

Congress of Aboriginal Peoples

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Final Report to the Nuclear Waste Management Organization

September 2005

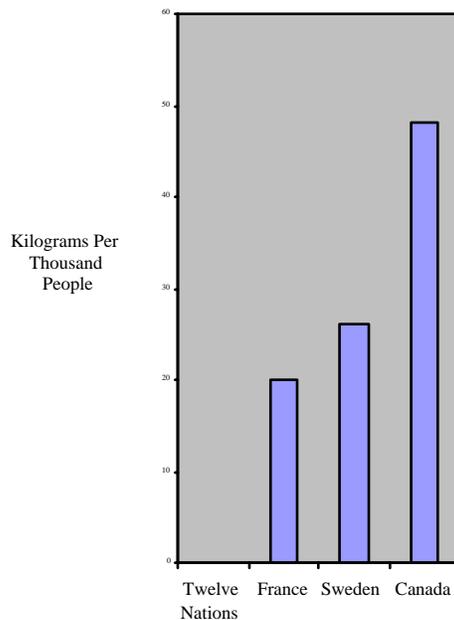
Final Report to Nuclear Waste Management Organization

Introduction

Under the agreement between the Congress of Aboriginal Peoples (CAP) and the Nuclear Waste Management Organization (NWMO) we are providing our final report. High-level radioactive waste is a major threat to our health and environment and we recognize it to be a complex and costly problem. For Aboriginal people, this issue raises many immediate and long-term spiritual, social, environmental and economic questions. Nuclear fuel waste is the largest and most complex environmental issue that we have ever faced.

According to numerous opinion polls, Canadians like to see themselves as pro-environment; however, a 2001 study by the University of Victoria reported that we are among the three worst countries in the Organization for Economic Co-operation and Development (OECD) when it comes to the environment. In regard to nuclear waste, the study found that:

Canada produces more nuclear waste every year, per capita, than any other OECD nation. In terms of total nuclear waste, only the United States produces more (although Canada is projected to surpass the U.S. by 2010). The annual volume of nuclear waste produced in Canada has grown by 76% since 1982.



Nuclear waste generated in kilograms per thousand people.

Source: OECD environmental data 1999

All statistical information used in the University of Victoria study came from data verified and published by the OECD. On nine environmental indicators, the Canadian economy was considered among the most polluting and least efficient in the industrialized world. In regard to nuclear waste the studied found that:

The total amount of nuclear waste generated in Canada in 1998 was 1,510 tonnes, almost seven times the OECD average, and second only to the United States.

In 1998, the *Federal Environmental Assessment and Review Process Report*, (Seaborn Panel), made important statements in regard to engagement with Aboriginal peoples:

- Neither the proponent nor the Panel had consulted Aboriginal people in an appropriate manner that respected their culture, languages and consultative processes. This must be done if there is to be any chance of meaningful Aboriginal participation in solving the nuclear waste problem.
- Aboriginal people have not been given the time or opportunity, in their own languages and in their own way, to study and understand the proposals for deep geological disposal. From their present understanding, it appeared to many participants that the concept strongly conflicted with their deeply held beliefs about humankind's relationship with and responsibility to Mother Earth, as well as with their sense of responsibility for the welfare of the traditional next seven generations.
- Most Aboriginal participants did not have great confidence in the current proposals of science and technology to manage nuclear fuel wastes safely, in part because these proposals do not incorporate traditional knowledge.
- There was little confidence that the principle of voluntarism and a community's right to refuse a facility would apply to Aboriginal people. The decision-making process proposed did not fit with their traditions and culture and did not correspond with the Aboriginal view of community. Their suspicion in this regard was heightened by the past history of broken promises and broken agreements in dealings with non-native people and governments.
- Aboriginal people have not shared proportionately in the economic prosperity of other Canadians and feel they should not be forced to accept the waste products from the industrialized economy. They doubted that they would derive any significant benefit from agreeing to accept a facility.

The Seaborn Panel reported that many Aboriginal people throughout Canada depend on a healthy and sustainable environment for their well being. The panel recognized that many of our enterprises are dependent on delicate environmental resources to which nuclear fuel waste represents a significant environmental threat. Seaborn understood that our

spirituality is tied to Mother Earth and our culture and its preservation is intimately bound to the land.

In the 1998 *Government of Canada Response to the Seaborn Panel*, the federal government indicated that it would undertake a participation process for Aboriginal people to understand and assess nuclear fuel waste issues. The federal government also stated that to the extent possible, the process would be designed and executed by Aboriginal people so that it would be appropriate to our value systems. S. 7 of the *Nuclear Fuel Waste Act (NFWA)* states:

The waste management organization shall consult the general public, and in particular aboriginal peoples on each of the proposed approaches. The study must include a summary of the comments received by the waste management organization as a result of those consultations.

On November 15, 2002, the *NFWA* was brought into force marking an important development for the federal government in meeting its responsibilities regarding the long-term management of nuclear fuel waste. The act set out the processes, structures and decision-making steps necessary for implementation. This statute is the legal framework that the federal government is implementing in order to reach a decision on the long-term management of nuclear fuel waste. The *NFWA* required the major owners of nuclear fuel waste to establish a waste management organization. In 2002, the Nuclear Waste Management Organization was incorporated and began implementing its mandate. Over the last three years, it has been dialoguing and investigating approaches for managing used nuclear fuel and developing a recommended approach for disposal. This will result in submission of a final report to the Government of Canada on November 15, 2005.

From an education perspective, the financial support and resource materials, as well as spokespersons from NWMO have allowed us to build knowledge of this important issue within our constituency. This initiative was neither consultation nor sufficient when considering the complexity of the issue and much work remains to be completed. The Seaborn Panel had envisioned a process where Aboriginal people would design and execute a consultation, having adequate time and resources to undertake the activity. CAP does not view the dialogue processes of either NWMO or Natural Resources Canada as having fulfilled the consultation requirements under the *NFWA*, nor meeting the Seaborn Panel's vision.

Overview of CAP Dialogue Process

Nationally

- Steering committee was established and maintained;
- Liaison took place with NWMO;

- Affiliate leadership and CAP Executive were regularly briefed on the process;
- Information was distributed to CAP's affiliate organizations;
- Questionnaires were developed and distributed to CAP's affiliate organizations;
- Publications including *Asking the Right Questions*, *Understanding the Choices* and the *NWMO Draft Study Report* were distributed;
- A review of issues related to nuclear fuel waste was undertaken; and
- A critique of NWMO's *Understanding the Choices* and commentary on the NWMO's Draft Study Report was completed.

Regionally

- Agreements were prepared and signed between CAP and its affiliate organizations;
- Information was distributed to CAP's affiliate organizations;
- News releases were prepared and distributed to Aboriginal and mainstream media; and
- Regional dialogue meetings were hosted;
- Regional leadership was briefed on the issue; and
- Regional coordinators participated in a CAP workshop for key informants.

Lack of Consultation with Aboriginal Peoples

Participants were concerned that NWMO funding of the CAP dialogue process would be considered as consultation. They indicated that no plan for consultation had been supported by NWMO nor had it ever been a subject for discussion. Participants viewed the overall effect of the NWMO Draft Study Report as a minimization of Aboriginal rights and interests in the nuclear fuel waste issue. It did little to alleviate the mistrust and unease that exists between Aboriginal peoples and the nuclear energy industry. High-level radioactive waste disposal remains an important issue for Aboriginal people since it involves our fundamental beliefs about Mother Earth.

On page 212 of the Draft Study Report, NWMO stated "*On treaty lands, Aboriginal and treaty rights are defined under s.35 of the Constitution Act, 1982.*" While this statement is true, it fails to capture the fact that the recognition and affirmation of Aboriginal rights in s.35 of the *Constitution Act* encompasses more than Aboriginal people who live on treaty lands. Also on the same it stated:

We have heard that these discussions did not constitute "consultation" as they [Aboriginal people] saw it. The nature of the specific obligation will be clarified as directly affected individuals and communities become more evident.

Participants have pointed out that meaningful consultation with Aboriginal people requires serious understandings of the potential for infringements of Aboriginal title, Aboriginal treaty and other rights. It implicates understanding our preferential access to traditional territory, which storage of nuclear waste could affect. Off-reserve, non-status and Metis people would require knowledge of: who are the beneficiaries of Aboriginal title, Treaties, and rights; access to traditional territories subject to Treaties of land cession; the limits government must observe in taking up tracks of ceded traditional territories for development, including storage of nuclear waste; how the entitlement of various classes of Aboriginal beneficiaries differ, particularly as between off-reserve, non-status, status and Metis peoples; what forms of justification are available for detrimental impacts to different Aboriginal rights, including unknown impacts as may be occasioned by storage of nuclear waste; and what consultation processes are required, and with whom these processes must be conducted in the case of off-reserve and Metis peoples.

Establishment of an Arm's Length Agency

The Seaborn Panel called for establishment of a neutral and arm's length nuclear waste management agency to support public trust in the process:

Recommendation 3.1

The Panel recommended that a nuclear fuel waste management agency be established quickly, at arm's length from the utilities and AECL, with the sole purpose of managing and co-ordinating the full range of activities relating to the long-term management of nuclear fuel waste.

In December 1998, the Government of Canada responded to the Seaborn Panel; however, they only partially addressed recommendation 3.1. Through s.6(1) of the *NFWA*, the federal government established the NWMO, calling upon the nuclear energy entities (Ontario Power Generation, Hydro-Québec, New Brunswick Power and Atomic Energy of Canada Limited) to establish a waste management organization. Our dialogue participants viewed this federal decision to be a failure, since it did not establish the arm's length agency as called for by Seaborn, and instead set up one controlled by corporations responsible for the nuclear waste problem. This issue was central in our dialogues, since trust in a nuclear fuel waste management agency is implicitly one of the foundations of a credible process.

Participants acknowledged the effort of NWMO officials to distance themselves from the nuclear energy industry; however, they viewed the credibility of the messaging as compromised. They recognized that nuclear fuel waste represents a significant environmental threat and *bona fide* initiatives will be required including establishment of a truly arm's length nuclear fuel waste management agency.

Advisory Council - Aboriginal Traditional Knowledge

Under s.8(2) of the *NFWA*, NWMO was required to establish an Advisory Council to be appointed by the governing body of the waste management organization. Among the membership, the council was also required under s.8(2)(b.1) of the act to reflect expertise in traditional Aboriginal knowledge. CAP participants were unaware of anyone on the Advisory Council who reflected expertise in Aboriginal traditional knowledge. At no time in the last ten months has CAP received any communications from any member of this Council in regard to the nuclear fuel waste dialogue or Aboriginal traditional knowledge. We are aware that this would not be considered by NWMO as a specific duty of the members, but dialogue participants thought that traditional protocol would require an Aboriginal individual serving on the Advisory Council to make some contact with CAP.

According to the NWMO document, *How the Advisory Council of the Nuclear Waste Management Organization Intends to Fulfill its Mandate (2005)*, the Council plays an important role in reviewing and commenting on the comprehensiveness of the NWMO Draft Study Report and the integrity of the process. We questioned how the Council intended to do this without any engagement with CAP. We were not aware of any comments that members of the Council have made on the integrity of the NWMO process and specifically the Aboriginal dialogue. This lack of communication and silence from the Advisory Council does not reflect the transparency and openness that was expected from this body.

Adaptive Phased Management - Option 4

S.12 of the *NFWA* describes the requirement of the study to be carried out by the waste management organization:

12. (1) Within three years after the coming into force of this Act, the waste management organization shall submit to the Minister a study setting out:
 - (a) its proposed approaches for the management of nuclear fuel waste, along with the comments of the Advisory Council on those approaches; and
 - (b) its recommendation as to which of its proposed approaches should be adopted.
- (2) Each of the following methods must be the sole basis of at least one approach:
 - (a) deep geological disposal in the Canadian Shield, based on the concept described by Atomic Energy of Canada Limited in the *Environmental Impact Statement on the Concept for Disposal of Canada's Nuclear Fuel Waste* and taking into account the views of the environmental assessment panel set out in the *Report of the Nuclear Fuel Waste Management and Disposal Concept Environmental Assessment Panel* dated February 1998;

- (b) storage at nuclear reactor sites; and
- (c) centralized storage, either above or below ground.

During our dialogue process, participants were asked which of the proposed approaches contained in the *NFWA* they preferred, if any. They opted strongly for extended storage at the current reactor sites. In NWMO’s Draft Study Report, a fourth option was proposed comprising of a management system as well as a technical method. CAP presented this fourth option to key informants and their views were solicited.

Option 1	Option 4
<ul style="list-style-type: none"> ▪ Long term management of used nuclear fuel through containment and isolation in a deep geologic repository 	<ul style="list-style-type: none"> • Centralized containment and isolation of the used fuel in a deep geologic repository
<ul style="list-style-type: none"> ▪ Used nuclear fuel is transported from the nuclear reactor sites to a central location for long-term management 	<ul style="list-style-type: none"> ▪ Provision for an interim step in the implementation process in the form of shallow underground storage of used fuel at a central site, prior to the final placement in a deep repository
<ul style="list-style-type: none"> ▪ Following an interim period of monitoring, the repository is closed, with the intent to retrieve the used fuel 	<ul style="list-style-type: none"> ▪ Potential for retrievability of the used fuel for an extended period, until such time as a future society makes a determination on the final closure, and the appropriate form and duration of post closure monitoring

When unpacked, Option 4 was recognized as a re-tread of the AECL 1978 concept described in the Environmental Impact Statement on the Concept for Disposal of Canada’s Nuclear Fuel Waste. In 1998, after seven years of public hearings, this concept was found to be unacceptable and questionably safe by the only public, independent and credible review it has ever had: the Seaborn Panel. Our key informants were surprised that NWMO does not consider Option 4 as a solution to the problem of nuclear fuel waste but rather a management method that would require constant and on-going monitoring. This was not clear in the informational materials distributed by NWMO.

Aboriginal Traditional Knowledge

Aboriginal Traditional Knowledge (ATK) and its involvement in the nuclear fuel waste problem was a central issue for CAP’s dialogue participants, since a great deal of uncertainty exists concerning how ATK will be taken into account. The *NFWA* referenced ATK and the NWMO held one workshop on the subject in September 2003. Our participants were not convinced that there was a valid engagement with ATK holders and a wide gulf remains between ATK and the NWMO process.

In the Draft Study Report, there were appropriate comments concerning ATK, but old elitist attitudes still dominated the text. For example, in reference to seeking a community to host the central facilities, the report stated “*The site must meet the scientific and technical criteria...*” but when ATK was considered, it would only need to be “*responsive.*” Our dialogue participants indicated that a balance between scientific and technical work needs to be made with ATK. They recognized that striking a balance between nuclear science and ATK will not be an easy task and will demand careful study and development.

In the Citizen Engagement section of the NWMO Draft Study Report, we were informed that technical and scientific experts were involved; however, it was clear to our dialogue participants that ATK holders were not appropriately engaged. In the Technical Possibilities section, ATK holders were not involved in the examination of alternative management approaches. ATK and its involvement in the nuclear fuel waste problem raised many issues and questions among our participants and a great deal of work remains to be undertaken.

Safety

Our participants were clear that nuclear fuel waste should not be produced until such time as it can be safely disposed. The Canadian experience in the handling and storing of nuclear fuel waste is only about 50 years, yet this waste will be hazardous for another 250 000 years, if not longer. Proof of safety in any proposed option will be indirect given the impossibility of directly demonstrating the safety of the proposed options. Our participants understood that no fully safe method can be put forward in this generation.

In the Draft Study Report under Safety - 1.1 First Principles, it stated “*...we do not live in a risk-free world and that a technical method cannot be practically demonstrated over thousands of years prior to implementation.*” Our participants understood that no intellectually sustainable argument can be developed for a method likely to last at least 250 000 years. All interests concerned with this timeframe agree that it is beyond the capacity for humans to create and implement such a method.

Many of our participants commented that most people take electricity for granted, enjoying its benefits and comforts without being aware of the impact on earth and how present-day actions will resonate into the future. ATK holders have warned us about the lack of concern for Mother Earth and how generations to come will be affected.

The NWMO Draft Study Report stated that the primary objective of nuclear fuel waste management was *Public Safety*. Throughout the dialogue process, NWMO officials informed us that it would be unfair for communities in the vicinity of nuclear reactors to be

left with the waste because they had agreed to the reactor, not the nuclear waste. The Draft Study Report stated:

“However, the existing sites were not chosen for their technical suitability as permanent storage sites. Furthermore, the communities hosting the nuclear reactors have an expectation that the used nuclear fuel will eventually be moved. The NWMO believes that the risks and uncertainties concerning the performance of these storage approaches over the very long term are substantial in the areas of public health and safety, environmental integrity, security, economic viability and fairness.” (pg.15)

Through our dialogue process, we discovered that these communities were never aware that there was a nuclear waste disposal problem. It was not until the 1977 Hare Report that the federal government acknowledged publicly that the problem of nuclear waste even existed. Today, AECL through its website for children still presents the old message:

Luckily, nuclear power reactors are great news for the environment. This is because they don't produce any ash, smog, greenhouse gases like carbon dioxide and methane, which can contribute to global warming, or acid rain pollutants, like sulphur dioxide. In fact, there's no doubt that nuclear energy is a Clean Air energy in Canada!

Nuclear generated electricity also doesn't pollute the environment. By 1997, nuclear generated power had saved the earth's atmosphere from being polluted by more than one billion tonnes of carbon dioxide emissions.

(<http://www.aecl.ca/kidszone/atomicenergy/environment/index.asp>)

Our key informants recognized that NWMO's Draft Study Report was silent concerning the phasing out of nuclear energy and its potential to work concomitantly with a method to deal with nuclear fuel waste. This omission created uncertainty as to the objectivity of the study, since reduction at source is a fundamental principle in all environmental issues. To CAP participants, building more reactors and producing more waste does not make sense as long as there is no credible solution to the disposal of nuclear fuel waste.

Economically Feasible

CAP's dialogue participants commented on the nuclear energy industry and its numerous examples of exorbitant cost overruns such as the construction costs for Point Lepreau in New Brunswick and the Gentilly-2 reactor in Quebec. These reactors cost three times the original estimates. There are financial uncertainties concerning NWMO's projections based on the deeply troubling financial record of the nuclear industry. It is clear that financial considerations are required over a massive time frame for multi-generations and covering

much political uncertainty. Our participants were highly skeptical of NWMO's undertakings concerning the economic feasibility of their fourth option. The Draft Study Report stated:

An economically feasible management approach, as it has been defined through dialogue in the NWMO study, is one that ensures that adequate economic resources are available, now and in the future, to pay the costs of the selected approach. The cost must be reasonable." (Page 11)

While agreeing that financial costs must be reasonable, CAP participants do not support the probabilistic methodology used by NWMO to support their case for adaptive phased management. They understood that the nuclear industry could not exist without public funding, bailouts, subsidies and protective legislation. The financial uncertainties are deeply troubling by themselves, but taken in concert with environmental risks, they form a potent argument against expansion of the nuclear energy industry in Canada.

Concern was raised in our dialogue sessions that the true costs of nuclear energy have been hidden. In 2001, the United States Department of Energy undertook an economic analysis of energy producers and reported that nuclear fission, per kilowatt-hour, was the most expensive form of energy production with the exception of solar photovoltaic. Nuclear fission is more expensive than hydroelectric dams, natural gas, geothermal, biomass, coal, small hydroelectric, wind, and solar thermal.

The 'polluter pays' principle means that all funds for future liabilities such as nuclear waste management and reactor decommissioning should be in place in order to avoid the financial burden falling on future generations. The "polluter pays" principle puts the onus not only on the generation that produces the waste but also on the actual producer of the waste.

Status of Financing Systems for High-Level Radioactive Waste Management
GF Energy, LLC (October 2003)

CAP views the polluter pays principle as a minimum requirement. The major difficulty with this laudable principle is its application to the problem of nuclear fuel waste. The principle loses its meaning when projected against the timeframes during which the waste will remain dangerous. Our participants saw the primary financial and legal liability remaining with the waste owners until the waste is no longer a threat to the environment and human beings.

Some of the costs for security are accounted for in the economic costs of all three approaches through facility designs and monitoring programs. However, recent international events indicate that security standards can be breached and additional costs may be required to address as yet unspecified risks. With the passage of time, it may be necessary to change current security standards and

activities to account for changing world events. This may dramatically change future security requirements and its attendant costs. Cost uncertainty is greatest for the Storage at Nuclear Reactor Sites and Centralized Storage since both these approaches provide opportunities for the accessibility of used nuclear fuel throughout the entire lifetime.

Assessment of Benefits, Risks and Costs of a Proposed
Adaptive Phase Management Approach
Golder Associates and Gartner Lee Limited

Many participants commented that there are major financial considerations involved with the security of nuclear fuel waste. Since the submission of the Golder Associates and Gartner Lee report, there has been increased uncertainty about security and the concomitant financial costs, yet there were no changes in the NWMO financial projections.

Throughout our dialogue, it was clear that there is no financial mechanism that could encompass the timespan involved with nuclear fuel waste management. In the 1996 Environment Canada report *The State of Canada's Environment*, the frank admission was made that "true walkaway disposal methods are unlikely to be possible, given the long time periods (a minimum of 250 000 years) for which the longer-lived radionuclides would have to be isolated from the soil, air and water." For CAP participants, this legacy represents an unacceptable burden for generations to come and major financial uncertainties are reason alone to begin the immediate phase out of nuclear energy in Canada.

History of the Nuclear Industry

Discussion Documents 1 and 2 were deficient in describing the history of the nuclear industry in Canada, and in particular answering the question as to why it has taken so long to deal with the issue of nuclear fuel waste. The Draft Study Report continued to be silent on the history and used a selective approach in its presentation. Many of our participants were unaware of the industry's history and past efforts to deal with nuclear fuel waste. When presented with additional background information, participants found this very helpful and in particular the industry's past relationship with Aboriginal people.

Our participants recognized that spent nuclear fuel is a worldwide problem and that there is no proven safe method for handling the storage of this waste. According to the International Atomic Energy Agency's *Guidebook on Spent Fuel Storage*, prior to 1997 very little information on the storage of nuclear fuel waste was available. Our participants said that they were searching for a frank and open process where they could trust risk assessments, communications and management viewpoints. The failure of Canada's nuclear energy industry to deal with the long-term disposal issue prior to 1977 did not build confidence with our participants that the industry would deal competently with future issues.

CAP participants want this environmental issue approached in a holistic way that considers the entire nuclear cycle including mining, conversion, fuel fabrication, reactor use and spent fuel storage. In contrast, the Draft Study Report adopted a narrow approach to the environmental problems that exist throughout the entire nuclear cycle. There was consistent concern expressed by our participants about uranium tailings in northern Saskatchewan, northern Ontario and in parts of the Northwest Territories. These tailings continue to represent a serious threat to our environment and health, and form an important part of the nuclear industry in Canada.

For fifty years, nuclear energy was promoted to Canadians as a clean and safe form of energy where benefits outweighed risks. In 2005, AECL's website for children continues to distribute this misinformation:

All energy sources produce waste that must be managed carefully. Luckily, nuclear wastes are amazingly small in volume and easy to control. In Canada, the total amount of nuclear waste over 40 years would only fill three hockey rinks to the height of the boards.

(<http://www.aecl.ca/kidszone/atomicenergy/environment/index.asp>)

Radiation

The issue of radiation is an important part of the list of uncertainties that our participants have in regard to spent nuclear fuel. CAP participants were aware that there continues to be a great deal of uncertainty about the health risks of radiation throughout the front and back end of the nuclear cycle. They were not confident in the estimates of risks that are associated with the various radioactive materials in nuclear waste. They recognized safety as a preeminent objective but it was difficult to understand much of the scientific literature associated with the issue of radiation. Considerable controversy exists concerning the scientific basis on which decisions have been reached concerning the health effects of exposure to radioactive materials. Participants were aware of a recent report from the U.S. National Academies (Beir VII Report-June 29, 2005) which made important findings in regard to low levels of ionizing radiation:

WASHINGTON -- A preponderance of scientific evidence shows that even low doses of ionizing radiation, such as gamma rays and X-rays, are likely to pose some risk of adverse health effects, says a new report from the National Academies' National Research Council.

The report's focus is low-dose, low-LET -- "linear energy transfer" -- ionizing radiation that is energetic enough to break biomolecular bonds. In living organisms, such radiation can cause DNA damage that eventually leads to

cancers. However, more research is needed to determine whether low doses of radiation may also cause other health problems, such as heart disease and stroke, which are now seen with high doses of low-LET radiation.

Our constituency was skeptical of NWMO and nuclear industry assurances that low doses of radiation are harmless and they were aware that the issue is far more dangerous than represented by the pro-nuclear lobby. Our participants were aware that NWMO provided little information on the health effects of radiation, especially the transmission of radioactive materials through the food chain. Many raised the issue of cancer rates near nuclear reactor stations. NWMO made no reference in its materials to tritium releases from CANDU reactors and the dangers of this material when inside the human body. The Beir VII Report found that the cancer risk from radiation released into the environment is approximately 35% higher than current U.S. government risk estimates. This major report also found that even very low doses of radiation can cause cancer and there is no safe level or threshold of exposure. The study also warned that children born to parents who had been exposed to radiation could also be affected by those exposures.

Transportation of Nuclear Waste

NWMO undertook research related to transportation of nuclear fuel waste. The Wardrop Engineering Incorporated report, *Status of Transportation System for High-Level Radioactive Waste Management*, referenced a study by Cogema Logistics Inc. Cogema factually set out the large number of truck shipments necessary to move the existing waste; 18 747 required to transport the existing 3.6 million fuel bundles to a centralized facility. If the rail option was chosen, this would mean 1 930 shipments including an additional 12 960 road shipments. In the CAP dialogue sessions, considerable uncertainty was expressed in regard to transportation of nuclear fuel waste from the reactors to storage sites. Participants were surprised at the quantity of transportation necessary to deal with the existing spent fuel. The core elements in our concern related to the lack of information on potential routes and the nuclear industry's minimization of risks.

Participants understood that during transportation of nuclear fuel waste, radioactive release would occur outside of the potential for accidents, spills, or fire. They were also aware of the complexity of transporting nuclear fuel waste and were surprised that none of the engineering reports contained any analysis of the radioactive releases expected during transportation.

In the NWMO Draft Study Report, Table 3-1 Fairness, the risks and uncertainties of transportation are listed. In regard to Option 4 - Adaptive Phased Management, it states:

Transportation of the used nuclear fuel will involve more communities in the risk associated with the implementation of the approach. However, it is expected that this risk

will be small and that the approach to engagement in decision making at each step of the way of those who are affected embodied in this approach will ensure that fairness issues are identified and explicitly addressed before implementation proceeds.

This minimization of risks stands in contrast to recent terrorist events and does not compare well to the prescient remarks made in the 1976 report by the *United Kingdom Royal Commission on Nuclear Power and the Environment*. At that time, Sir Brian Flowers reported that where necessary, security measures might even seriously affect personal liberties; an issue that the Draft Study Report did not consider. Flowers reported the following reasons for the elevated risks:

- One reason for theft would be the value of the element: if plutonium-fueled reactors become common then it will be traded internationally. One kg of plutonium can produce as much energy in a power station as 1,700 tonnes of oil, currently worth about £80 000 pounds.
- The other reason would be because of its potential use in a terrorist weapon, which would have enormous psychological impact. It could be disseminated into the atmosphere with conventional explosives, when it would pose not only acute and long-term radiological hazards to those who inhaled the airborne particles, but would contaminate large areas of land. Decontamination would be very costly.
- The dispersion of a small amount of plutonium into the atmosphere with conventional explosives would pose a very serious radiological hazard since an individual dose of only a few milligrams is sufficient, if inhaled, to cause massive fibrosis of the lungs and death within a few years. Much smaller quantities can cause lung cancer after a latent period of perhaps 20 years.

Importation of Nuclear Fuel Waste

The *NFWA* contains no prohibition on the importation of nuclear fuel waste for disposal in Canada. CAP dialogue participants were aware of this gap and are opposed to the importation of spent nuclear fuel for disposal in Canada. The fact that the prohibition does not appear in federal legislation was an additional element in the general uncertainty and distrust we have of the process, as well as the selective calculation model being advanced by the *NWMO*.

Reprocessing of Nuclear Fuel Waste

The *NFWA* contains no prohibition on commercial reprocessing of spent nuclear fuel. The participants in CAP's dialogue saw this as a policy failure on the part of the federal government. They viewed the gap in the legislation with suspicion and questioned the true

intentions of the federal government and the nuclear energy industry. Dialogue participants were informed that since 1977, the Americans have had a law against commercial reprocessing of irradiated nuclear fuel - the *Nuclear Waste Policy Act*. They were surprised that no such similar ban exists in Canada. Our participants were aware of the following in regard to the reprocessing option and the failure of NWMO documents to deal with the history and nature of this process:

- reprocessing entails the separation of plutonium from other radioactive waste products in irradiated nuclear fuel, after solid fuel bundles have been chopped up and dissolved in acid;
- production and storage of separated plutonium poses the highest security risk in the entire nuclear enterprise;
- residual radioactive wastes from reprocessing includes large volumes of highly toxic wastes in the form of corrosive radioactive liquids;
- in the 1940's and early 50's, reprocessing of irradiated fuel for the purpose of separating plutonium was carried out on a pilot scale in Canada;
- in the 1970's, AECL advocated routine reprocessing of irradiated CANDU fuel on the same site as any proposed geologic repository;
- In 1978, the Ontario Royal Commission on Electric Power Planning explicitly recommended that centralized storage of irradiated nuclear fuel not be allowed because it would "presuppose" the reprocessing option -- an option which the Royal Commission recommended against; and
- In the 1980's, research on packaging post-reprocessing waste was carried out by AECL at the Whiteshell Nuclear Research Establishment in Manitoba.

The reprocessing issue remains central in our distrust of the nuclear industry since in previous processes, reprocessing was considered. For example, it was referenced on the first page of the Overview section of AECL's 1993 Environmental Assessment Document, which was submitted to the Seaborn Panel for public review:

"If used fuel were reprocessed, the most radioactive material that remained (the high-level waste) would be solidified. The term 'nuclear fuel waste,' as used in this document, refers to either the used fuel, if it is not to be reprocessed, or the solidified high-level waste from reprocessing." (AECL-10711 COG-93-1)

The fact that reprocessing has played an important role in the history of Canada's nuclear industry was not referenced in any NWMO communication materials. In comparison, the issue was explicitly included in AECL's previous documentation on the subject of geological

repositories and was singled out by the Ontario Royal Commission in relation to centralized storage.

CAP participants were aware that the use of plutonium fuel, referred to as MOX, and other advanced fuel cycles remain an important part of AECL's research and development priorities. Our participants do not accept NWMO's assurances that reprocessing is highly unlikely in Canada, since AECL is still considering it as a priority.

Participants were aware of the negative effects that a plutonium extraction plant could have on the environment, our people, the health and safety of workers and the public, as well as security risks. These considerations would be of significant importance for our people living near a potential host community or region.

Referendum

The questions of nuclear fuel waste disposal and the future of nuclear energy are of national importance. CAP participants do not view the current *NFWA* as setting an appropriate process to reach a decision and are opposed to one being reached in secret by the federal cabinet. We are supportive of a national debate and referendum and favour the view that:

The collective wisdom of a large body of well-informed people most reliably produces the best decisions. Pooled information and variety in experience can blend to produce not only a sound course of action, but also and as important, the underlying consensus necessary to implement it.

(Patrick Boyer – Referendum Expert)

Our dialogue participants were aware that in a 1980 referendum, voters in Sweden opted for nuclear phase out. Our participants support the call for a similar national debate and referendum to be undertaken in Canada with regard to phasing out nuclear energy and what to do with existing nuclear fuel waste.

Recommendations



Phase Out of Nuclear Power - Phase out of nuclear power in Canada should be the first priority in dealing with nuclear fuel waste.



Research - Reduction at source via phase out of nuclear power in Canada needs to be researched as part of the methodology for dealing with existing nuclear fuel waste.



Consultation with Aboriginal Peoples - The federal government should immediately initiate an adequately funded consultation process with Aboriginal people, who should design and

execute the process. This should lead to a formal consultation process on the complete nuclear cycle.



Establishment of an Arms Length Agency - NWMO must be re-structured to achieve the Seaborn Panel vision of an entity at arm's length from the producers and owners of nuclear waste.



Advisory Council - The restructured NWMO should have an Advisory Council with representation from the Congress of Aboriginal Peoples.



Comprehensive Nuclear Waste Strategy - The Canadian nuclear waste strategy should be comprehensive to include radioactive waste generated by uranium mining and milling, fuel enrichment, decontamination and decommissioning of nuclear facilities, and other activities using isotopes and spent nuclear fuel.



Transportation - Research and information needs to be developed and disseminated on the transportation of nuclear fuel waste, focussing on potential routes and communities to be affected including an analysis of radioactive releases that will take place during transportation.



History of the Nuclear Industry in Canada - Research and plain language information on the history of the nuclear industry in Canada, as well as its relationship to Aboriginal peoples, needs to be developed and distributed.



National Debate and Referendum - A national debate on nuclear energy and nuclear fuel waste should be undertaken by the federal government, followed by a referendum on the issues.



Aboriginal Traditional Knowledge - A valid process needs to be established and implemented where Aboriginal Traditional Knowledge holders are fully respected and engaged.



Radiation - Independent and credible research needs to be undertaken on radiation hazards and this information needs to be communicated in plain language to all Canadians.



Reprocessing - The *Nuclear Fuel Waste Act* should be amended to specifically ban the reprocessing of irradiated nuclear fuel.



Importation of Nuclear Fuel Waste - The *Nuclear Fuel Waste Act* should be amended to specifically ban the importation of nuclear fuel waste.



Financial Considerations - Financial projections on the intensive cost of nuclear energy should be based on a realistic time schedule and encompass the entire nuclear cycle. This work must be completed by entities that are arm's length from the nuclear industry.

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