Amendments Act of 2005,⁸⁹ each operator undertakes to indemnify, in the event of a nuclear incident, up to USD 100 million per reactor unit at USD 15 million a year. As there are 104 reactors in the U.S., this contingent liability currently amounts to over USD 10 billion. In Canada, by contrast, there are currently only 22 reactor units, and either the amount of coverage by pooling would be considerably smaller, or the operators would be required to commit to pay a great deal more for each of their reactors. Germany was also mentioned by Greenpeace as a potential model for a nuclear liability regime at the November committee hearing. The liability cap in Germany is set at EUR 2.5 billion and is satisfied by a private “Solidarity Agreement” concluded between the four parent companies of the 17 German nuclear power plants. Under the agreement, the insurance industry covers the first EUR 255.6 million of the liability cap while the four parent companies guarantee the remaining EUR 2.24 billion by a pooling arrangement. As in the U.S., the companies are not obliged to pay their contribution in advance, but only after an incident has occurred. The companies who pay their contribution gain a right of recourse against the operator of the plant responsible; however, the claims of the victims for compensation have priority over those rights of recourse.⁹⁰ Germany, however, may not be an appropriate model for Canada, as in 2002, the Social Democratic/Green Party coalition amended the 1959 German Nuclear Act to phase out nuclear power. That decision has not been revisited by the new Government.⁹¹

85. Bill C-5, An Act respecting civil liability and compensation for damage in case of a nuclear incident (Nuclear Liability and Compensation Act), 2nd Sess., 39th Parl. (first reading 26 October 2007; second reading 30 October 2007; committee report 12 December 2007).

86. Nuclear Liability Act, R.S.C. 1985, c. N-28, s. 15(1).

87. Bill C-5, s. 21(1).

88. Bill C-5, committee meeting 27 November 2007, minutes of proceedings, online at www.parl.gc.ca/legisinfo.

89. Energy Policy Act of 2005, Pub. L. 109-58, 119 Stat. 594 (2005); Title VI, Subtitle A known as Price-Anderson Amendments Act of 2005, Pub. L. 109-58, sec. 601, 119 Stat. 594, 779 (2005), amending Price Anderson Act, 42 U.S.C. 2210 (2000), Subchapter XIII of Atomic Energy Act of 1954, 42 U.S.C. 2011 (2000).

90. Pelzer, Norbert (2007), “International Pooling of Operators’ Funds: An Option to Increase the Amount of Financial Security to Cover Nuclear Liability?” *Nuclear Law Bulletin* No. 79 at pp. 43-5.

91. Raetzke, Christian and Micklinghoff, Michael (2006), *Existing Nuclear Power Plants and New Safety Requirements — An International Survey* (Carl Heymanns Verlag), at p. 12.

Under Bill C-5, Cabinet would have the authority to increase the amount of the cap by regulation.⁹² Operators may substitute for mandatory insurance a portion of the coverage by other acceptable financial security.⁹³ At the committee hearing on 27 November 2007, the nuclear industry sought the greater flexibility to access available markets for the entire amount of the coverage. In response to the experience of Three Mile Island, where there proved to be no release to the environment, Bill C-5 now covers damages caused by preventative measures recommended by the authorities acting under a federal or provincial nuclear emergency scheme,⁹⁴ regardless of whether there was a radioactive release into the environment. Other notable changes include coverage of transportation accidents involving radioactive material,⁹⁵ psychological harm,⁹⁶ economic loss,⁹⁷ lost wages and damages from loss of use of property,⁹⁸ other than the costs resulting from the failure of the responsible nuclear generating facility to provide electricity,⁹⁹ and the reasonable costs of remedial measures taken to repair, reduce or mitigate environmental damage caused by a nuclear incident, if the measures were ordered by an authority acting under a federal or provincial environmental protection legislation.¹⁰⁰ The new bill would increase the limitation period on bringing a claim for bodily injury from the current 10 years¹⁰¹ to 30 years.¹⁰² As with the current act,¹⁰³ the new act would allow the Minister to reinsure risks which an insurer is not willing to assume.¹⁰⁴

At the committee hearings on Bill C-5 on 4 December 2007,¹⁰⁵ a spokesman for Natural Resources Canada pointed out that if the liability amount was raised above CAD 650 million, in light of the reinsurance agreement, some of the risks would be borne by the Federal Government. Consequently, a motion by the New Democratic Party (NDP) to amend the bill to increase the liability where the operator cannot establish its lack of negligence was ruled “out of order” by the Chair because it would “involve an increase in spending where a royal recommendation was involved”.¹⁰⁶ The concern is more than speculative. At the 2 October 2007 Nuclear Inter Jura Congress of the International Nuclear Law Association in Brussels, representatives from the Swiss and British Nuclear Insurance Pools expressed reservations with the full insurability for liability arising from environmental damage. These reservations stemmed from a lack of identifiable insurable interest, no

92. Bill C-5, s. 21(2).

93. Bill C-5, s. 24(2).

94. Bill C-5, s. 8(2).

95. Bill C-5, s. 8(1)(b).

96. Bill C-5, s. 14.

97. Bill C-5, s. 15.

98. Bill C-5, s. 16(1).

99. Bill C-5, s. 16(2).

100. Bill C-5, s. 17.

101. Nuclear Liability Act, s. 13.

102. Bill C-5, s. 30(2)(a).

103. Nuclear Liability Act, s. 16.

104. Bill C-5, s. 26(1), (2).

105. Bill C-5, committee meeting 4 December 2007, minutes of proceedings, David McCauley for Natural Resources Canada.

106. *Ibid.*

direct and quantifiable economic interest, difficulty establishing when particular damages occurred and poor industry experience with other “open-ended” exposures such as asbestosis.¹⁰⁷ Another NDP proposed amendment which was turned down by the committee on 4 December would have had a separate CAD 650 million liability limit apply to each reactor unit instead of the installation as a whole. Mr. McCauley, spokesman for Natural Resource Canada (NRCAN), pointed out that a single vacuum building would contain all the radionuclides from a multiple reactor facility in the event of an incident and for that reason there would be one liability cap for that facility, which would be designated as one installation for liability purposes, regardless of how many reactors it had. A second spokesman for NRCAN, Monsieur Henault, pointed out that the first tier of liability in the U.S. – USD 300 million – operated by station rather than by reactor unit, though he did concede that the pooling arrangement mentioned above operated by reactor unit.

Above the CAD 650 million coverage, payments are to be made by the government out of an account separate and apart from the Consolidated Revenue Fund, to be known as the Nuclear Liability Reinsurance Account.¹⁰⁸ Even assuming the bill were to receive Royal Assent early in 2008, before the act could become enforceable, regulations would be necessary for apportioning the percentage of the risk which may be guaranteed by financial security alternative to private insurance and the classes of insurable nuclear facilities.¹⁰⁹

Long-term spent nuclear fuel management in Canada and disposal of low-level radioactive waste generated by uranium enrichment facilities in the United States

Following the enactment and proclamation of the 2002 Nuclear Fuel Waste Act,¹¹⁰ the companies which own spent nuclear fuel resulting from the production of electricity by means of a commercial reactor were required to:

- establish a waste management organisation (Nuclear Waste Management Organisation or NWMO) as a separate legal entity to provide recommendations to the Government of Canada on the long-term management of used nuclear fuel; and to implement the approach selected by the Government;¹¹¹
- establish trust funds to finance the long-term management of used fuel.¹¹²

In addition, the act directs the NWMO to establish an independent Advisory Council whose comments on waste management organisation’s study and reports are made public.

The NWMO was required to submit to the Natural Resources Canada Minister, by November 2005, proposed approaches for managing used nuclear fuel and a recommended approach. This was done on schedule with the release in November 2005 of a Final Study entitled *Choosing a Way*

107. Reitsma, Sebastiaan and Tetley, Mark, “Current Market Capabilities and Possible Future Insurance Arrangements” (unpublished).

108. Bill C-5, ss. 27(1), 58, 60, 61.

109. Bill C-5, s. 66.

110. Nuclear Fuel Waste Act, S.C. 2002, c. 23, Royal Assent 13 June 2002, proclaimed in force 15 November 2002.

111. Nuclear Fuel Waste Act, s. 6.

112. Nuclear Fuel Waste Act, s. 9.

*Forward: The Future Management of Canada's Used Nuclear Fuel.*¹¹³ The recommendation of the NWMO study was to pursue Adaptive Phased Management of the used fuel. This approach consists of the following:

- ultimate centralised containment and isolation of used nuclear fuel in an appropriate geological formation;
- phased and adaptive decision making;
- optional shallow storage at the central site prior to placement in the repository;
- continuous monitoring;
- provision for retrievability of the waste;
- citizen engagement.

On 14 June 2007, Natural Resources Canada announced that it had accepted the NWMO's recommended approach for managing spent nuclear fuel in Canada. "This is a safe, long-term approach. APM [Adaptive Phased Management] will ensure the used nuclear fuel is monitored and retrievable", said Natural Resources Minister Gary Lunn.¹¹⁴ The NWMO will now begin planning and designing a site selection process collaboratively with the public.

At the end of 2007, the U.S. Court of Appeals for the District of Columbia Circuit upheld the Nuclear Regulatory Commission's decision to grant a licence for a new, privately owned facility in New Mexico to produce enriched uranium as fuel for nuclear reactors.¹¹⁵ The petitioners argued, amongst other things, that the licence applicants failed to provide a reasonable cost estimate for disposing of the radioactive waste from the facility. To guard against unforeseen costs, the applicant had added a 25% contingency factor on top of the Department of Energy's cost estimate for waste disposal. The court conceded that the petitioners' argument that the costs were underestimated, because they were based on "near surface disposal" as opposed to deep disposal hundreds or thousands of feet underground, was "weighty".¹¹⁶ Nevertheless, the court concluded: "We are not authorized to micromanage the NRC's licensure proceeding, or to second-guess its acceptance of reasonable cost estimates".¹¹⁷ Judicial deference to a regulator in matters involving the balancing of environmental protection, costs and other benefits is not unique to American courts. In Canada, the appropriate inquiry on such a judicial review is also whether the decision maker had before it information from which it could reasonably reach its conclusion.¹¹⁸

113. Nuclear Waste Management Organization, *Choosing a Way Forward: The Future Management of Canada's Used Nuclear Fuel* (November 2005), online at www.nwmo.ca.

114. Natural Resources Canada, News Release, 14 June 2007, "Canada's Nuclear Future: Clean, Safe, Responsible", online at www.nrcan-rncan.gc.ca/media/newsreleases/2007/200750_e.htm.

115. *Nuclear Information and Resource Service v Nuclear Regulatory Commission* [unreported, 11 December 2007, U.S.C.A. (D.C. Circ.)].

116. *Supra*, at p. 14.

117. *Supra*.

118. *Inverhuron & District Ratepayers' Assn. v Canada (Minister of Environment)* (2001), 39 C.E.L.R. (N.S.) 161 at paras. 38-39 (F.C.A.), leave to appeal to S.C.C. refused [2002] 1 S.C.R. vii, and more recently, *McLean Lake Residents' Assn. v Whitehorse (City)* (2007), 32 C.E.L.R. (3d) 60 (Y.T.S.C.), at para. 31.