

Understanding the Choices – The Future Management of Canada’s Used Nuclear Fuel.

NWMO Discussion Session Final Summary Report

**Thursday, December 2, 2004
Holiday Inn Hidden Valley Resort
Huntsville, Ontario**

1.0 PARTICIPANTS

There were five participants at the discussion session in Huntsville.

The NWMO representatives were Pat Patton and Jo-Ann Facella. Christel von Engelbrechten and Sarita Swamy were present from DPRA Canada.

The following is a summary of comments from the discussion session in Huntsville

2.0 MANAGEMENT APPROACHES

What are the Strengths and Limitations of each Management Approach?

2.1 Storage at Reactor Sites

2.1.1 Strengths

- One participant asked whether used fuel could be left at the sites to allow society to seek a better solution in the future.
- A participant favoured reactor site storage because it leaves open the possibility for potential future methods of use of the used fuel or management of the fuel.

2.1.2 Limitations

- One participant commented that reactor site storage is not a long-term solution.

2.1.3 Other Comments on Storage at Reactor Sites

- Questions raised included the following:
 - Does the reactor site option include maintenance costs forever?
 - Are we looking at the fuel cycle?
 - Is the entire nuclear fuel cycle included within the scope of the study?
 - A participant remarked that the cost of reactor site storage appears high compared to the other management options and wanted clarification on the costs of the methods.

- What work has been done on the cost of these approaches since the Seaborn Panel? The cost figures look similar to those put forward by AECL.
- It seems as though the associated consequences were not addressed when choosing the nuclear plant sites. Why wasn't a solution found for the used nuclear fuel before we went ahead with nuclear power?
- Is this the method that China is using?
- Are the nuclear plants at a point where they have to decide now regarding future storage options?
- For now, can the fuel bundles stay at their current sites for some time longer?
- Are the costs for management high because they have to maintain the site?

2.2 *Deep Geological Disposal*

2.2.1 Strengths

- One participant commented that deep geological repository keeps used fuel away from people who might misuse it.
- A participant noted that deep geological repository puts capital costs upfront.

2.2.2 Limitations

Participants noted the following limitations:

- There is uncertainty regarding the stability of the geologic medium.
- There is a lack of knowledge regarding geologic forces and geological time frames.
- Deep geological disposal has the same limitations as the other two options in that “you’ve got all your eggs in one basket”, and potential problems will be more difficult to fix.
- Monitoring would be difficult over the long-term.

2.2.3 Other Comments on Deep Geological Disposal

- I would be interested in the deep geological studies that have been conducted in terms of research and science.
- Questions raised include:
 - What is a pluton?
 - Is there any water infiltration?
 - Will the environment be able to adapt to an unnatural material?
 - Future generations should be aware of the deep geological repository.
 - A deep geological repository would require long-term monitoring.
 - While monitoring may be difficult, it would presumably not be impossible.
 - Would a deep geological repository be sealed immediately?
 - A phasing approach could be considered whereby the repository is first located in an existing mine. The next phase would be to move the used fuel into a permanent disposal site.

2.3 *Centralized Storage*

2.3.1 Strengths

A few participants made the following comments regarding strengths of centralized storage:

- Centralized storage allows for a choice in locations.
- The ability to monitor and adapt is an advantage of centralized storage.
- An interim measure is available by adopting this approach.

2.3.2 Limitations

- An important limitation is transportation. The participant mentioned they thought there may require 1600 trucks per year on Highway 11, and there is the possibility of accidents occurring.
- Due to the cost of transportation, it may be better to leave used fuel at reactor sites.
- If something should occur while transporting the waste, it would take more time to react, because it's so far away. Help should be available immediately if needed.

2.3.3 Other Comments on Centralized Storage

- Consider having multiple centralized sites in different locations, which would allow for different responses. By having more than one centralized site, a potential problem wouldn't affect the entire inventory of waste.

3.0 ASSESSMENT FRAMEWORK

Is the assessment framework comprehensive and balanced? Are there gaps, and if so, what do we need to add?

Participants made the following comments/questions regarding the assessment framework:

- Generally felt the framework is appropriate. One participant mentioned it is a substantial improvement over past efforts to find a management approach because it gives attention to social and ethical considerations.
- Safety and adaptability should be number 1.
- Stewardship should be part of the safety from harm. It is difficult to apply stewardship to this process. Used nuclear fuel is not a renewable resource. It's something society wants to get rid of.
- Fairness is a difficult issue because the approach chosen may offer short-term benefits to disadvantaged groups when perhaps long term factors ought to be considered.
- On the subject of economic viability, some participants noted the following comments/questions:
 - A nuclear waste repository will create jobs in the host community;
 - Economic viability may be better as a guide rather than an objective that must be followed;
 - Community well-being includes economic activities not only economic viability.
- A key issue for Huntsville is the transportation of nuclear waste.
- On public acceptance, a few participants made the following comments:
 - Public acceptance should be an objective;
 - Gaining public acceptability is difficult; However, it may be difficult to measure this. For instance, it is not clear whether a majority vote in a region would be sufficient for public acceptance? Public acceptance is a very difficult issue.
- I found the costs of disposal for all three options surprising. The participant did not realize the substantial costs that would be required to implement the methods.
- I am concerned that future societies will not be prepared for the amount of money required? It is important that some type of trust fund be established in perpetuity for future generations.
- None of the options take into account that nuclear energy might continue to be an energy source in the future. Society will continue to need storage and responsibility to manage this waste will extend into the future.
- What does fairness to marginalized groups mean? How can there be unfairness to marginalized groups?

4.0 IMPLEMENTATION PLAN

Are there specific elements that you feel must be built into an implementation plan? What are your thoughts on what a phased approach must include?

Participants made the following comments/questions regarding an implementation plan:

- How much money is being spent on research? It is important that sufficient money be spent on research
- Consider the possibility of a 3-step approach where the management approach would start with reactor storage, followed by centralized storage and then finally deep geological disposal. The advantages of a 3-step approach are: it's possible to have storage in the same location, it allows time for change and to evaluate the final disposal solution later, it may be good to move the waste, since reactor sites may be closed in the future.
- The original idea was that a solution would be found in 30 years – now the timeframe has been extended. Does this mean that we originally were going to have a solution by now, and now we are talking about drawing the process out even further by staged implementation and extended monitoring and retrievability?
- Instead of monitoring the used fuel, develop active research programs in Canada which may develop solutions to reprocess the used fuel or decrease the amount of waste from nuclear power.
- We need to keep citizens aware and educated, and develop criteria for what to tell the public and report regularly.
- Colleges and universities should be involved. Students should be educated in schools on nuclear energy and nuclear waste management to ensure knowledge is passed on to future generations.
- Nuclear waste management, the risk and hazard, should be put into context with other programs in order to ensure public acceptability.
- The decision should be made now, but the phasing-in period may be longer.
- On implementation considerations, the wording regarding research should read more active i.e. develop research at home to include methods we haven't decided upon.
- It all comes down to money. I wouldn't mind if some of my tax dollars were allocated to research.
- On communicating to the public, how often will we hear from you? It is important to have a regular schedule for NWMO to report on progress through any staged implementation process.

5.0 Additional Comments on Discussion Document 2

With respect to the document, "Understanding the Choices?" there were no additional comments made.

6.0 Other Comments

Other comments that were received by participants at the discussion session in Huntsville, which were not directly related to Discussion Document 2, have been grouped under thematic headings and are summarized below.

Energy and Alternative Technologies

- Have there been any solutions involving ice or microbes?
- Have researchers looked into methods that deal with the waste through the use of sound? i.e. by putting a lower frequency of sound to slow the frequency of gamma rays?
- In medicine, blue light is used for healing. Could this be used in combination with sound?
- Can Canada use reprocessing as a method?

- Technologies that are unfeasible today perhaps will be feasible in the future.
- Unfortunately solar and wind energy do not provide as much energy as atomic energy.

Geologic Media

- Salt and sand media would be worth exploring for disposal. Unlike the Canadian Shield, sand and salt act as a self-healing medium. I wonder if the trade-off is place in the Canadian Shield with small populations versus sand areas with large populations?

The Nuclear Waste Management Organization and Public Engagement

- Are you funded by the agencies that produce the used fuel?
- Is continuing research a part of NWMO's work for all three management options?
- Are colleges and universities interested in the opportunity to work on this challenge?
- Given that people in the Huntsville area rate themselves high on environmental issues, the low turnout to this session is surprising.
- So many other societal issues are important; it is difficult to make this issue just as important.
- Did you e-mail anyone else in terms of communication materials?

Nuclear Energy and Used Nuclear Fuel

- Is it possible to re-use the waste in the future?
- Do gamma rays have the greatest harm?
- Why was nuclear energy implemented before having a solution for used fuel management?
- What is the half-life?
- Is there a limited amount of uranium deposits?

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