

Commentary by J.A.L. Robertson on “Understanding the Choices” by the Nuclear Waste Management Organization

Before “Understanding the Choices” (NWMO DD-2) is analyzed critically the NWMO should be complemented for the existence of a document that exposes for scrutiny and comment the organization’s progress, thinking and plans. Its predecessor, the Blair Seaborn (BS) Panel was repeated urged to do this, but it never did.

This commentary - summary

DD-2 should be judged against its stated purposes:

1. Identify relevant Canadian values and ethical principles.
2. Hence develop specific objectives for nuclear waste management.
3. Develop, describe and test a comparative assessment procedure.
4. Identify lessons learned and forecast the NWMO’s future activities.

Incidental to these is a summary of the NWMO’s activities to date.

This commentary provides detailed comments and discussion on all four purposes but here only the broad conclusions are reported.

1. The seven values identified can be readily endorsed. Four of the five Aboriginal values duplicate those of other Canadians. The only notable feature of these values is that they are self-obvious, raising the question whether the resources spent on identifying them was justified. Similarly for the six ethical principles.
2. Much the same applies to the eight specific objectives. DD-2 fails to mention that these were the objectives – most were mandatory requirements – of AECL’s 1975 proposal for nuclear waste management that was endorsed by the 1977 Hare Report and that formed the basis for the voluminous 1994 Environmental Impact Statement for the BS Panel. So far, DD-2 could be titled “The wheel reinvented: what goes around comes around”.
3. Superficially, the assessment procedure appears reasonable. On closer examination it presents an air of spurious quantification, concealing the fact that value judgements, many implicit, are being made throughout. To the general public, the Assessment Team operating an extremely complex procedure involving about 200 “influences” will appear as a “black box” whose output they must take on trust. This violates one of the fundamental values, transparency. This criticism is elaborated subsequently under the heading “Assessment methodology”.
4. Part 3 of DD-2, “Towards a Management Approach”, is largely an elaboration of what has already been described and an intention to continue as before. This part was said to “take stock of lessons learned” but there is little if any indication of how the past year’s “Dialogue” has affected the NWMO’s thinking.

Topics not covered in DD-2, but that should be, are discussed in the next section.

For each criticism of something in, or omitted from, DD-2 a specific recommendation is advanced.

Omissions and other failings

- The NWMO has made serious efforts to engage the public in its activities. DD-2 shows this has been largely unsuccessful but DD-2 does not acknowledge the fact. Even allowing the 70,000 visits to its website since February 2003 as evidence of 70,000 different Canadians taking an interest in the subject, and allowing a generous 30,000 for other participants, 99.7% of Canadians have *not* participated. The significance of this is that the great majority of Canadians are not seriously concerned about nuclear wastes, something relevant to any assessment of “acceptance” of a proposal for their management.

The NWMO should recognize and acknowledge that the overwhelming majority of Canadians is not sufficiently concerned about nuclear wastes to bother participating.

- The NWMO, like its predecessor the BS Panel, places great stock in public acceptance. Yet much of public opinion relating to nuclear wastes is based on false or misleading information. Evidence for this can be found in my submission on the Report on the National Citizens’ Dialogue (Citizens Dialogue.doc posted on the NWMO website 2004 September 10) and elsewhere. DD-2 does not address the question of how much weight the assessment should put on such opinions. The Roundtable on Ethics did not even recognize the problem but provided examples of it.

The NWMO, in assessing public opinion, should not rely on opinions that it considers to be based on erroneous or misleading information.

- The NWMO has been repeatedly asked to define the criteria by which it will determine public acceptance, but this is still missing.

The NWMO should define an acceptable management system as one that is scientifically, economically and ethically defensible, that is consistent with Canadian values, and that is not opposed by more than a small fraction of the Canadian population.

- DD-2 claims that the NWMO is providing the public with relevant impartial information, partly through its web site. However, several of the Background Papers (BP) have been severely criticized as erroneous and misleading in submissions to the NWMO posted on the website. In each case the disagreement is such that both BP and submission cannot be correct, yet both exist on the web site without any attempt by the NWMO to reconcile the disagreement. This can only confuse the public seeking reliable information. DD-2 stresses dialogue, that it says involves “a response to the opinions or ideas presented” (p.98), but so far there has been no response by the NWMO to any of the submissions.

The NWMO should ensure that nothing that it publishes, including on its website, misleads or confuses the public: where there are conflicting statements, the NWMO should clearly state its position on the issue.

- DD-2 states that 60 submissions have been received but only eight are listed in Appendix 3, and by author only. Some of the submissions have discussed and criticized the NWMO’s own activities, but there is no mention of these. The concealment of critical submissions is part of a larger problem. Despite the emphasis on dialogue, DD-2 is largely silent on what it learned and how this changed its thinking since DD-1. The major exception is to report that a public opinion poll endorsed the Ten Questions in DD-1. The overall impression from DD-2 is one of self-satisfaction that no changes were or are needed.

The NWMO should publish a document summarizing submissions, indicating what it has learned from them, where it agrees, where it disagrees and why.

- History teaches that siting is a major hurdle. Because of opposition as a result of the NIMBY effect, AECL fundamentally altered its approach to separate concept assessment from siting; and the Low Level Radioactive Waste Management Task Force foundered on this issue. DD-2 should therefore have exposed for discussion at this stage the approach

that it intends recommending. Yet the only reference in DD-2 is “principles to guide site selection” – five words - and those on p.86! A proposal for a siting process is proposed later under “Siting”.

The NWMO should publish for open comment a proposed siting process along lines described later in this commentary.

- A very serious failing underlying the whole NWMO program is the assumption that “the volume of used nuclear fuel to be managed would be limited to the levels projected for the life of the current facilities” (p.39/2). It is for governments, not the NWMO, to determine future energy policy. DD-2 stresses the need for adaptability (p.19/2). After 30 years to reach this point it would be intolerable to have to go through the whole process again if another reactor is proposed.

Whatever management system the NWMO recommends should be capable of being adapted to continuing, even expanding, exploitation of nuclear energy.

It appears from DD-1 and DD-2 that the NWMO approach is based on a particular mindset – if an organization can have a mind – involving several explicit or implicit assumptions that are open to challenge. These include: radiation and hence nuclear wastes present a dreaded hazard; their disposal represents a major problem; no further nuclear reactors will be committed; all social effects of a repository would be negative; and no community will want to host one. An alternative mindset would include: the public realize that their health, economy and environment depend on adequate energy; that nuclear energy is a benign source; that radiation at expected levels is harmless, or even beneficial; that the hazards of nuclear wastes, including their transportation, are no greater than many others that we accept every day; that nuclear plants are safe and attractive work-places; and that in the long term a used fuel management plant that incorporates recycling and fresh fuel manufacture would represent an employment opportunity. Such jobs may not appeal to tenured academics, professional ethicists or risk analysts but for many Canadians north of the major population centres their alternatives are lumbering, tourism services or welfare. Mining communities dread the day that the ore is mined out and the mine closes. Actuarial risks for lumbering and mining are much greater than for the nuclear industry.

Assessment methodology

The assessment methodology is based on eight objectives that have not been challenged. However, they are not all comparable. For four, Public Health and Safety, Worker Health and Safety, Security and Environmental Integrity, any proposal must satisfy criteria set by the regulator, i.e., these are mandatory. For the other four, Fairness, Community Well-being, Economic Viability and Adaptability, there is no such standard and no threshold, i.e., they are desirable and largely subjective.

The NWMO’s Discussion Document 1 (DD-1) put great emphasis on Ethics as a separate criterion. In my commentary on DD-1 (NWMO Commentary.doc of 2004 February 4) I argued that sound ethical principles are assumed to be as necessary in any project as sound engineering and accounting principles. This appears to have been accepted by the NWMO since Ethical Considerations is one of the Ten Questions in DD-1 that have had no effect on the Eight Objectives in DD-2 (p.54); and that there is little mention of ethics in DD-2.

In the specific example of Public Health and Safety it is conceivable that all management systems present an infinitesimal risk, but that one had a lower calculated risk than the others. In the absence of any statement to the contrary, this would result in the one gaining one-eighth of the potential score from this objective alone.

The assessment does not adequately recognize that on-site or centralized storage would not eliminate transportation of the wastes only postpone it. When decommissioning of the storage facilities occurs the wastes would still be radioactive, even if less so.

These two examples show how it would be necessary to weight the different objectives and the results within them. This would require value judgements. Throughout the assessment involving about 200 “influences” many more value judgements would be required. Those making the value judgements, “The Team”, are faceless technocrats (p.39/1) the sort of people that the public is said not to trust. DD-2 does not reveal their names or their qualifications to make these judgements. It would be interesting to test one objective on a team composed of different individuals to see how much the assessment varies.

The methodology is so complex that it is extremely unlikely that members of the general public will bother to review it, even if they are competent to do so. At the end of the process the public will be required to take on trust the output of some opaque “black box” manipulated by unknown individuals who are not accountable. If people appeal the decision it will be practically impossible to explain to their satisfaction why one system scored highest.

This sort of methodology, that attempts to quantify decision making in what appears to be a logical manner, has been tried elsewhere in my experience, e.g., in allocating federal R&D funding within energy projects and in cutting budgets across R&D programs, but never successfully for the reasons already discussed. I submit that the present methodology could be useful in showing the sensitivity of the different systems to various assumptions within each objective. This would then be reduced to a few factors where there are significant differences between systems. At this stage the decision makers, selected for their broad *relevant* experience and proven wisdom, would make a recommendation. From evidence to date, these qualifications are not available within the NWMO staff but may be in its Board of Directors together with its Advisory Council.

In the safety analysis of nuclear reactors it was once thought that risk assessment, involving very complex fault trees, could replace the much simpler criteria and expert judgement then used. Now it is realized that risk assessments can be very valuable in showing what is important and the sensitivity to selected variables, but it does not replace informed judgement. Hence the current term “risk-informed assessment”. Another possible model for decision-making is the AECB, now the CNSC, where the Board, now the Commission, makes the value judgements based on analyses and recommendations by the staff. It is the Board/Commission that receives submissions from the public on policy issues and that is accountable to its Minister and Parliament.

The NWMO should regard the assessment methodology as one input to informed value judgements, not as a decision-making mechanism.

Compromise system management

The assessment methodology in DD-2 shows, subject to comments on DD-2, that on balance all three systems examined would probably be acceptable, and that deep geological disposal would probably be the preferred system. However these conclusions are dependent on implicit assumptions about weighting for the various objectives, something that has been criticized earlier in this commentary. DD-2 as a whole indicates that the greatest difficulty in selecting one of the three will concern adaptability, one of the seven fundamental values: on-site and centralized storage would be more adaptable than deep geological disposal.

A compromise system would seem to satisfy the objectives as a whole better than any one of the present three. The final result would be deep geological disposal but this would be implemented in a manner to provide maximum adaptability. The design of the repository would be modular in that waste capacity could be expanded as needed. Siting, construction of surface facilities, vertical mining and preparation of a few passages and rooms for placement of the wastes would be carried out without undue delay. Used fuel would be emplaced in these demonstration rooms that would be back-filled and sealed locally. It would thus be possible to monitor the demonstration's behaviour while further passages and rooms were excavated. As these became ready, used fuel could be emplaced but these would not be back-filled or sealed. Any necessary technology for final sealing would be developed and proven; and all necessary materials would be stockpiled on site.

This solution ensures that the present generation provides the know-how, commitment and most of the cost of permanent disposal of its own wastes while providing decision points along the way and allowing some future generations to decide if and when to expand or seal the repository finally. A consequence of this solution would be that on-site storage would continue to be needed until the disposal facility is ready to receive used fuel, i.e., at least a generation. During this period policy changes are possible but would involve tremendous costs and delays.

The NWMO should include this compromise system as a distinct option in its assessment.

Siting

The voluntarism approach developed by the Siting Process Task Force (SPTF) for Low-Level Radioactive Waste Management still represents society's best hope for overcoming the NIMBY effect. Briefly, local communities, having been informed of what might be wanted of them, have the opportunity to volunteer to accept a generally unpopular facility under conditions acceptable to the community. The government can select between bids.

As a result of my experience with the SPTF I submitted a document "An attempt to learn useful lessons from Deep River's experience" (with the SPTF) to the BS Panel in 1995. I consider that Section 3, "Suggested remedies", are still relevant and so are reproduced here. Since the items are indexed to the causes identified in previous sections of my document, it less Section 3 is reproduced as the appendix of this submission.

3. Suggested Remedies

The items in this section are indexed to the causes identified in previous sections that they are intended to answer.

1.1 On the assumption that the current FEARO Panel endorses AECL's proposed concept for the disposal of nuclear fuel wastes, the federal government should designate an implementing organization (IO) with a mission to dispose of the wastes. An essential preliminary is that the federal government, not the IO, reach agreement with the owners of the wastes on terms of reference and funding arrangements for the IO. There are strong arguments for the IO being a distinct operating company, comparable to AECL CANDU, under the AECL corporate umbrella. However, this would be secondary to the IO being a strong organization, committed to the public-participation aspects of the siting process, able to draw on multidisciplinary R&D support, and accountable for delivering a solution. See also 2.5.

1.2 Remedy 1.1 would address the need for a champion.

1.3 To improve public confidence in the process, the IO should clarify the legal position at the onset: each relevant level of government should provide such undertakings as are legally possible; and all involved should shorten the process as much as possible

1.4 The question of what constitutes the affected community is a difficult one that deserves serious discussion. As an opening bid, a radius of 25 km might be proposed, but this could vary between Central and Northern Ontario, and could vary for different purposes.

1.5 To help prevent conclusions being drawn precipitately, the IO should prepare a generic proposal for the consideration of a potential host community, including reasonably typical estimates of the risks and benefits, possible forms of mitigation and a compensation package likely to appeal to potential host communities. This should be available before any approach is made to specific communities and, ideally, before the siting process is announced publicly. While such a generic proposal would not be perfectly suited to any community, it would be better than the alternative, a vacuum.

2.1 The generic proposal (1.5) should include cost estimates for several broad geographic locations, and should indicate what, if any benefits would accrue from the higher cost locations.

2.2 Apart from the measures to increase public confidence in governments proposed in 1.3, any referendum must be very carefully planned and managed.

2.3 To avoid causing intercommunity antagonisms the negotiation for benefits and the compensation package should ensure that these are attractive beyond the host community on a narrowly legal definition. Ideally, the attractiveness should extend to all communities that perceive themselves to be subject to the risks. The possibility of having zones of different radius for different purposes has been raised in 1.4. The need for surrounding communities to learn the positive as well as negative aspects from the start should be recognized in preparing the generic proposal (1.4 & 2.1)

2.4 A generic proposal that sets out both positive and negative aspects (2.3) would help to counter opposition within the potential host community as well as in surrounding communities.

2.5 The IO must be, and remain, committed to the voluntarism principle. This involves the IO maintaining control over its scientific and engineering staff that may, by reason of their training and culture, favour a more technocratic approach. [Some professional codes of ethics require the practitioners to do what is best for their clients, which can be interpreted as requiring them to ignore public perceptions where these differ from their own assessments.] This measure is just one aspect of the first requirement (1.1), that the IO have strong, competent management.

2.6 The replacement of an STF by an IO with a clear mandate to act as proponent for the proposal would avoid some past confusion in the public's mind. However, there would still be a need for local CLGs and their role deserves further discussion. The objective should be to have the affected communities (see 1.4) feel that their CLGs truly represent them. Direct election, to replace nomination by elected councils, is a possibility.

Constitution of a CLG as a committee of council would encourage the council to take a greater interest in the process but would exclude surrounding communities. Having councilors from all affected communities on the CLG might be an acceptable compromise but would impose an additional burden on busy councilors.

The NWMO should, in its recommendations, include a proposal for a siting mechanism along lines outlined in this submission.

Specific comments

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- 2/1 The NWMO is said to be adopting “a precautionary approach” but this is nowhere defined. In view of the severe criticism (my submission Stirnwmo.doc of 2003 November 28) of the BP on this subject the term should be defined and defended.
- 16/2 Similarly, the NWMO’s mission is said to be based on “the concept of sustainable development” but the BP on this topic has also been severely criticized (my submission Runnnwmo.doc of 2003 November 11).
- 18/1 For the Citizens’ Dialogues it is claimed that “groups of approximately 40 people were randomly selected to be representative of the Canadian population”. However, my submission Citizens dialogue.doc of 2004 September 10 shows why these groups are far from representative. Also, the submission noted that several opinions expressed by participants were based on false assumptions, raising questions on the quality of the information provided before and during the meetings.
- 19/1 “Dialogue participants were surprised and upset that the decision to use nuclear fuel was made 30 or more years ago without a plan in place to manage the used fuel for the long term.” This is simply untrue (see my submission of 2004 September 10). If the organizers were unaware of this they were not competent to run a meaningful dialogue on the subject. The submission also showed that participants were unaware of the existing technology for fuel reprocessing (e.g., p.20, margin) and of the large amount of research already performed on alternative energy sources.
- 19/2 “... participants saw reducing the volume of waste as a necessary part of the management approach.” The design and operation of a waste repository depend primarily on the radioactive heat produced by the wastes, not their volume, and this is determined by the amount of energy that the fuel has produced. Therefore, reducing the volume would have little benefit. That participants were not informed of this indicates that the organizers were not familiar with the subject of the dialogue.
- 20/1 “People must be told the truth. There must be greater transparency in decision-making and monitoring by both government and industry.” In the absence of any evidence, this is libel against an industry that is exceptionally open. (I cannot speak for the government.) This accusation of secrecy is often made, apparently by people who are unaware of the vast amount of information that is available.
- 20/2 Participants expressed needs for an independent oversight body, apparently unaware of the Canadian Nuclear Safety Commission’s role; for better efforts to provide information, apparently unaware of the vast amount available; for more research, apparently unaware of what is already done and in progress; and for more international cooperation, apparently unaware of all the existing agreements. These are examples of the public forming opinions based on false or misleading information.
- 21/1 Nevertheless, DD-2 reports the opinions of participants on their preferred management systems without comment or warning. As stated here, the Nuclear Fuel Waste Act requires the NWMO to consult with aboriginal people. To state that “the participation processes should, to the extent possible, be designed and implemented by aboriginal

- people” may be discriminatory. If so, the NWMO findings could be open to Charter challenge by litigious opponents to nuclear energy. The NWMO should be careful not to discriminate *against* aboriginal communities, in the belief that it is protecting them. As explained earlier in this submission, these communities may consider a nuclear fuel waste management plant represents an opportunity.
- 22/2 What is most notable about aboriginal views is the extent to which they duplicate the values of other Canadians. The only view that I consider inadequate is honouring the wisdom of elders. As someone who is 79 years old, I, like Galileo, believe that the validity of an argument should take precedence over the authority of its proponent.
- 23/1 The account of the Roundtable on Ethics, in recommending that ethical considerations should be embedded, and in the enunciation of six principles, fails to tell readers that these features were integrated in the industry’s development of a waste management proposal over the past generation. As for the Citizens’ Dialogue, the ethicists were drawing conclusions based on misleading information, or ignorance. A failure to inform the public of such facts can only exacerbate the lack of trust that the NWMO deplors.
- 24/2 DD-2 tells readers of more than 50 papers by “experts” available on its website but fails to inform them that several have been challenged in subsequent submissions. It reports that its website received more than 70,000 individuals visits since February 2003, that it received more than 60 submissions, and that just under 200 individuals completed a survey. The implication is of successful communication. However, it means that 99.7% of all Canadians are unaware of the NWMO or are uninterested in the issue. (For perspective, my amateur website with the book “Decide the nuclear issues for yourself” and a section on nuclear ethics (www.magma.ca/~jalrober) received 80,000 visits in 2003 alone.) The significance is that nuclear waste is not a burning issue for Canadians: an objective of broad public support for NWMO recommendations would be totally unrealistic. The absence of such support was the reason for the BS Panel rejecting the proposal for deep geological disposal.
- 25/1 DD-2 reports public opinion research to provide Canadians’ “views and opinions” without any discussion of what weight should be given to these when its own website demonstrates that these are formed from misleading information and ignorance. Worse, the website is part of the problem since both BPs and critical submissions can not be justified: the unresolved conflict can only confuse visitors to the site. The polls are claimed to have involved representative samples but my submission of 2004 September 10 showed that this was not valid for the Dialogues. An article in the Ottawa Citizen of 2004 September 25 (p.B3) is relevant:
- “More important, he said, is the low response rate among people phoned at random across the country – people who refuse to take part in a survey. It takes a minimum 6,000 phone calls (to) produce a survey sample of 1,200 but that 1,200, he said, is not necessarily representative of the whole population. Pollsters don’t like to talk about the low response rate.”*
- 26/1 DD-2 states that the NWMO process has adopted the “precautionary principle” but has not defined the term that means all things to all people. The BP on the subject was criticized in my submission Stirnwmo.doc of 2003 November 28 but the disagreement is unresolved here or on the website.
- 27/1 It is not that current technology is inadequate to permit fuel recycling, but that while uranium is plentiful it is economically preferable to use once-through fuelling. This does not deny future recycling. In Table 3-1, “Reprocessing, Partitioning and Transmutation” is not a single “Method”: reprocessing is possible without the other two.
- 29/1 Participants recommended that Canada should monitor reprocessing research without apparently being aware that AECL had done much on this before the federal government directed it to suspend the work in favour of waste disposal in the late 1970s. DD-2 is

- wrong in stating that enriched uranium could be obtained from existing used CANDU fuel; presumably plutonium is intended. However, reprocessing does not necessarily result in the separation of plutonium: a possible process would be to simply remove most of the fission products. Even if the plutonium were separated, as high burnup plutonium it would be unattractive for weapons. This is an example of superficial understanding being misleading.
- 30 The Ten Key Questions are repeated from DD-1 without the criticism of them in submissions, only additional considerations (p.31) and a few “comments” (p.32/2). From Table 3-3 (p.33) it appears that the response was overwhelmingly positive.
- 31 Some of the additional considerations are for information and research that is already available – see comment on p.20/2. To require “technical best practices and best proven technology” regardless of cost could diminish overall safety by taking limited resources from less safe activities. Also, there is no indication that ethical and social factors have to be considered. There is no recognition that “adaptive management” could delay implementation and add to the costs.
- 32/2 DD-2 reports a request for explanation of the meaning of “public confidence”. The NWMO has been repeatedly asked to define the criteria by which it will determine public acceptance, but this is still missing.
- 34/1 DD-2 reports participants requiring “least risk” and “minimize risk” without consideration of cost. This is similar to the requirement for best practices in the comment on p.31. Further down the column there is reference to the reasonable requirement for “technical adequacy”.
- 34/2 The heading promises “Insights from research and analysis” but, with one exception, all that is provided is a list of what the NWMO has done – no insights. The exception is five conclusions in a specific area, “key engineering design assumptions and cost estimation process”. The reader is not informed of many submissions critical of NWMO documents that might have provided some insights.
- 39/1 Not enough information is provided to judge the competence of members of the Assessment Team. The Team should not consist predominantly of academic analysts but should include engineers experienced in the design and operations of major projects.
- 39/2 The second assumption has been challenged. It is not obvious that Economic Regions based on census divisions are appropriate here since census divisions would favour large population densities while siting here may wish to favour regions of small population densities.
- 40/2 As already discussed, reprocessing should be separated from partitioning and transmutation. Reprocessing for fuel recycling should not be excluded.
- 41/2 Should Canada wish to participate in an International Repository, it would probably be one dominated by the U.S. or the European Union: both are producing used fuel significantly different from Canada’s. In either case, Canada would have very little say in its policies and management.
- 45/2 Monitoring should start sooner, as proposed in “Compromise system management” earlier in this commentary, to reassure the public even though the expectation of detecting releases would be extremely low.
- 49/1 The public should be informed that an independent, well qualified Scientific Review Group found the Deep Geological Disposal concept to be feasible and adequately safe.
- 51/2 It is not clear how \$16.2 billion in 2002\$ becomes \$6.2 billion in 2004\$. Any cost estimates should be in terms understandable by members of the public who are not economists, and should provide for perspective the value of the electricity that resulted in the wastes.
- 52/1 It is seriously misleading to claim what “Canadians want” when 99.7% of Canadians have *not* participated.

- 53/1 There is nothing on how various objectives will be scored. How does an “overarching objective” fit into the eight objectives?
- 54 Note that three of the original ten questions apparently had no input to the eight objectives.
- 56/1 Persons and communities should have an opportunity to be heard but not to “participate in decisions”. See also “opportunities for decision-making”. All these factors do not have to be accepted by everyone. “lessening”.
- 56/2 The bottom paragraph illustrates how the Assessment Team is making value judgements and injecting its own projections of the future throughout.
- 62/1 Evidence to date demonstrates that communities’ concerns would be based on erroneous or misleading information. The NWMO should explain how it will allow for this. A scenario of continuing nuclear energy with need for a clean, stable industry in a region of high unemployment could greatly change the assessment here. In this eventuality there would be no “boom and bust”.
- 62/2 To talk of communities being “vulnerable to impacts” shows bias.
- 63/1 For the last sentence see the comment at 62/1.
- 64/1 Again exclusion of on-going nuclear energy seriously biases the assessment.
- 64/2 Since Aboriginal values largely correspond with those of other Canadians, the Aboriginal perspective will be most relevant during siting.
- 65/1 “Without *unduly* infringing on freedoms”. “Health, safety and environmental integrity” are the subjects of other objectives and should not be counted twice.
- 66/2 The low risk of a security breach during transportation requires more critical examination than appears to have been performed here: there is a widespread assumption that a shipment of used fuel could be hijacked by terrorists to make a nuclear weapon.
- 67 “Cultural, archeological and historical properties” and “Aesthetics” belong in Objective 4.
- 69 Explain “ROI” and “O&M”.
- 70/1 It is not obvious that the costs for storage systems include allowances for eventual transportation of the wastes and decommissioning of the facilities. Disposal costs should be expressed as percentages of the value of the electricity produced before judging if the costs are manageable. My analysis of Ontario Hydro’s cost overruns for Darlington and Pickering-A refurbishment shows that most of the schedule delays and hence the cost overruns were due to political interference. (I have submitted a paper on this to the Bulletin of the Canadian Nuclear Society.)
- 71/1 There is inadequate recognition that adaptability, while desirable, has its costs, both in dollars and in compromising other objectives. This is in conflict with the need “to provide assurance that commitments made will in fact be met” (p.75/2). In a project lasting decades there is a danger of adaptability leading to delays and changes in direction. The public does not want “neverending referending”.
- 73/2 The claimed advantage of no transportation is merely postponement and so could also be regarded as a limitation.
- 74/1 Similarly, eventual transportation is a limitation here too.
- 75/1 There is no indication of how objectives are weighted, if at all. The large range of the scores is an indication of how much value judgements and biases are entering into the assessment.
- 77/1 What insights have been gained is not apparent in Parts 1 and 2. The NWMO cannot claim to have determined “Canadians’” values and objectives in light of the inadequate sampling and statistics. “Additional issues” – what are these? They should be identified so that interested members of the public can have input.
- 77/2 The reference to the National Citizens’ Dialogue does not inform readers that its report was criticized in my submission.

- 82/2 The warning on “adaptability” (p.71/1) applies to “A Staged Approach”. A senior engineer experienced in the design and construction of a large project should be involved in formulating the management system.
- 83/1 DD-2 fails to recognize that opinions on research and technology expressed by participants in the Citizens’ Dialogue were based on ignorance of what has already been done – see my submission of 2004 September 10. The fact that DD-2 fails to discriminate between reprocessing on the one hand and partitioning and transmutation on the other suggests that the NWMO staff too are weak in this area.
- 83/2 The NWMO has an obligation to establish whether the demands for greater transparency and more information are justified. As it is, DD-2 is simply repeating a myth uncritically. If the NWMO staff are unaware of this it suggests that they are not familiar with the vast amount of readily available relevant material. The meaning of “opportunities for real engagement” is obscure: to imply that it means actual participation in making the decisions would be misleading.
- 84/1 Participants in the Citizens’ Dialogue, in requiring a “watchdog”, were apparently unaware of the role of the Canadian Nuclear Safety Commission. For reasons given in the Appendix, the NWMO is not a suitable organization to implement a management system, although it might be the body to contract out the project.
- 84/2 “This disagreement” emphasizes how the final selection should not be performed by manipulation of mathematical scores, by an Assessment Team of technocrats, by anonymous NWMO staff, or by a single individual but has to be the collective responsibility of the NWMO at the highest level as proposed in “Assessment methodology”.
- 86/2 “Implementation plans” should already have been developed and exposed for comments. Similarly for volume of used fuel and nature of the hazard.
- 87/1 In examining geological media the NWMO should take advantage of what AECL has already done.
- 90/1 In the light of the criticism of the Citizens’ Dialogue Report, any proposed “deliberative surveys” have to be viewed with suspicion.
- 95/2 There is no justification for the implicit assumption that Canadians have to participate even if they have no interest in doing so. “Citizens”
- 96/2 DD-2 seems to believe that participants who were initially “uninformed” became informed as a result of the workbook but this is contradicted by the Citizens’ Dialogue Report – see my submission of 2004 September 10.
- 98/1 According to the six criteria for a dialogue to be meaningful, the NWMO fails since it has not responded to submissions critical of its Background Papers and other activities.
- 99-106 DD-2 list NWMO activities but provides no information on what was achieved. It fails to inform readers which Background Papers and activities were challenged in submissions; and notes only seven of the sixty submissions. As a result, the account is severely biased to suggest a lack of dissent.

2004 October

Appendix

LOW-LEVEL RADIOACTIVE WASTE MANAGEMENT TASK FORCE

AN ATTEMPT TO LEARN USEFUL LESSONS FROM DEEP RIVER'S EXPERIENCE

The process to find a site for the low-level radioactive waste from the Port Hope area is in serious trouble. From the original 26 potential volunteer communities only one, Deep River, remained in 1994. In October of that year, only the Mayor's casting vote prevented its council from withdrawing too. All 12 members of the local community liaison group (CLG), as well as the local staff member of the siting task force (STF), had resigned en bloc, citing problems with the process, just before the vote. Several neighbouring communities voted 80% against receiving the wastes in Deep River in referenda associated with the 1994 municipal elections.

Despite this setback, the process still remains the most promising approach to overcoming the NIMBY syndrome in disposal of hazardous wastes. This document is therefore an attempt, first, to learn lessons from this experience and, second, to suggest how to improve the process in future applications, in particular the proposed disposal of nuclear fuel wastes as described in Atomic Energy of Canada Limited's (AECL) Environmental Impact Statement (Report AECL-10721 of 1994).

1. CAUSES INHERENT IN THE PROCESS

1.1 The praiseworthy objective of having the process directed by an impartial and independent body inevitably resulted in a relatively inexperienced and weak management. A few individuals, drawn from their regular positions in the federal government, were made responsible for the day-to-day management. This resulted in the process being highly dependent on contractors with their own priorities. Policy oversight was provided by a board consisting of part-time members. The STF as a whole, board and staff, was not part of a large organization that would provide the experience, organization, commitment, accountability and corporate memory necessary for success. Over the nearly a decade of the process there has been inevitable turn-over of personnel resulting in loss of invested experience.

1.2 The process provides for no proponent or champion for disposal in the volunteer community to balance the opponents that come out for any such proposal. The Government of Canada is the body seeking a solution to the problem but neither it nor its two agencies concerned in the process championed any proposal. The STF stated that it could not act as a proponent: its terms of reference consist of six actions but do not include the objective of securing a disposal site. The mandate of the CLG is to be a neutral, two-way conduit for information between its public in the community and the STF. AECL, with a mandate to develop and demonstrate the safe disposal of nuclear wastes, maintained an aloof stance with respect to the process, for whatever reason. Deep River's Economic Development Committee and Officer, with a declared objective of attracting industry, were invisible.

1.3 While the holding of a referendum, by inviting public participation, is a positive aspect of the process, in our political system a referendum within the process is not binding on the local government and one local council cannot commit its successor. Furthermore, there is no assurance in the process that the federal government, which would have to provide the funds for any agreement with the community, would be bound by the outcome of a referendum or of a council decision: or would honour any agreement reached in negotiating mitigation, compensation and benefits. In a process lasting nearly a decade, two federal lifetimes and three municipal ones, this lack of political commitment is serious.

1.4 The process assigns decision-making and veto-power only to the municipality within which the disposal site might be located, regarding that as the "volunteer community". In Deep River potential sites were much closer to neighbouring jurisdictions than to Deep River's own

population, giving rise to objections from those jurisdictions. At the instigation of the CLG and Deep River Council, not the STF that was responsible for administering the process, representation on the CLG and the roll of those eligible to vote in the referendum were expanded to include those immediately adjacent to the potential sites. However this did not satisfy neighbouring jurisdictions within a radius of approximately 50 km, which considered themselves to be potentially affected. Also, the interests of communities along the transportation route were not addressed.

1.5 The process fails to recognize that most people form their opinions on public issues at an early stage before enough information is available for what experts would regard as an informed decision. These early opinions are largely derived from existing mindsets and messages conveyed by the media. Once opinions are formed it is very difficult to change them: new information is either used to reinforce them, or is rejected. As a result of this and the lack of balance in available information (2.4 below) many people had decided at a relatively early stage to vote against the proposal, and so were unreceptive to new information available through the CLG.

2 AVOIDABLE CAUSES IN APPLICATION OF THE PROCESS

2.1 In Deep River there is a widespread perception of a waste of public funds, both in needlessly transporting near-harmless soil hundreds of kilometres and in the process itself. The STF eventually put out a report purporting to show that "a Deep River solution . . . could be less expensive than some alternatives in the source communities" but by then most minds were made up (1.5), and the report received little attention. The repugnance to wasting public funds is exacerbated by the fact that the whole process stemmed from an election promise by Brian Mulroney to the riding that includes Port Hope that the wastes would be moved out of their area, seen as buying votes with our own money.

2.2 There is a lack of confidence that the various jurisdictions involved would respect the outcome of the proposed referendum. This is partly due to the inherent lack of political commitment (1.3) but also to the fact that an earlier opinion poll, at the end of Phase 3, was bungled. Because of inadequacies in the process (7% voted to continue the process, 13% voted against and 80% did not vote for one reason or another) the Deep River Council decided to ignore the result and to proceed to Phase 4. Fears are being expressed that a "No" vote might be overruled, even for a rigorously conducted referendum. This is one example of a more general problem - a lack of trust in the various bodies involved

2.3 There is general antagonism in neighbouring communities to Deep River receiving the wastes as evidenced by referenda held in conjunction with municipal elections in 1994 and in the proceedings of the Renfrew County Council. Many Deep River residents are reluctant to sacrifice good neighbourly relations for the sake of only marginal perceived benefits.

2.4 Underlying the previous cause (2.3), for both Deep River and the neighbouring jurisdictions, there is a perception that the proposal involves all risk and no benefit. It is a simple fact that traffic, by rail and/or road, would be increased so that the associated risk would be increased by a finite amount. Recent traffic accidents along Highway 17, and on VIA Rail, have been well publicized. It is also a fact that there is a finite possibility of radioactive and non-radioactive pollutants from the wastes being released to the environment. To some people, any amount of radiation, however small, is absolutely unacceptable. The opposition to the proposal, because of the increased risks from traffic and pollutants, however small, is particularly and understandably strong among mothers of young children. (It is ironic that pro- and anti-nuclear factions are united in opposing the disposal of the wastes in Deep River, the former because the

wastes pose such a small risk that their long-distance transport is unjustified (2.1), and the latter because they pose such a large and dreaded risk that their presence is unacceptable under any conditions.) There is recognition that the proposal would result in some jobs, but these would be mainly short-term and therefore disruptive to the community. The root cause of this lack of balance between perceived risk and benefit is that relevant information to the CLG, and hence to the public, has been too little and too late. At the end of 1994 the proposed traffic route was still unknown; the preferred site and engineering design were still unknown; hence the predicted health effects were still unknown; the proposed mitigation measures were still unknown; and the proposed benefits package was still unknown. Under these circumstances, and considering the lack of trust in the bodies involved (2.2), it is surprising that anyone favours the proposal.

2.5 In contrast to the innovative feature of voluntarism claimed for the process, the actual process has increasingly reverted to the old and discredited decide-announce-convince formula. The STF concentrated its attentions and resources on technical factors, e.g., geology, engineering and pathways analysis, at the expense of social factors, e.g., public communications, mitigation, remediation, compliance, monitoring and compensation.

2.6 Because of the absence of a proponent (1.2) and the presence of opponents (2.4) the CLG has been put in the position of appearing to favour the proposal when it is simply presenting neutral facts. The STF has been virtually invisible in the community but, to the extent that it is considered at all, it is regarded as part of a remote government bureaucracy that is the source of the problem in the first place. The public is largely unaware of the extent to which the CLG has tried on its behalf to obtain from the STF the information needed in a timely manner. All this has contributed to the lack of trust in the bodies concerned (2.2).

(For Section 3, see the main body of the commentary under “Siting”.)

4. BROAD CONCLUSIONS

In applying the siting process to nuclear fuel wastes, many of the difficulties experienced in the low-level radioactive-wastes program could be avoided by adopting two major measures:

1. A strong and competent Implementing Organization with a mission to dispose of the wastes safely and responsibly should be established.
2. The Implementing Organization should prepare a generic proposal before approaching the public.

Further discussion is desirable on the definition of affected communities (1.4) and the role of CLGs (2.6), preferably while recent experience is still fresh in peoples' minds.

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J.A.L. Robertson

(613)584-2765