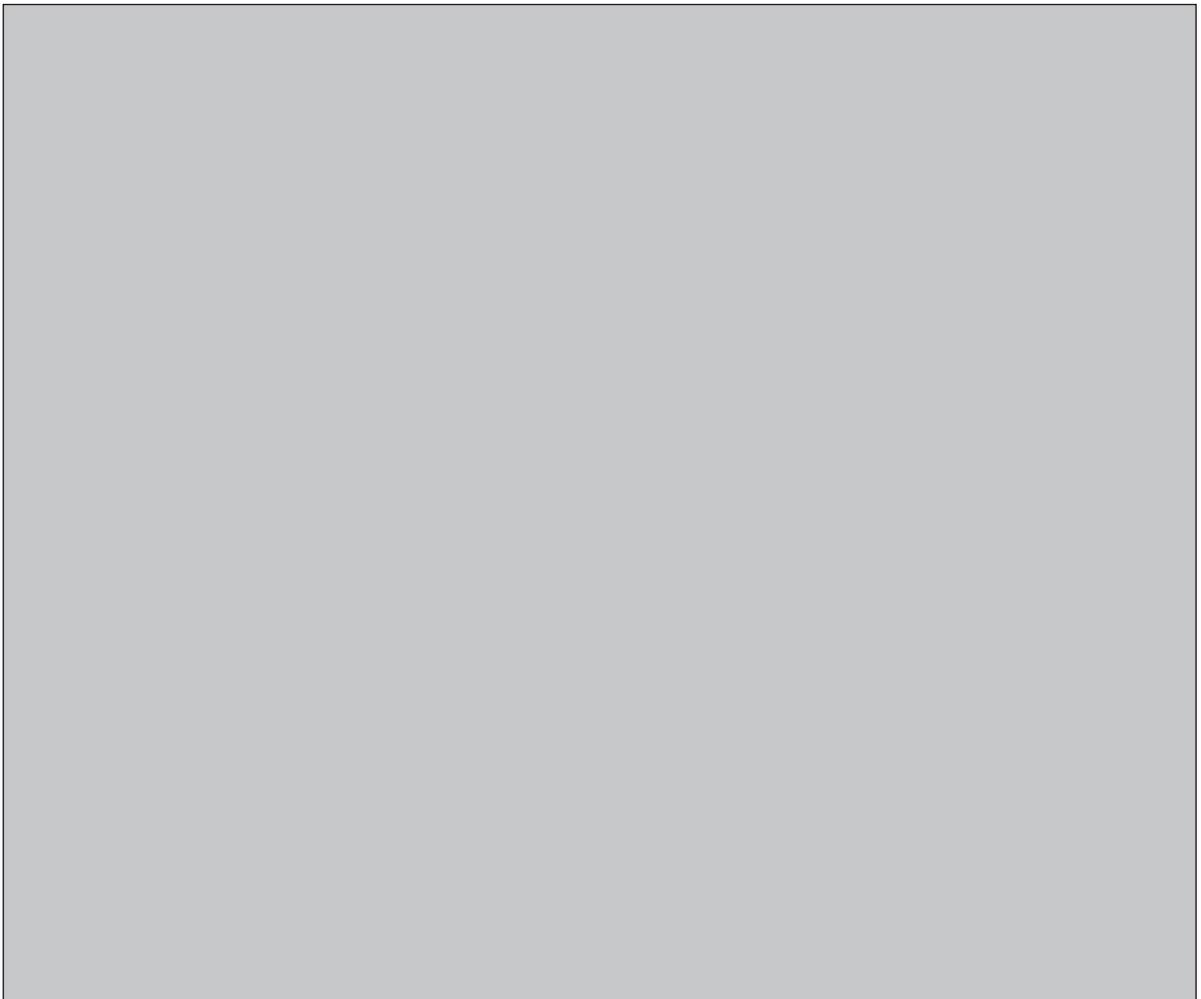


NWMO BACKGROUND PAPERS
2. SOCIAL AND ETHICAL DIMENSIONS

**2-9 REVIEW OF FACTORS INFLUENCING 'SOCIAL ACCEPTABILITY' - IN CONSIDERING
LONG TERM WASTE MANAGEMENT APPROACHES**

Nuclear Waste Management Organization



Review of Factors Influencing ‘Social Acceptability’
- in considering long term waste management approaches

Nuclear Waste Management Organization

I. INTRODUCTION

The NWMO has committed to “develop collaboratively with Canadians a management approach that is socially acceptable, technically sound, environmentally responsible, and economically feasible.” This paper is designed to support discussion concerning the first of these four dimensions - social acceptability.

The objective of this paper is to help spark thinking about how the concept of ‘social acceptability’ might be understood, and what its requirements may be in decision-making related to the long-term management of used nuclear fuel in Canada. This paper begins with a brief discussion of the context within which ‘social acceptability’ entered into the dialogue on this public policy issue in Canada. The paper then outlines some of what various others have done and/or said. The paper concludes with a brief reflection.

II. HISTORICAL CONTEXT

i) Background

The question of what should happen to Canada’s nuclear energy wastes is one that has taken the time and energy of more than a generation of stakeholders. Dialogue on this issue has largely been focused on stakeholder reaction to a specific, preferred solution selected by experts - the AECL concept for deep disposal in the Canadian Shield. Relatively few members of the public, outside of the small and specialized stakeholder community, have been involved in any dialogue (and decision-making), or have even been exposed to the issues.

Public opposition has forced changes to the program to develop and implement the geological concept, at a number of key points in the program. Included among these are: substantially derailing the progress of technical research activities related to the disposal concept (through Municipality refusal to allow activity within their borders in 1977); and, forcing the program to step back from siting considerations and the public controversy associated with it, in favour of further review of the concept itself (1981).

The more than 20 years of formal dialogue on this issue lead in December 1998, with a Federal Government Policy Statement, in part in response to a close to ten-year environmental assessment of the AECL concept. This statement featured the conclusion that the AECL disposal concept, the foundation for the long-time dialogue, had been demonstrated to be technically acceptable, but public acceptance had not yet been demonstrated.

From the perspective of public acceptance, this announcement might be interpreted as the formal culmination of an evolution in approach to decision-making on this issue:

from the view that this “facility design decision” can be made by the nuclear technology community itself, to a recognition that the broader society must be involved in decision-making in a meaningful way before such a program can be effectively implemented.

ii) The Seaborn Panel

In 1984, a concept for the management of used nuclear fuel in Canada was developed by Atomic Energy of Canada Limited (AECL) at the request of the federal and Ontario governments. This concept was subjected to a close to ten-year public Environmental Assessment and Review process which, in 1998, culminated in a report known as the ‘Seaborn Report’ after its chairman, Blair Seaborn. Among the key conclusions of the report were the following:

From a technical perspective, safety of the AECL concept has been on balance adequately demonstrated for a conceptual stage of development. But from a social perspective, it has not.

As it stands, 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 fuel wastes.¹

The Panel set out a list of criteria which it believed needed to be addressed in order that a concept for managing nuclear fuel wastes be considered acceptable. According to the Panel, an *acceptable* concept must:

- a) have broad public support;
- b) be safe from both a technical and a social perspective;
- c) have been developed within a sound ethical and social assessment framework;
- d) have the support of Aboriginal people;
- e) be selected after comparison with the risks, costs and benefits of other options; and
- f) be advanced by a stable and trustworthy proponent and overseen by a trustworthy regulator².

In order to assess broad public acceptability, the Panel considered it important that the management options be measured against the predominant *values* held by Canadian society.³ The Panel considered it important that the ethical and social assessment framework also address *social and environmental issues and priorities*⁴.

¹ Report of the Nuclear Waste Management and Disposal Concept Environmental Assessment Panel, CEAA website: www.ceaa.gc.ca/0009/0001/0012/001/7_e.thm p. 2.

² Ibid, Page 34 - 35

³ Ibid, Page 72

⁴ Ibid, Page 73

The Panel advised that “[a]ssessment of the safety and environmental implications of any major proposal is likely to involve related social and ethical questions. ... Technical, social and ethical aspects of nuclear fuel waste management are inextricably related and must be viewed within the full context of contemporary societal thinking⁵

The Seaborn Panel alluded to the potential difficulty in achieving public support or acceptance in its discussion of the many unresolved ethical questions and the differing and conflicting value systems or ethical approaches which surface in discussion of this issue, including:

- emphasis on economic growth to improve the lot of humankind versus the need for sustainable growth;
- valuing the natural environment primarily for its usefulness to humans versus a less anthropocentric view;
- faith in rationality, science and technology (government or institutions) to solve difficult technical problems versus a lack of such faith⁶.

iii) **The Nuclear Fuel Waste Act**

This dialogue culminated, in November 2002, with the Government of Canada passing the *Nuclear Fuel Waste Act*. Importantly, the *Act* has set a requirement that the framework which is used to consider the management options must include social, ethical and economic considerations. The Act (Section 12(4)) specifically states:

Each proposed approach must include a comparison of the benefits, risk and costs of that approach with those of the other approaches, taking into account the economic region which that approach would be implemented, as well as ethical, social and economic considerations associated with that approach.

This forms an important part of the context within which the NWMO was formed, its mandate identified and the nature of the social acceptability requirement established.

⁵ Ibid, Page 17 – 18.

⁶ Ibid, Page 17.

III. REVIEW OF OTHER COUNTRIES – OBSERVATIONS FROM EARLY INTERNAL REVIEW

i) Introduction

At the inception of the NWMO, NWMO staff conducted an informal and high level review of the past efforts in four countries (UK, France, Sweden, Germany) to identify and implement an “acceptable” long-term waste management method in their jurisdiction. The focus of the review was on actions being undertaken in these countries leading up to the time of the review as identified and discussed publicly by selected authorities in that country. These authorities included: implementers; regulators; and, government departments.

The review suggested that these authorities did not tend to identify and discuss a stream of activity related to “acceptance” that is separate and distinct from their other programs and activities. Acceptance related activities, instead, tended to be raised and discussed in the context of the fundamental question facing the long term waste program of why a disposal project or site had to be abandoned or delayed within the country. And, for the most part, both the problem and the solution were seen to lie in the social/public rather than technical domain. Any activities which were described by authorities as directed at overcoming obstacles to progress on waste management not amenable to a strictly technical, scientific and/or engineering solution were considered.

In order to begin to identify these activities, the review included papers and presentations made by authorities in forums which were specifically designed to discuss the various non-technical types of approaches and activities being employed to advance long-term waste programs. Two forums were selected for the purpose of this discussion:

- ***Forum for Stakeholder Confidence:*** A workshop that was sponsored by the Nuclear Energy Agency in Paris, August 2000 and which involved industry representatives from a number of European and non-European countries. The workshop was introduced as having the following purpose in mind:

In recent years, radioactive waste management institutions have become more and more aware that technical expertise and expert confidence in the safety of geologic disposal of radioactive waste are insufficient, on their own, to justify to a wider audience geologic disposal as a waste management solution or to see it through to successful implementation. Partly due to a sensitivity of the public on all matters connected to protection of the environment, nuclear power, and especially nuclear waste ... the decision whether, when and how to implement geologic disposal will need a thorough public examination and involvement of all relevant stakeholders. ... The Forum on Stakeholder confidence has been charged with investigating and distilling the lessons that

can be learnt from national and international experience. The intention is to be useful to the Member countries of the Nuclear Energy Agency in their efforts to set up effective means of radioactive waste management while taking into account the input of relevant stakeholders.⁷

- ***The VALDOR symposium.*** A Symposium that was sponsored by Swedish Nuclear Power Inspectorate, Swedish Radiation Protection Institute, Environment Agency UK, UK Nirex, and European Commission/DG Environment in Stockholm in June 2001. The stated objective of the Symposium included the following:

The symposium addresses the role of experts, media and regulators in complex decisions, as well as procedures that can enhance transparency. Special focus is given to biotechnology and nuclear waste management. The problems of risk communication and transparency in these areas such as high degree of complexity, fragmentation in debates, mixing facts and values, mistrust in experts, etc, are shared with many other fields. We thus hope that VALDOR 2001 can contribute to the development of transparent decision processes for complex issues in modern democratic society.⁸

Appendix 1 outlines some of the references consulted as part of this early and informal review.

ii) Key Themes in Discussion of Acceptance

The review suggested that a number of issue areas had come to be commonly identified in each of the countries as important to increasing acceptance within their jurisdiction and moving their long-term nuclear waste management program forward. Although these issues appeared to be commonly recognized, the countries appeared to differ in their response to them. The different country approaches, at least in part, appeared to reflect the differing cultural contexts and evolution of the issue within the jurisdictions.

a) Shift in Leadership on Issue from Implementer to Government

Each of the four countries had shifted away from an implementer lead effort to a largely political, or partnered effort lead by the government. This is because the characterization of the waste management decision as a largely technical issue, to be resolved by the implementer, had failed in each of the countries in the face of what was in some instances violent, public opposition. The waste decision had come to be seen as one that largely needed to be made in the political arena.

⁷ Stakeholder Confidence and Radioactive Waste Disposal Workshop Proceedings, Nuclear Energy Agency, August 2000 pp. 28-31

⁸ From Foreword to Symposium Proceedings, Valdor 2001.

The UK, France and Germany appeared to have moved towards a Parliament lead process. Sweden, closer to siting, had increased the role of the regulator in terms of influencing, and leading, what had become a more public decision-making process.

b) Shift from Technical Considerations to Process Considerations

Along with this shift away from an implementer lead effort there was also a shift from an effort centred on the acceptability/appropriateness of the technical approach itself towards a focus on implementing, what might be seen by stakeholders as a more 'legitimate' *decision-making process*. The decision-making processes that were being implemented tended to be distinguished from past approaches in the following ways:

- Have no predetermined outcome, in contrast to a decide-announce-defend approach (no decision on waste management option made in advance, and/or the process to be used to choose a site not yet determined). This involved reopening, or providing the potential to reopen, past decisions;
- Present the decision process as more open-ended with incremental (staged decision making) rather than final decision-making;
- Conduct ongoing research as a prominent component with research to be conducted throughout, and potentially beyond, the decision process;
- Ensure decision-making process is clear and understandable to stakeholders/public;
- Focus on inclusiveness, and effort to involve a broader and more wide ranging set of stakeholders/public in dialogue;
- Attempt to achieve early involvement of stakeholders/public;
- Increase breadth of involvement through use of non-traditional consultation and dialogue techniques;
- Attempt to identify and address stakeholder/public values;
- Formally ensure independent sources of information and advice are input to the process as a means of ensuring that the information base is adequate for making the decision;
- Interest in using new venues for dialogue, which are not industry controlled and thereby may enhance the legitimacy of the decision process – the EA framework is of particular interest as a platform for dialogue and information exchange, although not decision-making.

In a Green Paper which laid out the path forward in long term nuclear waste management decision-making, the UK government set out a number of process related requirements for the purpose of inspiring confidence in the waste management plan decision to be made. Among these requirements, the government discussed the need to demonstrate: all waste management options are considered; choices between them are made in a clear and logical way; people's values and concerns are reflected in this process; information provided is clear, accurate, unbiased and complete;

involve a large and diverse group of people; provide independent authoritative advice (independent body) on research requirements; and, conduct consultation on the process by which decisions will be made. The paper suggested a variety of consultation/involvement techniques are required, including innovative techniques.

In France, the *Law of 1991* on nuclear waste established a process of democratic decision-making on the issue, with no predetermined outcome. The *Law* also established: an independent scientific assessment (implemented by the National Review Board to be submitted to the French government and Parliament); and a local Information and Oversight Committee (comprised of elected officials, local associations, professional organizations) to oversee any underground laboratory which may be built. Contemporary decision processes (Granite Mission) which had been instituted also featured an independent, primarily technical expert lead, process in an attempt (although failed) to increase the legitimacy of the process.

The efforts of both the Swedish regulator and the municipal governments of potential sites had come to greatly focus on issues associated with the legitimacy of the decision-making process. The process appeared to be evolving towards: increased role for regulator directed at ensuring, and being seen to ensure, that the national (public) interest is being protected; hearings selected as a platform for establishing/enhancing legitimacy of decision-making process by regulator and for broad participation and information dissemination; focus on making values explicit; use of unbiased and skilled moderators for hearings and use of independent verification for level and quality of participation; and, extensive efforts to engage the public both through traditional and unconventional means.

In Germany, the Government struck a Committee of independent experts (Committee on a Selection Procedure for Disposal Sites) to develop a comprehensive procedure for the selection of sites for radioactive waste disposal. The Government instructions to the group included: the procedure is to be built upon well founded criteria and derived in a sound and unprejudiced way; the Committee is to work independent of any ministerial or political instructions and comprise members with widely different views; and, the Committee can initiate research projects and be supported by external expertise. Initial work of the Committee highlighted the need: for early public participation; to obtain feedback on people's values and interest; and, to implement initiatives to intensify public participation.

c) Institutional Requirements Considered Critical

With a shift towards emphasis on the process had also come a greater recognition and emphasis on the characteristics and roles of key players within that process. More specifically, there was concern regarding how these organizations and their activities could contribute to the legitimacy of the decision-making process. This concern may have been in part due to past failures having left a legacy of mistrust concerning the authorities involved in the failed effort. The key issue, in this regard, appeared to be

mistrust concerning these authorities acting in the public interest. This had led to heightened emphasis on the trustworthiness of the proponent and/or the regulator as the lead organization and/or protector of the public interest in the oversight role. This had also led to greater exploration and use of independent authoritative groups to either make decisions, or contribute to decisions, at what are considered to be key points in the process (i.e. the assessment of information, the delivery of information, the assessment of breadth of participation).

The House of Lords Select Committee on Science and Technology in the UK, who produced the report to which the Government response was directed, concluded that organizational trust, although difficult to achieve, is important to developing acceptance of the waste management decision. The Swedish regulator had initiated substantial research activity to assist in identifying how it could present and conduct itself as a trustworthy and credible authority on behalf of the public interest. This reflected their conclusion that this trust and credibility is instrumental for ultimate public acceptance of the waste decision. The French and German decision processes factored in prominently the involvement of independent, non-industry, authorities in oversight and decision-making throughout the process.

d) Recognition Longer Timeframes Needed

In making these shifts in focus and leadership, the four countries had also appeared to move in the direction of revising, or making more open-ended, the timeframes within which they expected progress to be achieved.

France allocated 15 years to conduct additional research into alternatives before making a recommendation. The UK embarked on what appeared to be a largely open-ended process.

The Government and the Devolved Administrations recognize that it will take a long time to identify and implement a management option for radioactive waste that commands widespread support. We firmly believe that it will be important not to rush this process, but to take the time required to ensure that each step forward commands the widest possible public support.⁹

Sweden appeared to have encountered unexpected delays in its decision process and many issues, including the disposal methodology, were still to be resolved/confirmed. Germany's decision-making process for site selection was still under review and no timeframe had been set.

⁹ DEFRA. "Managing Radioactive Waste Safely – Proposals for developing a policy for managing solid radioactive waste in the UK. (September 2001)

e) Treatment of Risk

The approach to the identification and assessment of risk also appeared to be considered important and was an area of activity and exploration. The search for public/stakeholder acceptance had led to thinking and activity in the following direction:

- Assessment of risk is not amenable to an objective interpretation by experts, instead it needs to occur through public dialogue and debate;
- There is a need to involve the public/stakeholders in: scenario development; approach to dealing with long timescales involved; incorporation of issues that are more tangible to stakeholders; hazard identification; risk estimation; questioning technical assumptions; and/or, scenario development;
- There is a need to move away from trying to convey and demonstrate ‘zero risk’, which is not considered credible over the timescales involved, to finding a way to identify and demonstrate socially determined ‘acceptable risk’;
- The assessment of risk may not be a decision to be made at a single point in time but on which requires continual assessment since it is influenced by changing public attitudes and values;
- There may be a need to avoid irreversible decisions/situation because risk cannot currently be sufficiently mitigated for any ‘final decision’;
- It may be necessary to provide to public/stakeholders a compelling rationale as to why a solution needs to be implemented now, given the uncertainty which continues to exist around risk.

The French nuclear industry had initiated a project to explore the need to socially negotiate risk, as a continual process, associated with decisions that are reversible. The UK Environment Agency, a key government department for waste decisions, was investigating ‘participatory risk assessment’ as a means of engaging stakeholders and the public in the identification and assessment of risk. Nirex had work underway to involve stakeholders and experts in a mutual dialogue as part of risk based performance assessment, as a means to increase acceptance of the assessment. The Swedish regulator’s attention to identifying and addressing public values in waste decision-making also sought a broader dialogue among stakeholders/public and experts concerning identification of the source and level of risk. As well, each of these countries had acknowledged the need for some retrievability and reversibility as part of an incremental or step-wise decision-making process.

f) Influence of Policy Context

Recognition that acceptance of nuclear waste management plans can be negatively influenced by public concerns with the broader policy context lead to efforts to address, or minimize, the impact of policy concerns on acceptance of waste

management plans. The broader policy considerations that tended to be discussed included:

- Policy re future of nuclear energy in the generating mix: A policy which sunsets nuclear plants (Sweden, Germany) is helpful; a policy which supports open-ended continued use of nuclear energy in the energy mix (France, UK) is problematic. In the case of the latter, the public/stakeholders need to be convinced that a decision on waste management is not *de facto* a decision on future nuclear power generation;
- Policy on waste imports: A policy which bans imports of nuclear waste into the country (France) is helpful; a policy which allows such imports, or does not specifically ban such imports is problematic;
- Policy on construction of new nuclear plants: A policy which bans construction of new nuclear plants (Sweden, Germany) is helpful; a policy which allows or encourages construction of new nuclear plants (France) makes obtaining acceptance of waste management plans more difficult.

g) Modification to Concepts

It was generally recognized that some modifications to the deep disposal concept are necessary for its acceptance. The modifications specifically mentioned focused on retrievability and reversibility. It was broadly recognized that the need for both of these modifications is socially rather than technically driven.

h) Key Questions

While the issues above were raised by authorities in the four countries as important, none of these authorities claimed they had definitively addressed the issues in their plans. Instead, these issues were areas of active investigation, evolving plans, and information exchange. The following list of questions is only a subset of those explored within the four countries as part of their continuing efforts to identify and implement acceptable waste management methods:

- What does a legitimate decision making process look like? How can differences in values among stakeholders/public be addressed? What does legitimate public/stakeholder involvement look like?
- What does a trustworthy implementer and/or regulator look like and how does it go about conducting its activities? What does protecting or reflecting the public interest mean when there are stakeholders or members of the public who will oppose any plan which is put forward?
- How can the uncertainties around long timeframes and risk be addressed in a way that is meaningful to public/stakeholders? How can the need to make a decision now be communicated in the face of uncertainty about risk?

- How can stakeholder/public sensibilities and tolerances be brought into performance and risk assessment so that these risk assessments are more relevant to stakeholders/public? How can we engage experts and lay public in a single dialogue which will lead to confidence and support?
- How can the waste management decision be separated, in the minds of stakeholders/ public, from any policy determination to support continued nuclear generation?
- What do stakeholders/public mean by reversibility and retrievability? How does this impact the nature of the concept? What is the impact on how we go about assessing the performance of that concept?

IV) EARLY STUDY INPUTS

A number of early inputs to the NWMO study process suggested a range of prerequisites for social acceptability or public acceptance. Several of these early inputs are briefly described here.

i) Public Attitude Research

Some public attitude research conducted among Canadians early in the NWMO study process¹⁰ provides perspective on some of the practical constraints on achieving social acceptability of any approach for long term used fuel management.

- There exists a very low awareness of the issue, and desire to become involved, among the public at large;
- There exists very low knowledge of the existence of used nuclear fuel and how it is currently managed among the public at large;
- Although many consider it important for the public to be involved in decision-making, few are prepared to personally become involved;
- Information dissemination and education on the practicable options available, alone, does little to significantly increase acceptance of them;
- The trustworthiness of the institutions and authorities implementing and monitoring the waste management approach is key to the perception of risk and managing risk in the minds of many citizens. This trust influences public support both directly and indirectly through risk perception, stigma associated with nuclear uses and facilities, and perceived benefits;
- There exists among the public a deep scepticism about the trustworthiness of the nuclear industry, the ability of scientists to anticipate and fully understand the performance of options, and, to a lesser extent, the trustworthiness of government;

¹⁰ See: NWMO Dialogue Reports: 12-1. Report on Discussion Sessions. Navigator Ltd.; 12-2. Report on Nation-Wide Survey. Navigator Ltd.

- Before the public can be successfully engaged in a dialogue on alternatives, it must first be convinced of the need to make a decision on this issue;
- No amount of risk is perceived as acceptable in the absence of receiving what is perceived to be more than equal benefit. Acceptance of a waste management alternative is likely to be based on the public perceiving greater benefits associated with the alternative than costs/risks;
- Public and stakeholders must be convinced that practicable management approaches exist now from which we can choose.

ii) Roundtable on Ethics

Early in the study process, the NWMO's Roundtable on Ethics suggested that for a socially acceptable management approach¹¹:

- There is a need to embed ethical and value considerations in all aspects of the study, including the decision-making process and the outcome. These considerations need to be discussed openly;
- It is important to disclose uncertainty, clearly and humbly;
- It is important to strive for 'equity' both within the current generation and across generations, including humans and other species; and
- (To the extent feasible), benefits and harms associated with a management approach should be determined by those most impacted.

The Roundtable suggested an Ethical and Social Framework containing a set of questions which ought to be considered throughout the process. Within this framework,

- Process considerations include¹²: conduct activities in a way appropriate to making public policy in a free, pluralistic, and democratic society; in a way which is impartial; in a way that is inclusive; and which factors in the best science, the best natural science, the best social science, and the best ethical thinking; publicly identify and discuss limits to the current state of knowledge and areas of uncertainty; in a way which is transparent; consistent with the precautionary principle
- Substance considerations include: reflect respect for life, whatever form it takes, wherever it occurs, and whenever it occurs (now and into the foreseeable future); attempt to determine the risks, costs, harms and benefits of the options under consideration, including both financial and other costs; fairness, including appropriate allocation of costs and risks to the beneficiaries of nuclear power and affected regions, and future generations and nonhuman life forms; protection of the liberty of future generations to pursue their lives as they choose.

¹¹ See: NWMO Discussion Document: Asking the Right Questions? p.47

¹² See: NWMO Discussion Document: Understanding the Choices and NWMO Background Paper 2-7. Ethical and Social Framework. NWMO Roundtable on Ethics.

iii) NWMO Background Paper Authors

Many of the authors commissioned to write background papers as a means to help set the information foundation for the NWMO study suggested social acceptability prerequisites. Some of the direction which emerged through these papers is briefly highlighted below.

From the Perspective of Sustainable Development: David Runnalls¹³ suggested that options for managing nuclear fuel wastes must be measured against not only technical criteria, but also the predominant values held by Canadian society. “Though values vary greatly in detail within and between cultures, at the heart of the concept of sustainability there is a fundamental, immutable value set that is best stated as ‘parallel care and respect for the ecosystem and for the people within.’” From this value set emerges the goal of sustainability: “to achieve human and ecosystem well-being together”. He suggested a list of ten questions which must be answered as the practical embodiment of these values in assessing the suitability of waste management approaches:

- *Engagement.* Are there commitments to processes of community engagement ...
- *People.* Will the project/operation lead directly or indirectly to maintenance of people’s well-being? ...
- *Environment.* Will the project or operation lead directly or indirectly to the maintenance or strengthening of the integrity of biophysical systems so that they can continue to provide the needed support for the well-being of people and other life forms?
- *Economy.* Is the financial health of the project assured? ...
- *Traditional and Non-market Activities.* Will the project or operation contribute to the long-term viability of traditional and non-market activities in the implicated community and region? ...
- *Institutional Arrangements and Governance.* ... Is it conceivable that one could develop social and governance structures necessary to keep these wastes safe over literally thousands of years? ...
- *Overall Integrated Assessment and Continuous Learning.* Has an overall evaluation been made and is a system in place for periodic re-evaluation based on consideration of all reasonable alternative configurations at the project level (including the no-go option in the initial evaluation)? ...
- *Security.* Does this method of dealing with radioactive waste contribute to North American security? ...
- *Ethics.* Is this process itself being carried out in an ethical fashion? ...
- *Risk and precaution.* Do we have an adequate perception of the risks of each of the possible solutions?

¹³ See: NWMO Background Paper 1-1. Sustainable Development and Nuclear Waste. David Runnalls, IISD.

From the perspective of the application of Precaution: Andy Stirling¹⁴, in discussing the implications of the scope and complexity of risk on finding a socially acceptable management approach suggests there is a subjective component to risk appraisal, the implementation of which needs to be considered and addressed:

Put simply, the point is that “it takes all sorts to make a world”. Different cultural communities, political constituencies or economic interests typically characterize these different aspects of environmental and health risk in different ways and attach different degrees of importance to them. These translate into different – but equally reasonable – ‘framing assumptions’ in formal quantitative appraisal. Within the bounds defined by the domain of available information and plural social discourse, there exists much legitimate scope for divergent interpretation. No one set of values or framings can necessarily be ruled more ‘rational’ or ‘well informed’ than can any other.

He draws from his discussion of the subjective component of risk appraisal, the need for ‘independence through pluralism’ rather than ‘independence through objectivity’. The subjective element in appraisal can be acknowledged, while retaining due respect for the ‘hard scientific facts’, by providing for the balanced and systematic exploration of the implications of different assumptions and value judgments. He argues against conventional risk appraisal and for a new approach based on multiparty assessment, transparency and inclusion:

Rather than seeking to provide justification (whether general or specific) for policy decisions, the business of appraisal is far better seen as a matter of exploring the particular ways in which different – but equally legitimate – assumptions can yield a justification for a range of possible decisions.

From the perspective of Risk and Uncertainty: Kristin Shrader-Frechette¹⁵ reflected a similar perspective in suggesting the following:

Because choosing successful policies for long-term management of waste and spent nuclear fuel presents a case of uncertainty it is a decision for stakeholders and citizens, as well as experts. Experts can provide scientific, factual, and probabilistic information, but waste policy cannot be made merely on scientific, factual, and probabilistic grounds, for two main reasons. First, the policy must confront situations of uncertainty, without long-term data and without reliable empirical probabilities. Second, the policy choices will affect citizens’ welfare, rights, health, and security. Experts alone do not

¹⁴ See: NWMO Background Paper 1-2. The Precautionary Approach to Risk Appraisal. Andy Stirling, University of Sussex.

¹⁵ See NWMO Background Paper 1-5. Risk and Uncertainty in Nuclear Waste management. Kristen Shrader-Frechette, University of Notre Dame.

have the right to decide either what rules ought to govern behavior under uncertainty or what norms ought to govern choices affecting citizens' welfare, rights, health, and security. If not, then a waste-policy choice involves at least three goals or objectives: (i) making different kinds of scientific, mathematical, social, and cultural uncertainties as transparent as possible; (ii) clarifying alternative ethical and social norms (including assumptions and consequences) of different waste-policy options; and (iii) articulating just and equitable procedures for waste choices that both accommodate scientific findings and respond to democratic welfare, needs, rights, and duties especially stakeholder rights to make decisions affecting them.

The need for democratic decision making processes is highlighted in suggesting:

The preceding question of how to balance ethical norms (like distributive justice) with uncertainties (like societal ability to manage the wastes), however, is fundamentally an ethical/value issue, one that should be decided democratically because welfare, harms, and protections are at issue.

From the perspective of Social Issues: Maria Paez Victor¹⁶, in her analysis of 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, identifies “four seminal and inter-related social issues that set the contextual parameters for these and all other social issues on nuclear waste”.

These four issues are:

- The need to appropriately identify social values;
- The need to consider solutions which reduce or stop production of nuclear wastes;
- Scientific uncertainty and perpetuity of the risks and challenges to social institutions;
- The need for a process that is trusted.

The paper concludes that, in order to manage nuclear fuel wastes in a manner that might have broad public support, it will be necessary to:

- Have an innovative, representative and iterative process for identifying Canadian social values relevant to nuclear management;
- Include as part of any management scheme the need and means to reduce or stop the production of nuclear waste;
- Face scientific uncertainty from the perspective of complex systems thinking;

¹⁶ See NWMO Background Paper 2-3. Key Social Issues Related to Nuclear Waste, or What Do Canadians Want To Do about Nuclear Waste?. Maria Paez-Victor, Victor Research.

- Obtain broad, representative, clear, participation of Canadian citizens in a reflexive dialogue on the issue and in a politically sound decision-making process, that may, ideally, include a referendum.

From the perspective of public policy: The Public Policy Forum¹⁷, in a session convened with senior opinion leaders from the private and non-profit sectors who were asked to comment on potential elements of an implementation plan that would ensure that Canadians are comfortable and confident in the long-term solutions undertaken to manage nuclear fuel waste, outlined a number of social acceptability requirements.

Among the characteristics identified as essential to ensure that an implementation strategy is acceptable to Canadians, were:

- Use an incremental approach - Implementation will involve many layers of decisions and it is important to retain the flexibility to adjust course as appropriate. Adopting an incremental approach would also reassure citizens that policymakers are allowing technology to develop before making permanent solutions that might impact future generations;
- Provide incentives and appropriate risk management to communities - The local community or communities involved in siting will need to be engaged and given assurances that their community will benefit economically and that the risks to the community are minimal;
- Keep wider ethical debates in mind - The recommendation should reflect where the public's thinking is in order to sustain the course;
- Allow technologies to evolve - Any strategy adopted must be flexible enough to accommodate new technologies;
- Separate the debate about waste management from power generation - Because Canada has already produced nuclear waste that needs to be managed, regardless of whether we choose to continue to use nuclear power, it is important to focus the discussion of Canadians on waste management in order to identify a realistic solution;
- Use language that encourages individual accountability as Canadians - The debate should be a national one, focused on Canadians' common interests and responsibilities.

Among the characteristics for governance and oversight which were suggested as important in inspiring public confidence were:

- Institutions must be designed to be democratic and transparent in order to reflect and remain in tune with public opinion. They must continuously engage and be accessible to citizens;

¹⁷ See NWMO Dialogue Report 10-5. Implementing a Strategy for the Long-term Management of Used Nuclear Fuel. Public Policy Forum.

- Communities at the site should be involved in the management and oversight of nuclear waste facilities;
- Oversight structures need to be created at both local and national levels to ensure accountability;
- Governments should ensure that local facilities are expertly run and managed;
- Facilities should be managed with flexibility over the long-term so that new technologies and new approaches can be incorporated;
- Ensure mechanisms are in place to respond to accidents or threats to nuclear waste in the community.

From the perspective of a Review of Other Countries prepared by an independent consultant mid-way through the NWMO study: Kjell Andersson¹⁸ examined international programs where initiatives have been undertaken to take citizen values into account in order to build more acceptable and stable radioactive waste management programs.

Among the key findings from the review of various national and international activities were the following:

- Participation and transparency in decision-making processes and more direct dialogue between decision makers, experts and the public is needed;
- Radioactive waste management, due to its long-term nature, uncertainties, and emotive nature is not the exclusive domain of technical expertise. Wider stakeholders' concerns should be addressed at the same level as technical issues;
- The decision-making process must be open, transparent, fair and participatory. Radioactive waste management programs should provide sufficient time, resources and commitment for meaningful involvement of stakeholders;
- There is a need for early involvement and empowerment of local actors in the decision-making process;
- A core issue is how performance assessment (PA) can be made more transparent and what needs to be done to make it more accessible to the general public. To incorporate the value judgments of stakeholders into PA would involve conducting performance assessment by starting from the issues of concern among stakeholders and communicating with them during the PA work;
- There needs to be a guardian of the process, having the task to maintain dialogue and transparency. This must be someone having authenticity and societal trust;
- If transparency at a certain phase increases the amount of opposing views, there needs to be a well grounded democratic decision-making process that can incorporate them and different value systems in a trustworthy way;

¹⁸ NWMO Background Paper 2-5 Overview of European Initiatives: Towards a Framework to Incorporate citizen values and social considerations in decision-making

- A well-balanced program should have a time schedule to enable realistic technical and social goals. The time schedule should be within the boundary conditions set by science (critical scientific questions must be solved) and democracy (a legitimate decision-making process), and with flexibility to meet unexpected problems in both arenas;
- People must hear each other out on these issues to achieve a common understanding that there are a variety of legitimate perspectives to consider;
- The aim should be to make all stakeholders, including politicians and the general public, as aware of the entire issue including both factual and value-laden parts, as possible.

V) RECENT INTERNATIONAL REPORTS

Thinking on this issue continues to evolve in the international community. A recent report from the Forum for Stakeholder Confidence¹⁹, summarizing its collective learning suggests a number of contributors to social acceptability or public confidence. Among this learning are three overarching principles “essential for decision-making seeking broad societal support”. These are:

- *Decision making should be performed through iterative processes, providing the flexibility to adapt to contextual changes*, e.g. by implementing a stepwise approach that provides sufficient time for developing a competent and fair discourse.
- *Social learning should be facilitated*, e.g. by promoting interactions between various stakeholders and experts.
- *Public involvement in decision-making processes should be facilitated*, e.g., by promoting constructive and high-quality communication between individuals with different knowledge, beliefs, interests, values, and worldviews.

As well, decision processes should meet a number of competing requirements: they need to be participatory and accountable, goal-centred and adaptable. Competing requirements should be balanced by combining various policy tools, formal and informal procedures, analytic and deliberative techniques, linear and reversible steps, and their balance should be compatible with the type and context of the decisions. Overall, the aims are to ensure or augment familiarity and influence by the stakeholders, trust and confidence in the institutional actors, and legitimacy and supportability of the decisions.

¹⁹ See: Learning and Adapting to Societal Requirements for Radioactive Waste Management – Key Findings and Experience of the Forum for Stakeholder Confidence. 2004.

VI) CONCLUSIONS

The NWMO has committed to “develop collaboratively with Canadians a management approach that is socially acceptable, technically sound, environmentally responsible, and economically feasible.” This paper has outlined some perspectives on the prerequisites for the first of these four dimensions - social acceptability.

This review suggests that social acceptability is likely influenced by:

- The larger policy context within which the issue is being addressed;
- The characteristics and behaviours of the implementing organization, as these affect its overall trustworthiness among stakeholders and citizens;
- The characteristics of the decision-making process. More specifically, the nature of the decision-making process, the nature and extent to which stakeholders and the public have been involved and the overall approach to the treatment of risk and uncertainty, as these affect the credibility and trustworthiness of the decision-making process;
- Characteristics of the approach being implemented, including the extent to which retrievability and reversibility have been built into the approach;
- The impact on social learning more broadly, including the understanding of the issue which is built and understanding and respect for the multiple perspectives on the issue existent within the society at large.

Understanding on this issue continues to evolve both within Canada and abroad as social science research and practical experience through the implementation of program approaches proceeds. The review suggests that social acceptability may be best viewed as an ever evolving goal to strive for, rather than as a fixed and static goal which can be achieved by meeting a simple set of criteria or following a simple set of rules. This review suggests that efforts to understand and respond to the requirements of social acceptability must continue throughout the entire program of work of the NWMO and be among the important benchmarks for its efforts.

APPENDIX 1

References consulted as part of the early, informal and high level internal review of the past efforts in four countries (UK, France, Sweden, Germany) outlined in Part III of this report.

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