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NUCLEAR ENERGY AGENCY
RADIOACTIVE WASTE MANAGEMENT COMMITTEE

Forum on Stakeholder Confidence (FSC)

**Topical Session on "Addressing Issues Raised by Stakeholders:
Impacts on Process, Content and Behaviour in Waste Organisations"**

Paris, 2nd June 2004

At its 5th meeting in June 2004, the FSC held a topical session aimed at reviewing how organisations are adapting to the new outreach and decision-making context. Eleven organisations from eight countries provided the relevant information, which are collected in these proceedings. Learning and adapting to societal requirements – and organising institutions accordingly – is one of the main aspects of the future programme of work of the FSC. This topical session provides useful material for future initiatives as well as a source of information to interested stakeholders and practitioners.

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FOREWORD

Since its inception in 2000, the Forum on Stakeholder Confidence (FSC) has recognized that, because of changing expectations in the broader society, waste management institutions are challenged to engage in new forms of dialogue and decision making processes that address the views of a broad range of interested stakeholders. A new dynamic of dialogue and decision making process has been observed as representing a shift from the traditional “*decide, announce and defend*” model, focused only on technical content, to one of “*engage, interact and cooperate,*” for which both technical content and quality of the process are of comparable importance to a productive outcome. In this climate, scientific and engineering aspects of waste management safety are no longer exclusively important. Stakeholder confidence and trust in regulatory and implementing institutions are seen as key conditions for a successful societal decision-making process for radioactive waste management. Technical competence, while still essential, must be viewed as necessary, but no longer sufficient. Ability of organizations to communicate and to adapt to this new context are now accepted as critical contributors to public confidence and to successful programmes.

At its 5th meeting in June 2004, the FSC held a topical session aimed at reviewing how organisations are adapting to the new outreach and decision-making context. Eleven organisations from eight countries provided the relevant information, which are collected in these proceedings.

Learning and adapting to societal requirements – and organising institutions accordingly – is one of the main aspects of the future programme of work of the FSC. This topical session provides useful material for future initiatives as well as a source of information to interested stakeholders and practitioners. In particular it provides complementary materials to the recent publication by the FSC on “Public Information, Consultation, and Involvement in Radioactive Waste Management”, which provides an international overview of approaches and experiences of waste management organisations at the start of the century.

TABLE OF CONTENTS

Foreword	2
Executive Summary	4
Papers Supporting Oral Presentations	6
<i>Janet P. Kotra</i>	
Building Confidence in Nuclear Waste Regulation: How NRC is Adapting in Response to Stakeholder Concerns	7
<i>Elisabeth Atherton</i>	
Integrating Stakeholders' Issues and Concerns into Nirex's Technical Research.....	13
<i>Jacques-Pierre Piguet</i>	
Addressing Issues Raised by Stakeholders: Example of the Underground Research Laboratory of Meuse/Haute-Marne	21
<i>Anna Vári</i>	
Addressing Issues Raised by Stakeholders: Experiences of Eight Organisations	24
Papers by other RWM Organisations (Annex)	34
<i>Steve Chandler</i>	
Lessons Learnt from Stakeholder Engagement in the UK Environment Agency	35
<i>Peter Flavelle</i>	
Addressing Issues Raised by Stakeholders: Evolving Practices at the Canadian Nuclear Safety Commission (CNSC)	41
<i>Betsy Forinash</i>	
Overview of Stakeholders Issues and Activities: Report of the U.S. Environmental Protection Agency.....	43
<i>Björn Hedberg</i>	
Addressing Issues Raised by Stakeholders: Impacts on Process, Content, and Behaviour in Waste Organisations: The Swedish Radiation Protection Authority's View	45
<i>Timo Seppälä</i>	
Addressing Issues Raised by Stakeholders: Impacts on Process, Content, and Behaviour in Waste Organisations, the Finnish Case.....	49
<i>Kathryn Shaver</i>	
Addressing Issues Raised by Stakeholders: Impacts on Process, Content and Behaviour in the Case of the Canadian Nuclear Waste Management Organization	51
<i>Věra Šumberová</i>	
Addressing Issues Raised by Stakeholders in the Development of a Deep Geological Repository in the Czech Republic	59
<i>Mitsuo Takeuchi, Shigeru Okuyama, Kazumi Kitayama and Michiyoshi Kuba</i>	
Communication Activities For Numo's Site Selection Process	63

EXECUTIVE SUMMARY

The Topical Session on “Addressing Issues Raised by Stakeholders: Impacts on Process, Content and Behaviour in Waste Organisations” focused on how regulators and implementers responded and are restructuring to respond to stakeholders’ concerns, issues and needs regarding radioactive waste management. Three organisation-specific contributions were elicited for oral presentation: the USNRC with Janet Kotra, UK Nirex with Elisabeth Atherton, and Andra with Jacques-Pierre Piguet. Eight additional contributions were collected from other organisations. These were reviewed and summarised by Anna Vári. Overall, these proceedings collect the information provided by eleven organisations from eight countries.

Janet P. Kotra (U.S. Nuclear Regulatory Commission, NRC) presented the organisational, process and policy changes which have been taking place in the NRC aimed at improving public involvement in the agency’s decision making. First she summarised NRC’s efforts to improve its dialogue processes during the development of new, site-specific regulations for the proposed geologic repository at Yucca Mountain, Nevada. For example, NRC staff obtained training in risk communication, more time and resources were devoted to prepare for stakeholder interactions, new formats for dialogue were introduced, and more attention was paid to responding comments and questions raised by the public. NRC also established a HLW public outreach team which developed communications plans. These changes were successfully applied as the agency completed final regulations for Yucca Mountain, when introducing a draft license review plan for public comment, and when responding to public requests for information on NRC’s licensing and hearing process.

Ms. Kotra pointed out that changes taking place in the HLW regulatory program triggered changes in the agency as a whole. The introduction of the requirement of communications plans for all major program initiatives, the creation of a task force on external communications, a director of communications, and agency guidelines for risk communication are examples for broader organisational changes. Ms. Kotra emphasised that these changes emerged, and continue to be applied, in the context of evolving agency concern for increasing stakeholder confidence.

Elisabeth Atherton (Nirex) outlined some of the activities that Nirex has undertaken to integrate stakeholders’ issues and concerns into its technical research program. Nirex arranges a range of dialogue activities including workshops, meetings, interviews and focus groups with a wide range of stakeholders. The feedback and inputs Nirex has received at these events have been used to influence the work that Nirex undertakes.

Nirex’s interactions with stakeholders, particularly members of the public and local councillors in the aftermath of losing the 1997 rock characterisation facility public inquiry at Sellafield, have been fundamental to changing Nirex’s whole approach. Nirex are now trying to understand people’s issues and recognising that Nirex is accountable to a wide constituency of stakeholders. The dialogue has also enabled Nirex to integrate people’s issues and concerns into its work programmes.

One of the main changes that Nirex has implemented in response to feedback from stakeholders is the development of the Nirex deep geological disposal concept. It now includes a period of

underground storage that allows monitoring and retrievability while future generations decide whether to proceed to sealing and closure. This was initiated in response to feedback from stakeholders who stated that retrievability was an important issue. The development of the concept has been well received by stakeholders and the whole exercise has demonstrated the importance of listening to stakeholders and members of the public. It has also shown that social issues can impact on technical work and vice versa.

Jacques-Pierre Piguet, Professor (Underground Research Laboratory of Meuse/Haute-Marne, URL) described the public relation, communication and collaboration activities of ANDRA aimed at involving the scientific community and the broader public. He presented the background of the “Bataille Law”, which provided for the framework of the decision making process, and at the same time, aimed at keeping a balance between scientific and socio-political criteria, as well as between local/regional and national interests.

Professor Piguet described the most important public information and involvement activities taking place in the area around the URL. For example, a newsletter is published, municipal officials, elected representatives of concerned districts and media representatives are regularly invited, site visits are organised for interested citizens, and a local committee (CLIS) is operated. Professor Piguet also emphasised the role of scientists and experts in the project, especially that of evaluators and supervisors, such as the National Evaluation Committee, the National Nuclear Authority, the Institute for Radioprotection and Nuclear Safety, and the expert team commissioned by the CLIS for an external evaluation of the URL Research Programme. He underlined that expert competence, openness and rigorous control have significantly increased public confidence in the URL project.

Anna Vári, Professor (Hungarian Academy of Sciences) presented an overview of reports submitted by eight organisations, including the Canadian Nuclear Safety Commission, the Canadian Nuclear Waste Management Organization, the Nuclear Waste Management Organisation of Japan, Posiva of Finland, the Radioactive Waste Repository Authority of the Czech Republic, the Swedish Radiation Protection Authority, the U.K. Environment Agency, and the U.S. Environmental Protection Agency. Drawing on the above reports, she analysed how stakeholder concerns influenced various types of RWM decisions made by the above organisations. She also illustrated through examples that stakeholders’ views may influence not only specific decisions, but may also trigger changes in general decision-making practice.

Professor Vári then outlined various approaches to handling divergent stakeholder views. These include the reconciling approach aimed at integrating the views of the parties; the statistical approach aimed at aggregating divergent views by using quantitative methods; the compromising approach aimed at finding a compromise solution; and the confronting approach aimed at developing creative solutions via direct confrontation of the different opinions. The presentation concluded with recommendations extracted and derived from the eight reports.

PAPERS SUPORTING ORAL PRESENTATIONS

**BUILDING CONFIDENCE IN NUCLEAR WASTE REGULATION:
HOW NRC IS ADAPTING IN RESPONSE TO STAKEHOLDER CONCERNS**

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Abstract

Increasing public confidence in the U.S. Nuclear Regulatory Commission as an effective and independent regulator is an explicit goal of the Agency. When developing new, site-specific regulations for the proposed geologic repository at Yucca Mountain, Nevada, NRC sought to improve its efforts to inform and involve the public in NRC's decision-making process. To this end, NRC has made, and continues to make significant organizational, process and policy changes. NRC successfully applied these changes as it completed final regulations for Yucca Mountain, when introducing a draft license review plan for public comment, and when responding to public requests for information on NRC's licensing and hearing process. It should be understood, however, that these changes emerged, and continue to be applied, in the context of evolving agency concern for increasing stakeholder confidence reflected in institutional changes within the agency as a whole.

1. Introduction

From its start, in 2000, the Forum on Stakeholder Confidence (FSC) has recognized that, because of changing expectations in the broader society, waste management institutions are challenged to engage in new forms of dialogue and decision making processes that address the views of a broad range of interested stakeholders. A new dynamic of dialogue and decision making process has been observed by the FSC as representing a shift from the traditional "*decide, announce and defend*" model, focused only on technical content, to one of "*engage, interact and cooperate,*" for which both technical content and quality of the process are of comparable importance to a productive outcome. In this climate, scientific and engineering aspects of waste management safety are no longer exclusively important. Ability of organizations, and regulators in particular, to communicate and to adapt to this new context are now accepted as critical contributors to public confidence. Technical competence, while still essential, must be viewed as necessary, but no longer sufficient. Stakeholder confidence and trust in regulatory and implementing institutions are seen as key conditions for a successful societal decision-making process for radioactive waste management. To be fully effective in carrying out their mission, regulators need not only be independent, competent and reliable, but should also strive to achieve the confidence and earn the trust of stakeholders and the public at large (1).

The U. S. Nuclear Regulatory Commission (NRC) strives to serve the public interest as a reliable, objective, open, and efficient regulator. NRC identifies increased public confidence as an explicit goal of the Agency (2). NRC long ago established mechanisms and procedures to afford the public access

to major regulatory decisions. Recently, the NRC has again examined ways to enhance public involvement and foster confidence in NRC's actions as an effective and independent regulator. NRC has grown in its appreciation of the value of dialogue with stakeholders and is seeking to expand still further the opportunities for stakeholder interaction and participation in its regulatory process. For meaningful interaction, the public must have access to clear and understandable information about both NRC's regulatory process and the decisions reached through that process. Improved confidence in NRC as a regulator will depend on stakeholder confidence in NRC's organization and people, confidence in the process NRC uses to make regulatory decisions, and confidence in the decisions themselves and their outcomes. NRC, as an institution, and the people who represent it, must exhibit not only technical competence, but also institutional and individual integrity, and dedication to the greater good, namely, protection of public health and safety. NRC's decision-making processes must be seen as fair, open and capable of change in the face of new information. Confidence in the decisions that result from these processes depends on the extent to which such decisions result in outcomes that are protective, technically sound and, which can be corroborated and subjected to further monitoring.

2. Case study: Involving the public in developing new regulations for Yucca Mountain

In 1999, NRC proposed new regulations for the potential repository at Yucca Mountain, Nevada (3). These proposed regulations represented a significant change from prescriptive, generic criteria, developed in the late 1970s, to a more risk-informed rulemaking framework that incorporated insights about repository risks and performance that have emerged over the past twenty years. Staff members of NRC's Division of Waste Management held public meetings in Nevada, near the site of the potential repository, as well as in Las Vegas, to obtain public comments on the proposed criteria. Scientists and engineers who had drafted the Commission's proposed regulations went to Nevada to discuss the timing and technical content of NRC's proposal, to answer questions, and to invite the public to comment.

The speakers were knowledgeable about the technical bases for the proposed requirements, and experienced with presenting to scientific and technical audiences, the many difficult technical and policy issues associated with the proposal. The speakers were not prepared, however, for the range and intensity of questions and comments from the audience. Many participants had questions about issues that were not directly applicable to the proposed regulations, but which reflected deep interest and concern.

Over the course of the meetings, the questions and comments from the audience clearly showed that the speakers had not succeeded in communicating the reasons behind, and safety of, NRC's proposed regulations. It was obvious that these meetings had not contributed to public confidence in either the NRC staff or the Commission's proposal. These observations were confirmed by written comments received after the meetings. The staff's observations and the public feedback convinced NRC staff members of the need to improve its approach to future interactions and involvement with the public.

3. Need for a new approach

Reflecting on this experience, the staff sought specific ways it might improve. The task was to design future interactions with the public that would better communicate NRC's primary mission of protecting public health and safety and the environment. Future interactions would also need to convey better NRC's duty and commitment to be open and receptive to public input, and to act in

ways that enhance public confidence in the Agency. To improve the quality of interactions with stakeholders interested in Yucca Mountain, NRC's staff made many significant changes--organizational changes, process changes, and, eventually, policy changes, all of which reflect, to greater or lesser degrees, NRC's commitment to improve stakeholder confidence. They also reflect a conscious change in expectations of interactions with stakeholders. The intent is to improve common understanding of technical and policy issues to foster a more meaningful dialogue. Most important came the realization that greater respect for stakeholders and their role compels NRC staff to both listen and explain effectively, but avoid attempts to persuade.

4. Specific changes made

Simple organizational changes, identified immediately, included: (a) identifying lessons learned in earlier meetings; (b) allowing staff more time and resources to prepare for stakeholder interactions; (c) assigning a project manager for each public meeting who is not also a speaker at the meeting; and (d) providing expert coaching for all speakers in risk communication techniques. Although NRC's scientists and engineers may be effective communicators among their peers, they are accustomed to interacting with other technically trained specialists who insist on precise and complex explanations of technical and policy issues. They are not, generally speaking, familiar with risk communication nor are they trained public affairs specialists. As a result, NRC staff members often use technical jargon and acronyms in their presentations, rather than the more direct, plain language explanations the public seeks and has a right to expect. To address these communication challenges, NRC staff obtained expert training in risk communication, and continues to increase the number of staff members receiving training before conducting public meetings. All presentations are now reviewed for clarity and plain language.

Next, the staff adapted its processes for interacting with stakeholders. Many attendees at public meetings on the proposed regulations complained that the public comment period on the proposed regulations was too short. In response, NRC extended the allotted time, to allow for broader public involvement, and to allow enough time for the public to understand and evaluate the technical information and policy implications (4). Besides showing that NRC had heard the public's concern, and had responded affirmatively to the extension request, extending the time available for comment also allowed the staff more time to review transcripts of the earlier meetings. The staff then was able to catalog the comments and questions raised at the meeting, and subsequently, to provide personalized answers to certain specific questions asked, but not answered adequately, at these meetings.

Working with a trained facilitator, the staff restructured the format used for public meetings. For instance, formal presentations, if needed at all, are much shorter, and are punctuated with multiple opportunities for questions and dialogue. Other formats, such as public round-table discussions, poster sessions, open houses, and displays at technical conferences, are also used to advantage. Whichever format is selected, NRC makes greater efforts, when scheduling interactions, to recognize that stakeholders interested in Yucca Mountain have multiple demands on their time, and attention. Many attendees at NRC's public meetings have complained of schedule conflicts with public meetings conducted by the U.S. Department of Energy, State and local governments, as well as by multiple other review or oversight bodies.

To coordinate and carry out a more ambitious approach to public interaction, still more organizational changes were needed. NRC established a High-level Waste (HLW) public outreach team of technical and support professionals from various disciplines and offices within NRC, including members from NRC's Spent Fuel Project Office, NRC's Office of Public Affairs, and

NRC's contractors at the Center for Nuclear Waste Regulatory Analyses. Among its many responsibilities, this team developed, and subsequently updated, a Communications Plan for NRC's HLW regulatory program. This team has enabled better coordination with other agency offices and divisions, and its members have represented NRC at international forums, such as FSC, on issues involving stakeholder interactions. Eventually, senior technical staff were assigned responsibility for HLW regulatory communications, and staff excellence in interacting with stakeholders about NRC's HLW regulatory program are consistently recognized and rewarded.

It is important to keep in mind that these improvements, as significant as they are, did not occur in isolation. As NRC's HLW regulatory program pursued greater effectiveness in engaging stakeholders, the NRC as a whole was coming to grips with the need to improve the quality of its interactions with stakeholders and to place greater importance on inspiring their confidence and trust.

Communications plans are now required for all major program initiatives. In June of 2003, the Chairman of the NRC chartered a task force on external communications, headed by an NRC Commissioner. The task force issued its findings and recommendations in a public report later that summer (5). Coincident with the release of this report, the Chairman announced his intent to appoint an agency Director of Communications who would report directly to the Chairman and provide policy and guidance for communications activities across the agency. The new Director assumed his position in April of this year. In January, NRC issued guidelines for agency staff for interacting with stakeholders (6) and, as a separate document, published the technical basis for the NRC's guidelines (7). Both documents are available to the public. In recent weeks, the Commission has directed its staff to publicize the results of research projects in understandable terms, particularly those results involving conservative bounding analyses, using plain language, and in a manner that fosters understanding of the context and limitations of NRC's research findings. In addition, in response to Commission direction, the NRC added a "For the Record" section to its Web site to provide NRC responses to inaccurate, misleading or false information in print, on television and radio, to provide the public with accurate and truthful information. This represents a significant departure from the agency's past hesitancy, or at times, reluctance, to correct misrepresentations and false assertions about NRC's regulatory policies and actions made in print and broadcast media.

5. Results

NRC's HLW outreach team has applied this new approach at more than thirty public meetings, during the past five years. In response to specific public requests, NRC held workshops and meetings to explain NRC's licensing, inspection, and hearing processes. The outreach team has also responded to requests from local government officials in Nevada to conduct meetings in local communities where residents can hear and ask questions about NRC's licensing and oversight role for the potential repository. NRC also conducted meetings in Nevada to introduce a draft of its license application review plan and to invite public comment before issuing the final plan last year (8). Management and organizational commitment, intensive staff preparation, training and rehearsal by all speakers, and actively anticipating questions and discussing suitable answers in advance, have all helped to foster more constructive interactions with citizens in Nevada. Follow-up meetings on proposed NRC regulations, as well as information workshops, meetings, and displays on NRC's regulatory process, hearing process, and draft licensing guide, have generated many high-quality, constructive comments from a wide array of stakeholders. NRC has received positive feedback from meeting attendees and local government officials, and has received invitations to conduct more meetings, from other communities within Nevada. In general, media coverage of NRC's actions with respect to Yucca Mountain has been more accurate and balanced. These are all positive signs that NRC's efforts to improve its communications with the public are on the right track and are making progress.

That being said, however, it is important to note that better communications with stakeholders do not, in and of themselves, lead to greater confidence in NRC's policies and practices. Stakeholders invariably ask "What changes, if any, has NRC made to its policies or process in response to input from stakeholders?" Stakeholders want to know that the time and effort they put forth to interact with government institutions has some reasonable chance of having a meaningful impact.

Nevada stakeholders concerned with the development of NRC regulations for Yucca Mountain had both process and policy concerns. The overwhelming majority of comments NRC received during its Yucca Mountain rulemaking addressed one or more of the following four concerns: (a) NRC should await publication of final environmental and safety standards for Yucca Mountain by the U.S. Environmental Protection Agency (EPA); (b) NRC should retain a formal hearing process for reaching a decisions on whether or not to authorize construction of a potential repository at Yucca Mountain; (c) NRC should adopt EPA's more stringent numerical limits for individual protection; and (d) NRC should incorporate separate criteria for protection of groundwater at Yucca Mountain. NRC addressed all of these concerns when it published its final regulations five months after EPA issued its final standards (9). The final regulations directly incorporated EPA's limits for individual protection and adopted EPA's separate limits for protection of groundwater. The reasons for these changes to NRC's initial proposal are many, complex, and were not limited to the agency's goal of improving stakeholder confidence. Nonetheless, the NRC's final regulations incorporated changes that accommodated the four issues of greatest concern identified by the majority of stakeholders that chose to comment on NRC's proposal.

To build on these improvements, NRC's Division of HLW Repository Safety faces significant new challenges in the coming year. By year's end, the NRC expects to receive a license application from the Department of Energy for the proposed repository. U.S. law sets forth a three to four year time frame for the NRC to make its licensing decision. Balancing NRC's commitments to openness and stakeholder confidence with demands on time and staff resources, as well as with the constraints imposed by NRC's hearing process, may compel more changes beyond those discussed above.

6. Conclusions

In seeking to increase stakeholder confidence in its HLW regulatory program, NRC has made, and continues to make organizational, process and policy changes. Many of these changes could be seen as small, common-sense improvements. Taken as a whole, however, these improvements reflect a changing vision and increased commitment to discharge NRC's HLW responsibilities through a more inclusive regulatory process. By engaging the public earlier, listening to individual issues and concerns, and providing understandable and honest responses, we are earnestly working to make NRC's regulation of nuclear waste understandable and worthy of the public's trust. Further, these changes should be seen as examples of an evolving agency concern for enhancing stakeholder confidence and the corresponding institutional changes within the agency as a whole.

Note:

The views expressed herein are those of the author and do not reflect any judgment or determination by NRC on matters addressed or the acceptability of a license application for a geologic repository at Yucca Mountain.

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INTEGRATING STAKEHOLDERS' ISSUES AND CONCERNS INTO NIREX'S TECHNICAL RESEARCH

Elisabeth Atherton
Nirex

Introduction

This note outlines some of the activities that Nirex has undertaken to try and integrate stakeholders' issues and concerns into the technical research we have undertaken and how we are attempting to address their issues. Nirex arranges a range of dialogue activities including workshops, meetings, interviews and focus groups with a wide range of stakeholders. These events are coordinated under what is called the Nirex Involvement Programme. The feedback and inputs we have received at these events have been used to influence the work that we undertake.

Nirex's interactions with stakeholders, particularly members of the public and local councillors in the aftermath of losing the 1997 rock characterisation facility public inquiry at Sellafield, has been fundamental to changing our whole approach. We are now trying to understand people's issues and recognising that Nirex is accountable to a wide constituency of stakeholders, but particularly the general public and their elected representatives. It has also enabled Nirex to attempt to integrate people's issues and concerns into its work programmes.

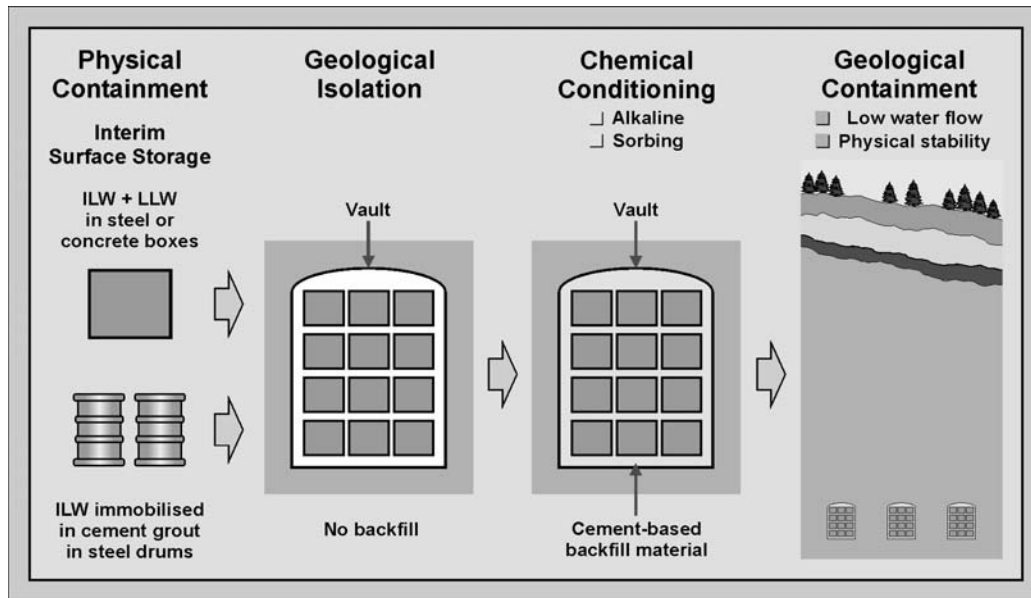
Specific examples of where stakeholders' issues have impacted on the technical work Nirex undertakes are outlined.

The Nirex Phased Disposal Concept

A practical example of how Nirex has incorporated stakeholders' issues is how the Nirex Disposal Concept has changed to become the Nirex **Phased** Disposal Concept. After previously resisting the introduction of retrievability, Nirex began to look at the issue following the RCF decision in 1997 and calls for work on the issue from stakeholders. Many members of the public, especially in Cumbria, had emphasised retrievability as an issue of great importance and this view has also emerged strongly in the international context. The House of Lords Select Committee on Science and Technology [1] requested further information on the feasibility of monitoring and retrievability and the UK Centre for Economic and Environmental Development (UKCEED) consensus conference on radioactive waste management [2] also highlighted monitoring and retrievability as important issues. After developing work on monitoring and retrievability Nirex held three workshops [3,4,5] to obtain the views of stakeholders, including the public, to influence the development of a strategy for progressing the work. The workshops helped Nirex to develop its work programme for monitoring and

retrievability. Nirex responded to all those who participated in the first workshops in July 2001 [6] and Nirex has created a Report that addresses all the issues raised by participants at the third workshop.¹

Figure 1. The Nirex Phased Disposal Concept



Outcomes

The work has been integrated into what is now the Nirex **Phased** Disposal Concept, see Figure 1. This revised concept has been well received and includes a period of underground storage that allows monitoring and retrievability while future generations decide whether to proceed to sealing and closure. The whole exercise demonstrates the importance of listening to stakeholders and members of the public. It also shows that social issues can impact on technical work and vice versa.

Nirex internal inquiry

During meetings with Nirex various stakeholders made allegations about Nirex's behaviour and conduct in the years leading up to the public inquiry that started in 1995 to gain planning permission for the rock laboratory at Sellafield and the Secretary of State decision in 1997 to refuse the planning permission. In light of its Transparency Policy [7] Nirex undertook an Internal Inquiry, of its own volition, during 2000, into allegations made against the Company and published a report detailing the findings and lessons that can be learned for the future [8].

Although most of the allegations could not be substantiated, the Inquiry process did highlight a number of lessons that Nirex believes it must recognise and implement. The emphasis throughout the investigation was to try to look honestly at the past and to draw lessons for the future. The allegations

1. United Kingdom Nirex Limited, *Responses to Feedback Received at Follow-up Workshop on Monitoring and Retrievability*, Nirex Report N/112, 2004.

centred on Nirex and in particular the conduct and reporting of its scientific programme, data and information and site selection issues.

Nirex staff members formed the Internal Inquiry team, which investigated the allegations. The Nirex Board appointed Lynda Warren, Professor of Environmental Law at the University of Wales and member of the Radioactive Waste Management Advisory Committee (RWMAC), as an external assessor. Advice was given by Guy Dehn, Director of 'Public Concern at Work' and legal advice was taken from Slaughter and May.

Outcomes

The report on the Nirex Internal Inquiry was published in July 2001, copies were placed in the House of Commons' and House of Lords' Libraries. Copies were sent to all those who participated in the Inquiry including those who had made complaints and to every member of the Board and to each member of Nirex's staff.

The Independent Assessor, Professor Lynda Warren, presented her findings on the Nirex Internal Inquiry to the Nirex Board.

Mechanisms have been put in place to address the recommendations made in the Inquiry Report.

The Company now endeavours to conduct its all its work in the most transparent way possible in line with its Transparency Policy [**Error! Bookmark not defined.**] and taking on board the lessons learned from the Inquiry.

An open door policy exists within Nirex and staff are encouraged to make any concerns known. Management makes time to listen and to follow up on any concerns raised. Questions submitted to the Company are rigorously answered. The Company Directorate meetings (monthly) now have an "Issues and Concerns" agenda item to maintain the visibility of issues raised and to ensure that staff are aware that their concerns (should they have any) are taken seriously and that there are means for dealing with them including provision of a formal response mechanism.

The published Inquiry Report received very positive feedback from the Office for Civil Nuclear Security (OCNS), The Ends Report, general media, BBC Cumbria, ITV Border, BBC Radio 4 and one of the persons making an allegation which was successfully proven by the Inquiry Team.

The Inquiry and its findings have also influenced Nirex's Whistle Blowers' Policy, 'Raising and Sharing Concerns at Work' [9].

Developing answers to questions raised

Nirex commissioned two sets of focus groups to investigate what members of the public think about radioactive waste management [10,11]. Participants were specifically asked what they would like more information about with respect to radioactive waste management. They wanted to know various things, including:

- What is radioactivity?
- How much is there? How much has been produced in the past? In terms that people can understand.

- How is waste being handled now?
- What are the differences between the different classes of wastes, how much is there of each sort, what are their relative strengths; their temperature; their longevity; the method of containment?
- How long does radioactive waste last?
- What is the risk? How will it affect people's health?
- What are other countries doing?

Outcomes

Nirex is developing leaflets to address some of the questions raised in the discussion groups. The leaflets are aimed at members of the general public and have been designed to use a mixture of words and pictures to present the information. To test the leaflets discussion groups were undertaken with Nirex staff. So far leaflets have been developed on:

- What is radioactivity? [12]
- What are the wastes? [13]
- Options for long-term management [14]
- What are the other countries doing with their radioactive wastes? [15]
- What is the Nirex Phased Disposal Concept? [16]

The work also influenced the development of the Nirex brochure. [17]

The following initiatives are also being undertaken to answer stakeholders questions that have arisen from discussions:

- The questions that were raised in discussion groups on the Nirex Phased Disposal Concept [18] have been addressed by Nirex staff and a report has been written outlining the answers. [19]
- Questions raised during a citizens' panel on partitioning and transmutation [20] are being addressed by the expert witnesses who presented to the participants.
- A list of answers to frequently asked questions has been developed and is available on the Nirex website.

Issues, concerns and scenarios

Nirex has identified from its dialogues various issues and concerns that stakeholders have and scenarios that they would like to be considered in assessments of waste management options [21].

Safety is often held as the most important aspect of radioactive waste management, impacts on **health** and the **environment** were also mentioned in most consultations.

In many of the consultations **transport** was an important issue, and during some consultations people mentioned **ethical** and **social** issues, including the impact of waste management on future generations.

Another measure that seemed to be important to consultees is the ability to deal with unexpected events, accidents and technological developments. To enable this **monitoring** of and **accessibility** to the waste management facility are seen to be important. Some people want **mitigation measures** or **contingency plans** to be in place and **retrievability** is an important aspect. Some of the consultation participants wanted **flexibility** to be built into the waste management system to enable future generations to take advantage of technical developments and/or to be able to manage the waste differently.

People were also concerned about the process by which decisions are made and implemented. People were concerned about **openness**, **transparency** and the ability to **influence** the decision-making process. The **structure** of the industry and the **behaviour** of those involved are also important and need to be addressed.

Integrating the issues and concerns into Nirex's work

The outcomes of the dialogues have led Nirex to want to add social and ethical research as a specific research area alongside its traditional scientific and engineering research. Nirex is also undertaking work to integrate the outcomes of its stakeholder dialogue more fully into its assessment work. An internal review of the current Nirex assessments has been undertaken to determine which of the issues are already addressed, which can be addressed in the next set of assessments, and what work is required to do this.

Nirex is also developing a social and ethical assessment of the Nirex Phased Disposal Concept and other waste management options alongside its technical assessments. The social and ethical assessments provide preliminary evaluation of the options against social and ethical principles that have been raised in relation to radioactive waste management.

The issues raised with respect to decision making have been fed into our work in that area and the issues raised about organisational structure have impacted on discussions about making Nirex more independent from the nuclear industry, the issues raised about behaviour are influencing the way that Nirex undertakes its work.

Review of Nirex's performance

Nirex has several policies and documents in which it makes commitments about the way it will undertake its research, engage with stakeholders and allow them to influence and input into its work. Nirex commissioned Environmental Resources Management (ERM) to conduct a series of face to face interviews with representatives from different stakeholder groups. The aim of the interviews was to provide a snapshot of stakeholder views on Nirex's Mission Statement and Objectives [22], policies on Transparency [**Error! Bookmark not defined.**], Corporate Responsibility [23] and the Environment [24] and investigate how people felt Nirex was performing against its policies and statements.

The work first showed [25] that:

- A large majority of interviewees stated that Nirex's current ownership damages Nirex's credibility with many stakeholders and limits its ability to carry out its mission and specific activities, such as providing credible endorsement of packaging proposals.
- Many felt that a new independent organisation needs to be formed which retains Nirex's expertise but is set up in a different way.
- Nearly all interviewees felt that Nirex's mission was too constrained and should refer to radioactive waste management options rather than just disposal options.
- Almost all of those interviewed stated that the Mission should also be extended to cover high level radioactive waste and other radioactive materials, such as spent fuel, plutonium etc.
- There is strong support for the Transparency Policy, Environmental Policy and Corporate Responsibility Policy.
- There is widespread support for Nirex's increased focus on dialogue with stakeholders, and most interviewees commented that Nirex are fairly open and transparent.

Outcomes

The Nirex Board agreed in September 2001 to change the Nirex Mission; it is now:

"To provide the UK with safe, environmentally sound and publicly acceptable options for the long-term management of radioactive materials."

The membership of the Nirex Board is also being reviewed and the addition of more people who are not members of the nuclear industry is planned. The feedback has been used to develop Nirex's work programmes and has been used in our responses to Government consultations.

In July 2003, Margaret Beckett, Secretary of State for the Environment, announced:

"The Government will consult Nirex shareholders on the best way of making Nirex independent of industry and under greater government control, and our aim is to establish and announce the appropriate way forward by autumn of this year." [26]

Nirex repeated the stakeholder review in 2002 [27] and 2003 [28] the results were similar to those obtained in the first stakeholder review and Nirex is looking at how to incorporate the findings into its work and the way it is undertaken.

Conclusions

Nirex has used, and will continue to use, a variety of dialogue techniques co-ordinated under the Nirex Involvement Programme to engage with stakeholders about the work we undertake. The dialogues we have undertaken have helped us to identify a wide range of issues that are of concern to stakeholders. We are now trying to address the issues, concerns, scenarios and questions raised in our work programme.

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ADDRESSING ISSUES RAISED BY STAKEHOLDERS: EXAMPLE OF THE UNDERGROUND RESEARCH LABORATORY OF MEUSE/Haute-MARNE

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Context

The aim of the project is the evaluation of feasibility of a deep repository of high activity/long life radioactive waste within a geological context characterized by :

- a thick layer of argillite (130 m);
- a depth of 500 m for the medium of the layer;
- geomechanical, geochemical, hydrogeological favourable properties, to be confirmed further by field experimentation;
- geological favourable conditions (quiet and ancient geological history, little tectonic fracturation, low hydraulic transmissivity of surrounding rocks...).

The Underground Research Laboratory (URL) is located in the eastern part of the Paris basin (about 300 km from Paris, near the border of the Lorraine and Champagne-Ardennes regions and the Meuse and Haute-Marne districts, on the territory of the Bure village).

The legislative frame for the project is provided by the law of 31th December 1991 (“Loi Bataille”). This law identifies 3 avenues of research to be carried out during a period of 15 years, with regular scientific assessment by an ad-hoc commission (“Commission Nationale d’Evaluation”).

Eventually, the French government will have to propose the parliament a decision about the mode of continuation (if any) of the project.

One of the main idea of this law was to keep balance between:

- scientific and socio-political criteria;
- local/regional and national interest.

So, a local committee for public information (CLIS: Comité local d’information et de suivi) was created early on. At the same time, funds for local economical development and country planning are made available by the waste producers (who are also supporting financially the technical project).

Today, the surface facilities of the URL are achieved. Two shafts have been sunk down to 450 m and 475 m respectively (target : 500 m). A large crop of results have been collected thanks to geological and geomechanical survey in the shafts and through a large set of boreholes drilled from the surface to different depths and at various distances from the site itself (up to 20 km and more).

Regional geological, hydrogeological and sismical survey have provided a good knowledge of natural conditions.

Actors in the Project

Three groups of actors can be distinguished:

- citizens;
 - scientists and experts;
 - “customers” and “decision makers”.
1. The “citizen group” is characterised by social expectations (i.e. wish to find a solution to the national issue of radioactive waste management, by civic attitude and realism, and/or wish to catch the chance for further local development through employment and activity generated directly or indirectly by the URL or, eventually, by the repository).

But in the same time; this group is sensitive to fears: fear of a negative image of the region prejudicial to tourism, fear of potential long term effect of radioactivity on environment and health; hostility against a reinforcement of the French political choice in favour of energy from nuclear origin ...

The actions and answers developed concern mainly the provision of information:

- a newsletter “Vie du Labo”: 4 numeros/year, local diffusion: 25 000;
- visits: 5 000 visitors/year (including open door day, with 400 to 1 500 visitors);
- specific invitations addressed to municipal councils of surrounding villages, elected representatives of concerned districts, medias...;
- participation in the CLIS: board meetings each month; public plenary meetings 3 times/year.

The chairman of the CLIS is the prefect of Meuse Department and the composition of the committee (96 persons) includes local politicians representative of national (parliament) and mainly local (departmental) assemblies, trade-unions, economics organisations, associations of wildlife and environment protection, employees of the laboratory...

The economical impact of the URL is in relation with the construction itself and also with accompanying funds for economical development.

These funds (20 M€/year equally shared between both concerned department (Meuse and Haute-Marne), are managed by a public management group, gathering departmental elected representative.

A project of a Technological and Scientific “Pole” is elaborated in close relation with the regional universities.

About the impact of the URL activity: 19 % of the markets for construction have been attributed to local and regional enterprises, and 350 people are employed today on the URL site.

2. Scientists and experts are divided into direct actors and evaluators/supervisors.

Direct actors are Andra’s scientists, their contractors and their partners (French and European universities and Research centers).

In all, probably more than 150-200 persons can be considered as scientific contributors to the project for a significant part of their time.

Evaluators/supervisors play a role:

- Between Andra’s research teams and scientific community: scientific council of Andra, orientation and supervision committee of the URL, external review (NEA); reviewers of publications.
 - Between Andra’s research teams and government: National Evaluation Committee (CNE) carrying out regular audits and producing an annual report to government; National Nuclear Authority, with technical support by Permanent Group of experts (GPD) and by the Institute for Radioprotection and nuclear Safety (IRSN).
 - Between Andra’s research teams and population: regular presentations of results to the CLIS. The latter has also contracted a third party for an external evaluation of the URL Research Programme.
3. The group of “customers” and “decisions-makers” is composed by:
 - The final users of the facilities and financial contributors to the project, namely: the waste producers (EDF, COGEMA, CEA). Technical and scientific interactions with Andra take place through regular working group meetings (several times each year).
 - Politic decision-makers at national and local level.
 - European Union, with incentive politic and financial support (through CPRD actions).

Conclusion

The confidence relating to the URL project needs to be built upon excellent and strong relations and collaboration with the scientific community. The necessary condition for the acceptance of citizen is to be based upon the conviction that the scientific work is carried on seriously, with the best specialists and up-to-date methods, under a rigorous control, and in opened context. This way, the exciting scientific challenge represented by the URL could find approval.

But these considerations only concern today the URL project, and there is no clear indication about the potential acceptance of an eventual repository.

**ADDRESSING ISSUES RAISED BY STAKEHOLDERS:
EXPERIENCES OF EIGHT ORGANISATIONS**

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Demand for stakeholder involvement has become imperative in the field of radioactive waste management. Providing for fair and competent stakeholder involvement, however, raises several questions of practice, for example: How to address issues raised by stakeholders? How to take stakeholders' views into consideration if they are divergent or conflicting? This paper reviews eight case studies prepared for the Topical Session on Addressing Issues Raised by Stakeholders, aimed at analysing the impacts of stakeholder involvement on decisions in RWM organisations. The studies outline the experiences of the following organisations: Canadian Nuclear Safety Commission (CNSC)¹; Canadian Nuclear Waste Management Organization (NWMO)²; Nuclear Waste Management Organisation of Japan (NUMO)³; Posiva, Finland⁴; Radioactive Waste Repository Authority, Czech Republic (RAWRA)⁵; Swedish Radiation Protection Authority (SSI)⁶; United Kingdom Environment Agency⁷; United States Environmental Protection Agency (EPA)⁸. Case study reports are included in the Annex of this volume.

The paper outlines the main trends and lessons learned from the above case studies. The first section focuses on impacts of stakeholder involvement on specific RWM decisions regarding policy and process. Examples presented in the second section illustrate how stakeholders' concerns may influence general decision-making practices and organisational behaviour. In the third section various approaches to handling divergent stakeholder views are introduced. The paper concludes with recommendations extracted and derived from the eight reports.

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1. Flavelle (this volume).
 2. Shaver (this volume).
 3. Takeuchi et al. (this volume).
 4. Seppälä (this volume).
 5. Šumberová (this volume).
 6. Hedberg (this volume).
 7. Chandler (this volume).
 8. Forinash (this volume).

1. Issues raised by stakeholders: Their impacts on specific RWM decisions

Case studies focus on the following types of decisions:

1. Designing the process aimed at selecting RWM option(s) (e.g., defining criteria for evaluating and comparing options, planning the dialogue between stakeholders and experts, etc.).
2. Selecting RWM option(s).
3. Designing the site selection process (e.g., defining stages, site selection criteria, stakeholder involvement tools, etc.).
4. Selecting a site for an RWM facility.
5. Defining the details regarding the RWM facility (concept, safety standards, monitoring, community oversight, etc.).

In the following, using the cases as illustrative examples, we shall show what procedures were followed in exploring stakeholder views and concerns, and how they influenced the decisions taken by government agencies and implementers.

1.1 *Designing the process aimed at selecting RWM option(s)*

Ensuring the participation of stakeholders in designing the process aimed at selecting RWM options facilitates the identification of widely accepted management options. Involving stakeholders in this type of decisions calls for national dialogue.

- In 2002, the Canadian Nuclear Waste Management Organisation (NWMO) was mandated by the government to undertake a study of different waste management options for spent nuclear fuel. In order to design a process which reflects the values and perspectives of Canadian society, NWMO has conducted a comprehensive national consultation process. This includes face-to-face conversations with a number of individuals and representatives of organisations at local, provincial, national and international levels, and public opinion research studies. NWMO invited comments on how it should approach the overall design of the study of RWM options. Stakeholders cited transparency and fairness as a priority for the study process and also emphasised that the process must be grounded in knowledge and expertise. In response, NWMO has committed to seek an open, transparent dialogue with all interested citizens and communities. It makes accessible to the public on a website as much relevant information as possible (e.g., research papers, submissions by the public, minutes from meetings, etc.) and invites public reflections where possible. In order to provide for knowledge and expertise, NWMO has engaged a large number of – Canadian and international – scientific advisors from technical, legal and management fields. Formal and informal reviews and panels are arranged around all key documents (Shaver, this volume).

To prepare the development of an evaluation framework, NWMO elicited stakeholders' ideas on the priorities concerning RWM options through National Citizens' Dialogues in 2004. The identification of key values emerging from these dialogues has assisted NWMO in developing the assessment framework of waste management options (Shaver, this volume).

1.2. *Selecting RWM options*

Involving stakeholders in strategic decisions on selecting RWM options is a relatively new phenomenon. Earlier, the selection of RWM options was typically the responsibility of national governments, and the consideration of stakeholder values took place through the mechanisms of representative democracy. However, this practice has changed recently and stakeholders increasingly demand that their voices be heard.

- In Finland, an 1983 government decision obliged the waste producer TVO to make preparations for final disposal of spent fuel in addition to the option of shipping the waste abroad for reprocessing. The issue of prohibition of waste transport to Russia was first taken up in the Nordic Council and later the minister representing Finland in the Nordic Council brought up the issue in the Finnish government. There were also requests by the Green Party to stop spent fuel export. In addition, in the early 1990s, when it was expected that Finland would join the EU, the prohibition was needed to prevent potential waste import from EU and, for the sake of balance, the export as well. Finally, both export and import of waste was prohibited by a Parliament decision in 1994 (Seppälä, this volume).

In accordance with the above decisions of the Finnish government and Parliament, long-term storage of spent fuel was not assessed as a zero alternative to final disposal in the Environmental Assessment Program report. However, statements provided by the Finnish Environment Institute and the Ministry of Trade and Industry noticed this deficiency. As a result, assessment of the zero alternative was introduced in the EIA final report. (Seppälä, this volume).

In a number of countries, where stakeholders were not sufficiently involved in strategic decisions on selecting RWM options, conflicts subsequently unfolding in the course of site selection processes led the public and the politicians to call into question the option(s) selected by technical experts. This happened at the end of the 1990s in Canada and more recently in the Czech Republic.

- In the Czech Republic long-term RWM policy is defined by a basic strategic document entitled “The Concept of spent nuclear fuel and radioactive waste management” (Concept). The Concept was prepared by the Ministry of Industry and Trade in cooperation with the implementer (RAWRA) and several other interested parties, and it was approved by the government in 2002. According to the Concept, construction of a deep geological repository for the direct disposal of HLW is the only realistic option for a final solution based on the current level of knowledge. However, a new evaluation of options is expected in 15-20 years time, which could revise this decision. Before the government decision the Concept was subjected to an EIA, which included a public hearing. Throughout the policy development process, RAWRA made efforts to attract the attention of the public to the Concept and the EIA process, however, the issue failed to grasp the interest of the media and most people learnt about the decision only later, during the site selection process. (Šumberová, this volume)

The Concept requires that two suitable sites for the construction of a deep geological repository be selected before 2015. The screening stage of the site selection process was completed by RAWRA by 2003 when six potentially suitable sites for a disposal facility were identified. Then petitions were submitted and referenda were organised in 15 communities at 4 of the sites, opposing any further development in their vicinity. Even the legitimacy of the geological disposal option has been questioned by politicians, communities and other stakeholders, who suggested that other options, e.g., a European regional repository and transmutation technologies should also be considered. As a result, the

government decided to postpone geological activities at all sites for five years. (Šumberová, this volume)

In order to avoid similar conflicts, a growing number of countries strive to base the selection of RWM options on national dialogue.

- Besides Canada, in the U.K., too, a national consultation involving key stakeholders is ongoing in order to determine the waste management options that constitute the elements of the national RWM strategy. (Shaver, this volume; Atherton, this volume)

1.3 Designing the site selection process

There are two ways for involving stakeholders in designing the site selection process. One way is to involve them in preliminary planning (e.g. in the case of the German AkEnd process), another is to design a stepwise site selection process, where stakeholders are consulted from time to time and their opinion is taken into consideration in shaping the process.

- In Sweden, the Act on Nuclear Activities prescribes that the implementer (SKB) must every third year present its research and development programme to the government, which may set conditions for SKB's future work. The review of the programme is carried out by the regulator (SKI), which in turn invites comments from a large number of organisations, e.g. other authorities, municipalities involved in SKB's siting process, environmental groups, universities etc. Thus, the review serves the two-fold purpose of giving a broad audience insight into SKB's work and providing the same audience with a possibility to comment, and hence influence, SKB's future activities. (Hedberg, this volume)
- In Japan, the Specified Radioactive Waste Final Disposal Act stipulates that a HLW repository site be selected via a stepwise process including three stages. The implementer NUMO is required to submit a report describing the results of the investigations at the end of each stage and before proceeding to the next stage. Local residents will be notified about the publication of this report and the document will be open for comments. In addition, the Ministry of Economy, Trade and Industry must solicit opinions from the governors and mayors of concerned communities prior to finalising decisions made during the site selection process. Views of elected officials and the public will be respected when designing the subsequent stages of the siting process. (Takeuchi et al., this volume)

1.4 Selecting a site for an RWM facility

In many countries, EIA is considered the primary framework for public participation in site selection processes. EIA procedures are sufficiently flexible to accommodate new needs as they appear during both the scoping and the assessment phases of the process. (Hedberg, this volume)

- EIA was chosen as the primary tool for stakeholder involvement in the Finnish site selection process. In the scoping phase of EIA, the implementer Posiva organised public meetings in each of the candidate communities where local residents could raise their concerns about the planned facility. For example, impacts of the disposal facility on the image of the municipality and on the consumption of local farm products were discussed. In response to these concerns, social impact assessment studies were conducted. (Seppälä, this volume)

In cases where site selection strategy is based on voluntariness and local acceptance, the affected public has a strong influence on the final site. A special way of involving stakeholders is providing for veto right, i.e., allowing communities to withdraw from consideration within a certain period.

- In Finland, from the very beginning, a veto-right was assured for municipalities, and a host community for the HLW facility was chosen primarily on the basis of local consent. Similarly, in Sweden, site selection strategy has been based on voluntariness and local acceptance. (Hedberg, this volume)
- In Japan, NUMO has chosen an “open solicitation” approach for finding candidate sites for the HLW repository. Therefore NUMO has invited municipalities throughout the country to consider volunteering as candidates for areas to explore the feasibility of constructing a final repository. (Takeuchi et al., this volume)
- In the Czech Republic, a number of NGOs and communities demand a veto right for potential host communities. An amendment to the Atomic Act on this issue was put forward by a number of independent senators, but has been rejected so far. (Šumberová, this volume)

1.5 Defining the details of the RWM concept

In recent practice, details of the waste management concept, including safety standards, monitoring and mitigation measures, are finalised through consultations with a variety of stakeholders.

- In the Finnish case, the concept of retrievability was not originally a part of the final disposal concept. When the regulator, STUK introduced the safety requirements, one member of the government insisted that retrievability be included in the requirements. In response to this request, in the final version of safety requirements, retrievability became a precondition for final disposal. (Seppälä, this volume)
- In Sweden, the regulations developed by SSI concerning the final management of nuclear waste have a clear goal, but are very general and leave a large number of approaches open to show compliance with the standard. SSI needs to develop more detailed guidelines that give adequate guidance to the implementer on how to fulfil SSI’s requirements, but also to meet the concerns of, and to be understood and accepted by, the concerned public. SSI decided to engage the municipalities involved in the siting process for a HLW repository in the development of guidelines on long-term safety of spent fuel disposal. SSI invited persons from the municipalities that participate in SKB’s site specific investigations to focus group discussions, so that questions and comments from the discussions will provide an important input to SSI’s work on the guidelines. (Hedberg, this volume).

2. Issues raised by stakeholders: Their impacts on decision-making practices

In the foregoing we have shown the methods used by the decision makers in exploring the concerns and values of stakeholders and how these influenced the various types of RWM decisions. However, stakeholders' views may influence not only specific (process or policy) decisions, but also the general decision-making practice and behaviour of organisations. This is illustrated by Kotra (this volume), Atherton (this volume), Piguet (this volume), and the following examples drawn from the case study reports.

- Following an extensive consultation program in association with the certification decision on the WIPP facility in 1992, the U.S. Environmental Protection Agency (EPA) assessed stakeholder satisfaction with the program. They found that stakeholders appreciated some aspects of the program but were frustrated with the lack of two-way dialogue and were interested in getting clearer information on technical issues. (Forinash, this volume)

The EPA is using the results of the assessment in formulating the stakeholder consultation program for WIPP's first recertification review in 2004. In response to stakeholders' criticisms, the Agency decided to provide more opportunities for dialogue and face-to-face meetings. This is a departure from past strategies emphasising public hearings and comments periods, in which the Agency only gathers information, and responses to concerns tend to be provided long afterwards. The Agency has also been more direct about asking stakeholders about their preferences for information and meetings, rather than trying to predict. Other key elements of the revised program include (1) defining the goals for public participation more clearly, (2) communicating the stages of the review process, the estimated schedule, and the public's role at each stage, (3) seeking a broader group of stakeholders, (4) using e-mail and Internet technologies to a larger extent, and (5) communicating the basis for the Agency's decision. (Forinash, this volume)

- Based on its experience of public consultation, the UK Environment Agency has developed a six-step approach to designing and implementing consultation and engagement activities. This approach includes the following steps: (1) defining context for engagement/consultation with stakeholders, (2) identifying objectives for engagement/consultation with stakeholders, (3) identifying stakeholders, characteristics and needs, (4) designing the best fit consultation or engagement approach, (5) engaging with stakeholders, monitoring and adapting the process, (6) evaluating and reviewing effectiveness of consultation or engagement. The adopted approach reflects the recognition that – contingent upon existing relationships, political circumstances, stakeholder understanding, etc. - there might be a different way to engage various stakeholders to achieve the best outcome. (Chandler, this volume)

The Agency is also looking at ways of taking account of public concerns about particular risks in decision-making. One approach has been to try to assess the level and depth of public concern, and to include this as a criterion for weighing up options; another approach is to involve members of the public in risk assessment. (Chandler, this volume)

- The Canadian Nuclear Safety Commission (CNSC) has responded to the increasing expectations by the public to be heard by, and for transparency of, their government, by changing its practice in a number of ways. Public hearings and meetings in communities where licensees have their operations have become the most important tools for increasing transparency and public engagement. License applications, environmental assessments, stakeholder interventions and CNSC staff evaluations and recommendations are published and distributed to all interested stakeholders. Improved scheduling of hearings and meetings and the use of teleconferencing, videoconferencing and video webcasting improve

accessibility to public events. The CNSC publishes detailed Records of Proceedings, including the reasons for decision, within six weeks of closing of a hearing. (Flavelle, this volume)

CNSC also provides a broad range of documents and information on its internet site. A corporate outreach program is continually evolving to coordinate and improve the effectiveness of CNSC staff interactions with various stakeholder groups, including municipal organisations, major licensees, the general public and other stakeholders, often at their request. (Flavelle, this volume)

Stakeholder consultation is an integral part of developing new or amending existing regulations. It took three years with consultations to develop the regulations pursuant to the Nuclear Safety and Control Act. Subsequent amendments to those regulations also receive stakeholder scrutiny, and in some instances the implementation of regulations is modified in response to stakeholder consultation (for example, some elements in the program to implement the Cost Recovery Regulations are included at the request of stakeholders). (Flavelle, this volume)

- In Sweden, SKI and SSI conducted a joint research project entitled RISCUM to explore how facts and expert and stakeholder judgements interact to form the basis for decisions. The project introduced the concept of “stretching” to emphasise that transparency requires that SKB’s environment is sufficiently demanding and that SKB can be challenged from different angles. (Hedberg, this volume)

Drawing on the experiences of consultation processes, the RISCUM project recommended two stakeholder involvement tools as especially useful for stretching: EIA and hearings. Hearings have been used to serve for stretching SKB, as well as the regulators. On the other hand, well-structured procedures for EIA have been developed in the municipalities of Östhammar and Oskarshamn. In EIA processes, - as well as various other decisions, - regulators are expected to assist the municipalities in stretching institutional actors and act as the “people’s experts”. (Hedberg, this volume)

3. Addressing divergent stakeholder views

The case studies show clearly the trend that regulators and other policy makers, as well as the implementers increasingly inform and consult stakeholders about alternative solutions, anticipated consequences, values and preferences. The question arises, how can the decision maker take into consideration stakeholder views if there is a considerable difference in opinion among the various stakeholders.

Research in this field indicates that the following four approaches or their combinations can be applied (Vári, 1989):

1. The reconciling approach, aimed at integrating the views of the parties.
2. The statistical approach, aimed at aggregating the views of the parties by quantitative methods.
3. The compromising approach, aimed at finding a compromise acceptable for each party.
4. The confronting approach, aimed at finding a creative solution via direct confrontation of the different opinions.

The essence of the *reconciling* approach is that it does not try to remove the divergences between the views, ideas, values of various stakeholders, but attempts to integrate them⁹. An example for this approach is the development of an assessment framework for evaluating and comparing RWM options, by integrating the values elicited from a number of Canadian stakeholders (Shaver, this volume). Another example is the identification of possible impacts to be considered in Finnish and Swedish EIA processes (Seppälä, this volume; Hedberg, this volume). In all these cases, ideas of various stakeholders were integrated in a joint framework, without the need for reaching a consensus on the relevance of various concerns and values.

Similarly to the reconciling approach, the *statistical* approach does not try to remove divergences, but aggregates different views by using mathematical methods (e.g., statistical procedures, decision analysis). An example for this approach is the statistical analysis of views elicited via public opinion surveys in the Japanese siting process (Takeuchi et al., this volume). Measuring local and national acceptance via local government vote and Parliament vote in the Finnish case and public referenda organised in the Czech Republic are other examples (Seppälä, this volume; Šumberová, this volume). An innovative tool is the UK decision analytic procedure, which tries to assess the level and depth of public concern and include this as a criterion for weighing up options. (Chandler, this volume)

In case of the *compromising* approach, a decision is reached which is a deliberate compromise between the various stakeholders. This approach assumes that the views of the stakeholders may come closer to each other¹⁰. The UK experiments to involve members of the public in risk assessment with the expectation that a compromise can be reached among them, is an example for this approach. (Chandler, this volume)

In contrast to the former three approaches, the *confronting* approach focuses on the differences between the problem representations of various stakeholders. It is based on the assumption that revealing and confronting different opinions may help exploring the sources of conflicts and thus may facilitate the finding of creative and mutually acceptable solutions. An example is the introduction of the concept of “stretching” and the use of hearings in Swedish decision processes (Hedberg, this volume). Confronting the stakeholders’ claims of truth, legitimacy and authenticity is likely to bring underlying knowledge, beliefs, values, preferences, etc. to the surface. This process will help testing the arguments of all parties, as well as testing the authenticity of stakeholders and experts¹¹.

4. Recommendations

A number of recommendations can be extracted and derived from the reports reviewed in this paper. In the following, these recommendations are summarised:

- It is important to be clear about the goals of stakeholder involvement, the steps of the process, the estimated schedule, and the role of the public at each stage.

9. Phillips (1989) calls this „requisite modelling” where the model „is requisite in the sense that everything required to solve the problem is either included in the model or can be simulated in it”. According to Phillips (1989) requisite models must be developed by all key stakeholders.

10. Negotiation support methods (e.g., computer-assisted bargaining and analytic mediation) are primary tools for the compromising approach (Hoch et al., 2001).

11. This method was developed by Wene and Espejo (1999). Another method for the confronting approach is for example, the Strategic Assumption Surfacing and Testing (SAST) (Mason and Mitroff, 1981).

- It is important to be clear about the information sought and the feedback to be provided by the decision makers.
- It is important that the basis for the decision is clearly understood.
- It is important to keep records of the comments and questions raised by the stakeholders and ensuring that all points have been dealt with.
- It is important that stakeholders closely follow and influence the scientific/technical investigations and the decision process.
- It is important that evaluation and feedback be provided for the public.
- There is a general demand for „independent” expertise on the part of the public.
- There is a general demand for stakeholder funding.
- Consulting the public when the legal scope for them to influence the decision is small causes anger, so it is important to be clear on what issues can reasonably be influenced.
- People want to see that they have influenced the process and have had a meaningful impact on the outcome.

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Annex

PAPERS BY OTHER RWM ORGANISATIONS

LESSONS LEARNT FROM STAKEHOLDER ENGAGEMENT IN THE UK ENVIRONMENT AGENCY

Steve Chandler
UK Environment Agency

Introduction

The Environment Agency has many reasons and occasions for engaging with stakeholders and does so very frequently. Many of these are relatively formal, often statutory, consultations which are part of the determination of regulatory permits. Other consultations are part of the Agency's role as developer, for example in the construction of flood defence schemes. The Agency also consults nationally on its significant policies, such as the stocking of salmon fisheries.

This paper gives some examples of lessons learnt from the Agency's own stakeholder engagements and also from our participation in those led by other organizations. In the next section it also describes the Agency's current approach to stakeholder consultation and engagement.

1. Agency consultation and engagement approach

Based on its experience of consultation and engagement, the Agency has agreed a 6-step approach to designing and implementing consultation and engagement initiatives.

It was agreed that for each stakeholder, there might well be a different way to engage to achieve the best outcome. Existing relationships, political circumstances and stakeholder understanding should all be taken into account. The approach adopted allows for maximum flexibility by providing a checklist, backed by some worked examples. The six-step approach (below) helps put into context all the usual questions asked when deciding if and how to engage and can be used for all engagement scenarios, whether local, regional or national.

Step 1	Define context for engagement/consultation with stakeholders
Step 2	Identify objectives for engagement/consultation with stakeholders
Step 3	Identify stakeholders, characteristics and needs
Step 4	Design the 'best fit' consultation or engagement approach
Step 5	Engage with stakeholders, monitor and adapt process
Step 6	Evaluate and review effectiveness of consultation or engagement

2. Current stakeholder engagement initiatives

The Agency continues to develop its work in the field of consultation and engagement. Relevant current and recent initiatives are discussed below.

Building trust in local communities

BTiLC is part of the Agency's wider Community Relations work and aims to help the business work more effectively with communities. In particular, the aim is to reduce the number of contentious issues that take up time and resources, cause stress to staff and damage our reputation.

Development of a national strategy for public participation in the Water Framework Directive

As Competent Authority for the Water Framework Directive, the Agency is responsible for providing access to information, formal consultation opportunities and encouraging the active involvement of stakeholders and all interested parties in river basin planning and the implementation measures to achieve the Directive's objectives. A project is being carried out to develop a draft strategy which will go out to public consultation in autumn 2004.

Burning of substitute fuels in cement kilns

In recent years the Agency has been consulting locally on applications from cement kiln operators to vary their permits to allow them to burn waste as fuel, such as tyres and used solvents. These have been highly controversial and the determinations have taken several years. A number of lessons have been learnt and the determination process (the substitute fuels protocol) is being revised as a consequence. Key points are:

- Consulting the public when the legal scope for them to influence the decision is small causes anger, so it is important to be clear on what issues can reasonably be influenced.
- Public meetings are usually demanded, but individual "surgeries" are much more effective in reaching ordinary people.
- Even when the most significant discharges will be reduced by use of substitute fuels, people are still angry about receiving other's waste in their community.
- One group of stakeholders that we consult is local health authorities, who find themselves in a very difficult position and rarely have the right expertise to comment or reassure.

Revision of radioactive discharge authorisations for the Magnox nuclear reactors

This was a major project to review and revise authorisations for all eight Magnox power stations simultaneously. This was necessitated by a change in ownership, but later demonstrated the advantages of a co-ordinated and consistent approach to stakeholder consultation across similar facilities. Some of the lessons learnt were:

- The importance of building a communication/consultation plan into the project from the start.

- The need for clear and brief summary documents, where the main documents are complex.
- The need for better intelligence on key issues of concern to the public.

Further details of an R&D project to evaluate this consultation in detail is in Appendix 1.

Revision of radioactive discharge authorisations for nuclear submarine refitting at Devonport

Although the actual discharges from the process and their radiological impact are very small, the issue was controversial for two reasons: firstly the dockyard is part of a major city (Plymouth) and secondly the operator was applying for a five-fold increase in tritium discharges to sea. Nevertheless, the Agency feels the consultation for this determination was a success, for the following reasons:

- We were very proactive in briefing local pressure groups and important stakeholders (e.g. MPs and local authority) before we released information to the press
- The lead nuclear regulator lives locally and is well known and respected in the community

3. Participation of the Agency in other organizations' stakeholder engagement processes

BNFL stakeholder dialogue

This is a process run by the Environment Council on behalf of BNFL. It is chiefly concerned with the issues surrounding the Sellafield site in Cumbria. The Dialogue process has been successful in changing BNFL's thinking on some important matters:

- The Company has been persuaded to put effort (and money) into Pu immobilisation R&D. It has also changed the behaviours of the individual people who've been involved with it (in terms of providing new ways of working with those who hold radically different views from the scientific consensus).
- There have been some issues/difficulties when representatives of particular organisations have had to account to their own constituencies for matters they had agreed within the Dialogue. For example, some Environmental Group representatives had agreed there was no practicable alternative to reprocessing Magnox fuel during the coming years. Not necessarily compatible with a campaigning position!

Project ISOLUS

This is a project to consider options for decommissioning of redundant nuclear submarines. Lancaster University has run it on behalf of the Ministry of Defence. There has been two phases of stakeholder engagement, so far. The first “front end consultation” was to ascertain the issues that the public and other stakeholders believe should be taken into account when deciding on the options and site(s) for the interim storage of this waste. The MOD then invited commercial contractors to submit outline proposals for the management of the redundant submarines, which took into account the recommendations and findings of the front-end consultation. These outline proposals then formed the subject of a second round of consultation. This process might be thought to be very much in line with the latest thinking on consultation processes, but from the Agency’s point of view it has had some serious problems:

- There is no clear role for regulators until permit applications have been made for a site and process. This has reduced the confidence of the public in the independent scrutiny of the whole process
- The university has been leading the consultation process ineffectively, in our view. This will also give problems for regulators in the future, when and if they hold public meetings.
- There have been no meeting transcripts to ensure that all points raised are captured and dealt with
- The MOD players have not had the right communication skills to overcome the public’s real suspicion of their motives

Appendix 1

THE USE AND ROLE OF INFORMATION IN MAJOR PUBLIC CONSULTATIONS

Executive summary

The Environment Agency has completed an R&D project to evaluate the use and role of information in its public consultation on the discharge authorisations for the BNFL Magnox nuclear power plants, run between 2000-01. The project has extended the Agency’s work on public participation¹ and will enable it to develop more effective methods for engaging stakeholders in deliberative processes.

The project comprised four main work programmes, split across two stages.

- An initial literature review to support the subsequent analysis by establishing whether there was a consensus on best practice in information provision. This has been published as R&D Technical Report P3-086/TR/1.

1. R&D reports published in recent years include: “Evaluating Methods for Public Participation: Literature Review” (2001), “Local Outreach” (2001) and “Evaluating Methods for Public participation: Technical Report” (2002).

- A comprehensive case study carried out with support from the Magnox project team members, setting out the stages of the process and lessons learned for the Agency.
- The development of criteria for evaluating promotional information.
- The development and application of a methodology for systematic transcript analysis and issues identification, allowing the evaluation of meeting formats and Agency presentation content.

The initial literature review (Section 2) revealed that the range of methods available for interacting with stakeholders has increased rapidly over the last few years and there is a continuing need for new work. Effective provision of information requires good practice in document design and presentation of data. Audiences must be carefully targeted using a variety of tools and methods.

The Case Study (Section 3) recognised that the Magnox consultation aimed at a ‘user-centred’ approach with wide public participation that was in advance of typical Agency practice at that time. Many aspects of the consultation, including the community surgeries, were useful and welcomed by stakeholders. Inevitably, however, there were also difficulties, and these provided valuable learning opportunities. Specific issues discussed in this paper include the value of bringing project teams together as early as possible in order to provide communications input to support the development of documentation and the consultation programme; the need for systems to budget, record and monitor consultation costs; and the need for better information on key issues of concern to members of the public. Some of these issues have already been taken on board in subsequent consultations. In other cases, shortcomings in effectiveness emerging from the evaluation seem more likely to have their roots – and their remedies – at a policy level, or in organisational matters and the allocation of resources.

While participants at public meetings are not always representative of the local community, the additional transcript analysis (Section 5) added important information concerning the issues raised, their relationship to the information provided, and the nature of perceptions revealed at the public meetings.

The results of the transcript analysis substantiate the conclusions of the Case Study and emphasise the need for information to address the range of issues of concern to the user, using a mixture of formats and levels of detail to meet different needs. About 1/3 of the questions or points made concerned topics directly linked to the authorisation, 1/3 were on public health and radioactive waste, and 1/3 related to issues such as regulation, decommissioning, power station operations and energy policy.

The Magnox consultation’s ‘user-centred’ approach with wide public participation was in advance of typical Agency practice at that time. Much of the learning from this experience has already been incorporated into Agency practice, at Sellafield and elsewhere. Outstanding issues that need to be considered are:

- The benefits of early specialist communications input into the project team;
- The importance of promotional activities, and the need for integration into the programme plan;
- The opportunities for improving the accessibility of Agency documentation;

- The need to give proper consideration to the challenge of facilitating access to third party information;
- Targeting of explanatory documentation for different audiences, and the central role of the summary document.
- The benefits of including 'surgeries' as part of consultation with the local community.

**ADDRESSING ISSUES RAISED BY STAKEHOLDERS:
EVOLVING PRACTICES AT THE CANADIAN NUCLEAR SAFETY COMMISSION
(CNSC)**

Peter Flavelle
Canadian Nuclear Safety Commission

In the years just after World War II, the security of the burgeoning nuclear industry in Canada was of greater regulatory concern than environmental issues or public concerns. In the subsequent decades there has been an increasing expectation by the public to be heard by, and for transparency of, their government. Stakeholders of the nuclear industry were demanding better access to the regulatory process, and an evolving societal awareness of the importance of protecting the environment lead the Atomic Energy Control Board (AECB; predecessor of the CNSC) to begin including environmental protection in licensing conditions.

In the 1980s the AECB opened its hearings to the public and began making decisions and documents related to these hearings publicly available. In response to stakeholder concerns, in the 1990s the AECB began holding some hearings in the communities where licensees had their operations, giving a wide range of stakeholders (including local citizens, non-corporate organizations and non-government organizations) better access to the hearings.

During the same period, societal concern over environmental issues culminated in environmental protection legislation, environmental assessment legislation and explicit inclusion of environmental protection in the responsibilities of the CNSC (“to regulate the use of nuclear energy and materials to protect health, safety, security and the environment”) which regulates the nuclear industry in Canada under the authority of the *Nuclear Safety and Control Act*.

The CNSC has continued the approach to openness and transparency through the participation of applicants and intervenors in its public hearing and meeting processes. Licence applications, environmental assessments, stakeholder interventions and CNSC staff evaluations and recommendations are published and distributed to all interested stakeholders in a timely manner, sufficient for thorough examination. Improved scheduling of hearings and meetings, holding more hearings and meetings where the licensed activities take place and the use of teleconferencing, videoconferencing and video webcasting improve accessibility to the hearings, allowing full participation by all stakeholders. The CNSC also publishes detailed Records of Proceedings, including the reasons for decision, within six weeks of the closing of a hearing. In addition to operating and publishing documents in both official languages, the CNSC adopts some measures to communicate with aboriginal stakeholders in their own language.

In addition to the hearing process, the CNSC provides a broad range of documents and information on its internet site <http://www.nuclearsafety.gc.ca/>. A new Communications and Consultation Policy has been developed to help ensure that communications and consultation initiatives of the CNSC are well coordinated, effectively managed and responsive to the needs of the

public, stakeholders and employees. A corporate outreach program is continually evolving to coordinate and improve the effectiveness of CNSC staff interactions with various stakeholder groups (including municipal organizations, boards of directors of major licensees, the general public and other stakeholders, often at their request). Stakeholder consultation is also undertaken for regulatory amendments, the development of regulatory documents and proposed changes in regulatory programs.

A consequence of enhanced accessibility, transparency and openness is the broaching of issues that are of concern to specific stakeholders or are in connection with a specific licensing decision. Frequently, issues that are presented in stakeholder interventions at hearings result in direction to CNSC staff by the Commission tribunal to pursue specific questions or to undertake specific actions. For example, at a recent hearing the issue of communication by a licensee was raised in an intervention by a non-government organization, resulting in the Commission recommending a follow up meeting between the local community stakeholders, CNSC staff and the licensee, leading to changes in the licensee's public information program.

Improved openness has also led to increased stakeholder requests for information on nuclear substance licences, on the nuclear industry and on regulating the nuclear industry. These requests are received through the CNSC information e-mail account (posted on our website), a toll-free telephone number, and the regular mail. In addition, the CNSC also receives requests for information under Canada's Access to Information Act. The CNSC responds to these requests as efficiently as possible. Stakeholder requests for information are passed to an appropriate CNSC staff member for an electronic or oral response. Interaction with an identifiable staff member contributes to developing confidence in the CNSC as a competent, open and transparent regulator.

There are several further examples of CNSC/AECB response to stakeholder issues. At the request of community groups, in 1994 the AECB began to publish the Radiation Index to provide information to the public on radiation exposure from Canadian nuclear generating stations. The proliferation of environmental assessment documents has led the CNSC to develop EA summaries to simplify information for interested stakeholders and to direct them to where more detailed information can be found. The CNSC created Report Cards on Nuclear Power Plants in response to a recommendation of the Auditor General of Canada for a more transparent reporting of the status of nuclear power plants.

Extensive stakeholder consultation is an integral part of developing new or amending existing regulations. It took three years of consultations to develop the regulations pursuant to the *Nuclear Safety and Control Act*. Subsequent amendments to those regulations also receive stakeholder scrutiny, and in some instances the implementation of regulations is modified in response to stakeholder consultation (for example, some elements of the program to implement the Cost Recovery Regulations are included at the request of stakeholders). Furthermore, the drafting of every Regulatory Policy, Standard and Guide includes stakeholder review and formal dispositioning of stakeholder comments as part of the Regulatory Documents Development Process.

In summary, operations and practices at the Canadian Nuclear Safety Commission have been evolving in response to changing societal expectations and in response to issues and concerns expressed by stakeholders about the nuclear industry and nuclear regulation in Canada.

**OVERVIEW OF STAKEHOLDERS ISSUES AND ACTIVITIES:
REPORT OF THE U.S. ENVIRONMENTAL PROTECTION AGENCY**

Betsy Forinash
United States Environmental Protection Agency

Over the past year, the U.S. Environmental Protection Agency (US EPA) has implemented a new, more interactive stakeholder program in preparation for conducting a comprehensive technical update of the Waste Isolation Pilot Plant (WIPP) after its first five years of operation. As the national repository for long-lived transuranic radioactive waste from U.S. defense activities and site clean-up, the facility continues to be of great interest both locally and nationally.

We have worked actively with stakeholders since Congress established EPA as the regulator at WIPP in 1992. Early on, we visited with local communities near WIPP to understand their concerns and information needs. In response, we established toll-free telephone information lines and developed numerous public documents (in multiple languages). During the technical review and regulatory decision regarding WIPP's safety, we provided numerous public hearings and solicited written comments on important topics.

Ultimately, we issued the WIPP certification decision (1998), finding WIPP in compliance with EPA's radioactive waste disposal regulations and allowing it to open (1999). During "lessons learned" assessments afterwards, we found that stakeholders appreciated some aspects of our program but were frustrated with the lack of two-way dialogue and were interested in getting clearer information on technical issues.

We are using the "lessons learned" in formulating our stakeholder activities for WIPP's first recertification review, begun in March 2004. The recertification review is intended to confirm that the WIPP continues to comply with EPA's regulations, taking into account the changes and new information gained over its first five years of operation. Key aspects of the stakeholder program are summarized below:

- Define the goals for public information and participation. Our goal is to gain public acceptance, not necessarily full agreement, of our actions. We want to foster in the public (1) a clear understanding of the basis for our decisions, and (2) belief in the integrity of our Agency people and processes.
- Establish clearly what recertification means, and how the review will progress. We have developed key messages describing the recertification:
 - The review is not intended to revisit the original decision to open WIPP.
 - We will conduct a thorough technical evaluation focused on *changes* to the WIPP.
 - Based on our ongoing oversight, we haven't identified issues to date that we expect would lead us to deny recertification.

We use the same messages internally and externally and repeat them often. In addition, we have published (in print and on internet) a step-by-step description of the review process, estimated schedule, and public role at each stage.

- Provide more opportunities for dialogue and face-to-face meetings. This is a departure from past strategies emphasizing public hearings and comment periods, in which the Agency only gathers information, and responses to concerns tend to be provided long afterwards. We've been more direct about asking stakeholders what information and meetings *they* want, rather than trying to predict.
- Promise only what we know we can deliver. This can be challenging because it means saying "no" (or "we don't know") more frequently, and often in person. It also requires being blunt about what kind of information is most useful to us, and about how we will (or won't) provide feedback. But we believe it is an important factor in building personal trust, and that establishing more realistic expectations will lead to less frustration for stakeholders.
- Take advantage of new technologies. While maintaining telephone hotlines and libraries of printed material (for those who are uncomfortable with computers, or do not have them accessible), we are increasingly using e-mail and the internet to allow broader and quicker distribution of information. Through a new e-mail alert system, we can notify interested stakeholders of actions the same day they occur. Similarly, we have been able to make DOE's technical documentation fully available on our web page.
- Seek a broader group of stakeholders. We are cultivating the interest and participation of communities along transportation routes and near DOE sites sending waste to WIPP. This provides a greater diversity of views and interests.

The revised stakeholder program builds on our "lessons learned" and also those expressed through the FSC. There are some challenges to implementing this new strategy within our Agency structure, which is oriented towards more formal rulemaking procedures and building defenses against legal battles. Nevertheless, we have gained the necessary internal support. Stakeholders have been very receptive to the new approach and already we see that there is more dialogue and less hostility (although of course that doesn't mean they always agree with us!).

ADDRESSING ISSUES RAISED BY STAKEHOLDERS: IMPACTS ON PROCESS, CONTENT, AND BEHAVIOUR IN WASTE ORGANISATIONS: THE SWEDISH RADIATION PROTECTION AUTHORITY'S VIEW

Björn Hedberg
Swedish Radiation Protection Authority

Stakeholders

There is not a formal definition of a stakeholder in the Swedish nuclear waste management programme. The general attitude is rather that those who have an interest or feel concerned should be taken seriously and listened to. This is for example reflected in the Environmental Code which states the implementer (in this case SKB) must consult “government authorities, municipalities and organisations together with the public widely. Consultation will relate to the localisation, extent, design and environmental impact of the measure together with the content and preparation of the environmental impact statement.” Thus, the Environmental Code emphasises public participation and does not specify any criteria for qualifying as a stakeholder.

Without an exact definition the stakeholders include: The implementing organisation (SKB), Municipalities involved in the siting process, Regulatory authorities - primarily SKI and SSI, Environmental organisations on a national level, Local interest groups, and Affected individuals. In addition to these parties the County Administration Boards have important functions, as they are requested to assist the implementer in identifying stakeholders and to facilitate consultations and exchange of information.

Siting of nuclear facilities

Before SKB started the current siting process in 1992 both SKI and SSI had limited experiences of siting. The siting of the final repository for low and intermediate level waste, SFR, and of the central interim storage, CLAB, in the 1980's had given some insights in the complexities of siting but cannot be compared to the siting of a final repository of spent fuel, which always and everywhere appears to be controversial.

SKI and SSI at first considered siting a task essentially for SKB and the municipalities that volunteered. The main concern was that the regulators' independence and credibility would, or at least could, be lost by an active participation in the siting process. However, due to own research projects and to increasing demands from the municipalities, SKI and SSI since about 1995 are quite active in the siting process. Furthermore, the regulators' research relating to risk communication, transparency in decision processes etc. has continued to increase.

Stepwise implementation

In SKI's and SSI's opinion, which is shared by most concerned parties in Sweden, the stepwise approach to implementation is essential since it at each step allows for evaluation of steps taken so far and for the appropriateness of the next step. Thus, at each step it is possible to "reverse" or redirect the waste management programme. A key element in the Swedish step-wise approach is the requirement in the Act on Nuclear Activities that SKB must every third year present its research and development programme to the Government, which may set conditions for SKB's future work. The review of the programme is carried out by the SKI, which in turn invites comments from a large number of organisations, e.g. SSI and other authorities, municipalities involved in SKB's siting process, environmental groups, universities etc. Thus, the review serves the two-fold purpose of giving a broad audience insight into SKB's work and providing the same audience with a possibility to comment, and hence influence, SKB's future work.

Transparency in decision making

A prerequisite for a transparent and democratic multi-stakeholder process is that it should be possible to understand how facts, expert judgement and value judgement interact to form the basis for a decision. This was explored by SKI and SSI in a joint research project called RISCUM. The overwhelming conclusion from RISCUM was that that all issues raised in the interaction between SKB and its environment (various stakeholders) can, without exception, be brought back to claims of truth, legitimacy and authenticity. It is suggested that these three aspects are equally important in the decision making process and should be evaluated as separate entities. The RISCUM project introduced the concept of "stretching" to emphasise that transparency requires that SKB's environment is sufficiently demanding and that SKB can be challenged from different angles. This stretching should be able to apply not only on the implementer, SKB, but also on other organisations/stakeholders.

In a multi-stakeholder process, an important task for the regulators is to assist the municipalities in this stretching. The regulators should thus act as the "people's experts" in the process.

The RISCUM project has identified two channels for stretching, which were viewed as particularly useful, EIA and hearings. EIA is identified as the lead process for public participation and stretching. Well-structured procedures for EIA have been developed over the last years in the municipalities of Östhammar and Oskarshamn. Issues and concerns are in special EIA-forums shared among the different stakeholders involved in the siting process. The framework that has developed has proven very useful since it has been designed to allow for discussions between the stakeholders but at the same time allowing them to maintain independence. A key ingredient for the success has been that the procedures are flexible enough to accommodate new needs as they appear during the process

The regulators also take part in many of the consultations SKB is required to conduct according to the legislation regulation the Swedish EIA-process.

In short RISCUM proposed an increased use of hearings in the Swedish decision process. The motivation was that hearings are useful for testing the arguments of all parties and that they also test the authenticity of stakeholders and experts. It should be noted that the purpose is not to stretch only the implementer. It is equally important to stretch e.g. the regulators. However, RISCUM stressed that great care must be taken to avoid the creation of adversarial procedures, which may hamper genuine and sincere communication.

Hearings has been conducted on several occasions the recent years and it is important to stress that these hearings has served the twofold purpose of stretching SKB as well as the regulators.

Funding

The municipalities participate in the siting process on a voluntary basis. In SSI's and SKI's opinion the principle of volunteerism is a necessary condition for the site selection. This means that the municipalities concerned should give their consent to each stage of SKB's siting process. In order for volunteerism to work satisfactorily the municipalities must have the possibility to closely follow and, in particular, to influence the scientific/technical investigations and the decision process. In order to facilitate this, the municipalities receive stakeholder funding from the state up to certain amount. The funding has been of great importance for the quality and the progress of the siting process.

Over the years it has been suggested many times that also NGO's should receive stakeholder funding. In the reviews of SKB's latest research programmes both SKI and SSI recommended the Government to carefully consider if it is appropriate and possible to provide funds to the NGOs at the national level. The Government has in a recent proposition suggested that they should get the right to apply for money from the nuclear waste fund. It should however be pointed out that the municipalities could fund activities of the local NGO's. This is also done in practice. Typically the municipalities have paid certain activities arranged by the NGOs.

Information project on nuclear waste

The experiences from the early nineties show that the municipalities participating in the siting process for a final repository require active and visible authorities and that the authorities have an important role in providing information. The concerned municipalities are about to take the most important democratic decision ever and there is a large requirement of expertise.

SSI and SKI therefore launched a coordinated information project, 1997 to 2003 to inform and discuss issues of the nuclear waste in the concerned municipalities. The aim was to clarify the authorities roles and responsibilities, and increase knowledge about radiation, radiation protection and nuclear waste safety issues. The project advertised in the local press, arranged exhibitions and seminars, and made information available in brochures and websites. Target groups was not only the decision-makers, but also schools, opinion groups and local residents. The project was financed by the Swedish Nuclear Waste Fund.

Since 2004, SSI has continued the information project concerning radiation protection issues.

Dialogue on radiation protection criteria

The regulations developed by SSI concerning the final management of spent nuclear fuel or nuclear waste have a clear goal, but are very general and leave a large number of approaches open to show compliance with the standard. SSI needs to develop more detailed guidelines that give adequate guidance to the implementer on how to fulfil SSI's requirements, but also to meet the concerns of, and to be understood and accepted by, the concerned public.

As regulatory standards and criteria are the point of departure for the questions that the performance assessment, PA, should address they are the point of departure for introducing societal

values into the PA. This is a task for the regulatory authorities, which indeed are legitimate representatives of society and its citizens. If the authorities involve the citizens at the stage of developing the regulations, this would be a way to include their values in the framework of PA. This was the purpose of the initiative of SSI to engage the municipalities involved in the siting process for a HLW repository in the development of guidelines on long-term safety of spent fuel disposal. SSI invited persons from the municipalities that participate in SKB's site specific investigations to focus group discussions, so that questions and comments from the discussions could provide an important input to SSI's work on the guidelines. Focus groups were held in Oskarshamn and Östhammar in October 2002. The outcome of the Focus group discussions was a large number of questions related to:

- radiation and radioactivity;
- concept comprehension, measurement, risk and safety;
- information aspects and transfer of knowledge.

The Focus Group report was sent to an expert group within SSI that will provide answers and comments to the questions which will be presented to the municipalities, but also used as an important input to SSI's work on the guidelines.

A conclusion is that there is a strong involvement in Oskarshamn and Östhammar for contributing to and for developing the work in the process aimed at building a repository for spent nuclear fuel and nuclear waste. The discussions in the focus groups showed that:

- The participants had substantial comments on the content and the shaping of the guidelines which will be of use to SSI in the current work.
- Involved participants' needs for knowledge, as well as their comments, reach far beyond the outline of the guidelines. One can find questions on basic concepts and technical details of measurements as well as on issues of legal, health related, organisational and social aspects and consequences, ranging from today and far into a the distant future. This will be of use for building an information database that can place radiation protection criteria concerning final disposal into a broader context.

SSI plans to put forward a draft of the guidelines to be discussed further in the municipalities, followed by discussions with other actors. The guidelines are planned to be ready at the end of 2004.

**ADDRESSING ISSUES RAISED BY STAKEHOLDERS:
IMPACTS ON PROCESS, CONTENT, AND BEHAVIOUR IN WASTE ORGANISATIONS,
THE FINNISH CASE**

Timo Seppälä
Posiva, Finland

Over the years, when the site selection for final disposal of spent nuclear fuel in Finland was prepared, stakeholders frequently influenced the process. These inputs are shortly described in the following review.

Amendment in Nuclear Energy Act in 1994

Import and export of nuclear waste was prohibited by the Parliament in 1994. Although in the beginning of 1990's it was expected that Finland would join EU and consequently the prohibition was needed to prevent potential waste import from EU and also for the sake of balance, the export as well, there was also requests by the green party to stop spent fuel transports from Loviisa power plant to Russia. Issue of prohibition of waste transports was, however, first taken up by Bellona in Nordic council in the beginning of 1990's strongly arguing the banning on transports. Later on the minister that represented Finland in Nordic Council brought up the issue in Finnish Government.

Social studies in EIA

When compiling the Environmental Impact Assessment program report, Posiva organised public interaction meetings in each of the site investigation municipalities. In these occasions local people brought up their concerns about the final disposal project. For instance, impact of final disposal to the image of municipality and to consumption of local farm products was discussed. Subsequently, these issues were introduced to social studies covered in the Environmental Impact Assessment report.

Retrievability

Concept of retrievability was not originally a part of final disposal concept. When the Regulator (STUK) introduced the safety requirements, the Green minister in the Government insisted retrievability to be included in the requirements. In the final version of safety requirements, retrievability was a precondition for final disposal.

Assessment of the zero alternative for final disposal

When Posiva compiled the Environmental Assessment Program report for final disposal project, long-term storage of spent fuel was not assessed as a zero alternative for final disposal. This deficiency

was noticed in a statement given by Finnish Environment Institute and later on when the actual EIA final report was compiled, zero alternative was introduced in the report.

Amount of spent fuel reconsidered in the application for the decision in principle

When Posiva filed the application for the Decision in Principle with the Government, the amount of spent fuel to be disposed of according to the application was 9000 uranium tons. This estimation was based on an assumed operating time of 60 years for the four existing units and, in addition, two new units with the operation time of 60 years. In the Government, the green minister criticised the application where the estimation took also account non-existing units. Before the actual decision in principle was taken in the Government, Posiva amended its application by extracting the additional spent fuel from the application, the final amount of fuel being then 4000 uranium tons, estimated to be produced by existing four power plants in 60 years of operation. Later on, a new separate decision in principle was made on the additional amount of 2500 tons of spent fuel taking into account the decision made on the fifth reactor.

**ADDRESSING ISSUES RAISED BY STAKEHOLDERS:
IMPACTS ON PROCESS, CONTENT AND BEHAVIOUR IN THE CASE OF THE
CANADIAN NUCLEAR WASTE MANAGEMENT ORGANIZATION**

Kathryn Shaver
Canadian Nuclear Waste Management Organization

Introduction

The purpose of this paper is to highlight how stakeholder input has shaped the work of the Canadian Nuclear Waste Management Organization (NWMO) in both process and content.

In 2002, NWMO was mandated by the Government of Canada to undertake a study of different approaches for the long-term management of used nuclear fuel, and to recommend an approach to the Government by November 15, 2005. Public consultations are an important part of this legislated mandate. In inviting broad dialogue and feedback from the public at large, experts, and other communities of interest, NWMO intends that its processes, the study and its recommendations will reflect the values and perspectives of Canadian society.

The organization has adopted a reflective study approach, through which it deliberately seeks public input at each stage of study. A continuum of engagement activities provides for dynamic interaction between the engagement processes and the research and analysis. The insights gained from engagement are integrated into the NWMO's study, to continuously enrich the iterative learning process.

NWMO has received a wide range of comments, insights and questions from face-to-face discussions, workshops, roundtables, written submissions and public opinion research. The sections that follow illustrate how this stakeholder input has helped to shape the organization's public engagement plans, workplan and the focus of the assessment that is now in progress.

Going forward, issues and comments provided by different communities of interest will assist the assessment of the management approaches and help design NWMO's recommendation to the Government of Canada.

1. Conversations about expectations

A commitment to "listen and learn" has been at the heart of NWMO's study process from the beginning. By listening, NWMO is seeking to understand the expectations and values of Canadians, so that they may be reflected in the substance and process of NWMO's work.

With its establishment in Fall 2002, NWMO commenced a period of face-to-face conversations with more than 250 individuals and representatives of organizations at local, provincial, national and

international levels. These included representatives of aboriginal organizations, nuclear power plant workers, youth, residents of nuclear power plant communities, environmental groups, industry experts, faith communities, business, government agencies and parliamentarians. In addition, public opinion research was conducted to help NWMO understand the views of Canadians. The purpose of this early outreach was to introduce the newly-created NWMO and to explore expectations about its mandate. Through informal discussions over a number of months, NWMO received many comments on how individuals and groups wished to be consulted and involved in the development of an approach to the long-term management of Canada's used nuclear fuel.

NWMO explored expectations about who should be invited into the study process

Many emphasized the need for NWMO to consider the perspectives of a broad range of individuals and groups in the study. It is not acceptable to most Canadians for the NWMO to focus solely on experts – both experts and the public at large need to make important contributions to our work.

- NWMO has developed a study plan that provides for engagement in the broadest sense. Participation is planned with citizens at large, with targeted groups such as reactor site communities and aboriginal peoples, as well as interested individuals who offer experience from a range of disciplines and backgrounds.
- The study plan engages a wide range of experts who have been commissioned to prepare background papers, and to contribute to the methodology and assessment of management approaches. At the same time, the study plan provides for extensive engagement of Canadian citizens – through focused discussions with communities of interest, and invitations to the public at large to share comment and perspective. This is intended to enrich the study with perspectives and experiences of both the general public and those offering technical expertise.
- NWMO encourages dialogue in multi-disciplinary settings, to enrich the consideration of the issues by enabling participants to listen to each other. Roundtables and workshops have drawn together participants from a cross-section of disciplines, to allow an exchange of views around key issues related to the study.

NWMO asked about how best to provide information and opportunities for stakeholder engagement

The management of used nuclear fuel is not an issue that Canadian citizens tend to think about on a daily basis. Public knowledge and intensity of reaction on the issue of managing nuclear waste continue to be low. However, when asked directly, citizens responded that nuclear waste management is considered to be an important issue, and people expressed interest in receiving information and learning more. Public opinion research suggested that there is only a moderate to low probability that citizens will actively seek out this information. There appears to be a preference for more passive means of receiving information that comes into their homes through newspapers, brochures, or television.

- NWMO understands the importance of, and challenge associated with, informing interested Canadians throughout the study. In addition to making information available on the NWMO website, NWMO has provided notices of its discussion papers in some local and national papers, and works closely with some key media contacts to increase awareness of the NWMO study. NWMO continues to schedule frequent speaking engagements that allow the

NWMO President to address a wide range of publics, raising the profile of the NWMO's work.

- As NWMO prepares for the release of its next discussion document in 2004, communications planning will consider how best to make information readily available to the general public. Also under consideration, are opportunities to use national television broadcasts and "open house" meetings for purposes of furthering the dialogue around the issues. NWMO expects that through its focused work with nuclear host communities, suggestions will be raised around the most effective means of providing information to those communities.

Stakeholders have requested factual, neutral baseline information. Provide the facts – and people will form their own opinions. The view expressed was the richer the baseline information, the more meaningful the input.

- NWMO is committed to being rigorously neutral, to demonstrate to the public that it is neither advocate nor apologist for the nuclear industry. Recognizing the importance of providing objective, fair and balanced advice, NWMO seeks to publish factual information in its major discussion documents and fact sheets and background papers, all available on the website, and encourages submissions to provide a range of perspectives.

The website is accepted as a very important and useful way of reaching out to Canadians across the country. At the same time, NWMO was reminded not to rely exclusively on the website to get the word out. Not all Canadians have access to, or refer to, the website for information.

- Early in its mandate, NWMO designed a sophisticated website, to serve as the major repository for NWMO documents and to facilitate an interactive dialogue with Canadians from coast to coast. NWMO recognizes that it must be mindful that electronic communication will be accessible to some, but not all, Canadians. A toll-free number is available to take requests for information, and other vehicles for engaging the general public are under consideration at this time.

NWMO received different perspectives from stakeholders on the most appropriate method for conducting consultations. Clearly, no one approach is appropriate for all. Some expressed interest in working with the NWMO to tailor information packages appropriately and assist the NWMO in convening local dialogue with communities and groups, including nuclear workers.

- Nuclear reactor site communities made it known to NWMO early in the process that they would welcome an opportunity to advise on the engagement initiatives in their respective communities. NWMO has invited Mayors, local councils and community advisory committees to help shape NWMO's consultations using preferred venues and consultation approaches. Aboriginal organizations expressed interest in designing and leading consultations within their respective communities. To facilitate this, NWMO is setting up agreements with these organizations to ensure that comments are provided throughout the study process. Through other regional and national dialogues, NWMO is learning more about the desired approach to engagement and information needs in different communities and regions.

NWMO was reminded by stakeholders that financial support may be required for some interests to participate. Some identified a need to engage experts to help them understand the issues, so they can ask the right questions and participate in a meaningful way.

- NWMO recognizes that fulfilling its commitment to active engagement and inviting a broad range of perspectives will, in some situations, necessitate the provision of participant support through honoraria and/or travel expense reimbursement. Where some representatives, participants or organizations may not have the resources or expertise required to effectively engage in NWMO activities, the NWMO is committed to address barriers to engagement on an as-needed basis.

NWMO was urged to seek out expertise in citizen engagement, and defer to professionals to develop and manage sophisticated, two-way dialogue with Canadians.

- NWMO's approach is to have most workshops, formal dialogues, and roundtables designed and facilitated by third parties with expertise in this area.

NWMO research revealed that while a large percentage of people believe that the general public should be involved in the NWMO study, only a small percentage would personally like to be involved.

- This suggests a challenge for the NWMO in engaging the general public in the dialogue. In the initial phase of its work, NWMO sought to benefit from the input of Canadians on a range of issues through workshops and dialogues to which different cross-sections of society were invited. In addition, an extensive program of national citizens' dialogues was convened in locations across Canada, to allow a random selection of unaffiliated Canadians, chosen to reflect the regional demographics, to share their perspectives with NWMO as proxies for the public at large. As NWMO proceeds to table its assessment and draft recommendations for public comment, the organization will attempt to invite the general public's views through a range of outreach initiatives.

A certain level of skepticism was evident in NWMO's early conversations regarding the impact that contributions of the public would have on NWMO's study. People want to see that they have influenced the process and have had a meaningful impact on the outcome.

- By integrating inputs of the public into each phase of the study, it is NWMO's hope that Canadians will see their values and contributions reflected in the final report in 2005. For example, questions that provided the foundation for the assessment framework for the study flow directly from these early conversations with citizens.

2. Suggestions on study design

The NWMO is approaching the study as an iterative process of learning and response, allowing for adjustments along the way in response to expectations and needs of Canadians.

NWMO invited comments on how it should approach the overall design of our study of management approaches

Transparency was cited as a priority for the NWMO process. There is a high level of cynicism regarding the nuclear industry, and awareness of nuclear matters is low. From early informal conversations across the country, NWMO was told that whatever management approach is ultimately recommended, it must be the product of a fair and transparent study process. Early conversations

highlighted strong support for the notion of the NWMO “thinking out loud”. People wanted to observe and follow the thinking through of approaches, and reflect on the research, as it evolves.

- As an organization, NWMO has committed to seek an open, transparent dialogue with all concerned citizens and communities of interest. NWMO believes that sharing information and encouraging an exchange of perspectives is fundamental to enriching the NWMO’s review and analysis of management approaches. NWMO makes accessible to the public on the website all of the information that NWMO creates, receives and analyzes in support of the study. Where third party submissions are mailed to NWMO, permission is sought to make those submissions public, to support an exchange of perspectives. Through the website, NWMO encourages transparency in the dialogue and debate, inviting public reflections prompted by NWMO’s research papers and submissions posted by the public.
- Also in support of transparency, the NWMO’s Board of Directors requested that all minutes from Board meetings be posted on the NWMO website once approved. Similarly, the independent Advisory Council to the NWMO regularly publishes its minutes following each Council meeting. This commitment to transparency has been well received by NGOs.

People wanted to know how NWMO was approaching its work and how and when they could get involved. NWMO was asked to share openly with the public its workplans, including key timelines for decision-making at each step of the study.

- NWMO responded by scoping out a study plan for 2002 through 2005 that is shared publicly. Posted on the NWMO website, the plan makes transparent a roadmap and key milestones for the organization, providing clarity for individuals interested in following and participating in NWMO work.

NWMO was requested to run an inclusive process – one that engaged broadly and communicated often with Canadians. There is interest in contributing to NWMO’s early thinking. Stakeholders requested that NWMO not wait for study completion to present them with a large final report for review. People need time to think about such complex issues, and provide informed, thoughtful feedback. NWMO was requested to analyze and consult on “bite-sized pieces” along the way. However to avoid “information overload”, NWMO was asked to develop user-friendly documentation, distributed in manageable amounts through the study period. There was interest in having written discussion documents distributed by NWMO as a tool for focusing dialogue and discussion within different groups and communities.

- These comments influenced heavily NWMO’s study plan development. NWMO responded by adopting a plan in which its work is undertaken in a step-wise fashion. The NWMO study is being approached in phases, to allow information, analyses and thinking to be shared and considered publicly in a staged manner. NWMO decided to issue a series of documents to invite feedback at each stage. A first discussion document (2003), presented context around the issue, described some of the management options, and posed key questions for analysis. A second discussion document (2004) will share results of the preliminary assessment of approaches. A Draft Study Report (2005) will invite public feedback on draft recommendations and implementation plans, prior to finalizing the submission to Government later that year. NWMO has targeted to have at least 4-5 months for engagement following the release of each document.

NWMO's stakeholders shared their expectations for the study of management approaches, emphasizing that the NWMO study process must be grounded in knowledge and expertise

The assessment of management options must be based on the best science, knowledge, and experience available in Canada and worldwide. First and foremost, NWMO heard support for the involvement of Canadian and international scientists and engineers from the nuclear industry. The principles established by Canadian regulatory authorities are considered important, as is the work of international organizations with expertise in oversight of nuclear operations. Often reiterated, were expectations that Canada benefit from, and build on, the experiences and learning of other countries on the topic of nuclear waste management, as well as best practices in involving the public and communities of interest.

- NWMO has engaged a large number of scientific advisors, and advisors on a wide range of technical, legal and management matters. Many accomplished Canadians are engaged in NWMO's work, as are a number of individuals known internationally for their areas of specialized research. Recognizing a strong interest in looking to the experiences of other countries, NWMO has initiated background research to scope out international approaches, invited international advisors into the study, and participates where possible in international fora and technical conferences to support further information exchange.

Members of the public expect that the study will seek out multi-party evaluation in conducting its work. Having expert panels to counsel, monitor and report on the study were some mechanisms that people felt would provide confidence in the study.

- NWMO arranges for peer reviews for most of its commissioned background papers. A multi-disciplinary group of experts has been appointed to lead the NWMO's assessment of management approaches. Formal and informal reviews and panels are arranged around all key documents.

NWMO was encouraged to involve some specific communities of interest. For example, there was strong support for involving people from communities with existing nuclear plants, to draw upon the special experiences and insights of people who live and work near nuclear facilities. NWMO was urged to engage aboriginal communities, and to do so at an early point in the study process to integrate perspectives and priorities of traditional knowledge in our work. NWMO was reminded that seeking the perspectives of youth will be instrumental in developing its study, given the implications of an approach for many future generations to come.

- NWMO convened a Traditional Knowledge workshop early in its process, to initiate discussion on how NWMO's study might be enriched by the learning of Canada's aboriginal people, and looks forward to working collaboratively with Aboriginal peoples on the design and delivery of their own consultation processes. NWMO is engaging young people through such activities as presentations and dialogues on its first discussion document at a Young Nuclear Congress, and engagement of graduate students in consideration of the issues. Through e-dialogues, NWMO plans to continue to invite perspectives of youth. NWMO has responded to stakeholder suggestions that it engage in a very specific and special way with communities where nuclear reactors are currently located. These communities have worked and lived with a nuclear presence for a long time and can bring a special and experienced perspective to help inform the NWMO work. In initiating this work, NWMO brought together representatives from nuclear site communities across Canada, inviting an exchange of experiences from living in communities that have hosted nuclear facilities for many years.

3. Framing values

Through meetings with stakeholders, NWMO heard that there is no one correct analytical framework by which to compare options. The framework for Canadians must be developed through broad consultation if it is to reflect accurately the values and perspectives of society.

- NWMO has sought to identify a values framework that will underlie the study of management approaches. NWMO convened National Citizens' Dialogues in early 2004 at twelve locations across the country, bringing together members of the public, randomly selected but representative of the local demographics of each area, as proxies for the public at large.
- The identification of key values emerging from this work has assisted NWMO in understanding widely held values and principles that Canadians would like to see reflected in the NWMO study. This research also provides insights as to how Canadians approach, assess, and make tradeoffs around the complex issues associated with nuclear fuel waste management.
- This input is used in different ways:
 - Key themes and values have been incorporated into the assessment of management approaches that is under way.
 - The values and comments shared through these dialogues will also guide the NWMO's development of implementation plans for the management approaches.

4. Exploring the fundamental issues

NWMO invited citizens to help shape the questions to be asked in the analysis and to offer comment on how those questions should get answered in the course of the study

Prior to commencing the formal study and in the course of NWMO's early conversations about expectations, many flagged areas of priority that they felt should be carefully considered in the assessment of management approaches. Issues were wide-ranging, from health and safety, security and environmental protection; to matters of ethics and social justice and socio-economic and cultural impacts on affected communities.

- With this input, NWMO shaped the foundations for the assessment framework: Guided by the comments provided through early meetings with Canadians, NWMO developed 10 key questions, proposed as the general foundation for the assessment of management approaches.

NWMO published these 10 key questions in Discussion Document 1, entitled "Asking the Right Questions? The Future Management of Canada's Used Nuclear Fuel". The intent was to spark dialogue and explore whether Canadians felt that their priorities and key concerns would be captured in an assessment based on these key questions. NWMO convened a range of engagement activities over a five-month period to invite feedback on the questions proposed for the assessment. In discussions with different groups, views differed on the relative importance of the key questions, and suggestions were offered on desirable characteristics of a management approach. However, most participants responded that they were able to see their values and concerns reflected in the framework questions proposed for the basis of the assessment.

- Having tested and validated the key questions through engagement, NWMO adopted the ten questions for the basis of the assessment.
- Using those questions, NWMO proceeded to design detailed assessment objectives and criteria. These criteria are presently being applied in the comparative assessment of management approaches.

Using Discussion Document 1 as a tool of engagement, NWMO invited comment on a proposed set of technical methods proposed to be the focus of the assessment. While NWMO received a few submissions from individuals who felt that NWMO was too dismissive of a particular method that they would like to have studied further, overall NWMO received support for focusing the study on the three methods mandated in the *Nuclear Fuel Waste Act*, along with some other methods receiving significant international attention. There was strong support for learning more about opportunities to “recycle” or reduce the hazard of used fuel.

- Having confirmed through dialogue with Canadians the range of technical methods appropriate for further study, NWMO has initiated a comparative assessment of those methods.

NWMO sought feedback on the effectiveness and the readability of Discussion Document 1, so that the organization might learn and improve communications. Through targeted focus groups and a range of dialogue sessions, NWMO received positive feedback on the document overall and many felt it answered their initial questions. Opinions varied on the level of information that was desirable: some felt it was easy to read, was sufficiently detailed, and answered their initial questions; others were eager for more details and discussion about the management approaches, in order to start considering the relative merits of each. Some felt that combining French and English text in one edition created a cumbersome document.

- NWMO has taken these comments into consideration in designing the format for the next Discussion Document. Discussion Document 2 will be released in formats that NWMO hopes will be appropriate for a wide range of audiences – providing a full account of the assessment, but referring interested readers to more detailed technical documents, or shorter summaries, as may be appropriate. Separate English and French editions will be produced to keep the document to a manageable size.

NWMO’s next discussion document is targeted for release in Summer 2004. This document, “Understanding the Choices”, will invite public comment on:

- NWMO’s preliminary comparative assessment of different management approaches; and
- Principles to guide NWMO’s development of implementation plans for each management approach.

Guided by this input, and the further issues and questions raised by Canadians, NWMO will then refine its assessment, design the governance and institutional features of each management approach, and develop its draft recommendations.

NWMO is presently designing the next phase of public engagement that will commence with the release of this discussion document in August. Different models of engagement are under consideration to enable NWMO to share in an open and transparent manner the results of its assessment, and to broaden the engagement of Canadian in a dialogue on these important issues.

ADDRESSING ISSUES RAISED BY STAKEHOLDERS IN THE DEVELOPMENT OF A DEEP GEOLOGICAL REPOSITORY IN THE CZECH REPUBLIC

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Radioactive Waste Repository Authority, Czech Republic

Introduction

The mission of the Radioactive Waste Repository Authority (RAWRA) is to ensure the safe disposal of all existing and future radioactive waste. In order to fulfil this task RAWRA, in addition to the operation of radioactive waste repositories in the Czech Republic, coordinates all those activities relating to the construction of a deep geological repository. This long-term goal implies first creating and then building upon the public's confidence in the decision making process and the project as a whole as well as in RAWRA as a competent and efficient implementer since clearly public acceptance is an essential condition for a successful final outcome. Since its establishment in 1997 RAWRA has been looking for ways in which to inform the public about its activities and how to involve the various stakeholders in the development process. The communication tools employed to achieve this goal have, to date, depended on the specific stage of the process but RAWRA has aimed at a continuous improvement in its activities; consequently a large number of changes have been made to RAWRA's policy and approach in recent years. This paper, which aims to describe RAWRA's dialogue with stakeholders (mainly local communities), provides examples of the way in which issues raised by stakeholders concerning a repository are reflected in RAWRA's approach.

National policy and the deep geological repository

To date progress concerning high level waste management can be divided into 3 stages: development of a national RAW management policy, deep geological repository site selection screening stage and the narrowing down of the number and area of selected sites based on aerial measurement.

Long-term policy regarding radioactive waste management is set out in a basic strategic document entitled "The Concept of spent nuclear fuel and radioactive waste management". This document was prepared by the Ministry of Industry and Trade in co-operation with RAWRA and several other interested parties. According to the Concept, construction of a deep geological repository for the direct disposal of spent fuel and other high level waste is the only realistic option for a final solution based on the current level of knowledge. However, a new evaluation of options is expected in 15-20 years time which could well revise this decision. The Concept requires that two suitable sites for the construction of a deep geological repository be selected before 2015 with the construction of a "confirmation" underground laboratory commencing in 2030. The construction of the disposal facility itself is scheduled to begin after 2050. In 2001 the Concept was subjected to an environmental impact

assessment which included a public hearing (not required by law) and in May 2002 the document was approved by the government.

The screening stage of the repository site selection process was completed by RAWRA in April 2003. The whole of the Czech Republic was surveyed according to a complex array of safety and legislative criteria and 11 potentially suitable sites were identified. When additional criteria were applied (concerning e.g. landscape character, transport options, environmental impact etc.) the number of sites was reduced to 6, all in granite rock formations. The following stage included the taking of aerial geophysical measurements at all 6 sites comprising an area of 240 km² and nearly 50 individual communities.

At the end of 2005, a number of sites, each reduced in area, will be selected for further study based on the data obtained and expert recommendations. Further geological research work at these sites will require the permission of the Ministry of the Environment. At all of the sites chosen, there has been to date strong public opposition to the future construction of a disposal facility as well as to the actual exploration of sites. Opposition took the form of petitions and the holding of local referenda in 15 communities at 4 of the sites and resulted in the government deciding to postpone geological activities at all 6 sites for five years.

Provision of information and public involvement

Throughout the policy development stage RAWRA made an effort to attract the attention of the public to the Concept itself and the EIA process. This included internet presentations and, in attempt to interest the media, press meeting and the distribution of publicity materials. Subsequently, RAWRA informed the relevant local communities (at the 8 original sites selected before the establishment of RAWRA) of the EIA process, provided information on RAW management in the CR and other European countries and invited communities to take part in the EIA process and public hearing in particular. However the issue failed to grasp the interest of the media and therefore most people learnt about the need for a deep geological repository only after the identification of potentially suitable sites.

Since the end of 2000 when RAWRA first established contacts with local communities at potential sites (initially the 8 recommended sites mentioned above then, on completion of the screening stage in 2003, at the 6 sites, partially coinciding with the previous group), meetings have been organised with local mayors and the chairmen of local councils. These meetings have taken place approximately twice a year with a participation rate of approximately half of those people invited. In addition, RAWRA has involved these communities by keeping them up to date on the domestic and international developments in the field and by inviting their representatives to visit storage or disposal facilities both in the CR and abroad (Gorleben 2003, Grimsel 2004). Furthermore, RAWRA actively invited these communities to participate in the EIA process related to the national concept in 2001 and in 2002, at the beginning of the screening stage, invited them to submit local data which, in their opinion, should be considered in the site selection process. A lot of public meetings have been organised by RAWRA, most of which have provided a good opportunity to discuss the various issues related to waste disposal. Some, however, have merely provided a platform for opponents to voice their vehement disapproval of the repository project especially in their vicinity. Before aerial measurements were taken, RAWRA distributed leaflets containing detailed information to each household at the sites. Furthermore, RAWRA has offered to establish small information centres at each of the sites, an offer which has been taken up at two of them and where, in 2004, centres were opened in specially reconstructed local libraries. These projects were financed by RAWRA and aim to provide information on RAW disposal as well as to substantially improve the libraries themselves.

Other communication activities have focused on the media (press releases, conferences, the organisation of visits for journalists to facilities, distribution of press materials etc.), both chambers of parliament (information letters, presentations) and regional authorities in those regions containing potential sites (personal visits to regionally elected representatives, environmental departments of regional authorities etc.).

Integrating the public's concerns into the process

Every on-site event (meetings, seminars, discussions, visits to nuclear facilities etc.) is seen not only as an opportunity to inform the public but also as a chance to learn about the concerns and values of local people and to listen to their comments, objections and proposals. The main concerns thus identified include the potential impact of the repository on the environment during both construction and operation, the impact on the landscape, waste transport (connecting roads and railways), potential terrorist attacks and social impacts such as the effect on inward investment, employment and tourism. Many questions have been put to RAWRA which currently cannot be satisfactorily answered since many studies which might provide the answers to those questions have not yet been carried out (planned for the later stages of the project for the final site). Nevertheless, in order to be able to answer certain questions more precisely, RAWRA has initiated basic studies for all the sites currently under consideration with several variations (e.g. the complete removal of all the mined material rather than storage of part of it, locating the encapsulation plant at a different location to that of the repository etc.). It is intended that these studies will form a starting point for later detailed discussions with local people.

RAWRA has always considered local communities as partners. Yet its approach has been criticised by opponents for carrying out aerial measurements at sites which had expressed their disapproval. Since any geological work in the next stage of the siting process requires the permission of the Ministry of the Environment, RAWRA, in order to increase confidence, is considering declaring that it will not apply for such permission against the will of the relevant local council. Moreover, such a declaration would come simultaneously with proposals supporting regional development. This proposal has been submitted to RAWRA's Supervisory Board for further discussion. Certain communities however feel that this proposal does not go far enough and indeed demand the right of veto for the construction of any nuclear facility. (An amendment to the Atomic Act on this issue, put forward by a number of independent senators, was discussed recently at Senate committee level and was rejected).

Despite RAWRA's efforts to present the potential advantages to the local area of future repository, many people see any such advantages as both unclear and distant in time and they feel that the whole process is an immediate threat to the economic development of the region as a whole (low level of investment, investors pulling out of the region, effect on tourism etc.). In order to address these concerns, RAWRA, in its plan for 2004, proposed that discussions be held between communities and representatives of the Ministry of Finance, the Ministry for Regional Development and the Ministry of Industry and Trade on supportive regional development programmes. Since only two communities have shown any interest in taking part in such discussions, other measures are being considered. RAWRA is currently drawing up a proposal that would pave the way for financial contributions to be paid to communities in those areas affected by geological survey work as well as by subsequent underground laboratory construction. Consideration of this proposal might take some time since it may require an amendment to the Atomic Act.

Changes to RAWRA's approach

From the very beginning RAWRA has aimed to be open with the public, to provide easily accessible, comprehensible, complete and up to date information on issues of public concern, indeed RAWRA has shown itself to be more than willing to adapt its communication approach based on experience and feedback. Accordingly, the information presented at meetings by RAWRA have been shortened and simplified; more pictures, diagrams, photos etc. have been added and the information provided more tailored to frequent comments and questions. Nevertheless it is still sometimes seen as over-complicated and difficult to understand. RAWRA has learnt to be flexible with regard to feedback, e.g. reactions to visits to the Dukovany repository and interim store were positive and thus RAWRA has made arrangements to provide further visits. RAWRA is constantly trying to improve the transparency of the siting process, e.g. by publishing criteria and providing running results. Recently, in order to emphasise its openness and unbiased approach to site characterisation, RAWRA twice invited representatives of local communities to its internal progress meetings on geological developments. Reactions were both positive and critical, criticism suggesting that the information provided was too technical.

Conclusions

RAWRA has always aimed and will aim in the future to maintain active dialogue with the public in general and local communities in particular on issues related to radioactive waste management and the deep geological repository. RAWRA's current communication approach reflects its deepening awareness that providing information is not sufficient and that it is necessary to communicate with all stakeholders in order to learn about their concerns and to integrate them in the developments. Recent events such as the rejection of the repository project in local referenda at potentially suitable sites and the government's decision to postpone all geological work for a period of 5 years clearly indicate that RAWRA's efforts have not been successful and that further changes to and improvements in RAWRA's approach are necessary. Thus the slowing down of the project provides an opportunity for RAWRA to thoroughly analyse the potential for improvement and to come up with a more effective communication approach.

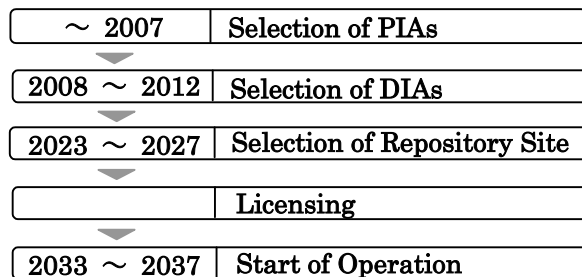
COMMUNICATION ACTIVITIES FOR NUMO'S SITE SELECTION PROCESS

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Nuclear Waste Management Organization of Japan

Introduction

A siting program for geological disposal of high-level radioactive waste (HLW) in Japan has just started and is moving into a new stage of communication with the public. Figure 1 shows the overall schedule for the HLW disposal program according to Japan's national policy. A final repository site will be selected via a stepwise process, as stipulated in the Specified Radioactive Waste Final Disposal Act promulgated in June 2000. Based on the Act, the site selection process of the Nuclear Waste Management Organization of Japan (NUMO, established in October 2000) will be carried out in the three steps [1,2] shown in Figure 2: selection of Preliminary Investigation Areas (PIAs), selection of Detailed Investigation Areas (DIAs) and selection of the Repository Site.

Figure 1. **Planned schedule for HLW disposal**

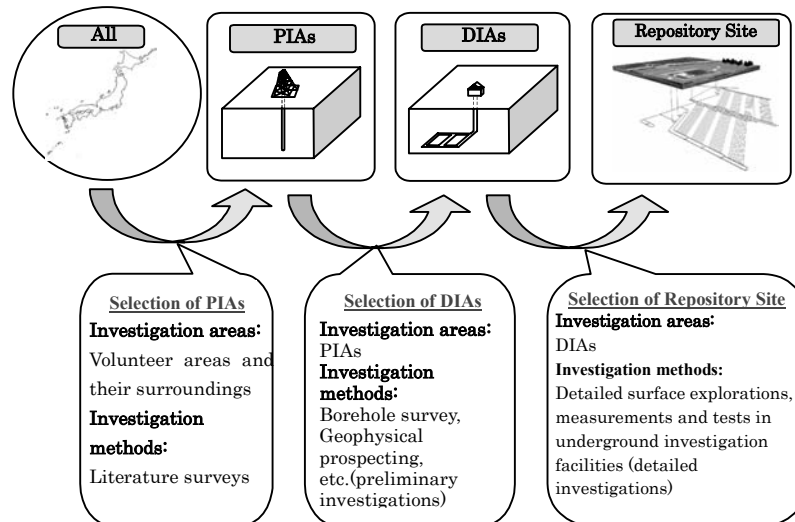


The Act also defines NUMO's responsibilities in terms of implementing the HLW disposal program in an open and transparent manner. NUMO fully understands the importance of public participation in its activities and is aiming to promote public involvement in the process of site selection based on a fundamental policy, which consists of "adopting a stepwise approach", "respecting the initiative of municipalities" and "ensuring transparency in information disclosure".

This policy is clearly reflected in the adoption of an open solicitation approach for volunteer municipalities for Preliminary Investigation Areas (PIAs). NUMO made the official announcement of the start of its open solicitation program on 19 December 2002.

This paper outlines how NUMO's activities are currently carried out with a view to encouraging municipalities to volunteer as PIAs and how public awareness of the safety of the HLW disposal is evaluated at this stage.

Figure 2. Three stages of the site selection process



NUMO's selection activities for PIAs

For the purpose of soliciting volunteer municipalities, NUMO has already distributed information packages to all 3,239 municipalities in Japan. The package contains four separate documents: "Instructions for Application", "Repository Concepts", "Siting Factors" and "Outreach Scheme". The document also specifies the selection procedure for PIAs as follows.

1. When a volunteer municipality applies for site investigations, NUMO will conduct a regional literature study, based on records of geological history, to determine seismic and volcanic activity and uplift and erosion in and around the area where the volunteer municipality is located. This study will be conducted in collaboration with experts who have specific knowledge and expertise regarding these phenomena in the area concerned. The evaluation of each area will be conducted in compliance with siting factors prepared and published in advance by NUMO.
2. All the evaluation results will be documented and then submitted to the governors and mayors of the relevant municipalities. NUMO will also disclose the evaluation reports for perusal by relevant prefectures.
3. Comments on NUMO's reports will be taken into consideration. The revised reports will then be submitted to the governors and mayors of the municipalities, together with lists of comments and NUMO's responses.
4. In accordance with the Final Disposal Act, NUMO will select candidate PIAs based on regional literature surveys and will request approval of the PIAs by the government.

5. The government will publicize the decision process relating to authorization of PIAs in the final disposal plan. In compliance with the Act, the government will have to ask for comments from the governors and mayors of relevant municipalities. The government will consider these comments in approving the selection of the PIAs.

NUMO's public relations activities

NUMO believes that the initial, and critical, milestone in the process is the first approach of a volunteer municipality. Therefore, in order to increase public awareness of HLW disposal and to encourage active discussion on the siting of the repository, leading to a first application by a municipality, NUMO has been carrying out the following public relations activities: promotion activities aimed at prefectural offices, public forums/"conversaciones" co-hosted by local media and information campaigns.

1. Approach to municipalities/prefectures

In 2001, NUMO directly visited all 47 prefectural offices in Japan to inform them of its assignments in the national HLW disposal program. After publishing a brochure on NUMO's siting procedure in November 2001, NUMO revisited all the prefectural offices and mailed brochures to all 3,239 municipalities. NUMO officially announced the start of open solicitation for PIAs in December 2002 and revisited the same prefectural offices again. A set of documents called the "Information Package" was also sent to all the municipalities. This package is composed of four separate documents: "Instructions for Application", "Siting Factors for the Selection of Preliminary Investigation Areas", "Repository Concepts" and "Outreach Scheme".

2. Public forums and conversaciones

NUMO organized public forums at 31 different locations out of 47 prefectures in 2001 and 2002. The number of participants was estimated to be approximately 5,000. Local media at each location jointly hosted the forums and made the discussions the subject of an article in their newspapers.

In 2003, NUMO started holding conversaciones; these were scheduled at 30 different locations with local opinion leaders, the aim being to talk about the HLW disposal issue. The co-hosting local media contributed to discussions and reported the outcome as feature articles.

3. Information campaigns

In order to increase public awareness of the HLW disposal program, NUMO has been conducting attention-catching information campaigns on TV, in leading newspapers/magazines and so on. So far, NUMO's program has been advertised in newspapers/magazines corresponding to more than 80% of Japan's total readership.

A poster campaign was also launched at major train stations. NUMO is currently planning to develop an interactive website for public dialogue.

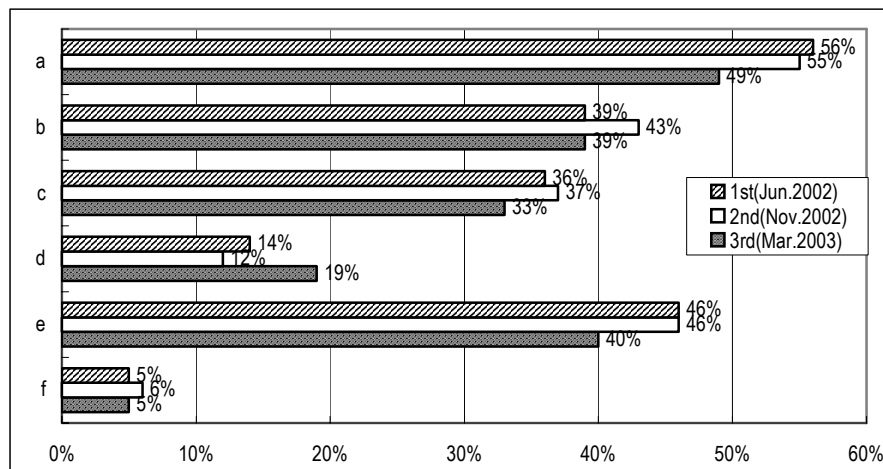
Public interests and views on safety issues

NUMO’s activities in terms of responding to questions from the public and providing adequate information are prerequisites to removing communication barriers and initiating open debate with the public. In this respect, it is important to examine what technical information the general public is interested in, particularly regarding safety-related issues relevant to NUMO. Therefore, some aspects were investigated in order to determine public viewpoints.

1. Public perception of HLW-related issues

In order to estimate public perception and the impact of NUMO’s advertisements relating to the HLW disposal program, public surveys based on telephone interviews were carried out three times subsequent to public acceptance campaigns in the media (newspapers, magazines, posters and TV). The results obtained are shown in Figure 3. The survey shows that around 50-55% of respondents have heard of HLW. Their knowledge levels and concerns about HLW, shown in answers “b” and “c”, are considered to be fairly high. Unfortunately, regarding any enhancement of public awareness, it seems that no remarkable change occurred as a result of the information campaigns. Only public recognition of NUMO is clearly increasing, although it still remains in the lower percentages.

Figure 3. **Results of public survey by telephone interview on NUMO’s PA activities**
 (Area: all 47 Prefectures, Coverage: 2,000 men and women between age 20 and 60)



【 HLW awareness 】
 a. “have seen or heard of”
 b. “fair knowledge”
 c. “fairly interested or more”
【 NUMO recognition 】
 d. “know or heard of”
【 HLW disposal 】
 e. “somehow necessary or more”
 f. “fairly informed or better”

The interesting result is found in answer “e”. Around 40-46% recognized that HLW disposal was somehow necessary or more, even though many people answered that they had doubts about the safe disposal of HLW. They also expressed a lack of satisfaction with the information provided by NUMO. This indicates that NUMO has to study more closely what the public would like to know about the HLW disposal program, particularly with respect to safety. NUMO will continue to survey these parameters periodically and will make adjustments to respond to the public voice.

2. Public interest in the HLW program

Based on information including nuclear energy issues and various open discussions about HLW disposal in Japan, group interviews were conducted with members of the public, focusing on university students, housewives, engineers, businessmen, schoolteachers, municipal government staff and senior citizens (over 60 years old) [3]. The following aspects emerged clearly as general characteristics:

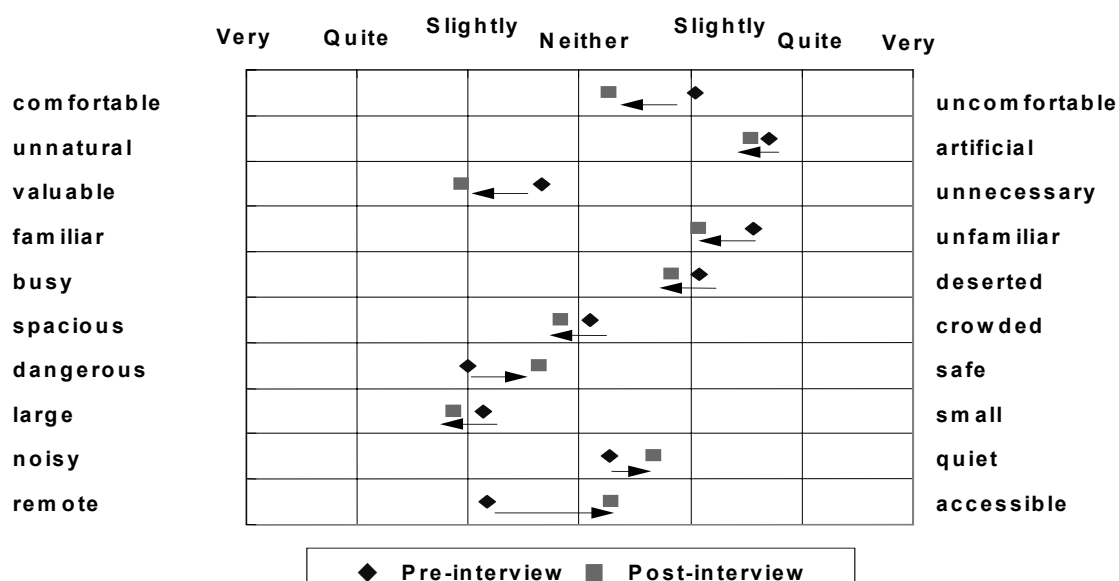
- a) The term, high-level waste has some level of recognition, but most people have no concrete image of what HLW actually is.
- b) Many people would like to know how issues associated with HLW disposal were recognized socially at the beginning of development of the nuclear power program.
- c) Instead of being concerned about the long-term safety of HLW disposal, people tend to worry more about risks in the more immediate future, for example associated with activities such as the operation of reprocessing plants and transportation of HLW.
- d) Some people expect major future developments in science and technology, so that they do not recognize geological disposal as being a “favorable” strategy at present.
- e) The NIMBY syndrome clearly exists in the case of the HLW repository siting.

The interviews also suggested that information on the risks associated with geological disposal and technical explanations, which cannot be comprehended easily by lay people, would possibly be understood better as a result of introductory lectures and discussions. Figure 4 shows changes in people’s feelings about HLW disposal after being provided with detailed information on the HLW disposal program.

The overall result of the survey of impressions given before and after the group interviews showed a rather positive trend. All the groups made progress on questions regarding safety, feelings of security, usefulness, familiarity and so forth. For instance, a feeling of being “slightly uncomfortable” before group interviews became “neither uncomfortable nor comfortable”. Further changes included: “quite unfamiliar” (before interviews) to “slightly unfamiliar” (after interviews); “slightly dangerous” (before) to “neither dangerous nor safe” (after); an impression of “slightly remote” (before) changed to “very slightly accessible” (after).

The results demonstrate that providing relevant information is a very useful way to mitigate major concerns regarding HLW disposal. The input is also useful for scrutinizing factors relating to safety issues that are considered to be important for building public acceptance of the HLW program.

Figure 4. Results of pre- and post-interview questionnaires



3. Key technical issues for communication

Based on investigations of information events related to HLW facilities in Japan and abroad, the content of discussions and the communication methods used were analyzed and characterized from the viewpoint of stakeholder interests. Based on the results obtained, three key issues for better communication with stakeholders were identified: “technical issues”, “procedural issues” and “communication issues”, shown in Table 1.

Table 1. Three key issues for better communication

Technical issues	Method for quantifying uncertainty Experimental methods and verification Theoretical approach, etc.
Procedural issues	Procedural fairness: consistency, non-prejudice, reversibility, representativeness, ethics
Communication issues	Public involvement Risk information

The group interviews also suggested various effective strategies for pursuing communication with the general public. Some technical questions raised by the group interviews are identified. As part of this study, further analysis was carried out to understand in depth the participants’ comments from group interviews.

In the previous 13 group interviews, the participants requested disclosure of information from diverse technical viewpoints. Table 2 summarizes the potential technical issues based on these requests.

Table 2. Potential technical issues based on communication with participants

Potential Technical Issues	Perceived Effects
A. Safety Engineering	
- Decentralized siting	- Reducing inventory per site
- Development of much safer engineered barriers with low-cost materials	- Cost effectiveness and improvement of intrinsic safety
B. Fail-Safe Engineering	
- Increase in disposal depth	- Low flow rate of groundwater
- Adopting quake-proof engineering	- Improvement of quake-proof performance
C. Institutional Control	
- Long-term maintenance of repository records	- Reducing risk of human intrusion
D. Monitoring & Retrievability	
- Development of remote monitoring and auto-restoration system	- Swift response to unexpected perturbations and accidents
E. Risk-Reduction Measures by Siting	
- Selection of a site with small uplift and low erosion rate	- Avoid risk of repository exposure
F. Assessment of Post-Closure Safety	
- Integrated assessment including key topics such as assessment period, etc.	- Active consideration of uncertainties
- Consideration of pre-excluded phenomena such as influence of micro-organisms and bacteria	- Advancement of assessment (aiming at complete assessment)
G. Pre-Closure Safety	
- Risk assessment during repository operation	- Development of risk-reduction measures during repository operation
H. Social Expectations & Trust in Future Science and Technology	
- Consideration of partitioning/transmutation	- Flexibility for adopting new technology
I. Miscellaneous	
- Disclosing prerequisites for theoretical calculations and policy of assumptions	- Enhancing social trust and preventing misinterpretation
- Scenario simulation using simulation models	- Improvement in practicality of scenario analysis
- Interpretation of safety based on demonstration and evidence	- Enhancing social trust and practicality

These, in other words, can be identified as “technical issues or challenges”. Table 2 shows not only issues based on most recent requests, but also items that have been raised repeatedly since earlier interviews. These issues were pulled together within an approximately two-hour interview session and are considered to be priority topics for NUMO’s future communication efforts. These issues are also thought to include key questions that may need establishment of specific measures.

Clarifying these general technical issues and responding to the public's demands would not, however, be the level of support that would generate a feeling of security and confidence. It is nevertheless important to remember that they are in fact prerequisites to ensuring a smooth initiation of communication with the general public.

When local municipalities apply as PIAs, NUMO will initiate close communication with the affected public, taking public concerns such as the above-mentioned technical issues into consideration.

Conclusion

The main mission of nuclear waste management is to maintain the environmentally friendly nature of Japan's nuclear energy program by implementing safe disposal of HLW. NUMO's responsibility is to develop the HLW disposal program with particular emphasis on ensuring safety at all stages. However, NUMO's "safety-first principle" is not yet fully understood by society for three reasons: 1) radioactivity cannot be detected by our senses; 2) members of society have no direct experience of a HLW repository; 3) few understand that the risks associated with HLW decrease with time as radioactivity decays away.

This paper has summarized some recent studies of public perception of HLW-related issues in Japan. Many of the experiences, such as public forums and conversations and public surveys (including group interviews and telephone interviews) have provided NUMO with a valuable opportunity to learn what the public would really like to know about. NUMO wishes to help resolve these important issues by providing extensive and understandable information about the HLW disposal program.

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Appendix

**JAPAN (NUMO)
DECISION ON THE HLW REPOSITORY**

Decision and decision maker	Relevant stakeholders and SI tools	Impacts on processes (P) and outcomes (O)
Choosing geological disposal and siting process by law (Parliament and government)	Politician (Parliament debate), general public (public comments)	Stepwise siting process (three stages) and stakeholder involvement (governor, mayor, residents (P and O))
Fundamental safety principle (Nuclear safety commission)	Regulator, implementer, general public (public comments)	Regulatory framework is under consideration by the regulator
Siting requirements for Preliminary investigation areas (Nuclear safety commission)	Regulator, implementer, general public (public comments)	
<ul style="list-style-type: none"> ➤ Choosing “Open solicitation policy” for siting process ➤ Publishing NUMO’s siting factors for Preliminary investigation areas (NUMO) 	<ul style="list-style-type: none"> ➤ Mayor (governor, municipality parliament, residents) ➤ General public (visiting prefectural offices, brochures, printed documents, public forums, discussions with opinion leaders, media campaign, poster campaign, website, public opinion surveys, focus group discussions) 	<ul style="list-style-type: none"> ➤ NUMO’s policy and siting factors were approved by the competent authority (not regulator) (P) ➤ Identifying key technical, procedural issues for making the communication strategy (P)

General impacts on process:

- Requiring transparency on the siting process.
- Safety regulation will be legislated in the future.