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

NWMO Discussion Session

Final Summary Report

November 30th, 2004
Fredericton Inn
Fredericton, New Brunswick

1.0 PARTICIPANTS

The discussion session was held on November 30th in Fredericton, New Brunswick; thirteen participants attended the session.

The NWMO representative was Mike Krizanc, the assessment team member was Michael Ben-Eli. Present from DPRA Canada were Laurie Bruce and Rachelle Laurin-Borg.

The following is a summary of comments from the Fredericton discussion session.

2.0 MANAGEMENT APPROACHES

What are the Strengths and Limitations of each Management Approach?

2.1 Storage at Reactor Sites

2.1.1 Strengths

- It was one participant's view that storage at the reactor site would be the best choice, noting that you can keep an eye on it and not forget about it. Another participant followed with who better to look after it?

2.1.2 Limitations

- One participant noted that nobody considered the existing storage to be long-term; i.e. storage at reactor sites for 1000's of year based on existing construction. The participant noted that work in Finland has determined that on-site storage is the best. (Michael Ben-Eli clarified that the on-site storage was deep geologic). The participant noted that perhaps we could have deep geologic on site too. Another participant responded that storage at reactor sites should only be for 100's of years, not 1000's. While it may be possible to determine how to make on-site storage long-term, today's technology has limitations. It is important to have flexibility for the future.

2.1.3 Other Comments

- Participants raised additional comments related to storage at reactor sites:
    - A participant raised the possibility that we may stop using nuclear energy and if this happens it might affect the selection of the preferred option for waste management. A couple of participants responded that there are major transmission lines at these locations. Given that it is difficult to site new hydro generating facilities and transmission lines, these participants felt that the nuclear reactor sites will be reused as much as possible even if not for nuclear energy. They noted that it was unlikely that companies would walk away from the grid; if they were to walk away, they would lose a big investment, therefore there will be staff there to continue monitoring if on-site storage is chosen.
    - One participant suggested that the rush to deal with the fuel waste is driven by the industry's desire to have a solution to the waste management issue. Once there is a solution they will be free to build more nuclear generating facilities.
    - Is there a physical limitation to the volume of reactor site storage?

2.2 Deep Geological Disposal

2.2.1 Strengths

- It was one participant's understanding that deep geologic disposal would not require on-going management. The second advantage listed in Discussion Document 2 states that site selection based on suitability for long-term used fuel management. The word management implies we are going to reuse it.

2.2.2 Limitations

- Assuming we're talking about the fuel to date and multiply that energy by 70, there is enough energy in the fuel bundles for a thousand years, giving time to find an alternative energy source. Fusion is always a future possibility and may always remain a future possibility. Don't eliminate future use of the fuel waste by burying it.
- A participant's response to the first limitation listed in DD2 that *performance has not been tested over thousands of years* was that she doesn't see the relevance of performance tests over 1000's of years. This hasn't been done for any of the other methods. We can have reasonable certainty. With the current storage, there is knowledge; it is in place and working. It's not fair to apply that to all options. With the on-site option, there is performance knowledge that goes back 20-25 years. This living knowledge can be applied. Another participant responded by saying that's a very important point. The participant added that when thinking of centralized storage and reactor site storage the assumption has been made that it would be existing storage containers that would be used as opposed to better containers (e.g. better concrete) developed over time.
- 175 year timeframe sounds irresponsible. The nuclear waste is with us forever. We can't dispose of it. There is nothing man-made that can contain it forever. That means 200 years from now we might not even know where we buried it.

2.2.3 Other comments on deep geological disposal

Participants raised the following other comments related to deep geological disposal:

- A participant asked if the fuel waste would still be safely stored if it is not sealed? The participant suggested that we shouldn't go through the trouble of deep geologic disposal if we're not going to backfill it.
- One participant noted that there seems to be a conflict between the advantages and limitations of deep geologic disposal: the third advantage in DD2 states that oversight is not required while the second limitation states that monitoring would be difficult. It was suggested that perhaps the monitoring refers to the short-term only. If there is not going to be long-term monitoring, the participant indicated that would be a concern. The question was asked, is there a need for long-term oversight or not?
- If geological event is a concern, 200 years is not a very long time geologically.

2.3 Centralized Storage

2.3.1 Strengths

- It was the view of one participant that DD2 is missing a clear statement on the amount of energy left in the bundles. One feasible scenario is that bundles be left at sites a long time and then one day taken into centralized storage for future use, as opposed to disposal. The participant suggested including as an advantage, the possibility of reprocessing and use of the large quantity of energy available in the bundles placed in Centralized Storage. Seventy times the amount of energy that has been extracted from used fuel bundles remains in the bundles.

2.3.2 Limitations

- It was the opinion of one participant that the limitation that states transportation of used fuel carries risks and cost should be more realistic. Transportation of used fuel carries minimal risks. Costs are trivial if transporting huge quantities of energy that can later be used for reprocessing.
- Another participant suggested that in terms of safety it isn't good to have all wastes at one site in the event of disaster or terrorist attack. The potential for a major devastation exists.

2.3.3 Other comments on centralized storage

Participants raised the following other comments related to centralized storage:

- It might be cheaper to build one reasonably safe facility than to build five facilities.

Another participant responded that he wonders if that's really true since the infrastructure of the existing facilities could just be expanded, whereas centralized storage would likely require a new facility.

- In this country there is no place where the earth is sound enough other than the Shield.

So where would we site a centralized storage facility that would give the kind of safety we should have?

3.0 ASSESSMENT FRAMEWORK

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

- Does the reference to stewardship under citizen values refer to who will be responsible for the nuclear waste? N.B. Power is currently responsible, but if they sold Point Lepreau to a private out-of-province company would they have the same responsibilities?
- One participant offered that the list of values is excellent, however, the values and ethics are not all addressed in the objectives. The NWMO is paying lip service to these values and ethics. The assessment falls short of these citizen values and ethical principles. For example, the continued use of nuclear energy and the responsibility we are placing on future generations. The participant indicated that she didn't feel the subsidization of waste is fair, nor the production of waste by private companies for profit is fair. Another participant commented that she was talking about nuclear power as opposed to nuclear waste and that this exercise is about what to do with the waste. She responded that she doesn't think it's ethical to take this narrow view; the public is not informed and there is not justice and fairness in a lot of ways.
- The documents don't make the link between the Framework elements (citizen values and ethics) and the objectives. It's not clear.
- A participant expressed the perspective that they failed to see how this group has any influence on government transparency.
- A participant stated that New Brunswick Power cannot sell Point Lepreau. It is N.B. Power's responsibility to decommission and manage the nuclear waste.
- If we continue to use nuclear power is it ethical to ask a community to continue accepting storage of wastes at site or just to accept a certain amount for a period of time and then move it.

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?

- Doesn't the fourth point, which states that the implementation plan should provide opportunities for future generations to affect its implementation, rule out deep geologic disposal? A participant responded that it would require that future generations decide to plug it. Another responded that there is no need to rush into deep geologic disposal because nothing is compelling us to bury it today.
- One participant asked that the following be reflected: whichever solution is chosen it has to be flexible and robust enough to address a growing waste stream that is larger than which is stored at the reactors now. The participant felt that it was partially there, but not directly stated.

5.0 Additional Comments on Discussion Document 2

With respect to the document, "Understanding the Choices?", the following comments were made:

- The following comments were made when evaluating the limitations listed in Discussion Document 2:
  - Unrealistic short-term limitation

- It was the opinion of one participant that all of the limitations may be relevant to Ontario Hydro but they have no consequence for Point Lepreau.
- The limitation that Reactor Site Storage involves multiple sites: a participant asked if it really matters?
- A participant responded to the limitation that the used nuclear fuel remains hazardous long after the reactors are decommissioned by noting that a site will not be decommissioned for 40 years after closing. He noted this is the worst case for Point Lepreau.
- It was the opinion of one participant that all of the limitations have a time limit to them and that next to each limitation there should be brackets stating when the limitation would apply (e.g. which might apply after 50 years).
- The participant also noted that the limitation that the waste would be close to a body of water is presented as if it is dangerous. He felt the risk should be put in context of other risks that we face such as global warming. New Brunswick will be under water before it reaches the height of land at Point Lepreau. Might be a problem in Ontario, so words could apply to Ontario, but not Point Lepreau. Statements are made without being analyzed. Are these psychological or technical concerns? Problem with very simple statements is that they aren't relevant. NWMO is failing to put this information into a technical context.

- One participant requested that it be noted for the record that she would like to see solid figures on the number of fuel waste bundles that would be produced if plants are refurbished.
- On the subject of how much waste is produced, another participant noted that if the Terms of Reference includes existing reactors with some maintenance only that this seems short sited. If we realize green renewable resources aren't going to do the job and coal is out, nuclear is the only choice we have. Setting off on this venture without including this possibility of future nuclear use is difficult.
- The true cost of producing fuel needs to be articulated for transparency purposes.
- One participant felt that the future scenarios presented are entirely inadequate. They have not looked at enough possibilities, including more optimistic possibilities. To be fair, there should be more detailed scenarios and more of them. There are far out scenarios that don't make much sense. Use other scenarios in the influence diagram. I understand that this is outside of the NWMO mandate, but scenarios affect the choice of method. The participant noted that, she would choose deep geologic repository if we were to cease using nuclear energy while on-site storage from an oversight perspective might be better if there was on-going nuclear energy use.

6.0 Other Comments

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

NWMO Process

Comments on the DVD Presentation

- At the beginning of the DVD, it mentions that 3.8 million bundles will be produced. Does that take into account refurbishment of plants? Where does that number come from?

Nature of the Hazard

- What is the life span of radioactivity, 500 years?
- Is it true that where uranium is mined, nothing grows and animals don't go near it because they sense the danger?

Energy Policy

- What's wrong with using wind power and saying no to radiation?

Funding

- At New Brunswick Power and other utilities, there has always been money set aside for the long-term care of the waste. This is noted in their financial reports. It comes from electricity rates. In contrast those that burn coal do not put money aside to remediate the effect of air pollution in the future.
- A participant noted that the assessment team had concern over the adequacy of the funds for management of the waste.
- When the NWMO was formed, there was a change in the funding management so that it would be transparent. The participant was a little surprised that this doesn't come out up front and centre in the NWMO documents. Previously the money was all over the place.

Other comments

- Who's neighbourhood will the waste be in, New Brunswick or Ontario? How many reactors are in Ontario? There's only 1 in New Brunswick.
- When we talk about long-term storage is there also low-level radioactive waste included or is it just the fuel bundles?

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