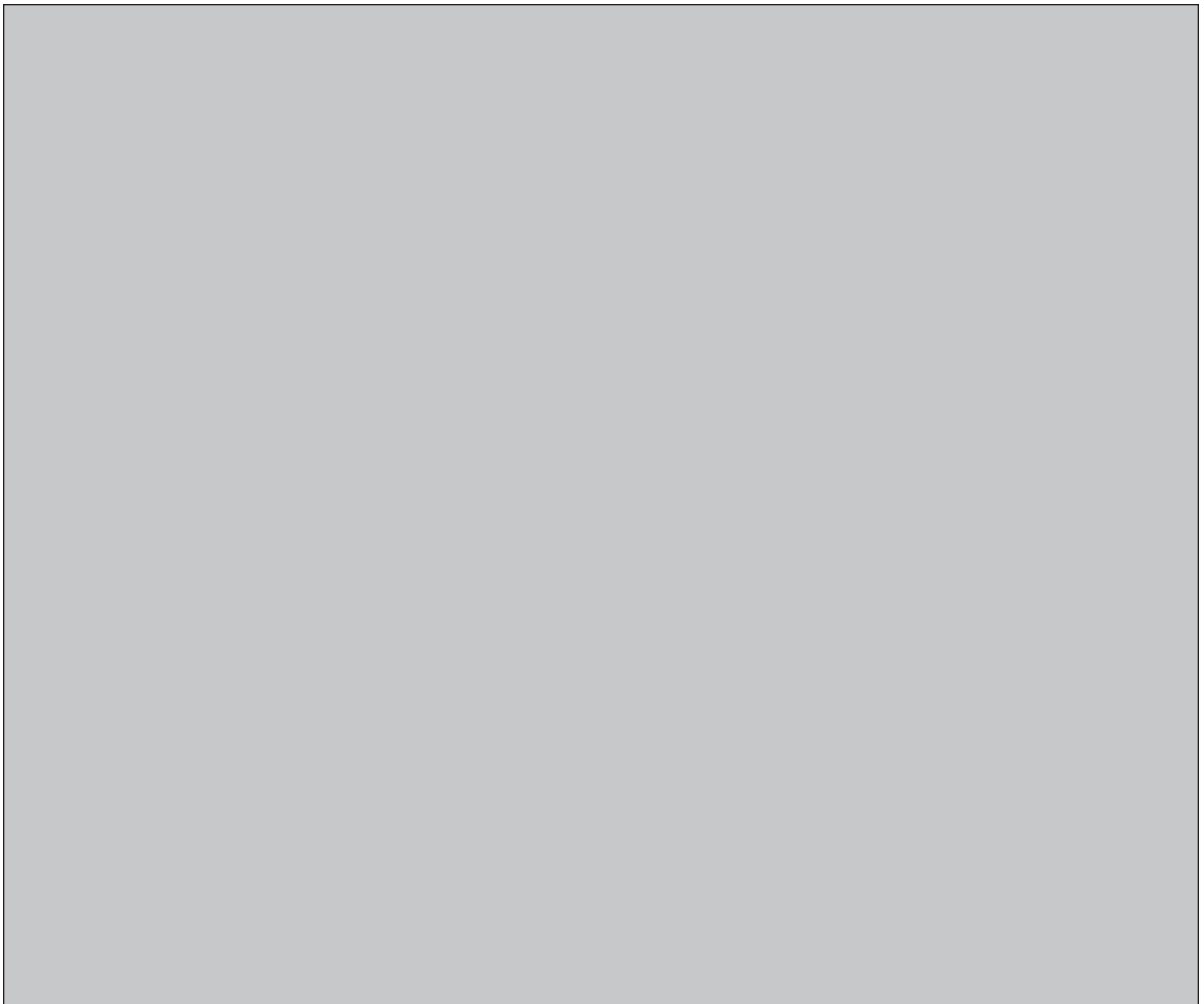


NWMO BACKGROUND PAPERS
7. INSTITUTIONS AND GOVERNANCE

7-13 THE PUBLIC POLICY CONTEXT FOR NUCLEAR LIABILITY IN CANADA

William Leiss & Associates Ltd



NWMO Background Papers

NWMO has commissioned a series of background papers which present concepts and contextual information about the state of our knowledge on important topics related to the management of radioactive waste. The intent of these background papers is to provide input to defining possible approaches for the long-term management of used nuclear fuel and to contribute to an informed dialogue with the public and other stakeholders. The papers currently available are posted on NWMO's web site. Additional papers may be commissioned.

The topics of the background papers can be classified under the following broad headings:

1. **Guiding Concepts** – describe key concepts which can help guide an informed dialogue with the public and other stakeholders on the topic of radioactive waste management. They include perspectives on risk, security, the precautionary approach, adaptive management, traditional knowledge and sustainable development.
2. **Social and Ethical Dimensions** - provide perspectives on the social and ethical dimensions of radioactive waste management. They include background papers prepared for roundtable discussions.
3. **Health and Safety** – provide information on the status of relevant research, technologies, standards and procedures to reduce radiation and security risk associated with radioactive waste management.
4. **Science and Environment** – provide information on the current status of relevant research on ecosystem processes and environmental management issues. They include descriptions of the current efforts, as well as the status of research into our understanding of the biosphere and geosphere.
5. **Economic Factors** - provide insight into the economic factors and financial requirements for the long-term management of used nuclear fuel.
6. **Technical Methods** - provide general descriptions of the three methods for the longterm management of used nuclear fuel as defined in the NFWA, as well as other possible methods and related system requirements.
7. **Institutions and Governance** - outline the current relevant legal, administrative and institutional requirements that may be applicable to the long-term management of spent nuclear fuel in Canada, including legislation, regulations, guidelines, protocols, directives, policies and procedures of various jurisdictions.
8. **Workshop Reports** - provide information on the outputs and outcomes of some NWMO engagement activities including discussions and expert workshops.
9. **Assessments** - provides perspectives on the advantages and limitations of the management approaches under study.

Disclaimer

This report does not necessarily reflect the views or position of the Nuclear Waste Management Organization, its directors, officers, employees and agents (the "NWMO") and unless otherwise specifically stated, is made available to the public by the NWMO for information only. The contents of this report reflect the views of the author(s) who are solely responsible for the text and its conclusions as well as the accuracy of any data used in its creation. The NWMO does not make any warranty, express or implied, or assume any legal liability or responsibility for the accuracy, completeness, or usefulness of any information disclosed, or represent that the use of any information would not infringe privately owned rights. Any reference to a specific commercial product, process or service by trade name, trademark, manufacturer, or otherwise, does not constitute or imply its endorsement, recommendation, or preference by NWMO.

The Public Policy Context for Nuclear Liability in Canada

**A Paper prepared by William Leiss
at the request of
The Nuclear Waste Management Organization**

**William Leiss & Associates Ltd.
534 Mansfield Avenue
Ottawa, ON K2A 2S9**

wleiss@uottawa.ca

<http://www.leiss.ca>

Tel (613) 297-4300

July 12, 2005

Executive Summary

This paper considers the issue of nuclear liability in the context of Canadian public policy, specifically:

1. the four components of risk management for major hazards, as detailed in the case of natural hazards, a scheme which arguably is applicable to major technological hazards as well; and
2. the comprehensive allocation of responsibilities, in the case of natural hazards, between the two senior levels of government and the insurance industry; and
3. the wider structure of multi-faceted federal laws and regulations which establish a risk management framework for nuclear installations and substances; and
4. the place of nuclear liability within the foregoing dimensions.

Within the four component stages of risk management – mitigation, preparedness, response, and recovery – issues of liability come into play as a part of the fourth stage (although they are anticipated in the earlier ones). Depending on the type of major hazard, whether natural or technological, various parties have different types of responsibilities, across the four stages, a point that is illustrated in the text.

The fundamental idea of good risk management is to anticipate and prepare for the potential damages to persons and property associated with major hazards; this is the essence of a precautionary approach. This approach is well-established in Canada for the risks associated with the nuclear industry: A comprehensive network of laws, policies, and regulations is focused on reducing these risks to acceptable levels by a series of elaborate mitigation and preparedness steps.

The potential damages to persons and property from nuclear accidents which cannot be prevented give rise to liability for such damages. The monetary scope of liability for the nuclear industry is limited to a relatively small amount by Canada's *Nuclear Liability Act* (1985). However, this same Act imposes on the federal government the obligation to act as insurer of last resort and to provide “special measures for compensation” that have no preset monetary limit. The provisions of the Act are not consistent with prevailing international practices in countries with civilian nuclear power installations, however, and it is expected that the Act will be amended or revised in the coming years to achieve greater consistency with current international norms.

A. Introduction.

In a public policy context the issue of liability and insurance – for damages to health, environment, and property arising out of the use of nuclear materials – is a relatively small subset of the risk management framework. This framework is intended to deal with both minor and major risks. Minor risks involve the everyday hazards, mostly of an occupational nature, associated with any complex technology, such as nuclear power facilities, with a special focus in this case on radiation hazards. Major risks involve the possibility of catastrophic events – spills, fires, explosions, large releases of radioactive materials into the environment – in which significant public, as well as worker, exposures would be expected.

Liability and insurance coverage for damages is the last line of defense within our society's overall risk management framework for catastrophic events. This framework has been worked out in detail for major natural hazards – earthquakes, floods, forest fires, ice storms, infectious disease outbreaks, etc. - and is also applicable to what might be called major technological and social hazards, of which catastrophic nuclear events, large-scale electrical grid failures, and terrorism are prime examples. The framework has four components: Mitigation, Preparedness, Response, Recovery; liability and insurance issues are part of the “recovery” component.

The basic concept in this framework is that foresight, investments, training, and planning should be concentrated on the two “front end” components (mitigation and preparedness), which are designed to limit the scope of the damages – since it is impossible to prevent all such events from happening. “Response” is also a key factor in damage limitation. All of the foregoing is designed to reduce the scope of the recovery effort (including payments for insured risks) to the smallest possible level.

Finally, in the more limited context of federal legislation, the issue of liability – for damages to health, environment, and property arising out of the use of nuclear materials – has a number of key aspects, including:

1. The sharing of responsibilities for damages, as provided in the *Nuclear Liability Act*;
2. The obligation to assess and control risks, as provided in the *Nuclear Safety Act* and Canada's international obligations under the *Convention on Nuclear Safety*; and
3. The anticipation, control and limitation of potential damages, using the precautionary approach, through a careful risk assessment carried out under the *Canadian Environmental Assessment Act*.

B. The Public Policy Context.

Like all other nations Canada faces a number of catastrophic risks, some of which have been present for a long time (natural hazards) and others of which are quite new (terrorism). These may be usefully separated into three major categories:

1. Natural Hazards, such as:

- major forest and building fires;
- major earthquakes;
- floods;
- infectious disease outbreaks (human and farm animal);
- ice and snow storms, and hail;
- hurricanes and tornados.

2. Technological Hazards, such as:

- electrical grid failures;
- chemical and petroleum plant fires and explosions;
- nuclear power plant events, especially release of radioactive materials;
- railway, roadway and airline accidents;
- medical devices, medical treatments, and pharmaceuticals;
- urban air pollution.

3. Social Hazards, such as:

- terrorism, especially involving the use of chemical, biological, radiological, and nuclear materials;
- ethnic, racial, gender, and social group hostility and intolerance;
- crime (including perception of crime);
- poverty, injustice, widespread unemployment.

Responsibilities for preventing, mitigating, responding to, and paying for the human and property consequences which arise when we experience such hazards is divided between (a) individuals and families, (b) social and governmental institutions, (c) business owners and their employees, and (d) insurers. The sharing of these responsibilities differs quite markedly with respect to the three types of hazards listed above.

1. *Natural Hazards*: One of the major characteristics of this type of hazards is how they differ with respect to what is or is not an insurable loss in Canada:

- *Floods* are an example of partially insurable loss. Property owners are expected to carry flood damage coverage in their insurance policies (where and to the extent to which it is available), but the limits in that coverage are often exceeded, whereupon governments are expected to step in to provide supplemental benefits. For example, the government

of Alberta has promised disaster assistance – up to a certain ceiling per family or business – for the 2005 floods in that province.¹

- *Fire* is an insurable loss and homeowners and businesses are ineligible for direct disaster assistance. However, governments are expected to provide support services and to repair damaged infrastructures, the costs of which are shared at provincial and federal levels. The British Columbia government's response to the 2003 forest fires in that province was estimated to cost the province about \$550 million.² The private insurance industry estimated its payout to policyholders for insured damages at \$250 million.
- *Earthquakes* present another hazard with mixed responsibility, especially at the catastrophic level, such as the long-expected severe event forecast for the West Coast area. Private insurance coverage is available as an option for policyholders, but losses would be so large that governments would be forced to become insurers of last resort.

In general, it would be fair to say that Canadian practice both (1) requires property owners to take limited responsibility for damages arising from natural hazards, and (2) obligates governments to serve as insurers of last resort for catastrophic losses of this type.

2. *Technological Hazards*: In general, private business owners and their insurers – or governments, where they are the owners of facilities, such as public utilities – are entirely responsible for damages arising from hazards of this type. There are a few exceptions to this rule, as noted below.

- Technological hazards arise in the manufacture of goods and services, and generally speaking the manufacturers are responsible for damages in these areas, either in the production facilities or in the consumers' use of products. Governments generally do not act as insurers of last resort for these types of damages, even if they have approved the sale and use of some products made by the private sector, such as medical devices.
- The nuclear industry is an obvious exception to this rule; see Section D below for further discussion.

¹<http://www.gov.ab.ca/home/index.cfm?page=1194>

²<http://www.2003firestorm.gov.bc.ca/firestormreport/executivesummary.htm>

- There is at least one other industry where the manufacturer has limited liability for damages to individuals arising out of the use of a specific technology, namely, vaccine manufacturers. The public policy rationale for this exemption is the obvious public health benefits arising from the use of vaccinations, especially for children, against infectious diseases. However, it is well known that vaccination is not risk-free, with a fatality risk on the order of one in a million. Thus this policy choice is a source of significant controversy, for example, involving widespread allegations of autism risk.³
- A new and related source of controversy are laws (in the United States) mandating certain types of responses to terrorism incidents, including mandatory medical procedures such as vaccinations, and exempting both manufacturers and the persons carrying out these procedures from liability and lawsuits for damages.⁴

3. *Social Hazards*: Individuals have many responsibilities to obey laws relating to these types of hazards, where certain types of behaviours are criminalized. But since private insurance coverage in this area is quite limited, the largest share of collective responsibility falls on the shoulders of governments.

- Terrorism risk is the exception, especially with respect to property damage: There is still some ongoing uncertainty about the share of responsibility between private insurers and governments.⁵

C. The Risk Management Framework for Major Hazards.

This framework is elaborated in a key publication dating from 1997 and entitled *Coping with Natural Hazards in Canada*.⁶ Each of its components is described

³See, for example, <http://www.vran.org/philosophy/purpose.htm>; http://www.marytocco.com/child_worth.htm

⁴<http://www.909shot.com/Issues/homeland%20security.htm>

⁵Edmund L. Andrews, "Who Bears the Risks of Terror?" *The New York Times*, July 10, 2005.

⁶<http://www.utoronto.ca/env/nh/title.htm>: Søren E. Brun, David Etkin, Dionne Gesink Law, Lindsay Wallace & Rodney White: *Coping with Natural Hazards in Canada: Scientific, Government and Insurance Industry Perspectives*. A study written for the Round Table on Environmental Risk, Natural Hazards and the Insurance Industry, by the Environmental Adaptation Research Group, Environment Canada and the Institute for Environmental Studies, University of Toronto (June 1997). This comprehensive study includes a full sketch of the sharing of responsibilities among federal and provincial governments, and the insurance industry, for each of the four components.

briefly below. The relevance of this material to the topic of this paper is that it puts the issues of insurance and liability for all types of catastrophic events in the proper perspective.

1. Mitigation.

This component⁷ is largely a matter of

- *physical mitigation*, that is, the design and construction of “protective” elements or works such as dams, water channels, firebreaks, and the strengthening of structures to withstand earthquakes; and
- *policies and regulations* such as general building codes and highly specialized regulations for specific types of structures, such as nuclear power plants.

The basic concept of mitigation is, of course, to try to anticipate the types of damages that could occur in the context of a specific event and to design structures to minimize those damages. An outstanding example is the network of flood control structures in and around Winnipeg and the Red River Valley, where truly devastating floods occur with some frequency.

The scope of mitigation is constrained by formal or informal benefit-cost analyses which determine how much money can be invested at any particular time, and how much is needed for the other components (preparedness, etc.). On the other hand, earlier initiatives are often upgraded as additional resources become available.

2. Emergency Preparedness.

The second component is “emergency preparedness – development and practice of emergency plans to respond to natural hazards and monitoring of the geophysical and atmospheric environment to allow for timely hazard warnings.”⁸ Significant investments, almost entirely the responsibility of governments, are necessary, for example, in weather forecasting, emergency vehicles and training, and stockpiling of supplies.

As with mitigation, the objective here is to minimize loss of property and life by (1) providing timely, well-communicated and reliable warnings and (2) having emergency facilities available to offer temporary assistance.

⁷<http://www.utoronto.ca/env/nh/pt5ch7-1.htm#physical>

⁸<http://www.utoronto.ca/env/nh/pt5ch8-1.htm#intro>

3. Disaster Response and Relief.

Here what is needed is to “mobilise and position emergency equipment; ensure that individuals are out of danger; provide food, water, shelter, and medical equipment; and bring damaged services and systems back into service.”⁹ For the most serious events the federal government can bring into play a specific piece of legislation (the *Emergencies Act*) and a dedicated agency (OCIPEP), and all provincial and territorial governments have emergency measures organizations.

4. Recovery.

Recovery involves recuperation from both the physical and financial impacts of disasters.¹⁰ Governments and private insurers share responsibilities in differing degrees, depending on the type of hazard, in the rebuilding of physical structures and infrastructures.

D. The Nuclear Industry and the Liability Issue.

The monetary limitation on liability for damages arising from accidents occurring at “nuclear installations,” which the nuclear industry has enjoyed in Canada and elsewhere, has been a source of controversy for many years. For example, Energy Probe and its associates undertook a ten-year legal battle over this issue in the Canadian courts which was abandoned in 1996.¹¹

The *Nuclear Liability Act* (1985), subtitled “an Act respecting civil liability for nuclear damage,” is perhaps the least complex of all pieces of federal legislation. Part I establishes the limitation of liability for operators of nuclear installations, setting the monetary limit at \$75 million per installation and requiring the operators to carry insurance in that amount from an approved carrier. (There are 14 installations in Canada requiring such coverage.) Part II establishes the federal government’s unlimited liability for compensation for any damages arising from a “nuclear incident” in excess of that amount. Most of Part II is devoted to specifying the nature and procedures of the special Commission that would be set up in order to adjudicate claims for damages.

In 2003 the Canadian Environmental Law Association assisted an individual in filing a series of petitions with the Office of the Auditor General which raised a series of ten detailed questions about the *Nuclear Liability Act*.¹² These questions

⁹<http://www.utoronto.ca/env/nh/pt5ch9-1.htm>

¹⁰<http://www.utoronto.ca/env/nh/pt5ch10-1.htm>

¹¹<http://www.energyprobe.org/energyprobe/index.cfm?DSP=content&ContentID=190>

¹²<http://www.oag-bvg.gc.ca/domino/petitions.nsf/viewe1.0/10460C3D4656D9A985256DB1006E0B06>

were accompanied by pertinent background information, including comments on these issues in previous years by parliamentary committees in Canada and many references to practices in other countries having nuclear installations, as well as comments on relevant international conventions. Some of the key questions raised are:

1. "Has the Minister or his Department obtained any reports regarding what an appropriate limit would be for the *Nuclear Liability Act* and if so, could the Minister identify them by date, author and title? What were the main findings of such reports?"
2. "Has the Minister or his Department considered an approach in the *Nuclear Liability Act* that would set a minimum required insurance amount per nuclear facility (such as \$650 million dollars), but without continuing the "cap" or exemption from additional liability to operators that the *Nuclear Liability Act*, in section 31 presently provides? Is the Minister planning to seek public input on such an approach?"
3. "Has the Minister studied the sufficiency of the \$75 million limit under the *Nuclear Liability Act* to cover anticipated or potential damages to person and property that could result from an accident at a nuclear generating facility that breached containment? If so, could the Minister identify the studies and documents by date, author and title? What were the main findings of such studies?"
4. "Has the Minister responded to the recommendation of the Senate Standing Committee on Energy, the Environment and Natural Resources, Interim Report, "Canada's Nuclear Reactors, How Much Safety is Enough", dated June, 2001, Recommendation # 8, which recommended that:

"The Committee recommends that the government take immediate action to amend the Nuclear Liability Act, and increase and maintain the mandatory operator held insurance coverage from the current 75 million dollars at an amount in line with the Paris and Vienna Conventions "over 600 million dollars"."

The reply from the federal Minister of Natural Resources Canada¹³ contained the following statements, among others:

1. "The standard government process for preparing legislative amendments is currently underway for the *Nuclear Liability Act*. Departmental recommendations to Cabinet will lead to a draft Bill for introduction into Parliament.
2. "As a key aspect of the government's comprehensive review of the Act is to increase the mandatory operator held insurance coverage, a number of options have been considered regarding an appropriate amount. The intent is to be able to deal realistically with accidents that are foreseeable. The recommended coverage should also take into consideration inflation, the availability of increased insurance capacity, and international trends.
3. "The Department is not considering the approach that you have suggested that would impose liability upon a nuclear operator beyond the required insurance amount set out in the Act. Public views on this issue may be expressed as part of Parliament's

¹³ <http://www.oag-bvg.gc.ca/domino/petitions.nsf/viewe1.0/DC55D731EAB519F085256E190060B510>

review of the Bill.

4. “Beyond the study referred to in my response your question no. 4, the Department has not conducted any studies on the sufficiency of the \$75 million liability limit of the current *Nuclear Liability Act* to address the damages to person or property that could arise from an accident at a nuclear power generating plant that breached containment. Canadian nuclear power plants, employing CANDU technology, are designed and built to such standards that the chance of a severe accident involving a breach of containment – and hence a large release from the plant – is extremely low. Canada's nuclear regulator, the CNSC, considers such accidents to be unrealistic in the Canadian setting and does not include them in its assessment of foreseeable accidents when imposing licensing conditions on nuclear operators.
5. “The Government of Canada acknowledges the merit of the recommendation in the Standing Senate Committee report to increase the mandatory operator held insurance coverage from the current 75 million dollars to an amount in line with international levels. No response was considered necessary since raising the operator's mandatory insurance coverage is a key aspect of the government's comprehensive review of the Act which addresses improvements in victim compensation, clarification of key provisions and the responsibilities of the federal government, as well as improvements to technical aspects of the Act.”

Despite the references in this letter, dated 1 December 2003, to the preparation of amendments and new legislation, I can find (through an Internet search) no other later material pertinent to this matter.

In my opinion it would be fair to conclude that the Government of Canada is well aware of the inadequacy of the provisions for insurance for damages in the current *Nuclear Liability Act*. By any other comparative standard, in terms of other countries with civilian nuclear power installations, the insurance coverage required of operators is too low, and consequently the liability of the federal government itself is far too great. In my opinion we will see in the coming years a set of revisions to the Act that will increase significantly the insurance coverage required of operators, to bring Canadian requirements into line with current international standards.

E. The Risk Management Framework for the Nuclear Industry.

The main point to be made here is that an interconnected set of federal laws and regulations provides the legal basis for the prudent risk management of nuclear installations and radioactive substances in Canada.¹⁴ From a public policy perspective, it is this set of laws and regulations taken as a whole, and not the

¹⁴This is of course consistent with the perspective adopted by the authors of NWMO Background Paper 7-3 (Mark Madras & Stacy Ferrara, “The Status of Legal and Administrative Arrangements for High-Level Radioactive Waste Management,” July 2003), who state in their conclusions (p. 70): “The premise of our nuclear regulatory regime is one of risk management.”

provisions of the *Nuclear Liability Act* taken separately, that seeks to ensure for Canadians that the risks associated with nuclear facilities are at a level which may be deemed acceptable.

This wider set of laws and regulations, as applied to nuclear installations, has the same character as that of the risk management framework for natural hazards, discussed in Section C above. Specifically, it seeks to manage the associated risks using a comprehensive framework, one in which the chief focus is on mitigation and preparedness. All aspects of the final phase of “recovery” from serious incidents, including allocating liability for damages to persons and property among various parties, is here too the last line of defense against such hazards for our citizens.

The set of federal laws and regulations designed to manage the risks of damages to health, environment, and property arising out of the use of nuclear materials has the following five principal aspects:

1. The obligation to assess and manage all relevant risks, as provided in the *Nuclear Safety and Control Act* (NSCA 1997):

- The chief purpose of this Act is to grant comprehensive regulatory authority to the Canadian Nuclear Safety Commission (CNSC).¹⁵
- It is worth noting that this Act singles out a specific industry for regulatory control and risk management, whereas all other industries fall under the provisions of more general health and environmental protection legislation; in a sense, this special attention is the counterpart to the limitation of liability offered in the *Nuclear Liability Act*.
- There are provisions for public participation at Commission hearings and access to documentation.¹⁶

2. The anticipation, control and limitation of potential damages, utilizing the precautionary approach, through a comprehensive environmental risk assessment carried out under the *Canadian Environmental Assessment Act* (CEAA 1992, amended 2003):

- The 2003 amendments to CEAA coordinate the provisions of CEAA

¹⁵http://www.nuclearsafety.gc.ca/eng/regulatory_information/ (CNSC general information);

http://www.nuclearsafety.gc.ca/eng/regulatory_information/regulations/

¹⁶<http://www.nuclearsafety.gc.ca/eng/commission/>

with those of *NSCA*, in order to provide a seamless federal regulatory environment applicable to nuclear facilities;¹⁷

- The obligation to undergo a comprehensive environmental assessment, as triggered by specific conditions, exists over and above all of the other regulatory obligations referred to in #1 above;
- This Act specifically requires such an assessment for any proposed high-level nuclear waste facility;¹⁸
- This Act also has specific requirements for public participation and decision-making transparency.

3. Canada's international obligations under the *Convention on Nuclear Safety* (1996) and other treaties:

- There are no fewer than seven international treaties and conventions relevant to nuclear facilities and substances, and these legally-enforceable obligations provide another layer of oversight in a risk management context;¹⁹
- Again it should be noted that this level of international obligation and scrutiny is unique to the nuclear industry and is another counterpart to the limitation of liability offered in the *Nuclear Liability Act*.

4. The *Nuclear Fuel Waste Act* (2002):

- The requirement imposed on the nuclear industry by this Act, namely to conduct a public review of risk management options for the long-term disposal of nuclear fuel waste, is unique in Canadian risk management practice, representing yet another counterpart to the limitation of liability offered in the *Nuclear Liability Act*;
- The choice of preferred option, which must be made by the federal cabinet, is still subject to further review under the *CEAA* process.

¹⁷http://www.ceaa-acee.gc.ca/013/0002/nr031104_e.htm

¹⁸See NWMO Background Paper 7-3, pp. 33-36: "Projects involving the abandonment or disposal of nuclear substances therefore trigger the application of *CEAA* and must be subject to an environmental assessment" (33).

¹⁹NWMO Background Paper 7-3, pp. 57-63; see also "Canadian National Report for the Convention on Nuclear Safety," Third Report, September 2004: http://www.nuclearsafety.gc.ca/pubs_catalogue/uploads/I0750_e.pdf

5. The *Nuclear Liability Act* (1985):

- The controversial monetary limitation of liability (\$75 million) in this Act is very clearly balanced by an explicit provision in section 18(b) that “as a result of any injury or damage attributable to a nuclear incident, it is in the public interest to provide special measures for compensation”;
- The entirety of Part II of this Act is devoted to “Special Measures for Compensation” - a clear and unequivocal recognition of the government's responsibility to act as insurer of last resort in this matter.²⁰ (See also the comments in Section D above.)

F. Concluding Remarks.

This paper has considered the issue of nuclear liability in the context of Canadian public policy, specifically:

1. the four components of risk management for major hazards, as detailed in the case of natural hazards, a scheme which arguably is applicable to major technological hazards as well; and
2. the comprehensive allocation of responsibilities, in the case of natural hazards, between the two senior levels of government and the insurance industry; and
3. the wider structure of multi-faceted federal laws and regulations which establish a risk management framework for nuclear installations and substances; and
4. the place of nuclear liability within the foregoing dimensions.

Within the four component stages of risk management – mitigation, preparedness, response, and recovery – issues of liability come into play as a part of the fourth stage (although they are anticipated in the earlier ones). Depending on the type of major hazard, whether natural or technological, various parties have different types of responsibilities, across the four stages, a point that is illustrated in the text.

²⁰<http://www.uic.com.au/nip70.htm>, “Civil Liability for Nuclear Damage,” June 2004 provides some useful background information in an international context. The authors of NWMO Background Paper 7-3 do not comment on the sections dealing with these “special measures” in their discussion of the *Nuclear Liability Act*.

The fundamental idea of good risk management is to anticipate and prepare for the potential damages to persons and property associated with major hazards; this is the essence of a precautionary approach. This approach is well-established in Canada for the risks associated with the nuclear industry: A comprehensive network of laws, policies, and regulations is focused on reducing these risks to acceptable levels by a series of elaborate mitigation and preparedness steps.

The potential damages to persons and property from nuclear accidents which cannot be prevented give rise to liability for such damages. The monetary scope of liability for the nuclear industry is limited to a relatively small amount by Canada's *Nuclear Liability Act* (1985). However, this same Act imposes on the federal government the obligation to act as insurer of last resort and to provide “special measures for compensation” that have no preset monetary limit. The provisions of the Act are not consistent with prevailing international practices in countries with civilian nuclear power installations, however, and it is expected that the Act will be amended or revised in the coming years to achieve greater consistency with current international norms.