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NWMO BACKGROUND PAPERS
2. SOCIAL AND ETHICAL DIMENSIONS

2-5 OVERVIEW OF EUROPEAN INITIATIVES: TOWARDS A FRAMEWORK TO INCORPORATE CITIZEN VALUES AND SOCIAL CONSIDERATIONS IN DECISION-MAKING

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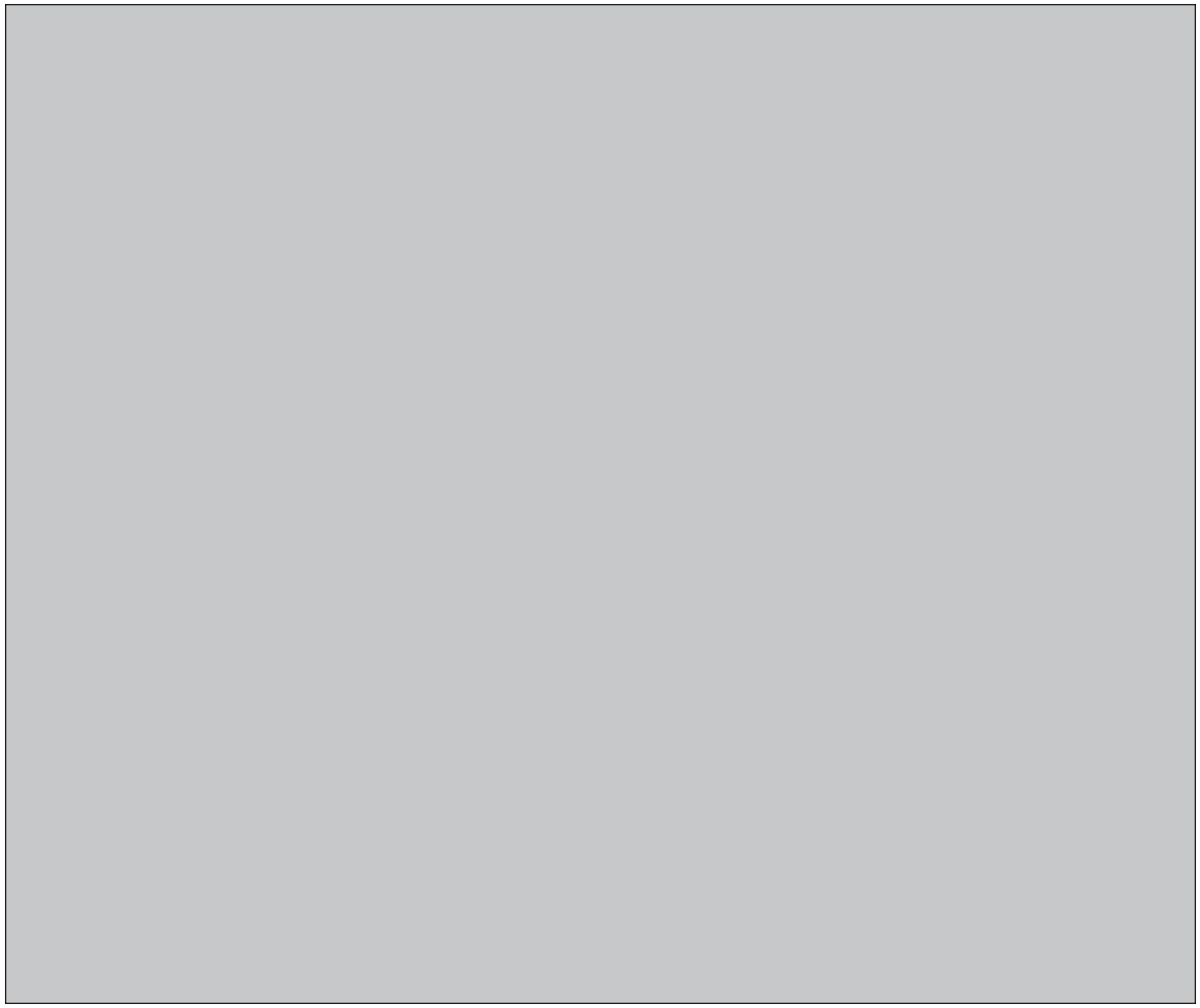

NWMO Background Papers

NWMO has commissioned a series of background papers which present concepts and contextual information about the state of our knowledge on important topics related to the management of radioactive waste. The intent of these background papers is to provide input to defining possible approaches for the long-term management of used nuclear fuel and to contribute to an informed dialogue with the public and other stakeholders. The papers currently available are posted on NWMO's web site. Additional papers may be commissioned.

The topics of the background papers can be classified under the following broad headings:

1. **Guiding Concepts** – describe key concepts which can help guide an informed dialogue with the public and other stakeholders on the topic of radioactive waste management. They include perspectives on risk, security, the precautionary approach, adaptive management, traditional knowledge and sustainable development.
2. **Social and Ethical Dimensions** - provide perspectives on the social and ethical dimensions of radioactive waste management. They include background papers prepared for roundtable discussions.
3. **Health and Safety** – provide information on the status of relevant research, technologies, standards and procedures to reduce radiation and security risk associated with radioactive waste management.
4. **Science and Environment** – provide information on the current status of relevant research on ecosystem processes and environmental management issues. They include descriptions of the current efforts, as well as the status of research into our understanding of the biosphere and geosphere.
5. **Economic Factors** - provide insight into the economic factors and financial requirements for the long-term management of used nuclear fuel.
6. **Technical Methods** - provide general descriptions of the three methods for the long-term management of used nuclear fuel as defined in the NFWA, as well as other possible methods and related system requirements.
7. **Institutions and Governance** - outline the current relevant legal, administrative and institutional requirements that may be applicable to the long-term management of spent nuclear fuel in Canada, including legislation, regulations, guidelines, protocols, directives, policies and procedures of various jurisdictions.

Overview of European Initiatives: Towards a framework to incorporate citizen values and social considerations in decision-making

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Ideally, radioactive waste management (rwm) develops through different phases from basic research to more focussed applied research and development and finally to the design and siting of proposed solutions. Experiences from the European programmes vary, however, and countries are at different stages of developing long-term solutions to their waste problems. There are examples of significant progress all the way to the siting of a final repository. For high level waste, one site has been selected in Finland, and in Sweden two sites are currently being investigated in detail, with the approval of the host municipalities. As in Canada, there are also in Europe examples of countries where the rwm programmes initially made good progress but where they have been forced to take several steps back due to local resistance or otherwise for social reasons.

This paper gives first an overview in section 1 of setbacks of rwm in certain European countries. In section 2 we turn to programmes where initiatives have been taken to take citizen values more into account in order to build more acceptable and stable rwm programmes. Some examples are mentioned where the problems mentioned in section 1 have resulted in a re-evaluation of the programmes, and we also go more into detail of the cases of Finland and Sweden. Section 2 also describes some initiatives of research character that have been taken in the European Union and otherwise on the international arena. Section 3 then tries to summarise key findings from the national and international activities and section 4 focuses on what I believe could be lessons learned of special interest to Canada and the NWMO study.

1. Setbacks of nuclear waste management programmes in Europe

The siting of radioactive waste installations has met public opposition in several countries. In the UK, the Government decided in 1997 to refuse the Nirex application to build a Rock Characterisation Facility (RCF) near Sellafield. In France the efforts to find a second site for an underground laboratory has been stopped. In Germany, the Gorleben investigations were also stopped due to distrust in officials and a lack of participation. In Switzerland, there have been negative cantonal referenda on the Wellenberg site in 1995 and 2002.

The UK Sellafield planning inquiry

The focus in UK is on intermediate level waste from nuclear power plants and from reprocessing at Sellafield, rather than high level waste and spent fuel. For high level waste, the UK policy has been to store the waste for at least 50 years before seeking a permanent solution. Developments in recent years, however, seem to indicate that more active measures will come also in this area.

For intermediate level waste, Nirex presented in 1987 the report "The Way Forward" (Nirex, 1987), which gave the policy of Nirex for a site selection process. A number of geological characteristics were considered. In 1989 Nirex had moved further with progressive steps in the site selection process to two main UK nuclear sites. In 1995 Nirex sought planning permission for a Rock Characterisation Facility (RCF) near Sellafield, West Cumbria. The Cumbria County Council, however, refused this application. Nirex appealed against the refusal, which forced a Planning Inquiry to take place.

The Inquiry was held, according to normal UK procedure, with an adversary format with Nirex, Cumbria County Council and others as opponents. The inquiry covered a large range of issues including the site selection process and "the safety case". The Inspector who led the proceedings reported in March 1997 to the Secretary of State for the Environment. Based on the report the Government decided to refuse the Nirex application for the RCF (Government Office for the North West, 1997).

There are probably many possible explanations to the Nirex failure in Sellafield. One procedural argument of the Cumbria County Council was that Nirex had entered a site selection process in fact without allowing the public to be involved and without any regulatory approval. Formally, the application from Nirex was to build an underground research laboratory at Sellafield, which did not require a licensing approval from the nuclear safety authorities. The RCF, however, was designed to add to Nirex´s information about a possible repository site in advance of the company deciding to apply for development authorisation. Therefore, it was in fact a major step in selection of a site for a repository and not just for a laboratory, as was the formal (“material”) argument by Nirex.

Furthermore, for the site selection, Nirex had used multi-attribute decision analysis (MADA) which is a quantitative decision analysis method that arrives at a preferred decision among a number of alternatives based on the importance and values of different factors. The weighting attributes were put into MADA with procedure and with weights that had been negotiated by an expert panel drawn together by Nirex. It was clear though, that the weighting of attributes, including transport costs, geology, post-closure safety and local experience, was a matter of value judgement more than science. If geologic attributes (especially the geological predictability) had been given higher values, Sellafield would have scored low in comparison with other sites. The County Council could thus argue that Nirex had followed an indefensible site selection process that involved the loss of sites with the most promising geology. The MADA exercise is a beautiful example of a method which looked very scientific but was applied with more or less hidden value-laden assumptions (Andersson et.al., 1998).

The French site selection programme

In France a period of successive problems resulted, in 1991, in a law that instituted a new approach to waste management in general, and site selection in particular, with responsibility,

transparency and democracy as lead principles (OECD, 2003, p 24). The new approach to site selection looked for consensus with, and involved actively, responsible territorial communities. A mediation mission by Mr. Christian Bataille, Member of Parliament, led successively to the appointment of one site for an underground laboratory, although the intention was that there should have been a second one in granite. Furthermore, the legislation stipulates three alternative research options (deep disposal, transmutation and sub-surface long-term storage) coupled to a coming decision in Parliament 2006. This fact together with the fact at least two alternative sites were looked for, had a high trust potential. However, now people start to perceive the one research site in Bure as an "operation to be" and the two research axes of transmutation and sub-surface long-term storage much less viable and less advanced than geological disposal (Westerlind et.al., 2003).

The Law institutes a local Information and Oversight Committee (CLIS) to be chaired by the Prefect of Department where an underground laboratory project (URL) is implemented. That committee shall be responsible for ensuring that all information concerning the evolution of the URL project is addressed. In particular, it shall be entitled to commission hearings or independent audits by certified laboratories. The CLIS is a new part in the process which must demonstrate its capacity for managing the debate and influencing the process - its success or unsuccess will be important for the future of the project

After the successful change in the French approach to site selection and the establishment of the CLIS committee, a new siting project followed for a granite site. Although it followed the same legal process, one returned, paradoxically, a more technocratic process and anti-nuclear movements gave rise to refusal reactions from the populations and organizations. The local political members preferred not to engage themselves in favour of the project, which is now standing still.

It could be added that in France a real dialogue between citizens and experts in the area of rwm is sometimes difficult to perceive because of the tradition of secrecy in the nuclear industry. According to some people, this was common in the past and still remains today even if the communication of nuclear institutions has changed (Westerlind et.al., 2003).

Germany – the Gorleben case

In 1977, the Gorleben site was selected for final repository for radioactive waste. This was mainly a product of geo-scientific and economical criteria (Bräuer, 2003). Public involvement in a transparent site selection procedure was not a matter of concern at that time. Site investigations from the surface and underground exploration, as well as an extensive laboratory programme, resulted in a comprehensive database that confirmed the potential suitability of the site at Gorleben. However, many local people in their distrust of the "officials" saw the selection of Gorleben as politically motivated but scientifically justified.

Information activities used traditional methods, but meetings were held to allow for controversial discussions. Lectures were held by scientists and technicians belonging to the organizations involved in the Gorleben process and scientists from universities and environmental organizations. During all meetings there was an extended controversial discussion between the "officials" and the audience.

The heated climate about nuclear energy in general in Germany in combination with the fact that there was no real participation made further progress impossible in reality. The

exploration at the potential repository site at Gorleben was stopped following an agreement between the German government and the utility companies.

Referenda in Switzerland

Switzerland, with its traditional federalist structure, has a long tradition of involvement of the public in decision-making on all political levels. The public decides on factual questions in binding communal, cantonal and federal referenda.

Following detailed investigations at various locations, NAGRA proposed Wellenberg (Canton Nidwalden) as the site for a deep geological repository for low- and intermediate-level waste in 1993. Due to the negative result of the cantonal referendum in June 1995 on the mining concession for the repository, the project was politically blocked for several years. In March 2000 the federal energy minister and the government of the Canton set the conditions for the continuation of the project, including a stepwise approach with as a first step being a concession only for an exploratory gallery and later for the repository itself. The implementer NAGRA could thus apply for the mining concession for the exploratory gallery in January 2001. The cantonal government granted the concession in September 2001, but this decision was subject to a cantonal public referendum. After an intense campaign the mining concession was rejected at a referendum in a referendum on 22nd September 2002 and the project is still blocked (OECD, 2003).

The efforts made in Switzerland for citizen participation seem to have been of a relatively traditional character with public reports, media conferences, information brochures, etc. One element has been increasing efforts by the safety authority HSK to enhance the knowledge among the public on its existence and of its functions. HSK has also become better recognized as a separate entity from implementers and policy makers (OECD, 2003).

2. Initiatives to take citizen values into account

As a result of the to a large extent negative experiences in the implementation of radioactive waste management programmes, the international community at large, as well as European countries and the European Commission, have identified public perception and confidence as an area where progress would be most important. Here some of the initiatives in national programmes are discussed, first as a result of the early experiences in the UK and Germany, then mostly in Sweden and Finland since these two countries have made the most substantial progress during recent years. Research efforts on the European and international radioactive waste management arenas are then described as well as the broader framework of risk management and citizen participation.

National programmes

In the UK, the refusal of the RCF led Nirex to a new Transparency Policy (Nirex, 2003) with a dialogue on the future long-term management of wastes. The new approach includes preview (OECD, 2003), which is a process by which opinion is sought about a research project, or a research programme, before the research is carried out. The purpose of preview at Nirex is to allow internal and external stakeholders to make inputs to the research

programme at the planning stage and to increase the transparency of decision-making. Although it is too early to evaluate, the new approach has received initial positive response. Stakeholders are seeking dialogue with Nirex on the future long-term management of wastes. A dialogue on the future long-term management of radioactive wastes has thus started and a number of dialogue processes are now being tested. However, it needs to be said that so far this is done more on a research basis than as implementation in the actual programme.

Many initiatives are taken in UK (OECD, 2003), not just by Nirex but also by British Nuclear Fuels Ltd (BNFL) with a stakeholder dialogue to advise BNFL on the environmental implications of its work, the Environment Agency with consultation on applications from BNFL for authorisations for radioactive waste disposals, including discharges, from eight Magnox power stations in England and Wales, and the Ministry of Defence with a "Front End" Consultation on the Decommissioning of Submarines.

In Germany, according to the new nuclear policy of the German government that followed the Gorleben experience, the entire radioactive waste management had to be reviewed. To examine further sites in different host rock formations, a group of experts (AkEnd) had been appointed by the Federal Ministry for the Environment to develop a new site selection procedure (Bräuer, 2003). The procedure should be built upon well founded criteria with a clear transparent structure. It is now the policy that public participation should be an indispensable part of the programme from the beginning.

The development of a site-selection procedure and corresponding criteria has been done by AkEnd from 1999 to 2002 and the final recommendations were given at the end of 2002. Now the procedure goes through political/legal obligatory establishment, expected to take place in 2004/05. The site selection procedure involves five steps. Step 1 is a determination of areas which fulfil specific minimum geo-scientific requirements. The starting point of the procedure is the whole area of Germany. There is therefore no predetermination or exclusion of any area prior to the start of the process – which thus starts with a "white map of Germany". All areas are treated the same. This also applies to the specific site region of Gorleben which is also included in the selection process.

Step 2 selects smaller localised areas with particularly favourable geological conditions. Step 3 is the identification and selection of site-regions for surface investigation. At the heart of the third step is the agreement of the inhabitants of the site regions to authorise the surface site investigations planned for step 4. Only those regions which officially express their approval for surface investigations to be carried out in their locality remain in the evaluation process. Step 4 is a definition of sites for the underground investigation, and in Step 5 the site is selected.

The involvement of the general public in steps 1 through 3 primarily takes place through the comprehensive information to the public and all procedure participants and by their control of the procedure. For this an Information Platform and a Control Committee will be set up, which are active during the entire process.

In the third and the following procedural steps a Citizens' Forum is the core element for public participation. It organises the active participation of the inhabitants and formulates the questions for the discussion and all other questions about the selection procedure. The Citizens' Forum forwards its recommendations to the municipal council (or local councils) in the region. They make the final decision on the further course of action.

In Sweden, initiatives towards a more communicative approach were taken by SKI about 1990 with the Dialogue Project (Andersson et.al., 1993). This was at a time when the SKB site selection programme had not yet taken form, however, it was evident that the nuclear waste experts within just a few years would have to deal with new "customers", most notably potential host communities for a final repository. The core of the Dialogue project was a simulated licensing process which gave the participants a great deal of pre-understanding of procedures and arguments in a real decision-making process. The project also resulted in a recommendation to the government that NGO's should be given economical support for their empowerment.

After the Dialogue project it was clear that transparency and public participation would be core issues for research and development for years to come. SKI and SSI thus launched the RISCOM Pilot Project (Andersson, Espejo and Wene, 1998) which was followed by the EU RISCOM II project (Westerlind, et.al. 2003). Within these projects the RISCOM Model for transparency, to which we will return later, was developed and tested.

In 1992, SKB announced Oskarshamn as the preferred site for an encapsulation plant for spent nuclear fuel and in 1995, SKB sent a request for a feasibility study for final disposal which was approved by the municipality. Now Oskarshamn is one of the two municipalities where SKB is conducting deep drilling to find a suitable site. Just after the 1992 announcement by SKB, the municipality leadership took the decision to be an active part in the program demanding a completely open process with full participation and influence of the municipality and the public. Independent funding for the municipality participation was a pre-condition to participate and funding was established by the government in 1994.

The very active engagement of the municipality has been summarized in what has been called the Oskarshamn Model (Carlsson et.al., 2001) with seven points: total openness and participation, the EIA best principles as framework, municipality council as the local client, the public as a resource, the regulatory authorities as "our experts", the environmental groups as a resource, and stretching SKB and the regulators for clear answers. Early in the process an EIA Forum with all major stakeholders was created on the initiative of Oskarshamn. Now the municipality is further refining its model taking the RISCOM Model more actively into account.

One interesting aspect of the Swedish process is that the early initiatives towards participation and transparency were not taken by the implementing organisation SKB or by the government. Instead the regulators and one of the involved municipalities took the lead. The new initiatives were initially regarded with hesitation by SKB, and in the case of the early Oskarshamn initiatives also by SKI. Now SKB has the legal responsibility to carry on the EIA process while at the same time Oskarshamn maintains a strong position. Internationally, the Swedish regulators SKI and SSI have been forerunners demonstrating that active regulatory involvement in communities can be consistent with an independent licensing role.

Despite all this, it needs to be said that the Swedish programme has not yet passed the test of siting a repository. One issue of concern is the fact that licensing will take place according to both the Nuclear Activities Act and the new Environmental Code but the interaction between the two laws is not yet tested. Ten years after the Dialogue Project there is now a government proposal for funding NGO's for their participation in the EIA process. This should be beneficial for the process, and it is also supported by the municipalities, but the fact the NGO

empowerment comes in late introduces uncertainties about the relation between the national and the local processes.

In Finland, in December 2000, the Government on the basis of the application of Posiva, made a favourable policy decision, later ratified by the Parliament, on constructing the final disposal facility close to the nuclear power plant in Olkiluoto. The Municipality of Eurajoki had supported the construction of the facility in Olkiluoto and the preliminary safety assessment of the Radiation and Nuclear Authority (STUK) also supported the project. The government decision followed an EIA process during 1997–1999 with communication with the public, including interaction on the local level between the implementer, residents, entrepreneurs, politicians, officials of the municipal government, as well as members of associations (Leskinen, A., and Turtiainen).

The Finnish programme is often referred to as the most successful one in the world, since there is now one site selected for detailed investigation with government and community approval. The EIA process took into account international conventions since neighboring countries were informed, were able to provide comments, and a positive statement was obtained from their part. The EIA was regarded by Posiva as a major break-through in bringing about discussion of merits and disadvantages of alternatives in nuclear waste management. Posiva also emphasizes the importance of having a stepwise process relying on a clear legal background and a long-term commitment from the part of the government.

The Posiva process had high ambitions with regard to participation and transparency. Concerns and fears were taken seriously and Posiva took into account and analysed in practice all the impacts put forward by residents in the candidate municipalities. Reasons were given for including certain impacts in the analysis and excluding others. The involvement by residents was, however, not as active as Posiva had wished, and it was concluded that NGO representatives could have given more energy to the "stretching" process (Westerlind, et.al. 2003). There are also critical voices among researchers and opposing groups about the EIA process that took place in Finland (OECD, 2003). The participation has been described as negligible and decreasing throughout the process, which has been attributed to lack of such participatory traditions, lack of familiarity with the EIA instrument and a lack of confidence in the effectiveness of participation. According to these critiques, the process served only for legitimizing the decisions, which were taken in other arenas. One weakness, also recognized by Posiva, was lack of alternatives to the basic option of geologic disposal.

<u>European and international programmes</u>

Under its fifth Framework Programme, the DG Research of the European Commission has conducted the two projects RISCOM II and COWAM. **RISCOM II** was a three year research project with twelve organizations from Sweden, France, UK, Finland and the Czech Republic aimed to support the participating organisations in developing transparency in their radioactive waste programmes by developing a greater degree of public participation (see web site: http://www.karinta-konsult.se/RISCOM.htm).

The issues were analysed especially with respect to their value-laden aspects and procedures for citizen participation were tested. The focus on values in the otherwise very technically dominated area of radioactive waste management, and a multi-disciplinary approach opened new perspectives. In Sweden the project has supported the design of a new hearing format as

part of the regulatory review in a critical phase of the site selection programme for a spent nuclear fuel repository. The project also evaluated how the hearing worked with respect to transparency (Andersson, Wene, Drottz Sjöberg and Westerlind, 2003). In this case the RISCOM Model was directly applied in the decision-making context.

COWAM (COWAM, web site) was a three year collective learning process conducted as a concerted action within the EC programme which focussed on community needs. With four seminars hosted by local communities observations were made that can be used for improving the quality of decision-making in nuclear waste management. There were thus good conditions for local actors to participate actively and to bring their views and concerns into the work (Westerlind, et.al. 2003, Appendix 5).

Almost in parallel with these two EU projects, The **Forum for Stakeholder Confidence** (FSC) was created under a mandate from the NEA Radioactive Waste Management Committee (RWMC) to facilitate the sharing of international experience in addressing the societal dimension of radioactive waste management (OECD, 2001). It explores means of ensuring an effective dialogue with the public, and considers ways to strengthen confidence in decision-making processes. The Forum was launched in August 2000.

The three projects are quite different in approach. RISCOM uses a theoretical model to analyse certain aspects of nuclear waste management while at the same time testing the applicability of the model. COWAM gives practical examples concerning how programmes have engaged citizens at the local level and provides data on the needs of the communities with respect to the waste programmes. The FSC was set up to serve the four NEA RWMC constituencies (implementers, regulators, policy makers and R&D specialists) but turns toward social sciences and local representatives to understand different perspectives.

Risk management and citizen participation

Public confidence, government-citizen relations as well as science–society relations have become high-profile issues not only in radioactive waste management, but in risk management in general. The problems of narrow framing and lack of trust are shared with other fields such as big technological projects, environmental protection and biotechnology. There is no doubt that there is a sincere concern among European institutions about the lack of trust and the need to open new forms of dialogue. For example, the House of Lords (House of Lords, 2000) have concluded: “Direct dialogue with the public should move from being an optional add-on to science-based policy-making and to the activities of research organizations and learned institutions , and should become a normal and integral part of the process”. Furthermore, the French Academy of Science has created a scientific information and communication department to help bridge the gap between science and society. The department’s principal mission will be “to fill, as far as possible, the gulf between scientific discovery and society’s perception thereof” (Cordis Focus, No 203, 17). And the EU White Paper on Governance (CEC, 2001, p.3) has acknowledged that “people increasingly distrust institutions and politics or are simply not interested in them”.

A promising attempt to give the problem of risk management a structured framework is the approach to **strategic risk assessment** developed by the UK Environment Agency (Pollard, 2001). This approach takes both technical and social aspects as well as economical perspectives of risk into account with 17 attributes. It should offer better possibilities for risk

communication and a systematic and comparative basis for the selection of risk management strategies. Risk management approaches like this can help increase the awareness about different aspects of complex risk issues provided they there are suitable societal structures in place that can use them for this purpose. If such structures are not in place the use of structured and broad but still technical tools will stay within the circles of expertise.

Governments increasingly recognise their reliance upon the active contribution of citizens in making better decisions and achieving policy objectives. Within the OECD, a programme of work has been undertaken under the auspices of the **PUMA (Public Management Project)** Working Group on Strengthening Government-Citizen Connections during 1999-2000 (OECD/PUMA, 2001).Two comparative surveys were conducted among 23 OECD member countries and the European Union, and eight in-depth country cases were performed; the results were discussed in five meetings and published. Among the most important findings in PUMA is an imbalance between the amount of time, money and energy which OECD Member countries invest in strengthening government-citizen connections and their much lesser efforts to evaluate the effectiveness of these measures and their impact on public policy-making. Thus more effective ways of evaluation are recommended.

An **Action Plan for Science and Society** has been brought forward by the European Commission (European Commission, Research Directorate), and many different actors are being urged to participate including "member states, regions, local authorities, business, civil society organizations and individual citizens". Guidelines will be given for dealing with risk communication, particularly when faced with scientific uncertainty. However, one can question if the Action Plan goes far enough in opening real communication starting from peoples' concerns, instead of working within the traditional paradigm of having experts setting the agenda and only with the aim to inform. The Action Plan thus aims "to encourage scientists to gain and maintain public trust by making their work more accessible".

Environmental Impact Assessment (EIA) has been mentioned in this paper, especially in the cases of Finland and Sweden, as a framework for stakeholder involvement required by law. There is an EU directive on EIA (Union Directive 85/337/EEC as amended by Directive 97/11/EC) as well as national legislation in EU countries. The Directive requires public participation to occur as part of the EIA process for certain projects, including disposal facilities and facilities for long-term storage of radioactive waste. This participation must take place before a decision is taken on whether to grant development consent.

From the perspective of public participation and transparency, the development of EIA must be judged as a positive contribution. The requirement that the implementer must show the consequences of not realizing the proposed project (the zero alternative) broadens the basis for decisions, and the requirement for public consultation increases possibilities for concerned citizens for insight and influence. In a broader sense, "best practice EIA" (International Association for Impact Assessment, web site) rests on principles that can guide the entire decision-making process, such as public participation, the need to analyse the "zero alternative" and the need to start the EIA process early, that is before the real decisions have been taken (which is often done long before licensing).

However, the role of EIA varies between countries in Europe. In Sweden EIA on project level, or Strategic Environmental Assessment (SEA) on policy and programme levels, is seen as the lead process in complex and controversial environmental issues. In other countries,

where this is not the case, participatory technology assessment may play the role of the umbrella process.

3. Key Findings

Broadly speaking there is an overwhelming consensus among government agencies, policy makers and stakeholders that we need more participation and transparency in decision-making processes and more direct dialogue between decision-makers, experts and the public. This is reflected both in policy statements, programme plans and research programmes. However, there seems to be much less know-how in actual implementation of this general understanding and readiness to apply available knowledge about risk communication. Here we summarize key findings from the European programmes aimed to incorporate citizen values and social considerations in rwm programmes.

RISCOM, COWAM and NEA/FSC results

The three studies give similar results in many aspects. For example, they emphasise that radioactive waste management, due to its long-term nature, uncertainties, and emotive nature is not the exclusive domain of technical expertise. Wider stakeholders' concerns should be addressed at the same level as technical issues. The decision-making process must be open, transparent, fair and participatory. Radioactive waste management programmes should provide sufficient time, resources and commitment for meaningful involvement of stakeholders.

The need for early involvement and empowerment of local actors in the decision-making process is emphasised in COWAM. The project also highlighted that local participation requires a defined national decision-making process with clear decision-making points (a step-wise process). Furthermore, the roles of the participating parties must be clear from the start - who takes the decision, when and on what basis. The FSC work has recognised that the decision-making process should embody competing social values, while the approaches to achieve this may change over time. The Forum also recognises that active regulator involvement is needed and is achievable without compromising integrity, independence and credibility.

Even if there is hardly any contradictions between the results of the three studies, the focus of results reflect the different points of departure. In RISCOM, the transparency model is used as an instrument to analyse certain aspects of nuclear waste management, COWAM gives practical examples from the local level, and FSC evaluates a number of cases with citizen participation from the perspectives of implementers and regulators. Perhaps more research should be done on the interfaces between the three studies.

The RISCOM Model

The model has emerged as an outcome of Habermas' theory of communicative action (Habermas, 1981) and Stafford Beer's organisational theory (Beer 1979, Espejo 2003). It has been developed from problems in risk assessment and radioactive waste management, but is

generally applicable to decision processes on technically complex issues with uncertain but potentially large and unfavourable consequences. The model was first developed in the RISCOM Pilot Study (Andersson et al. 1998), and has been used, further developed and tested in the RISCOM II project (Westerlind et al. 2003).

The model includes three basic elements: technical/scientific issues, normative issues and authenticity. *Technical/scientific issues* can be clarified with scientific methods. They relate to questions like "Is this true?" or "Are we doing things right? *Normative issues* reflect what is considered fair and acceptable in society, what is legitimate. In an expert dominated area value-laden issues are often not openly explored. Instead they are discussed "under the surface", often hidden in expert investigation.

Authenticity is needed for trust; it has to do with consistency between the actions of a person (or an organization) and who the person (or organization) is, or the role in the decision-making context. If a stakeholder considers an organization to be authentic, he is more likely to trust its views and decisions, thus reducing his demands for technical details.

To achieve transparency there must be appropriate procedures (*transparency channels*) in which decision-makers and the public can validate claims of truth, legitimacy and authenticity. The procedures should allow *stretching*, which means that the environment of the implementer (of a proposed project), the authorities and key stakeholders is sufficiently demanding and that critical questions are raised from different perspectives.

As was shown by Swedish hearings on site selection in 2001 (Andersson, Wene, Drottz Sjöberg and Westerlind, 2003), the RISCOM Model can be used to support public events and decision processes for the sake of transparency. The hearing format that was developed was successful in many aspects such as a high level of involvement, the mental separation of levels of discussion and stretching without a too adversarial set-up. The methodology used for designing the hearings included active involvement of the hearing actors at the preparatory stage – an element that contributed to the fairness of the entire process. The methodology is available for use in any situation where a new step in a country's radioactive waste management programme is to be taken to enhance transparency.

Regulators role

It is important to have an independent regulator, with the capability of reviewing the safety assessment of the implementer, but experiences have shown that there is also a need to bring in the regulator early in the process (e.g. for site selection) and to maintain this involvement. There is strong connection between the regulator's role and the needs of the communities. In Sweden, communities want the authorities to be involved and they see the regulator's experts as the people's experts that should advise and help the people and the politicians. SKI and SSI have been involved from an early stage. They participate in the EIA group and play an active role in providing information on a community level.

Furthermore, as regulatory standards and criteria set the framework for performance assessment, it is important to open them up for public input. Efforts of the SSI in Sweden to establish a dialogue with citizens in potential host communities for a high level waste repository about regulatory guidelines were therefore made part of RISCOM II.

Communicating performance assessment

One of the cores issues addressed in the RISCOM study has been how performance assessment (PA) can be made more transparent and what needs to be done to make it more accessible to the general public. To incorporate the value judgements of stakeholders into PA would involve conducting performance assessment by starting from the issues of concern among stakeholders and communicating with them during the PA work. This issue has been much discussed in Europe over the latest years. The outcome from this discussion seems to be that PA needs to incorporate citizens values and concerns and the experts need to engage themselves in that dialogue. At the same time, PA also needs to keep its identity as a scientific and engineering enterprise. Engaging in public dialogue must not dilute the science and steer experts away (in focus or time-wise) too much from their core activity.

Alternative options

It may not be possible to make an objective assessment of the true risk of final disposal, but stakeholders may be able to compare the consequences of alternative actions. Such comparisons can be made using value-laden considerations and ethical principles rather than performance assessment in detail. After all, decision-makers will need to choose between alternatives on the basis of incomplete and uncertain knowledge.

Resources

There can be a number of reasons for stakeholder participation such as legal requirements, the right of directly affected people to have their say, legitimacy of the decision-making process etc. In the RISCOM model, participants from outside the establishment are needed as a recourse in stretching. Once it has been said that participation is required or wished, the issue of resourcing immediately comes up. A rwm programme must be resourced to allow a meaningful participation. Proper resourcing will encourage positive engagement, improve decision-making and increase public confidence.

Public participation processes

The role of and the need for risk communication and public participation in environmental and public policy decision-making have been increasingly acknowledged over the last 15 years and much research and development has been devoted to this field. Still, however, governments, industry and other participants struggle with what “good” public participation is. A variety of schemes for evaluation have been proposed, see e.g. Beierle (1999) and Rowe & Frewer (2000). A Swedish study indicated how processes can be mapped and how the requirements of the RISCOM Model thereby can be taken into account (Andersson, Balfors, Schmidtbauer and Sundqvist, 1999).

Obviously there is no one best process, and no one best criteria set for public participation processes. It all depends on the context and the purpose in the specific situation. In certain circumstances transparency will have top priority and in other cases it may be of more limited importance, and other factors dominate what is important. The further development of criteria

and frameworks for comparing processes thus needs to take not just the characteristics of the processes themselves into account but also the contexts in which they are supposed to work.

Monitoring and retrievability

On the international arena, the concept of retrievability has been given much attention during recent years, and in several countries, like France, retrievability is considered important for public acceptance of a repository. However, experiences in the Swedish communities do not support the conclusion that the public sees retrievability as a safeguard against possible shortcomings in the disposal method. Citizens want, instead, clear statements from the regulators and the government that the proposed disposal method is safe, which indeed may not be consistent with the idea of retrievability. The experiences and perceptions on retrievability thus differ between countries. Again, taking the perspective of transparency, we should openly discuss the pros and cons of longer-term monitoring, reversibility and retrievability taking both factual and ethical aspects into account.

4. Lessons learned of potential interest to Canada and the NWMO study

Based on lessons learned from the diverse amount of European experiences, this section focuses on a few points that could be of special interest to the NWMO study in forming the future of Canadian nuclear waste management.

Narrow framing should be avoided

Often, early narrow framing of a complex issue like radioactive waste management leads to a decision-making basis not sufficient, or even relevant, for the final decisions. There will be frustration and inability to solve important societal problems. In an open discussion, the participants identify several particular issues as central to the problem at hand. People must hear each other out on these issues to achieve a common understanding that there are a variety of legitimate perspectives to consider. Most often narrow framing is referred to as a result of expert culture (technology, natural sciences), however, in there can also be social narrow framing. One way to avoid this is to find ways to uncover values that form assumptions and prioritise questions being addressed in expert investigations (which is what should take place when applying the RISCOM Model).

Vaccination against fragmentation

Because of complexity, it can be easy for stakeholders to fragment issues in radioactive waste management in the public debate. They can do so when the programme approaches critical decision-making points. The fragmentation can impact peoples views on what is important and imprint the decision-making environment. This is certainly not beneficial for high quality decisions and we should do our best to vaccinate the system against such fragmentation. The aim should be to make all the stakeholders, including politicians and the general public, as aware of the entire issue including both factual and value-laden parts, as possible. The overall decision-making process should thus have this as a major objective and various mechanisms for public participation, tailored for specific points in the process, can be used.

A re-defined expert role

The experts often have a role in framing the problem to be more or less a matter of science and technology, which in the end is not sufficient. The expert role should thus be redefined. In today's society we mostly operate within a technocratic model, which could be called the "experts-agenda paradigm". In a paper in 2001 I argued that for the sake of democracy we need to change to a new approach, which can be called the "values-first paradigm" (Andersson, VALDOR 2001). Instead of letting the expert community decide which questions are important, we must set the vales on top of the agenda. However, we must also realize that the technical and scientific system of nuclear waste management must maintain its identity, otherwise safety might be in danger.

Often experts hesitate to break mental barriers and engage in active dialogue, but citizens often want access to the real experts rather than information departments. The willingness of experts to give up some of their control over the process and to include stakeholders' issues of concern in their assessments is a key to success both in the dialogue as such and in building a comprehensive and relevant basis for decisions.

Using technical tools for social issues

There is a danger that the widening of technical tools for risk assessment to include also social and economical values, for example in the weighting of risk attributes, again makes the entire business of risk management a seemingly scientific endeavor whereas it is ultimately a value-laden and political issue. It can only be beneficial, of course, if the approach supports an analysis in a structured fashion and if it allows a presentation of the results so as to better inform risk management decisions. What may be a problem is if an implementer or an agency itself assisted by different kinds of expertise makes the scoring of risk attributes. Different societal values are then dealt with using technical tools not accessible for ordinary citizens and political decision-makers. This is in part what we have learnt from the UK Sellafield inquiry, where value-laden assumptions were used within a technical framework. Tools like strategic risk assessment developed by the UK Environment Agency could also be used in a similar way.

In a democratic society not all issues of value-laden character can be subject to the politicians to decide. There must me some division of labor meaning that government agencies to a certain extent can take such decisions on for example issues in risk management acting on behalf of the people. In such cases, though, the decisions should be made transparent and accessible for public insight.

Clear roles of actors

As has already been emphasized, successful experiences in facility siting have shown that active regulatory involvement is needed, and also possible without endangering the independence and integrity of regulatory authorities. The involvement of the regulator, however, must be made in a way that avoids possible bias by too close involvement. A borderline has to be established about the nature of their involvement. In general, a system with clear roles of all actors, including NGO's, is to the benefit of transparency and awareness.

The importance of a process guardian

Ideally, communicative action, as compared to strategic action, of all parties would be to the benefit of radioactive waste management. However, the implementer (or any other stakeholder with control over the decision-making process) could use a seemingly communicative approach for concealed strategic action. This is why there needs to a guardian of the process, having the task to maintain dialogue and transparency. Obviously this must be someone having authenticity and societal trust. Who can that be? In our exploration of European programmes, we have found no country where this is set in place in a perfect way. Experiences indicate that a court system is not the way to do it. One reason is that it creates a polarized situation in which all stakeholders act strategically to "win its case", which may mean that certain pieces of information are not handled openly until the court process opens.

In Sweden, in practice it has been the regulatory authorities and (in the case of Oskarshamn) the municipality that have taken this role also with a great deal of trust from the public. One can argue that this is not an ideal situation since the authorities, and certainly a municipality, are to be considered as stakeholders having an interest in the outcome of the process. How the issue of process guardian can be handled is most probably a matter of tradition and culture and will therefore differ between countries.

Should we expect consensus?

Developing a systematic framework for the description of public participation processes is not a straightforward task. Sometimes there may be unrealistic expectations that public participation should lead to consensus about radioactive waste management solutions. However, the relationship between transparency and consensus building is a matter of concern. In certain circumstances, transparency may lead to increasing consensus, and in other situations to decreasing consensus. If transparency at a certain phase increases the amount of opposing views, there needs to be a well grounded democratic decision-making process that can incorporate them and different value systems in a trustworthy way. Transparency should lead to a higher level of awareness of all aspects of the issue, which should benefit the quality of decision-making. In that respect, transparency is more important than consensus.

In general, the role of public participation in a representative democracy is a huge field of research which relates to different models of democracy and contemporary developments in society (see e.g.Held , 2002) in which transparency has an important role to play.

A well-balanced timing

Radioactive waste management programmes are by nature long term endeavours. They have to go through many phases all the way from selection of the overall management strategy to finding appropriate sites for the preferred solution. Also the social part of rwm takes time. A well-balanced programme should thus have a time schedule to enable realistic technical and social goals. The time schedule should be within the boundary conditions set by science (critical scientific questions must be solved) and democracy (a legitimate decision-making process), and with flexibility to meet unexpected problems in both arenas. However, it is also

important to have clear more near term goals in order to keep the full engagement of both the technical project and involved citizens. This is why the concept of a step-wise process has become so important.

A word of caution

As we have already emphasized, we must not create expectations among citizens that in the end are not fulfilled. As Christian Vergez, Principal Administrator of the OECD Directorate for Public Governance and Territorial Development has expressed it (Vergez, 2003):

> *"While the benefits of engaging citizens in policy-making may be considerable, governments should not underestimate the risks associated with poorly designed and inadequate measures for information, consultation and active participation. They may seek to inform, consult and encourage active participation by citizens in order to enhance the quality, credibility and legitimacy of their policy decisions. However the opposite effect may be achieved if citizens discover that their efforts to be informed, provide feedback and actively participate are ignored or have no impact at all on the decisions reached."*

Participation requires influence in order be meaningful in the long run, and concealed strategic action must be avoided. On the other hand, we also need to set various public participation processes into the context of the overall political decision-making system. Perhaps, therefore, the real and in the long run most realistic role of participation is to create awareness for the public and the decision-makers.

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