

NUCLEAR FUEL WASTE DISPOSAL: CANADA'S ENVIRONMENTAL REVIEW BEGINS

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ABSTRACT

Canada has begun a technical and environmental review of the Canadian concept for nuclear fuel waste management. Under the auspices of the Federal Environmental Assessment Review Office, the concept of deep geological disposal, developed by Atomic Energy of Canada Limited is being subjected to a rigorous public review. Technologies for interim storage and transportation of used fuel, developed by Ontario Hydro, will also be examined.

While the Panel will focus on Canadian initiatives, other approaches for nuclear fuel waste disposal being developed elsewhere in the world and socio-economic implication will also be addressed. Scoping (issues identification) meetings have been held by the Environmental Assessment Panel and Guidelines for an Environmental Impact Statement (EIS) will be issued this year.

INTRODUCTION

The environmental and technical review of Canada's nuclear fuel waste disposal concept has begun. Under the auspices of the Federal Environmental Assessment Review Office (FEARO) the concept of deep geological disposal, developed by Atomic Energy of Canada Ltd. (AECL), is being subjected to a rigorous public review. Approaches for nuclear fuel waste disposal being developed elsewhere in the world and socio-economic implications are also expected to be addressed during this review.

NUCLEAR FUEL WASTE MANAGEMENT PROGRAM

Canada's nuclear fuel waste management research program had its formal beginning in 1978 when the governments of Canada and Ontario announced a joint program of research and development to assess whether or not permanent disposal in a deep underground repository in intrusive igneous rock is a safe, secure and desirable method of disposing of nuclear fuel waste. Research and development initiatives at the underground laboratory and the Whiteshell nuclear research establishment near Pinawa, Manitoba, have focused on geological, hydro-geological, geotechnical and geophysical aspects of disposal in granitic rock of the Canadian Shield.

The incentive to focus on deep geological disposal for spent fuel wastes came from two government studies. The first, a federal study in 1977 entitled "The Management of Canada's Nuclear Wastes", dealt with burial in geological media, as well as other disposal alternatives. It recommended that Canada investigate disposal in the stable, granitic rock of the Canadian Shield. In 1978 an Ontario Royal Commission on Electric Power Planning also recommended pursuing the Canadian concept for disposal in the Precambrian Shield.

Early in the development of the Atomic Energy of Canada Ltd.'s waste management research, a Technical Advisory Committee (TAC) was established by AECL to

advise them on the extent and quality of the technical program. This independent peer-review committee has, for nearly 12 years, contributed quality assurance and advice. With input from the TAC, AECL have researched waste forms, container development, disposal vault engineering and transport of radionuclides through the environment, while Ontario Hydro have focused on interim storage and transportation questions.

ENVIRONMENTAL REVIEW

It would be an understatement to say that environmental issues and social concerns have reached unparalleled heights on the public agenda. Nuclear issues are no exception. Consistent with Canadian Government Policy to examine the environmental and directly-related social impacts of proposals requiring government decision, the Minister of the Federal Department of Energy, Mines and Resources requested the Minister of Environment undertake a comprehensive environmental review of the proposed concept for nuclear fuel waste disposal.

In making the request for the review, the Minister of Energy, Mines and Resources noted that this will be one of the most important environmental assessments undertaken in Canada and will provide an essential foundation for future decisions on energy policy.

The environmental assessment and review process, under which this review is occurring, was established by the Federal Government in 1973. It is a proactive form of project planning which addresses potential impacts and concerns early in the planning process before irrevocable decisions are taken by government.

The process allows for the expression of public concern before a ministerially-appointed independent panel on projects which involve:

- areas of federal responsibility,
- federal financial commitments, or

- activities on lands administered by the federal government.

Only those projects which are considered by proponent departments to have the potential for significant environmental effects or high public sensitivity are referred to the Minister of the Environment for the formal public review phase of the process.

The Panel formed to review the nuclear fuel waste management and disposal concept was appointed on October 4, 1989. It consists of seven, about to become eight, members chaired by Mr. Blair Seaborn, a former Deputy Minister of Environment and former Co-Chairman of the International Joint Commission. The other panel members have diverse backgrounds: Dean of Science, University of Western Ontario; President of the World Council of Churches; Professor of Biology, University of Moncton; Chief, Department of Nuclear Medicine; an Environmental Consultant and Social Systems Analyst; an engineer; and soon, an aboriginal person from Northern Ontario with knowledge of native cultural and social issues.

While the focus of the panel review will be the safety and environmental impacts of the concept of geological disposal, other broader issues will also be examined. These include:

- the appropriate criteria by which the safety and acceptability of a concept for long-term waste management should be evaluated;
- different approaches, both domestic and in other countries, for the long-term management of nuclear fuel wastes; these approaches will include capability of monitoring, retrieval and remedial action, and the transition from long-term storage to permanent passive disposal;
- the social, economic and environmental implications of the nuclear fuel waste management program;
- a recommended process and criteria for siting an eventual long-term fuel waste management facility; and
- recommending the next steps to be taken with respect to the management of nuclear fuel wastes in Canada.

Administratively, the Panel is provided support through the Federal Environmental Assessment Review Office. Most panels also engage experts to advise them and other review participants on scientific, technical and social issues. Given the complexity of the issues associated with this review, a Scientific Review Group (SRG) of distinguished, independent experts has been established and given terms of reference by the Panel. The Scientific Review Group consists of fourteen individuals recognized for their specialized expertise in the areas of environmental research and risk assessment, engineered barriers and geoscience

research. Each individual is expected to serve in his or her own capacity and not as a representative of any organization. The Scientific Review Group will conduct a specific, in-depth and critical examination of the scientific and engineering aspects of the disposal concept, and provide advice to the Panel on other issues when requested. The SRG will report its findings to the Panel for consideration and input at various phases of the public review.

The information received during the review is public information. The Panel or SRG do not hold in-camera meetings or receive information in confidence.

Because of the great variety of scientific disciplines, and specialization within each discipline involved in assessing the concept of nuclear fuel waste disposal, the Scientific Review Group is expected to solicit advice from other sources, including governments, universities and consultants.

The first public events organized by the Panel were information meetings scheduled in May and June of 1990 in sixteen cities in the provinces of New Brunswick, Quebec, Ontario, Manitoba and Saskatchewan. Panel staff provided information on the review process, the mandate of the Panel, opportunities for public involvement, participant funding, and the timing of the next events. AECL and Ontario Hydro staff set up displays and models of the concept and transportation technologies. Since the concept for nuclear fuel waste management is not site specific, the meetings provided the opportunity for discussion of the review in a relatively non-confrontational manner. That is not to say the meetings were entirely uneventful.

Given the complexity of issues to be examined, the Panel encouraged government to provide funds to assist participants to analyze and understand the issues. Funding would also promote more effective dialogue. A participant funding program was subsequently announced in July, 1990.

One of the Panel's first tasks has been the development of specific Guidelines, or instructions, for the preparation of the Environmental Impact Statement. To assist in the development of the Guidelines, the Panel held a series of scoping, or issues identification meetings in October and November 1990. Participants at the meetings included the general public, native organizations, organized interest groups, government agencies and the Scientific Review Group. Panel staff are presently analyzing the comments received in one hundred and forty submissions and are incorporating them into *Guidelines which will be released this spring in draft form for public comment. After a review period of sixty days the Guidelines will be finalized and issued to Atomic Energy of Canada Ltd.*

FUTURE EVENTS

In response to the Guidelines, AECL and Ontario Hydro will complete and submit an Environmental Impact Statement to the Panel, who will in turn distribute the documents to review participants and the Scientific Review Group for evaluation and comment. The EIS is not expected before 1992. The Scientific Review Group will submit the results of its review of the EIS to the Panel for input into the public review process. On the basis of comments received and upon its own review, the Panel will determine the adequacy of the EIS in responding to the Guidelines and whether or not to proceed to the public hearings stage of the process. Any deficiencies in the EIS could delay announcement of public hearings until additional information is supplied. When the Panel considers that the information received adequately addresses the issues, public hearing dates and locations will be announced. The hearings offer a public forum to discuss issues of concern and to allow for supporting and opposing views on the proposal to be aired. To encourage the broadest public participation, hearings are held in locations and at times that are as convenient as possible for participants. The hearings are structured and follow pre-announced procedures but are not quasi-judicial in nature. A variety of hearings may be held. Some would

allow for general discussions while others would be more technical in nature.

Following public hearings the Panel will review all the information received and will prepare its report for the Ministers of Environment and Energy, Mines and Resources. The report would not likely be completed until 1994. It will contain a history of events associated with the review of the concept for nuclear fuel waste management, an examination of environmental, safety, health and socio-economic implications of the concept, and the Panel's conclusions and recommendations on the future steps that should be taken in the management of nuclear fuel wastes in Canada.

The Panel's report is advisory to Ministers and is a public document.

CONCLUSION

This paper has presented an overview of the status of Canada's environmental review of a major proposal at its conceptual stage. It is potentially one of the longest, most important and most comprehensive reviews ever undertaken by the Federal Environmental Assessment Review Office.