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Royal Roads University

**Ann Dale interviews Elizabeth Dowdeswell, President, Nuclear Waste Management Organization**
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**Participants**
**Ann Dale**, Professor, Science, Technology & Environment Division, Royal Roads University
**Elizabeth Dowdeswell**, President, Nuclear Waste Management Organization

**Dialogue**

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**Ann Dale**

Liz, welcome to this conversation. Your organization has just released the Draft Study Report, Choosing a Way Forward. The Future Management of Canada's Used Nuclear Fuel, some 300 pages.

You have had the courage to lead a process designed to reach decisions on a critical public policy issue, where values are high, conflict often inevitable, with multiple and very diverse stakeholders across the country. If successful, you will have developed a new decision-making process for contentious public policy issues. Can you tell me a little about your process of engagement with the Canadian public?

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**Elizabeth Dowdeswell**

Good morning Ann and thanks for your interest in our work.

At the beginning of our study, we signaled through our mission statement that we intended to work collaboratively with Canadians. Throughout our study we have tried as openly and as honestly as we could to engage Canadians in a dialogue to define the questions and discuss the possibilities.

Our study has been an iterative one - engaging Canadians at each of four critical points in the study: setting the expectations for the study; exploring the fundamental issues; assessing the options; and formulating the recommendation. Through these four phases we have heard from Canadians on: what an appropriate study process would look like; what are the questions which should be asked and answered in the study; what are the values and objectives against which possible management approaches should be

assessed; and, what might an appropriate implementation plan look like. The study was divided into four phases with each phase focused on a major decision point. We have used the direction from citizens which emerged from the dialogue to shape our thinking about the issues and to determine how best to proceed with each phase.

Thousands have helped in the search for societal direction and common ground. We have engaged citizens and specialists - citizens to help us understand the requirements for any appropriate management approach for Canada, and specialists to help us understand the practicable options available to address these requirements.

We have taken the license to experiment with a wide variety of approaches to engage Canadians - commissioning papers, convening workshops with specialists, environmental groups, faith communities, and citizens, organizing public information and discussion sessions and open houses, conducting public attitude research, using our web site to receive letters and submissions, and more.

Some of these approaches have been more productive than others. But we have learned lessons from each. It is the totality of the exercise that points to a possible direction.

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**Ann Dale**

So essentially you used diverse and plural strategies to engage Canadians. How much of your engagement strategy was devoted to educating people about the complexities of the issue--the management of Canada's used nuclear fuel?

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**Elizabeth Dowdeswell**

At every stage of the dialogue, there was listening and learning. NWMO learned from specialists and citizens and we believe that we were able to bring important information to the participants as well. But it is necessary to underscore that while some basic information is essential in order to have an informed dialogue, what was as important to us was to try to understand what really matters to Canadians - their values and fundamental beliefs.

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**Ann Dale**

Values articulation is critical to these kinds of public policy issues, particularly sustainable development issues. Making them explicit appears to be a critical part of the process. Are there any other things you learned from your extensive public outreach and engagement process?

**Elizabeth Dowdeswell**

We learned that citizens were genuine in their preparedness to accept responsibility for the waste that our society has generated. They may not have articulated how to meet this goal (nor perhaps should one expect that of non-specialists) but they believed that we should not leave a legacy of waste for future generations.

Not surprisingly participants felt strongly that safety and security for people and the environment was of greatest priority. Any approach chosen must give confidence that this goal could be met.

And, we heard that people wanted an approach that was not irreversible. They believe that new technologies might become available, that societal conditions might change and also that what we now consider to be waste might some day be considered an important resource. Therefore, any approach should be flexible - phased and adaptive.

These three learnings formed the common ground on which we then sought to develop an appropriate option.

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**Ann Dale**

My own research into social and sustainable community development shows that people do care about these issues, that they want their voices to be heard, they want to be listened to, for without active listening, people become disempowered and disengaged. It seems that the Nuclear Waste Management Organization (NWMO) has actively listened to people as part of the integrity of your process.

Your report embraces the precautionary principle, and is grounded in concepts of continuous learning and adaptive management. Can you explain what you mean by these terms, starting with the precautionary principle and why are they important to the management of used nuclear fuel?

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**Elizabeth Dowdeswell**

Perhaps the most significant feature of this issue is the time dimension. Nuclear fuel waste remains a potential health, safety and security hazard for many thousands of years, so the relative performance of any option must look out to these geological time frames. Any decision taken today will be implemented over a number of decades, at least. Undoubtedly the program will encounter major changes in science and technology, institutions, values, political perspectives, and economic and financial considerations.

We are contemplating designing and licensing a system to last for periods longer than recorded history. Furthermore, the technology used to store nuclear fuel waste today is safe, adequate and affordable for some period of time and there appears to be no imminent safety or environmental crisis forcing a decision.

Confidence in a proposed approach will certainly be affected by societal notions of what constitutes risk and safety. It is not simply a technical issue. At the same time, this generation does not want to leave as a legacy the burden of providing for and funding the management of the waste we have created.

The precautionary principle in essence places the burden of proof on us to ensure that greater benefit of the doubt will be given to the environment and to public health. And this must continue to be shown at various points in the process and over a very long time.

We do not know what technologies may be available to succeeding generations, or what they may choose to do with the wastes that we have generated. We also do not know what the capacity of future generations will be to take an active role in managing this waste. In the light of these uncertainties, our obligation is to give them a real choice and the opportunity to shape their own decisions while at the same time not impose a burden which future generations may not be able to manage. This means avoiding approaches that are irreversible or overly dependent on strong institutions and embracing those that are precautionary. It means planning conservatively by setting aside the financial resources to ensure that future generations will have genuine choice. It means making a commitment to continuous learning today to assist decision making tomorrow.

What we can do is plan for the foreseeable future, act responsibly and confidently with the best science and technology in hand. What we must not do is pretend that we have all the answers for all time. A measure of humility will be essential as we move cautiously but surely, one step at a time.

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**Ann Dale**

Forgive me for not recalling, but do you have a precise definition of the precautionary principle in the draft report?

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**Elizabeth Dowdeswell**

Yes Ann, there is a definition in the glossary that builds on one of the background papers we commissioned. We have not attempted to get into an academic discussion of the many definitions of precautionary principle and approach. In fact, during our dialogues people talked about the need for precaution and defined the elements in a variety of different ways. It is around these elements that we have designed an

approach for consideration. We have thought it more important to think about precaution in terms of the real and practical implications arising from this specific case - what to do with used nuclear fuel.

You also asked about continuous learning. Continuous learning requires that we keep our mind open to new advancements in technology, and in fact encourage these. It also means that as much as possible we create opportunities to accumulate information that will come from actual real life experience. We want to ensure there are opportunities to take advantage of new learning as we proceed.

The learning is not only about technologies, but also about the management method and supporting systems and indeed about society, in order to enhance performance and reduce uncertainties.

Our commitment to continuous learning today is to assist decision-making tomorrow. Consequently, we have proposed a phased and adaptive approach.

Adaptive Phased Management is a system that allows confidence to be developed and assured - in the technologies, the management method and supporting systems before moving to the next phase. It is a thoughtful and deliberative plan - not only for participative democratic reasons but because we genuinely expect to learn. New learning and technological innovation are continually incorporated.

At each stage, options are evaluated and decisions are made on whether and how to modify the management plan before proceeding to the next phase. Each decision point requires integration of the results of monitoring, continuous learning, and research and development.

The approach includes what we believe to be realistic, manageable phases - each marked by explicit decision points and continuing participation of interested Canadians. While we identify the end point, we believe we cannot be prescriptive about how and when we reach that point. The actual choices belong to the societies which will be affected.

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**Ann Dale**

With respect to continuous learning, part of learning is the ability to fail, or what some call safe-to-fail. Does this factor into your concept?

Concerning adaptive phased management, who do you think is the appropriate authority to evaluate the options, and make the decisions at each decision point?

**Elizabeth Dowdeswell**

Yes Ann, our proposal provides genuine choice, the opportunity for 'go-no go' decisions at points along the way. If sufficient confidence has not been built to move to the next step in the process, there is a contingency plan to ensure that the waste will continue to be managed safely and with care.

The NWMO will be responsible for the management of the approach. The established requirements of the environmental assessment process and licensing by the Canadian Nuclear Safety Commission will of course be triggered. These processes have a public involvement component. Furthermore, we have gone to considerable lengths in our draft study report to advance the notion that a collaborative process in which citizens continue to play a legitimate role in making decisions, while at the same time creating conditions for productive movement forward, is fundamental.

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**Ann Dale**

Liz, can you elaborate on phased decision-making and how this would apply to your recommendation for centralized containment and isolation of used fuel in a deep geologic repository in suitable rock formations?

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**Elizabeth Dowdeswell**

It is a risk management approach of deliberate stages and periodic decision points. It consists of two components: a technical method; and a management system.

Simply put, the technical method is centralized containment and isolation of used nuclear fuel deep underground in suitable rock formations. These might be the crystalline rock of the Canadian Shield. Or, they could be found in Ordovician sedimentary rock. Throughout implementation the used fuel will remain monitored and retrievable.

But while we envisage a deep underground repository as the end point, it is really the second component of the approach - the management system - that we believe is most responsive to citizens - and to the times. We know that people are as concerned about how a decision will be implemented as they are about the decision itself. Consequently we address issues of governance and institutions, financial surety, principles for siting and the role of citizens.

We map out a possible path of 3 phases:

**Phase One** would last approximately 30 years. It would be a period of preparation. The goals would be to site a centralized facility; build an underground research laboratory and continue a research and development program.

A key feature of our proposal is the option of including shallow underground interim storage at the central site -- before placement in a deep repository. So during this first phase a decision on whether or not to construct a shallow underground facility would be taken.

**Phase Two** would likely last another 30 years. Its purpose would be to confirm the suitability of the site and the technology for a deep repository, and to complete the final design and safety analysis needed for licensing the repository and its associated facilities.

Furthermore, if the decision had been taken to provide shallow underground storage, the facility would be constructed and fuel transported from the nuclear reactor sites.

**Phase Three** is expected to begin in about 60 years and could extend for several hundred years. That is when used fuel would be placed in the deep repository, still accessible, and monitored until the society of the day - possibly 300 years hence - decides to close it.

So while we identify the end point, we are not and cannot be prescriptive about how and when we reach that point. The actual choices belong to the societies which will be affected.

And thirdly, the approach is characterized by significant attention to implementation. Any management approach, with its institutions and systems, no matter how well conceived will fail if it is not also well executed - if it is not responsive to societal needs and concerns.

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**Ann Dale**

Another recommendation in the draft report is for financial surety through funding by the nuclear energy corporations, a consideration that was also raised in our second e-dialogue. Do you have any ideas on how this might be administered?

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**Elizabeth Dowdeswell**

Regarding financial surety, the Nuclear Fuel Waste Act requires the waste owners to fully fund the approach selected by the Government of Canada. We provide a funding formula that specifies the annual amount required to finance the management of nuclear fuel waste. It includes, among other things, the estimated total cost, rate of

return, life expectancy of the reactors, as well as the respective percentage of the total cost that is to be paid by each waste owner.

The trust funds have already been established and to date these accounts hold approximately $770-million. Audited financial statements for these accounts are available for review on the NWMO web site.

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**Ann Dale**

Your report talks about the fundamental beliefs that guided your work--integrity, excellence, engagement and accountability. It seems to me that this report reflects your vast experience and wisdom, do you think you could have listened so well and achieved such a synthesis of values and views from Canadians earlier on in your career?

Liz, let me end with a personal question if I may. Some of us have been talking about the need for greater wisdom if we are going to have a more sustainable world, and consequently, how do you convert information into knowledge, and transform knowledge into wisdom?

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**Elizabeth Dowdeswell**

I accepted this challenge because I felt that it was a job worth doing. It really is the quintessential public policy issue - it is concerned with complexity and uncertainty and requires the integration of a social and ethical dimension. In many ways it is a case study in sustainable development. Does the concept really work in practice?

For much of my life I have been engaged in work that has attempted to bring the public into public policy-making. And with each experience, whether cultural policy development, an unemployment insurance commission or water policy inquiry, I have benefited from the wisdom and insight of people from diverse backgrounds. The best scientific underpinnings and computer models have been enhanced by the real experiences and deeply-felt beliefs of both citizens and specialists.

I have previously described this work as being about the development of a contract between science and society - one which allows us to benefit from technological advances, minimizes the risks associated with those developments and respects the values of Canadians. It is a privilege to continue to grow and learn.

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**Ann Dale**

Liz, the NWMO is a rich research area, and I certainly hope that younger scholars research and document both the content and the process of engagement your

organization followed. Thank you for taking the time today for this conversation. It is always a pleasure.

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**Elizabeth Dowdeswell**

You're most welcome Ann. Thanks for your continuing interest in our work.