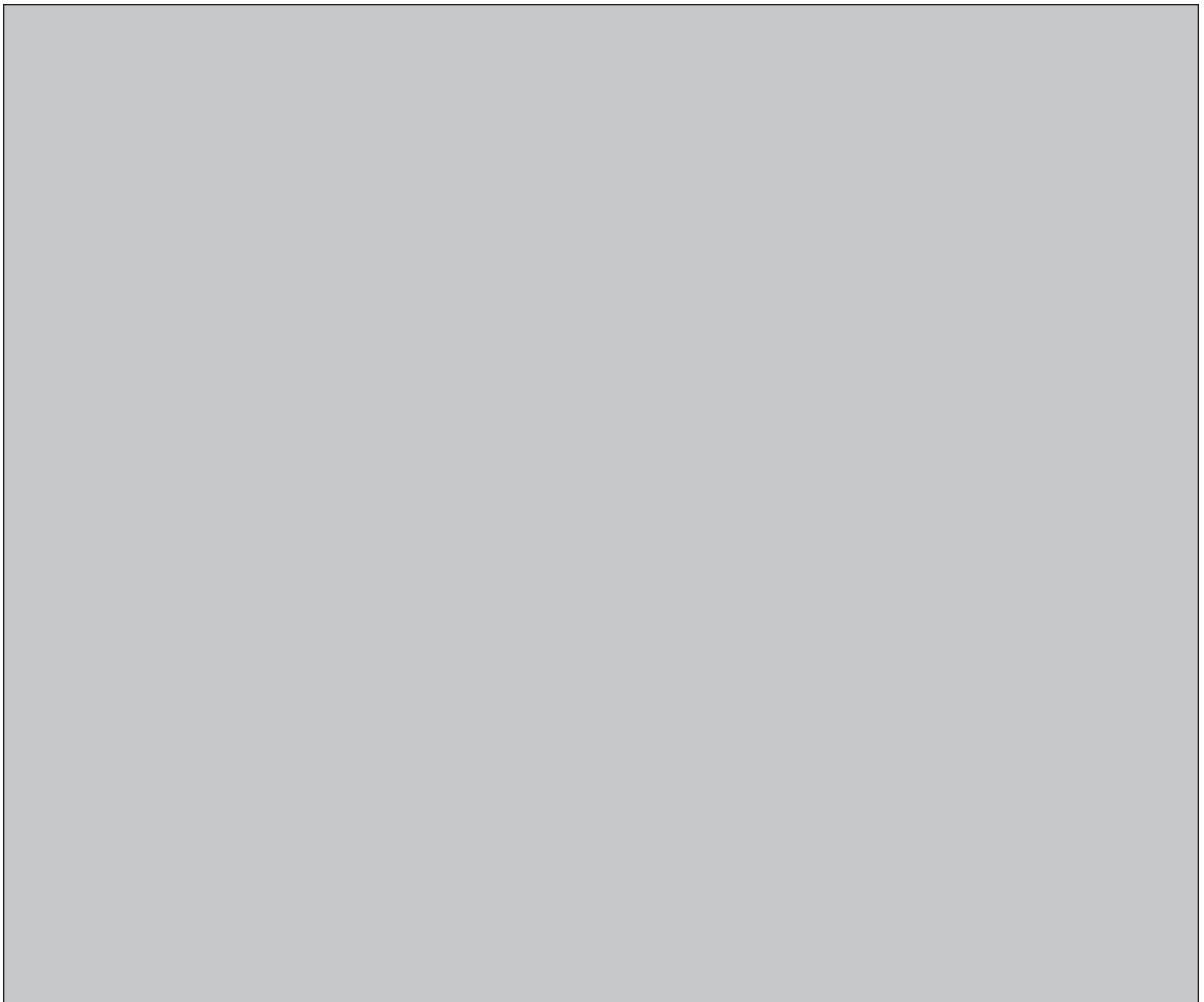


NWMO BACKGROUND PAPERS

2. SOCIAL AND ETHICAL DIMENSIONS

**2-3 KEY SOCIAL ISSUES RELATED TO NUCLEAR WASTE, OR
WHAT DO CANADIANS WANT TO DO ABOUT NUCLEAR WASTE?**

Maria Páez Victor, Ph.D.



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.

**Key Social Issues Related to Nuclear Waste, or
*What Do Canadians Want To Do About Nuclear Waste?***

Maria Páez Victor, Ph.D.

November, 2003

INTRODUCTION

Canada, as indeed every other country with nuclear power, has the serious challenge of finding a way to permanently and safely dispose, disable, store or use high level radioactive waste generated by the nuclear energy industry. Currently, Canada has 1.5 million used fuel bundles weighing 29,400 metric tonnes¹. About 85,000 spent fuel bundles are produced per year.²

This paper is an analysis of certain key social issues related to nuclear waste disposal with a focus on the conditions for and barriers to the emergence of social acceptability towards long-term management options for nuclear waste.³ The Seaborn Report defined social acceptability in this case, as follows

“To be considered acceptable, a concept for managing nuclear fuel wastes must

- a) have broad public support;***
- b) be safe from both a technical and social perspective;***
- c)***

f) Be advanced by a stable and trustworthy proponent and overseen by a trustworthy regulator.”⁴

HISTORICAL BACKGROUND

Decision to develop nuclear powered electricity

In Canada, the production of nuclear power began when Atomic Energy of Canada (AECL) was allowed to start a research reactor in 1962; then, in 1968, commercial electricity production with CANDU nuclear reactors was begun at Douglas Point. Subsequently, 19 nuclear reactors were built in Ontario, 1 in Quebec and 1 in New Brunswick.⁵ There was no significant formal process to consult Canadians or to seek their participation in the decision to go ahead with nuclear power. The benefits of nuclear power seemed self-evident to government and social acceptability was to a large degree, taken for granted.

Hare Panel

By 1977, the question of what to do in the long-term with the nuclear waste that was rapidly accumulating led to the appointment of a federal panel to study the issue led by Dr. Kenneth Hare. The Hare Report concluded that,

“Canada urgently needed a plan for the management and disposal of nuclear waste.”

AECL nuclear disposal project

The following year, the Government of Canada, in conjunction with the Government of Ontario, directed AECL to develop plans for the deep geological disposal of high level radioactive waste originating from used nuclear fuel of the CANDU nuclear reactors. The plans were to be maintained at the conceptual level, as no facility siting would occur until there had been a full

4

public hearing on the concept of geological disposal.⁶ AECL spent \$575 million on the research for this proposal.

The Seaborn Panel

In 1989, a FEARO panel was appointed to head the public hearing on AECL's nuclear waste disposal proposal, chaired by Blair Seaborn. Funds for participants to engage in the panel discussions amounted to only \$842,515. After ten years considering the AECL proposal, the Seaborn Panel concluded that

"The AECL concept for deep geological disposal has not been demonstrated to have broad public support...The concept in its current form does not have the required level of acceptability to be adopted as Canada's approach for managing nuclear waste."

The AECL proposal had inefficient public consultation and failed to take social science approaches as seriously as those of the natural sciences. In stating that the concept of deep geological disposal had been on balance, adequately demonstrated from a technical perspective, if not from a social perspective⁷, the Seaborn Report really indicated that the concept has not been demonstrated at all. Technical situations do not exist in an objective fashion, in some sort of social limbo. Technique and technology are the application of science in a real world of human beings, natural environment, society and culture.⁸ If a concept (deep geological burial) can meet certain engineering standards (the calculations of probabilities of risk) but does not meet social standards (the valuation of what that risk means to people and communities), then the concept or project is unacceptable in any real sense (except perhaps in a totalitarian society). The Seaborn Report concluded that,

⁶ Ontario Hydro owns most of Canada's nuclear waste, and it provided some studies for the AECL proposal (*Used Fuel Disposal Concept*), including the environmental impact assessment for the pre-closure stages of the project.

⁷ NWMO, Fact Sheet

⁸ Ursula Franklin, *The Real World of Technology*, 1990

“It became clear that there are widely differing views on the definition of safety, and on the question of how safe is safe enough, based on different technical and social perspectives.”⁹

The panel recommended the creation of a waste management agency to undertake a study of long-term nuclear waste management options.

Nuclear Waste Management Organisation

In November, 2000 the *Nuclear Fuel Waste Act* was enacted and the Nuclear Waste Management Organisation (NWMO) was set up to provide recommendations on the long-term management of nuclear fuel waste. The *Act* requires that the NWMO assess at least three approaches for the long-term management of nuclear fuel waste; deep geological disposal in the Canadian Shield, storage at nuclear reactor sites and, centralised

and what is considered relevant for measurement are all decisions which are influenced by social considerations.”¹¹

Technical issues –such as safety- are to be considered jointly with social issues -such as social acceptability- as indicated by the Seaborn Report. It defined safety as well as social acceptability in the following way,

“By safe, the Panel means meeting, on balance, criteria for safety as interpreted from both a technical and a social perspective. By acceptable, the Panel means broad societal consensus that the proposed course of action is the best available, taking into account ethical, social, technical and economic views.”¹²

FOUR SEMINAL SOCIAL ISSUES

Hearing participants, the Scientific Review Group and the Seaborn Panel identified any social issues and shortcomings of the AECL Nuclear Fuel Waste Management Disposal Concept.

These fall into the following categories,

- deficiencies of the “generic concept”, its appropriateness, need and timing;
- lack of consideration of alternative management options;
- inadequate public participation process including inadequate policy and decision-making;
- inadequate, flawed Environmental and Social Impact Statements including site selection; human health and safety impacts, transportation and costs;
- inadequate, incomplete risk analysis, inadequate modelling, unacceptable levels of uncertainty, insufficient capacity to make predictions over time;
- inadequate development of regulations and standards;
- inadequate ethical analysis;

¹¹ NWMO, “NWMO Approach to Development of Analytical Framework”, July 2003, p. 2

¹² Seaborn Report, 1998, p.21

- culturally inappropriate consultation with Aboriginal people and decision making process that ignored their rights;
- lack of trust or credibility of the proponent, the industry, the regulator and government to undertake, regulate or oversee this project.

There are, however, four seminal and inter-related social issues that set the contextual parameters for these and all other social issues on nuclear waste:

- The need to appropriately identify social values
- The solutions proposed do not include reducing or stopping production of nuclear wastes
- Scientific uncertainty and perpetuity of the risks challenges social institutions
- The need for a process that is trusted

(1) The Need to Appropriately Identify Social Values

Life in society means necessarily making choices, both individually and collectively. Resources and opportunities, never being limitless, inevitably induce conflict between shared values and between groups of peoples. Social values are simply, shared aims which are really important to people. Canadian society is rich in cultural diversity, which means that there are differing value systems among significant groups, in particular, those of the First Nations and Aboriginal peoples.

A situation in which two social values clash, that is, the two values cannot be upheld and attained equally, is more properly defined as a dilemma. Most environmental projects requiring impact assessment are enmeshed in such a clash of values. Typically economic values (desire for jobs, income, development) can clash with environmental values (desire for preservation and nurturing of the environment), or cultural values (desire to maintain a way of life or traditions), or ethical values (desire for social arrangements that reflect notions of truth, justice, equality, compassion).

The issue of what to do with nuclear waste is not a problem *per se*, but a dilemma. On the one hand, there is the search for a benefit: the Canadian government, seeking to provide Canadians

with the necessary electrical supply, made the decision to develop nuclear powered electricity. On the other hand, that very benefit posed a risk. There has been all along, grave potential for harm to human health and the environment ¹³which, we are bound to try to diminish because, as a society, we so highly value human health and life.

Values are intrinsic to evaluating risks

To address the issue of high level nuclear waste is to address the issue of risk and shared social values. Risk is an inherent characteristic of any project or proposal to deal with any level of nuclear wastes, as all of these wastes are potentially detrimental to human health.

Risk is, broadly, the existence of a threat to life and health.¹⁴ Technically, risk is defined as the probability of an event (“objective” calculation)

Different levels or types of social values

There are some important distinctions to be made about social values. First of all, they are shared, and not simply an individual preference. Some social values are core values. These are strongly felt, closely linked to a society's main social institutions and very hard, in principle, to be flexible about. These core values deal with rights, freedoms, duties, morality, life's ultimate aims and meanings. In our society, for example, two such values are the sanctity of human life and the pre-eminence of democratic rule.

Instrumental level social values relate to particular, more concrete situations, events or actual things that are esteemed by persons in a society such as money, social standing and jobs. These social values are more open to change, negotiation and even dissonance. Thus, while persons may uphold the sanctity of life, they may also value an army or automobiles, both, which may be detrimental to human life.

Process related social values have to do with the manner in which decisions and negotiations are made. These refer to principles such as fairness, openness, transparency, and accountability. For example, persons may justify soldiers taking life in war, if the war was legally declared according to its own constitution, UN rules and/or Geneva Convention, or may approve of automobiles so long as traffic rules and regulations are effectively enforced.

New social values emerge

Social values are not discrete nor are they immutable. They can change over time, especially in the light of new life challenges and social changes. For example, as the Seaborn Report indicates, there are today environmental values, such as conservation or sustainable development that were not widespread in the 1960's. Presentations to the panel

“...stressed the obligations of current generations not only to themselves but also to future generations and to the well-being of planet Earth itself; the need to reduce

¹⁶ Kasperson, 1978; Schrader-Frechette, 1991)

consumption and waste generation; the importance of re-using and recycling resources; and a trend away from disposal as a waste management approach.”¹⁷

We are witnessing the emergence of social values that stir a growing awareness in our society of the fragility of the natural environment and of the responsibility of our industrial activities and consumer consumption for the extensive damage to it. At the same time, there is a growing reluctance to rely unquestionably on technocrats, planners, industry or even politicians, to decide for the rest of society in matters where the environment, technology and economic activities meet to pose situations of risk.¹⁸

Given that all knowledge is a social construct, new values within the scientific community have also emerged with different perspectives that have implications for the management of nuclear wastes.

Values are not mere opinions

It is important to distinguish social values from transitory issues such as public opinion, concerns or trends. Values can be seen as a common conscience in individuals that is shared with the group or society, as opposed to simply an individual conscience.¹⁹ Not only do values guide an individual's behaviour, but also his/her society's because values are linked to the major social institutions such as religion, law, family, morals, economy, and polity.²⁰

There are important methodological implications if we want to identify social values. The methods by which social values are assessed have to be in tune with their nature, the gravity of the inquiry and the characteristics of the different social groups that comprise Canadian society. One does not seek people's core social values, or even medium-level values, as one would seek public opinions of taste, trends or and preferences. The run-of the-mill telephone polls, focus

¹⁷ Seaborn Report, February 1998, p. 17.

¹⁸ M. Paez Victor,

groups and questionnaires may not be adequate to convey the seriousness of the issue of nuclear waste nor the far ranging consequences of answers received. It needs a reflexive process that gives people a chance to consider what is important to them *and the reasons why*.

Consultation processes need to be tailored adequately; particularly those that intend to gauge “society as a whole” within a democratic framework. Along the same lines, the OECD Nuclear

(3) Scientific Uncertainty and Perpetuity of the Risks Challenges Social Institutions

It has been said that nuclear power represents a Faustian bargain: seemingly inexhaustible energy is given in exchange for eternal vigilance and control.²⁵ Nuclear risks have the potential to affect physically, socially, economically and politically, the local environments, people and communities and also the entire country for generations.²⁶ The nature of the waste is such that it

mechanistic way (i.e., the optimal number of trees in a forest or fish in a lake). New observations have led to a different perspective: that all ecosystems exist in cycles of growth, collapse and new types of re-birth, which allow for novelty and adaptation. This perspective has enormous implications for the nuclear waste options.

In ecosystem management, the complexity of the system increases as levels of uncertainty increase, and ability to control stressors decreases

*“Rather than assuming stability and explaining change as often done, one needs to assume change and explain stability”.*³¹

The conclusion arrived at from the perspective of complex systems thinking is that management processes can be improved by making them adaptable and flexible, able to deal with ecological uncertainty and surprise, and by building capacity to adapt to change. It emphasises the importance of process and the crucial need for feedback in shaping policy.³² This is a far cry from the idea of building an impregnable repository that will eventually be sealed forever from nature and equally independent from social systems. It is also a far cry from basing key decisions on the latest opinion poll - sn

Considering the results of the Seaborn hearing, this community has proven cohesiveness, vitality and efficacy. The relationship between NWMO and the community of interest will be tested on the process of public participation.

It has been said that attention to process is the first wisdom in facing environmental problems. A wise process for citizen participation is the only way that a significant degree of social acceptance for any nuclear waste management option could emerge. We can have an advanced technological society, but unless we develop ways to incorporate deeply felt shared social values in planning and decision making that includes the decision on the very existence, development and implementation of technologies, such as nuclear power then, we will not have an advanced democratic society.

Future governmental decisions regarding nuclear waste will not be as easily taken or regarded as was the initial decision to establish nuclear power, because of a host of subsequent safety incidents, inefficiencies and communication deficiencies attributed to the nuclear industry. These have led to a palpable degree of mistrust among interested non-governmental organisations, Aboriginal groups and environmental stakeholders.³⁴ The Seaborn Report recognised such mistrust:

“The process of developing an appropriate plan for managing nuclear wastes must reflect our societal context. That context includes widespread public concern over the handling of all toxic and persistent industrial wastes, fear of losing control in the planning and decision-making process, lack of trust in political and institutional leaders, scepticism of scientific predictions that are based on uncertainty, and a healthy suspicion that, in the final analysis, no one will be accountable...A deeply entrenched fear and mistrust of nuclear technology exists within some segments of our society. This “dread” factor is real and palpable.”³⁵

³³ M. Paez Victor, 1993, op. cit., p. 20

³⁴ Incidents at Chernobyl and Kyshtym (former USSR), Three Mile Island, Savannah River, Hanford (USA), Sellafield, UK. The CANDU reactors have had a much better accident record than others but have had numerous operation and environmental problems.

³⁵ Seaborn Report, 1998, p. 18

AECL failed to engage the general Canadian public, Aboriginal peoples and interested groups in meaningful and honest dialogue. In that first round, AECL's poor attention to the intrinsic nature of social and technical issues and its consequent deficient public participation process have left a much soured relationship with the social community in its wake.

The Seaborn Report counterbalanced that mistrust when it rejected the geological burial proposal and by setting important public participation guidelines for the new agency, NWMO. The Seaborn Report stated the following,

“The Panel believes that the chances of finding an acceptable concept and site(s) will be remote unless there is early and thorough public participation in all aspects of managing nuclear fuel wastes...Past public participation strategies, although well intended, do not appear to have been effective because a significant portion of the public did not trust the nuclear industry and the regulatory agency.

One way for the NWMO to overcome public mistrust is not to ask for it but to help the citizens and the community of interest have open access of information and resources through its own venue and through that of other organisations and institutions.³⁶

Obtaining Broad Canadian Participation

A key ethical principle (and process value) concerning environmental risks has been widely recognised: that those who are to bear the risks –i.e. the citizenship in general and the local communities- have the right to fully participate in the decision-making process concerning those risks.³⁷

³⁶ Peter M. Sandman, *Getting to Maybe: Some Communications Aspects of Siting Hazardous Waste Facilities*, Seton Hall Legislative Journal, vol. 9, 1986, No.2

³⁷ M. Paez Victor, Ontario Hydro, “Framework for the Social , Cultural and Economic Impact Assessment of the Used Fuel Disposal Concept, Support Document A4 to Ontario Hydro Pre-Closure environmental and Safety Assessment of the Used Fuel Disposal Concept, September, 1993

This is implicit in the NWMO mandate, which indicates that the NWMO must obtain broad Canadian participation to reach its recommendations. Broad however, might simply mean wide

There is a growing body of knowledge on how to incorporate people's values into policy and decision making.³⁹ The standard approach to risk and policy decision has been to forecast. That is, starting with two or three values, one can forecast the risk of a policy decision.

“It does not require that the elements of a desired future be known in advance. Instead the user goes through a process of learning and discovery, in which the desired future is a product of the process of trying to reach it.”⁴¹

Using computer technology and knowledge of risk communication, it is not only plausible but also feasible to arrange a program whereby Canadians from coast to coast can take part in such an exercise. It is clear that the mandate of the NWMO indicates that it must obtain the

to be made by political representatives either in the government party and the federal Parliament and, particularly if it comes to a process of siting, one, several or all provincial legislatures and municipal councils. There is no doubt whatsoever that the duly elected government has the legitimate right, and indeed mandate, to make decisions concerning nuclear waste. However, in terms of the participation of the citizenry, there are those however, that believe that only a referendum would give this generation of Canadians a sense of having been consulted and that their voice was heard. As C.P. Wolf insightfully stated with regards to nuclear waste

“Some kind of decision process must be established that even the loser will find acceptable, and we doubt that anything other than public referenda will be able to accomplish this goal.”⁴³

As the Canadian political experience well shows, a referendum option would need to be very precise, with clear options presented to the public. This option would be elaborated on the basis of what was discerned about Canadians’ values and desired future through the first, reflexive, phase of the process. As the Swedish experience on nuclear referendum has shown, a referendum may not be enough because its outcome needs to be accompanied by the political will to implement it.⁴⁴ The issue of the political will to implement

- **to have an innovative, representative and iterative process for identifying Canadian social values relevant to nuclear management**
- **to include as part of any management scheme the need to and the means to reduce or stop the production of nuclear waste**
- **to face scientific uncertainty from the perspective of complex systems thinking**
- **to obtain broad, representative, clear, participation of Canadian citizens in a reflexive dialogue on the issue that can dovetail into a democratic, institutional, politically sound decision-making process, that may, ideally, include a referendum.**