

Radioactive Waste Management

**STAKEHOLDER CONFIDENCE
AND
RADIOACTIVE WASTE DISPOSAL**

Inauguration, First Workshop and Meeting of
the NEA Forum on Stakeholder Confidence
in the Area of Radioactive Waste Management

Paris, France
28-31 August 2000

NUCLEAR ENERGY AGENCY
ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

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- to assist its Member countries in maintaining and further developing, through international co-operation, the scientific, technological and legal bases required for a safe, environmentally friendly and economical use of nuclear energy for peaceful purposes, as well as
- to provide authoritative assessments and to forge common understandings on key issues, as input to government decisions on nuclear energy policy and to broader OECD policy analyses in areas such as energy and sustainable development.

Specific areas of competence of the NEA include safety and regulation of nuclear activities, radioactive waste management, radiological protection, nuclear science, economic and technical analyses of the nuclear fuel cycle, nuclear law and liability, and public information. The NEA Data Bank provides nuclear data and computer program services for participating countries.

In these and related tasks, the NEA works in close collaboration with the International Atomic Energy Agency in Vienna, with which it has a Co-operation Agreement, as well as with other international organisations in the nuclear field.

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FOREWORD

In recent years, radioactive waste management institutions have become more and more aware that technical expertise and expert confidence in the safety of geologic disposal of radioactive waste are insufficient, on their own, to justify to a wider audience geologic disposal as a waste management solution, or to see it through to successful implementation.

Partly due to a sensitivity of the public on all matters connected to protection of the environment, nuclear power, and especially nuclear waste; partly because of the unique nature and required longevity of the proposed disposal concepts; and partly because of the changing societal conditions in the processes of decision making; the decisions *whether*, *when* and *how* to implement geologic disposal will need a thorough public examination and involvement of all relevant stakeholders. The latter include waste producers, waste management agencies, safety authorities, local communities, elected representatives, and the technical intermediaries between the public and the decision makers. The involvement of non-technical stakeholders will become increasingly important as more countries move towards siting and implementing geologic repositories.

The decision-making process and avenues for stakeholder involvement differ from country to country. It is important to identify similarities and differences, understand the key concerns of the various stakeholders, and develop means to interact effectively. The Forum on Stakeholder Confidence (FSC) has been charged with investigating and distilling the lessons that can be learnt from national and international experience. The intention is to be useful to the Member countries of the Nuclear Energy Agency (NEA) in their efforts to set up effective means of radioactive waste management while taking into account the input of relevant stakeholders.

The aim of the Forum's first workshop was to establish contacts amongst Forum participants and to lay the basis of its future programme and methods of work. In order to give guidance to the FSC and, at the same time, to give this initiative high-level input and visibility, the workshop was preceded by a half-day inaugural event. Members of the NEA Radioactive Waste Management Committee and invited speakers provided their perspectives in the area of stakeholder confidence. Over the following days, five themes were addressed through plenary talks. The Forum also broke up into working groups on the five themes. Each working group first heard and discussed a national case study, and then developed orientations for future meetings. The deliberations of these highly interactive working groups were reported in plenary sessions. Finally, a closed-door session reviewed future steps.

Overall, the entire event lasted three days. Its 75 attendees came from 14 countries and three international organisations. The participants had a very wide background, spanning both the technical and social sciences. Affiliations include universities, national academies, technical oversight bodies, safety authorities, implementing agencies, and advisory bodies to government. In addition, a mayor from Sweden and a parliamentarian from France were amongst the invited speakers. Y. Le Bars, the Chairman of the Board of ANDRA (France), chaired the workshop. He was assisted by C. Pescatore and H. Riotte of the NEA Secretariat. The latter received the professional support of K. Andersson and C. Mays.

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NEA/RWMC¹ FORUM ON STAKEHOLDER CONFIDENCE
INAUGURATION, FIRST WORKSHOP AND MEETING
28-31 AUGUST 2000

OVERVIEW

This Overview summarises the presentations and discussions at the Inauguration, 1st Workshop and Meeting of the FSC. It is based on the notes taken by the Secretariat and is conceived as a stand-alone document providing in a concise form information on how the meeting developed, the working atmosphere as well as the most important messages. The summary papers, which are available in the proceedings, contain the complete deliberations of the working groups and the actual texts by all speakers along with biographical details.

FSC inauguration

Welcoming addresses by speakers from the NEA and the RWMC

S. Thompson, Deputy Director-General of the NEA, welcomed the participants and situated the Forum. Waste is the unwanted by-product of any industrial process and carries an environmental stigma. Radioactive waste is especially unwanted. Yet the issues of long time frames and the potential hazard are not necessarily unique to that waste. There is a need, then, to clarify the issues, place the problem in perspective, and identify decision-making avenues that are within the framework of those identified by civil society for similar hazards. At the same time, potential problems and issues must not be minimised, and their solution should not be limited to the purely technical sphere. Active dialogue must take place amongst all interested parties.

The strengthening of public participation, transparency and accountability and, ultimately, policy effectiveness in Member countries constitute major areas of the work of the OECD. In this broader context, the NEA has an obligation to take up the challenges of understanding the needs of stakeholders and to provide a neutral forum where experience can be exchanged and analysed, and lessons can be drawn. The NEA strategic plan provides a broad framework for initiatives in this area.

Whilst this meeting is under the aegis of the Radioactive Waste Management Committee (RWMC), other initiatives are underway at the NEA dealing with the interaction with stakeholders. These initiatives are under the auspices of the Agency's Committee on Radiation Protection and Public Health, the Committee on Nuclear Regulatory Activities, and the Nuclear Development Committee. The RWMC Forum on Stakeholder Confidence is the first forum of its type worldwide.

S. Norrby, Chairman of the NEA RWMC, then spoke of the background of the Forum and the reasons why it cannot be a one-time initiative, but an ongoing activity of the Committee. The representation of industry, safety authorities, and governmental policy bodies make the RWMC uniquely placed to address issues in radioactive waste management. The NEA provides the needed neutral ground where cross-party dialogue can take place.

1. Radioactive Waste Management Committee of the OECD Nuclear Energy Agency.

In a recent document¹ the RWMC identified public perception and confidence as one of the strategic areas where the Committee intends to promote common understanding and further dialogue. These issues have been most critical in gaining approval for development of repositories for long-lived radioactive waste at specific sites. This is also shown in a recent study by the Committee that reviews progress in geologic disposal in the last decade².

A large amount of information, experience and theoretical analysis has been accumulated on the issue of stakeholder confidence in OECD countries. This is true both in the field of nuclear waste management and in other areas. The discussion of how decisions are reached in modern society on contentious issues should help place waste management and disposal in a societal perspective and remove it from the strict boundaries in which many place it.

The RWMC expects the FSC to keep under review the experience of its member organisations, to identify relevant stakeholders and examine stakeholder confidence issues, and to take action and become the preferred international forum for dialogue on these issues.

Invited speakers

Five speakers then addressed the Forum. These speakers gave the views and needs of implementers, regulators, local elected representation, national legislators and administration. The presentations often highlighted the siting of national facilities as a crucial step in any programme where stakeholders are drawn to explore and confront issues and interests.

For the sake of brevity, the items identified and/or discussed by more than one speaker are not reported at each time for each speaker. Rather they are italicised in the “bullet-point” summary below.

A. Hooper of UK Nirex provided the views of an implementer and reviewed the experience of the UK:

- *Management programmes have often included substantial public information and consultation efforts in their initial phases. However, these do not elicit massive response. Only when programmes move into a site-specific phase do non-technical stakeholders appear to take an active interest. It is thus a challenge to find ways of involving stakeholders early.*
- *Of special concern is the link between achieving a repository for radioactive waste and the future of nuclear power. This link – whatever it is in each country – must be spoken of openly and clarified;*
- A number of points must be demonstrable and clearly demonstrated to stakeholders:
 - A decision on waste management is not *de facto* a decision on future nuclear power generation;
 - The implementer is performing a service to society.
 - The waste generators provide finance under arrangements that secure value for money.
 - Financing arrangements are transparent.
 - The regulator, within its independent oversight role, is as committed as the implementer towards fulfilling the same government policy.
 - Institutional arrangements are robust, and meant to survive changes in political orientation.
- Proposals for further consideration by the FSC:
 - An increasing societal emphasis on environmental protection enhances the role of the Environmental Impact Assessment as a framework for dialogue. *Examine how the EIA is developing as an umbrella process for decision making.*
 - Develop an international position on waste retrievability, its value and drawbacks, its implementation (including reversibility of decisions).

1. *Strategic Areas in Radioactive Waste Management: The Viewpoint and Work Orientations of the NEA Radioactive Waste Management Committee*, NEA 1999.
2. *Geologic Disposal of Radioactive Waste – Review of Developments in the Last Decade*, NEA 1999.

- Explore best *organisational behaviour and culture with attention to trust building*, programme accessibility, and the recognition of uncertainty without destroying confidence.
- Seek ways of consulting and involving broader segments of stakeholders.
- Further reflection is needed on safety over long time periods: What time-scales have meaning and importance to different stakeholders? How can credible statements on arrangements for each time scale be developed and communicated?

Regarding the experience of Nirex and the UK, Mr. Hooper observed that:

- In the past, science and engineering skills have been seen as most appropriate for dealing with radioactive waste management tasks. Today, Nirex is hiring also experts in public decision making. A number of women have joined Nirex staff recently and often bring a valuable, new perspective to societal issues in the UK programme.
- The failure to obtain the authorisation to construct the Sellafield Rock Characterisation Facility, a necessary step towards gaining experience and data in order to assess the feasibility of geologic disposal, called in question the entire policy of final disposal by the UK government. At the root of this failure lies the fact that stakeholders had not been told WHY this policy, and WHY NOW. Should this be seen as a “massive failure of policy” or “failing a good policy”? The policy of emplacing nuclear waste below the dynamic surface of the Earth has been again validated in recent UK fora (House of Lords inquiry, National Consensus Conference,...), and is supported by reference to international experience in constructing and operating L/ILW disposal facilities. The past failure appears thus to have been in creating the conditions under which the policy could be implemented with the necessary acceptance of society.

A. Nies of Germany’s Federal Ministry of Environment presented regulators’ concerns. In discussing regulators’ needs, Mr. Nies recognised that these might be pertinent to other institutional actors as well:

- Policy makers should review and communicate the assumptions, sources and consequences of policy choices. The same is true for regulators. The public needs/wants to participate early in the decision-making process, when the “rules of the game” are being defined. In particular, regulators must clarify the reasons and basis for changing regulations at later stages in repository development.
- Regulators must determine and then communicate to stakeholders where, when and how public and other stakeholder input can be accommodated. They must also communicate the bases of their decisions.
- *Independence, competence and effectiveness are essential for public confidence in the regulator. The regulator’s role and responsibilities must thus be clearly defined, and separated from nuclear energy policy and promotion;*
- At initial phases of repository development everyone is a stakeholder, albeit often unaware of that role. In later phases of a programme, concerned citizens in siting communities take on a more central role. Also, the concerned citizens will change over time. *How to deal then with changing stakeholders?* A range of mechanisms for dialogue is needed to accommodate such shifts.
- Proposals for further consideration by the FSC:
 - Can people be convinced to co-operate in the solution to the waste disposal issue independently of their view on the desirable future of nuclear energy?
 - How can the public perception of benefits from radioactive waste management be increased? How can the perception of risks be improved?
 - How can radioactive waste disposal be made into a component of an attractive, acceptable regional development plan? How can a disposal facility be made into local stakeholders’

“baby”? A working group has been established on this and other issues in Germany. Its findings could be shared with the FSC.

The next two speakers, each elected representatives, drew the Forum’s attention to the importance of local and regional government as *intermediaries* in waste management discussions and decisions.

T. Carlsson, Mayor of Oskarshamn (Sweden), spoke of the learning process of a potential host community, giving insight on how multilateral partnerships have developed.

- The Oskarshamn experience illustrates the working of a national system for dialogue in which the disposal concept is reviewed every three years and in which the host municipality is given an explicit role.
- The municipality decided to adopt an active role in the dialogue. The alternative, a passive approach, was examined and rejected. This stance has gained heightened respect for the political system.
- An early start to the EIA process in this potential host community was accompanied by a clearly defined decision-making process, a commitment to openness and clarity by all parties, and economic support for competence-building in the municipality.
- *Each partner needs to have a clearly defined and well-communicated role both for the national dialogue and under the EIA framework:*
 - National government puts forward a clear policy and legal framework.
 - SKB proposes disposal methods and siting.
 - Safety authorities act as the “people’s experts”, available throughout the process.
 - Local stakeholders are qualified to represent and evaluate their current and future needs.

C. Bataille, Member of the French Parliament, spoke of the policy maker’s role and his experience.

- *The present generation must take responsibility for the choices made, or left unmade.* The impact of unmade choices in site restoration is visible in *e.g.* mining regions.
- *Localities should receive economic resources upon entering the (potential) host community role.* Allocations to favour local development have been wrongly criticised as “immoral” or a source of pressure. There is no reason that participation in waste management, as in other industrial activities, should not generate prosperity.
- The messages given by the decision makers must be clear, and attention should be given to the use of terms: “burial” (*enfouissement*, in French) is not the same as “placing in an underground repository” (*stockage souterrain*).
- *It is clear that the debate on waste disposal is important to the debate on the future use of nuclear energy;*
- Regarding the experience of France, he indicated that:
 - Early nuclear power development decisions were taken without consultation. Radioactive waste disposal, and attendant siting needs, catalysed the requirement for transparency.
 - The 1991 Waste Act has the virtue of stating the rules of the game. These rules can be discussed or modified but cannot be ignored by any stakeholder. In particular, the Act establishes a set of principles, *e.g.*, it requires that the waste of French origin should be dealt with in France and that a second underground laboratory should be built for the decision process to go forward. The Act also makes it clear that no solution is the preferred one at this stage for the long-lived waste and that the decision for or against a disposal site, or for postponing disposal, will be taken by Parliament.

P. Brown of Canada’s Ministry for Natural Resources commented that a remarkable symmetry exists between the UK and the Canadian experience, in that both countries undertook an important

R&D programme extending over decades, but no solution is yet identified and government decisions are pending. Brown presented the key concerns uncovered by an 8-year review of a deep geological disposal concept:

- The conclusions put forward by the review panel, based in part on input from public interveners, were that:
 - Today’s science and knowledge can meet the challenge of building technically safe radioactive waste disposal facilities for spent fuel and high-level waste. Safety, however, must be viewed also from a social perspective.
 - A single choice of management is not acceptable *a priori*. Geologic disposal would be accepted only if it were compared to other alternatives.
 - There is scepticism that science can resolve radioactive waste disposal issues. The preferred concept should maximise the freedom of choice of future generations while minimising burdens. Also, a balance should be struck between passive and active controls of a disposal facility.
- The review panel did recognise that they could not poll the public. Public input was limited to a minority (a total of 500 participants in public hearings and about as many submissions). Lack of broader participation was probably due to the fact that no safety threat was perceived. This raises questions of *how to effectively involve stakeholders early in the programme*.
- Heightened public confidence requires heightened awareness that:
 - The proponent is competent.
 - The regulator looks after health, safety and the environment.
 - Social, cultural and ethical issues are addressed alongside science and technology.

Round-table discussion

One theme of discussion centred on questions of political science. How can balance be found between national needs and local prerogatives? What kind of stand must be taken by central government to support the waste management process? What balance will be found between local autonomy to refuse a waste disposal facility and the inability of present, *de facto* host communities to rid themselves of unwanted spent fuel or waste? Decision structures are very different from country to country. These could be compared, in order to understand how stakeholders and elected representation will become involved and take responsibility.

Local decision makers are intermediaries in waste management dialogues. They can open up understanding, mobilisation and communication. Waste managers can trust communities to take up local problems and find solutions for them, as has been demonstrated in the field. Formal devolution in various nations means that more and more decisions will be taken on the local level. The FSC should address the present need of local decision makers for clear, pertinent information on waste management.

The funding of various stakeholders is a point on which comparisons might be performed. In Sweden, the municipalities have secured funding for their process of competence building, which is recognition of the legitimacy of their work. In particular, Mayor Carlsson pointed out that opponent groups should work, and receive funding, through the local community.

There was agreement that policy can no longer be made, nor implemented, without active input and commitment by all stakeholders. The need for an active regulator committed to the government policy was reiterated. Part of the success of the Oskarshamn model is that the regulators are known personally by the community and appreciated for their role as people’s experts.

An important issue is how to organise information, consultation and deliberation, *e.g.*, under the EIA umbrella. General questions worth addressing are: How can stakeholders be stimulated to become active early in the process? What public consultation formats are available? In what contexts may they be used? Who should organise them? Who are stakeholders at different points in the decision process?

Trust and confidence in the regulator and implementer are key ingredients for progress to be made. Trust must be based on the clarification of roles, coupled with competent, honest and responsible behaviour by waste management partners. When trust is lost, it is very hard to build up again. The relationships between trust among stakeholders and confidence in the waste management process overall, will merit further study by the FSC.

Overall, the round table discussion of the inaugural presentations confirmed the interest of the five topics that would be dealt with subsequently in the workshop.

FSC First Workshop and Meeting

The FSC Meeting and Workshop addressed five major topics. Each topic was framed by two plenary talks and subsequently developed in working groups. Y. Le Bars, the workshop chairman, provided an introduction. An opening talk was delivered by C. Thegerström.

Opening session

Y. Le Bars summarised the inauguration day's discussions, and made additional points while describing the five topics identified for the workshop. He noted, for instance, that the absence today of an energy crisis has changed attitudes towards nuclear power and reduces the pressure for planning for the future. Rural environments are increasingly committed to their quality image, which may be spoilt by the presence of a waste repository. The impact of deregulation, the image that electricity providers have to give, the need for multiple sources of expertise, etc. were some of the other aspects that he evoked.

C. Thegerström discussed the SKB experience of over ten years of public dialogue: in siting the CLAB, for interim storage of spent fuel, the SFR, for disposal of L/ILW, and Äspö, the Hard Rock Characterisation Laboratory, and, in the context of site characterisation studies for spent fuel disposal. Regarding the latter, he reported on the relations with municipalities in the North and South of Sweden. The experience with the Northern municipalities showed that SKB gained trust simply by accepting the No vote of a community and leaving it. SKB is now receiving much visible support in 6 candidate sites in Southern Sweden.

He presented a pyramid of conditions for the implementation of a deep repository. The process is founded upon a statement by the national government of the need for a repository, and support and commitment to that policy. Roles and responsibilities must be clearly defined. On that foundation must then be laid a scientific and technical programme of demonstrated quality. The next component will be a transparent and fair siting process. On that basis local social trust may be developed. When that is achieved, concrete local benefits must be introduced. Only by fulfilling these hierarchical conditions will a repository be achieved.

Mr. Thegerström discussed a trend in siting activities towards greater complexity, producing greater demands on resources and time, and carrying a higher risk of delay or failure, but resulting in greater support in the end. He recommended that implementers be prepared for a long-winded effort, and made these concrete suggestions:

- “Have a project”: a clear and understandable plan and concept for waste disposal. Communication should first focus on “why” rather than on “how”.
- Be ready to have your project questioned. There must be room for possible change or improvement of the project.
- Put priority on listening to, and dialoguing, with individuals and small groups.
- Put priority on actions. Trust or distrust will mainly be based upon the judgement of the way an organisation is behaving.

- Respect other opinions, anxiety and fears. People are themselves the experts on their own feelings and their own local conditions. They know what is of most importance to them and their neighbours.
- Demand respect in return. If you act in an open and fair way and with integrity you have the right to receive respect in return.
- Push forward and don't resign. The implementing organisation must play the role of "engine" for a long and difficult decision process. To succeed one will need flexibility and firmness, patience, and the ability to adapt to the specific circumstances encountered during the process.

The discussion of this talk revealed that the present success of SKB rests on:

- The commitment of a regulator whose credentials are well respected. The regulator was to be commended because it also had its share of difficulties with the communities.
- A stable financing system managed by a special Board and depending on an approved R&D programme that is reviewed every third year.
- SKB creating its own identity vis-à-vis the nuclear utilities.
- The unswerving conviction of the government that it is SKB who has to carry out this management task, and ultimately.
- A clear division of institutional responsibilities.

Finally, it was observed that the earlier public decision, in Sweden, to phase out nuclear power is, to some extent, helpful, in that people who were favourable to the phase-out agree that they need to have a constructive attitude in managing the waste.

Topic 1: The Changing Environment for Waste Management Programmes

D. Ipsen spoke about the changing modes of participation seen in the area of regional planning.

Communication across several fields of knowledge is a necessity and an issue in present day society. For instance, there are communication issues even in planning a playground, and it may well take a decade to implement one in a community. Siting of waste repositories is not unlike issues of regional and urban planning and it poses similar communication problems.

The regime regulating present day society is of relevance when considering how communication does or may take place. Several regimes are possible and were operating at some time or another in the past. One former regime ("fordism") was that of a hierarchically structured society, with strong consensus on values and respect for scientific and technical expertise. In the present regime, identified as "flexible", the social actors are situational and regional groups; production is characterised by information and organisation; pluralistic and subsidiary lifestyles are the norm; and the accumulation of wealth lies in global networks and in "producing the difference".

One communication difficulty derives from the fact that the *lebenswelt*, i.e., the level of self-organised knowledge and thinking that people have in their own control (the "normal" kind of thinking in everyday life) becomes more and more infiltrated by the social system of "politics", "economy", and "science". On the other hand, more scientific and professional skills do enrich the *lebenswelt*, so that knowledge and skill levels become more and more equivalent to those found in organisations. Additionally, the present technical opportunities make it possible that people very different from one another come in communication with each other. This allows the *lebenswelt* to take on more strategic weight in relationship to the formerly dominant areas of expertise in politics, economy, and science. At the same time, economic identification becomes important for the development of regions, as the present cultural and economic globalisation reinforces regionalisation as a basis for success in competition.

While trust is a sociologically key concept, a more pertinent concept for the present purpose is the need to enforce communication in designing the future. In other words, discussion of how we would like to live in the next decade and longer is key to discussing developments in nuclear waste and nuclear energy. This implies that nuclear waste management will have to be integrated with discussions on the development of the quality of life of a region.

In a field project, Prof. Ipsen found that people can contribute very effectively to planning if they are allowed to participate continuously in small groups over a period of about one year. This collaboration of professional planners and citizens was termed “deep participation”. Deep participation will be successful if one can find an agreement on the level of general values. This may be one important point also in handling nuclear waste.

A. Vári presented a conceptual framework to compare siting processes. This framework depicts competing social values that may be embodied in siting approaches. Flexibility competes with control, while an external focus competes with an internal focus. The resulting blends of values produce four main “types” of siting approaches: adaptable (flexible-external), goal-centred (control-external), data-based (control-internal), or participatory (flexible-internal) processes. The objectives of these four types differ as well: legitimacy, efficiency, accountability, and sustainability are sought, respectively.

The framework was applied to the analysis of L/ILW facility siting processes in the US (five sites), Canada, France, the Netherlands, Sweden, Switzerland and Hungary. A shift is seen over time from a technical approach (control-internal: focus on data and accountability) to an individual-rights approach (flexible-internal: focus on participation and sustainability). When participation and individual rights are accommodated in the siting process, a further shift is then seen to seeking distributive equity and legitimacy.

All competing values cannot be satisfied at the same time. On the other hand, it must be observed that the major weaknesses of most siting efforts were low level of perceived legitimacy and limited public support. Dr. Vári lists eight factors that enhance legitimacy. One important aspect is that the goal of site selection should be to identify a licensable site with host community support, rather than trying to identify “the” optimal site.

In addressing the situation in Hungary, she made remarks that could have wide applicability. Namely, nearby communities to a siting locality are more likely to voice opposition and need to be won as well. While it is important that a waste Agency build trust, the latter is also based on a tailor-made project of compensation and incentive packages. Finally, lack of trust is an issue affecting society beyond waste disposal.

H. Sakuma chaired Working Group 1. **O. Kurki** (POSIVA) made a presentation entitled “Why has geological disposal been so well accepted in Finland?”. At the moment it appears that POSIVA will obtain, during the winter of 2000-2001, the policy decision permission for a final deep disposal facility for spent nuclear fuel in the bedrock of Olkiluoto. The permission will make it possible to concentrate POSIVA’s investigations in Eurajoki, with an underground research laboratory built in Olkiluoto at a depth of 500 m. POSIVA have recognised that in addition to meeting safety criteria, their activities over time must also meet all the criteria specified by the surrounding society. While such criteria may be hard to predict, it is possible with appropriate listening and monitoring to follow the development of stakeholder needs and adjust to them. POSIVA strives in all its relations to be a credible, dynamic expert organisation. An incremental approach, learning by doing, and time were reconfirmed as important factors in developing acceptance for management offerings.

The working group then discussed the changing environment for waste management. Not only this environment but also the world at large is seen to be changing. Publics no longer have faith in the infallibility of authority and science. Technology is no longer perceived as the bright future. Those who contested the old order are now in decision-making positions. Centralised decision has ceded to a stronger involvement of local authority. Top-down decision styles are rejected.

Development projects in general are rejected when stakeholders have not been actively involved in creating them and developed a sense of responsibility for them. Radioactive waste is not perceived to be a shared societal problem, and the priority assigned to resolving energy-related issues may be low today when economic and energy shortages are just a memory.

In this context, the technical side of waste management is no longer of unique importance: organisational ability to communicate and to adapt now moves into the foreground. The obligation to dialogue and to demonstrate to stakeholders that their input is taken into account raises the questions of who can take on the role of communicator, what skills and training are needed, which tools should be developed, what organisational changes are necessary. The FSC could well serve as a forum of exchange on these issues.

Implementers and regulators alike perceive the importance of role clarification, within the organisation and within the national waste management system, such that responsibilities are identified, transparent and assumed. Finally, local and regional officials move into place as potential mediators when the programme shifts into the site-specific phase. Again, the FSC might review the map of roles, and investigate the modes of function and engagement of local and regional government.

Finally, a world trend is seen for persons to prefer extended institutional control of a repository, rather than counting completely upon passive safety systems. This reflects a general preference to judge at any time amongst alternatives, rather than be obliged to “buy” or reject a total package. The FSC might study whether there is more potential for building a higher degree of public confidence when programme alternatives and/or options are kept available.

Topic 2: Trust and the Institutional Framework

J. Caddy presented the work of the OECD Public Management Service, or PUMA, on “Strengthening Government-Citizen Connections” which focuses on how bridges are built between government and citizens so that policies can be designed and implemented with wide public support. The policy makers in all sectors are confronted with the challenge of reaching out, informing and consulting citizens. At the same time, better-informed critics now surround governments, and it is more difficult than before to develop policy and achieve objectives. Overall, it can be said that there exists a generalised crisis in government-citizens relations, as witnessed by recent biotech management issues, including the acceptability of using genetically modified organisms.

A questionnaire study shows that most OECD Member countries had adopted Freedom of Information legislation guaranteeing citizen access to information by the 1980s, while most have also adopted sector-specific legislation granting citizens rights to information (*e.g.*, environmental data, health data, and consumer protection). Many have adopted policies to make government information available on the Web. Mediators, ombudsmen or parliamentary commissioners are frequently appointed to represent citizen rights and to ensure implementation of various laws and policies dealing with government-citizen relations. The majority of laws and policies adopted by Member countries in support of consultation and citizen participation have occurred relatively recently, within the past 15 years, including many in the 1990s. While it is true that the amount of information provided to citizens by governments has grown significantly in OECD Member countries, opportunities for public consultation are still less widespread while the scope for public participation in achieving policy objectives remains relatively limited.

The potential for disappointment and frustration on the part of both governments and citizens during the formulation and implementation of sensitive policy decisions is high. It can be reduced by:

- Clearly defining expectations, “rules of the game” and limitations of a given information or consultation exercise from the outset.

- Using a “mix” of different tools and approaches in the provision of information and opportunities for consultation in order to reach a sufficient range of stakeholders in a given policy-making or decision-making process.
- Improving capacity for the evaluation of efforts to improve government-citizen connections.

It was felt that ongoing exchanges between the FSC and PUMA might be of value in order to benefit from this knowledge base on governance, *e.g.* with respect to defining “rules of the game” for consultation. In particular, in later working group discussion, Dr. Caddy raised similar issues to those voiced by other speakers who were experts in waste management. Namely: Even if governments try to undertake public consultations, relatively few members of the public participate; how much consultation is needed and at what stage of the decision-making process?; who is entitled to represent the public interest and what proxies may the public use?

R. Guillaumont described the different roles, actions and impacts associated with technical oversight bodies. On one hand such groups can be closely linked to specific organisations, and review their activities, as would a scientific council. At the other end of the spectrum, oversight bodies may have very broad competence, not only to review results but actually to define study actions. The oversight body might also have the authority to express its collective opinion upon the questions of society linked to waste management. Deliberations might be triggered only at the request of some other organisations, or on the contrary the group may enjoy complete autonomy in the definition of its scope. The independence of the members of any oversight body must be real and visible. Multi-disciplinarity will be an asset, as might also be international membership. Such bodies can play a mediating role between scientists and engineers, and, public authorities and the general public. The existence of a technical oversight body has definite potential for increasing confidence in the overall waste management process.

D. Metlay chaired Working Group 2. **M. Aebersold** presented the results of Switzerland’s Expert Group on Disposal Concepts for Radioactive Waste (EKRA). Its success in placing recommendations and in advancing the long-term waste management programme was attributed to *e.g.* the wide acceptance of the EKRA chairman, the competence, independence and commitment of EKRA members, the responsiveness of their recommendations to public concerns and social issue, and the openness and transparency of their work.

D. Metlay presented field studies related to trust in specific institutions in the USA. Discussion ensued upon the nature of trust, and its potential role in the siting and development of a repository. Trust implies that an individual is willing to give up a certain measure of control to another person, an institution, or a set of institutions. Trust must be earned, typically by verification through actions and meeting commitments. The actions of individuals in an organisation (including policy making) will affect the perception of the institution at large; interpersonal trust with agents of the institution can form a basis for regarding the institution with trust. Trust is much easier to lose than to win. Technical competence is necessary but insufficient in itself to earn trust. Other measurable components include caring, integrity, fairness, credibility, reliability and openness. If there is a failure on just one of those components, it may result in failure of the entire set, and in loss of trust. The parallel activities of an organisation involved in more than waste management must also be conducted in a trustworthy fashion to preserve overall trust.

Lack of trust may not necessarily be at the root of public rejection of a repository project: at issue rather may be unacceptable changes in lifestyle or other undesired impacts.

Waste retrievability and programme reversibility alleviate mistrust of technology and its implementation. Enhanced oversight by authorities and stakeholders constitutes a “defence in depth”, and the sharing of responsibility and control, as well as financial and other compensation, may work to build public confidence in the process.

The issues of trust were perceived to be an important area for future exploration by the Forum. The FSC should examine national differences in governance, which affect the ways in which stakeholders are brought into the debate and into decision making. With reference to existing studies and projects on trust, a framework could be developed to systematically report experiences in the member countries, explicitly addressing systems of governance, social values, legislative, legal, economic and other constraints. Stakeholder interactions could be analysed to determine stages at which trust is particularly important, and a set of “best practices” could be later developed.

Topic 3: Stakeholders and the Public: Who Are They?

M. English observed that public participation opportunities for environmental risk decisions have expanded in recent year. These, however, fail to distinguish among different groups in the public, and perpetuate the division between decision-making agencies and citizens. These deficiencies have opened the door for stakeholder involvement.

Broadly speaking, four categories of stakeholders are found: “risk losers”, “risk gainers”, “risk perpetrators”, and “risk managers”. These stakeholders are likely to bring not only radically different perspectives to the decision process and its outcomes, but also different abilities to participate.

Diffuse and long-term risks represent the hardest case of all for stakeholder involvement. Both losers and gainers are not only numerous and scattered; most are not born yet. And while key present-day perpetrators and managers can sometimes, with difficulty, be identified and engaged in deliberations, the longevity of the risk means that their successors will inherit the consequences of past decisions without having had the opportunity to influence those decisions.

In considering diffuse, long-term environmental risks – especially those with large uncertainties and potentially grave consequences, such as those typified by high-level radioactive waste disposal – there is a need to move away from a stakeholder-centred model of environmental decision making and towards a model that:

1. draws upon the concept of collaborative learning, and
2. emphasises the long-term common good.

Emphasis on the long-term common good calls upon people to think of themselves, not simply as self-interested stakeholders, but also as trustees for the well being of other people and the environment. The decision process should challenge prevailing knowledge and values without being adversarial. It should be deliberative and iterative, with incremental steps revisited as needed. And it should have as a goal a sustainable future for all, rather than focusing on satisfying the interests of stakeholders who happen to be present. This ideal is far easier to prescribe than to implement. Nevertheless, it should not be abandoned as an ideal.

D. Appel presented a detailed chronology of the Gorleben siting process, showing how great a gap there can be between a legal requirement for public participation, and effective stakeholder access and input. A case analysis shows that in early stages of development of the German waste disposal concept (1960s-70s), public participation was nil and even scientific peer discussion was extremely limited.

Participation in deciding to investigate the Gorleben salt dome was formally limited to representatives of selected stakeholder groups: The decision on underground investigation was not open, and so participants had no actual decision latitude. Funding was provided for counter expertise, but this was not sufficient to prepare for the intensive discussion on the results of investigations. The perception of a gap between geological realities and expected outcomes of a safety analysis also contributed, at Gorleben, to loss of confidence. This distrust hit not only the politicians responsible for the decision but, to some extent, the scientific agencies and their representatives as well.

Mr. Appel drew the following lessons from the German experience:

- Credibility is based on confidence in the responsible institutions. The latter is dependent on long-term behaviour.
- It is very difficult, if not impossible, to heal early procedural mistakes affecting the credibility of the entire subsequent process. The only way may be to go back to a point before the mistake was committed.
- A comprehensive disposal strategy, related technical concepts and proven siting and assessment methodologies are needed. Changes in strategy, concepts and methodologies must be convincing and must be discussed in detail prior to implementation.
- Scientific arguments can be misused as tactical elements in politics. That may reduce not only the politicians' but also the site-selecting scientists' credibility.
- Before starting a licensing procedure the discussion about benefits/risks and justification of the project and its alternatives must be initiated. In all phases of the decision making process public participation is essential.

So far there is no approach, in Germany, to phase-related stakeholder and public participation during decision making on final disposal of radioactive waste. The working group "Methodologies of Disposal Site Selection", therefore, will develop not only a procedure for site selection but also new approaches to public involvement in a stepwise decision making process.

S. Webster chaired the Working Group 3. **M. Westerlind** presented the current siting debate in Sweden from the perspective of the regulatory bodies.

The group found that the term "stakeholders" could signify different things to different people: it can mean someone with a vested interest or a preconceived view, or simply someone with a role to play in the process. This latter definition allows the regulator, as well as international organisations, to be considered stakeholders. However the designation of the regulator as a stakeholder is not acceptable in all countries.

It is relatively easy to define a list of stakeholders in the sense of persons or groups having a clear role or interest in the waste management process. The involvement of any group will vary over time and depend upon the stage in the process: the procedural step defines who the most relevant stakeholders will be. As an example, a Strategic Environmental Assessment (SEA) affects general "policies, plans and projects" and draws in national and/or regional government and, likely, NGOs. An Environmental Impact Assessment (EIA) in contrast bears upon a specific project proposal and implies increasing involvement of local groups and the regulator. EIA is becoming the main legislative instrument assuring public involvement in general in the siting process, and as such should be encouraged and developed. It represents a way of treating radioactive waste siting issues on a par with other environmental projects of a controversial nature.

The Working Group concluded to a majority that the term stakeholder should be understood as somebody with a role to play in the process. The identification of stakeholder groups is less difficult than the definition of interactions among groups and their respective roles, responsibilities and rights. Stakeholder groups may not be characterised by unitary opinions or needs. Regarding future stakeholders, the opinion was that we can only do what we think is best for them, but there was recognition of the conflicting priorities of leaving a passively safe situation, or, leaving enhanced possibilities of intervention.

Topic 4: Is There a New Dynamics of Dialogue and Decision making?

K. Andersson described the context surrounding technical or societal decisions like that of site selection for an underground repository:

- There is wide recognition that participation by citizens in decision processes is good for the quality of decisions and democracy as a whole.
- For this, it must be possible for the public to see how decisions are made, their factual basis and the underlying value arguments.
- The increasing complexity of today's society, the complexity of decision-making processes and the complexity of the underlying factual basis are all factors that work against transparency and participation.
- This complexity leads to restrictive framing and fragmentation of issues by stakeholders.
- Nuclear waste management, as one example, was early framed as an expert area, and value-laden issues have often been hidden in seemingly objective expert investigations.

Public participation is a way of ensuring that public values and ethical understandings are represented in decisions. It is justified in a political sense in that it lends stability and legitimacy to decisions, and the knowledge base is improved.

K. Andersson presented a framework, developed in the ongoing European Commission RISCUM project, for understanding transparency. To achieve transparency there must be procedures allowing decision makers and the public to verify claims of truth, legitimacy and authenticity. Transparency also implies that the environment of implementers and other stakeholders be sufficiently demanding, and that critical questions be raised from different perspectives. Waste management schemes and programmes can be evaluated on their degree of transparency, of public involvement in decision making, on manners of representing the public, and on the style of consensus-building.

T. Merceron recounted the Spring 2000 experience of the "Granite Mission", or how France tried to create a new phase of dialogue with citizens about radioactive waste management, and instead unleashed violent rejection. At this time, a second underground research facility is needed to advance the research commitment laid out in the Waste Act 1999. The aim of the Mission (composed of a prefect and two engineers, mandated by the Government) was not to convince people to accept a laboratory, but to inform local populations on the project in order to gather their opinions.

A number of special factors were seen in the context that greeted the three members of the Mission:

- Opinion in favour of nuclear power phase out is on the rise.
- A national coalition of small anti-nuclear or anti-repository groups has been formed, and makes active use of the Internet.
- Sensitivity is particularly high on the potential for stigmatising a local area and its products through association with radioactive waste.
- The economic incentives offered as part of a laboratory package are ill perceived as "buy-offs".

The extensive development, in France, of local decision making units – 35,000 communities – is unique in Europe and increases the difficulty of consulting and coming to consensus.

National opposition to the underground laboratories, including the Green party, organised protest meetings in parallel with scheduled Mission visits, with the result that the Mission was unable to gather opinion nor even conduct serene discussions with local populations. Elected officials from across the party spectrum registered strong protest. General and Regional Councils carried motions against the URL project. Moreover, hundreds of mayors within the 15 selected areas (involving 850 communities) joined the opposition to the URL. In early June, the government ordered the mission to halt its consultations.

Despite the national efforts to build up a complete and highly articulated waste management system, the Mission was able to report that many people appear to be unaware of its very existence. This experience suggests that a waste management system, and particularly the roles and engagement of each institution within it (including governmental and legislative engagement), must be clarified to citizens. ANDRA in particular, as part of the system, sees the need to clarify the understanding of the scientific part of France's program, and, to find new ways of creating a local dialogue. Inside the organisation, this may imply formalising an ethics of communication.

J. Kotra chaired the Working Group 4. She presented recent attempts by the US Nuclear Regulatory Commission to encourage greater public involvement in the development of new regulations for the proposed repository at Yucca Mountain. Of particular importance is the capacity for the NRC to demonstrate to stakeholders that their input has been received and incorporated into policy. This has implied a shift in organisational culture, bringing with it specific new management tasks and training needs. **V. Vanhove** (ONDRAF/NIRAS) presented Belgium's revised approach to siting a low- and intermediate-level waste facility. Key factors in the new approach are the clear identification and separation of ethical and technical choices, and the pursuit of partnerships with local municipalities. The extent of trust and reliance placed on the decisions of the participating communities is an outstanding feature of the program, and aroused the curiosity of the group. The impact upon the implementer was clear, as the Communication department of ONDRAF/NIRAS is fostering organisation-wide dialogue on what it means "to dialogue".

The new dynamics of dialogue and decision making were characterised in discussion as a shift from the traditional "decide, announce and defend" model, for which the focus was almost exclusively on technical content, to one of "engage, interact and co-operate" for which both technical content and quality of process are of comparable import to a constructive outcome.

The FSC may contribute to and support member programmes as they endeavour to rise to the challenges posed by the new dynamics of dialogue. Actions could include the development of a "tool kit" containing clear, concise, and robust information materials, and guidelines reflecting experience on effective ways of engaging dialogue on radioactive waste management. In preparation for stakeholder exchanges, reflection could also be undertaken on the sensitive issues of consideration of the common good, the importance or role of retrievability, the value to the waste management process of a community veto to the decision-making process, etc.

The organisational adaptations implied by the obligation to dialogue can also be supported by the FSC, through identification and validation of *e.g.* training and R&D needs. Not only member organisations, but also the NEA itself might be "stretched" by a real openness to dialogue; the working group voiced the demand that a broader range of stakeholders be invited to future meetings of the Forum, or even included as members.

Topic 5: Are the Waste Management Institutions Set Up for Achieving Stakeholder Confidence Over the Long Term?

R. Espejo spoke of the structural requirements for the effective performance of waste management institutions, giving a structural interpretation of "transparency". Transparency requires fostering, producing and maintaining dialogues and communications among those producing knowledge, those producing decisions, and the affected parties. The issues raised in these dialogues will refer not only to questions of technical efficiency, but also to questions of what is right and fair and whether decisions and their implementation reflect the societal view. Policy is in fact the outcome of a complex interaction of "meaning-making" units and their multiple spheres of influence. One strategy for enhancing organisational performance and managing the complexity of environmental issues is to render organisational units autonomous and responsible for "co-evolving" with the outside world. The only limit on this autonomy is the requirement to respect the cohesion of the larger unit within which a

smaller unit is embedded; in all else, the image given of the “recursive organisation” is far distanced from *e.g.* the bureaucratic model of dependence on central authority, which results in inertia. In later working group discussion, Espejo elaborated on the concept of “stretching”. Pressure to adapt to the environment is normally provided by the market, but waste management organisations do not have competition. The critical demands by stakeholders provide a constructive tension, leading these organisations to examine assumptions and adapt. As the landscape of stakeholders becomes more complex, implementer teams are stretched more and more; these challenges are necessary to shape an effective organisation.

T. Eng chaired the Working Group 5. D. Pawlowski provided an overview of recent research on the issue of public acceptance of waste management. She identified a trustworthy and credible organisation as one that could also be described as open, innovative, flexible, responsive, and fair.

Each member of the Working Group then offered views on what would characterise an organisation capable of achieving stakeholder confidence over long time periods. Most input focused on the implementer, but it was agreed that many of the recommendations and observations are valid for other actors, the authorities in particular. Participant input could be organised into three main areas: organisational aspects, missions, and behaviour. Organisational features include independence, clarity of role position, public ownership, dedicated and sufficient funding, a non-profit status, structural learning capacity, an internal culture of “scepticism” allowing practices and beliefs to be reviewed, high levels of skill and competence in relevant areas, including stakeholder interface, strong internal relations and cohesion, an ethical chart or code of conduct, and a general “quality consciousness”.

Mission features implied in achieving long-term confidence include clear mandate and goals, a specified management plan, a grounded and articulated identity, a good operating record, and responsibility for the back end of the nuclear fuel cycle, including decommissioning.

Behavioural features were explored and defined, and include openness, transparency, honesty, consistency, willingness to be “stretched”, freedom from arrogance, recognition of limits, commitment to a highly devoted and motivated staff, coherence with organisational goals, an active search for dialogue, an alert listening stance and caring attitude, proactive practices, emphasis on stakeholder interface, a policy of continuous improvement, use of allies and third party spokespersons, and a level of commitment comparable to that displayed by NGOs.

The FSC could pursue work on this topic by pursuing and refining the list generated. Two uses could be expected: development of a tool of direct use to member organisations for their internal purposes; review of items within the FSC to identify new topics for future research and deliberation.

Participants and Observers Impressions

Participants’ comments

Comments were received from participants throughout the event. Some comments were formulated in later communications to the Secretariat.

In general the Forum was described as a positive and successful undertaking. One observer stated that the Forum represented a rare opportunity to create dialogue and exchange among different institutions and nationalities.

Participants of WG 1 shared the view that the presence of the FSC itself is a vital example of the “changing environment” of waste management institutions. Working Group Chairs reported the high interactivity of deliberations, and attributed that in part to the significant efforts of preparation undertaken and encouraged by the Secretariat. The Secretariat had solicited and obtained written summaries from all presenting participants, and circulated the case studies prepared for the parallel working groups. Working Group registrees received a prior list of fellow participants, and their Chairs

invited them to make acquaintance by email. Response was high from all members, and the sense of prior acquaintance was reflected in the trust and openness observed during the course of the meeting.

The value of sharing knowledge stood out in plenary and workshop discussions. Participants welcomed the opportunity to compare experience and develop understanding of what can be exported to other contexts, and what cannot. Many participants said they had learned specific lessons that they would bring home to their organisations.

Participants clearly perceived the role the FSC could play in developing tool kits for dialogue, compiling “best practices” guidelines, and organising systematic analysis of country experience. The access offered to the knowledge bases of other OECD Directorates appeared particularly attractive.

The FSC can also legitimate the efforts made by individual member departments or organisations to address stakeholder confidence issues. This could facilitate the securing of consent and funding for internal training and development initiatives.

Critical comments bore on the transparency of the choice of topics. The topics had been developed by the RWMC in prior deliberations, but that perhaps had not been made sufficiently clear to all persons invited to participate in this first Meeting and Workshop (this was rectified in a plenary session). Some stated that they would evaluate future participation in the light of the direct pertinence of topics to current organisational concerns, and the degree of member involvement in selecting topics.

Finally, while it was recognised that the FSC represents an unusual and progressive initiative for the NEA, calls were heard to “stretch” the organisation even further. This might include “daring” to invite and include other stakeholders than those official member institutions currently involved. The name of the Forum on Stakeholder Confidence itself was questioned and tabled for future consideration. The calls reflected the high degree to which participants took seriously the notions of dialogue, transparency, and openness, and the desire to align institutional behaviour with avowed goals.

The Forum will discuss and address those critical comments at its next meeting.

The shift in attitudes on decision making over the last decade in the impressions of an outside observer

A social psychologist was in attendance and gave her impressions of the FSC workshop. These were influenced by her last experience of an OECD-NEA international workshop: that was the March 1992 meeting on “Public participation in the decision-making process in the nuclear field”. At that time, according to her notes, presentations spoke of a number of legal mechanisms by which members of the public could seek to influence decisions. However, there appeared to be a great deal of regret in some quarters that public opinion did not limit its expression to those outlets. Democracy, one participant went so far as to suggest, is endangered when the organised vote is not the only accepted form of public input. There was scorn expressed for both journalists and politicians in their unruly pursuit of outlying objectives. All attendees at the 1992 workshop very probably did not share these opinions, but they could be openly expressed at that time without eliciting objection.

At the FSC workshop in 2000 the discourse and attitude of institutional attendees appeared to this observer to be very different. There was recognition that existing consultation mechanisms are probably insufficient or sometimes inadequate, and that it is a real challenge for organisations and individuals to find new manners of communicating and receiving input. Each attendee appeared to be ready to rise to that challenge and curious about opportunities to learn. Members seemed to agree that democracy includes an extensive system of players and that power is necessarily shared. They expressed interest in interfacing with local and regional actors, recognising that large projects are articulated around this decision level. They called for clarification of roles in decision making and implementation, in the expectation that the clarification will not only result in better decisions, but globally in societal learning about risk management. Generally, to the eyes of the observer, attendees

seemed to embrace a broader, more realistic view of decision in society, far removed from the technocratic position seen at the beginning of the decade.

The presentations during the Forum often revealed that important strides have been made in remodelling modes of relation between implementers or regulators, and, other stakeholder groups. Some presentations were frank in recognising the discomfort of public rejection and the difficulty of revising organisational culture. To the mind of the observer, more detail could often have been given on how new forms of relationship and dialogue were created, including the multipartite negotiations that were certainly implied. The success stories, in other words, would be more informative if they gave better glimpses of issues and decisions confronted on the road to success.

Future Steps

The members of the FSC expressed general satisfaction on the outcome of the meeting. It was not given *a priori* that this would be a success. In particular, the initial goals of having the FSC members get to know one another have been met and a working relationship has been achieved. In addition, the wide breadth of expertise that was mustered at the workshop will now be available to the FSC.

With the success came also the realisation that high expectations are placed now on the FSC from both within and outside the NEA. The challenges that this poses will be taken on at the next meeting of the group in January 2001. The intervening months will be used to finalise the proceedings of the workshop for broad distribution outside the NEA, and to take stock of the lessons learnt and comments received in order to arrive at a modus operandi that takes into account the available resources and utilises to its best the experience of the FSC members, the NEA member countries, and the external experts that have accompanied and will accompany the FSC in its endeavours. A document will also be prepared outlining the strategic areas of the FSC working programme over the next few years.

**First Meeting and Workshop of
the RWMC Forum on Stakeholder Confidence**

Inauguration

Welcome Address

Sam Thompson
Deputy Director-General of the NEA

Ladies and Gentlemen:

It is my pleasure to welcome you to the inauguration and first meeting and workshop of the Forum on Stakeholder Confidence under the auspices of the NEA and of its Radioactive Waste Management Committee. We do appreciate your participation at a time which is normally devoted to vacations in many countries. In fact, the substantial attendance we are anticipating during the course of this week is perhaps a good indication of the interest in the timely focus of this workshop, whose theme revolves around the key words “Waste”, “Radioactive Waste”, and “Stakeholder”.

Waste is the unwanted by-product of any industrial process and has an environmental stigma. *Radioactive Waste* is especially unwanted and prone to social and political concerns beyond the scientific and technology community, especially when it arises from the nuclear power industry, as opposed to other sources, such as the non-industrial uses of isotopes, and to situations where radioactivity appears in large quantities but it is incidental to the primary process. Yet the issues of long-time frames and the degree of hazard are not necessarily unique to those types of waste. There is a need, then, to clarify the issues, place the problem in perspective, and to identify decision-making avenues that are within the framework of those identified by civil society for similar hazards. At the same time, potential problems and issues must not be minimised, and should not be limited to the purely technical sphere. Active dialogue amongst all interested parties must take place. Waste management should be part of the solution, and not of the problem, of the production of energy and other tangible benefits to society.

Participatory democracy is becoming more and more a reality in OECD countries, although differences in cultures, legal and political systems play a decisive role in approaches and priorities. Accordingly, the strengthening of public participation, transparency and accountability and, ultimately, policy effectiveness in Member countries constitute major areas of the work of the OECD as a whole on behalf of its Member countries.

The OECD itself is increasingly perceiving a need to reach out and communicate with civil society in a manner complementary to its constituency of member governments. Hence there is also debate at the level of the OECD Council as to what extent non-institutional representation should be sought, or allowed, in OECD committees and working parties. Individual Committees and directorates are being asked to keep an open mind in this area, and weigh their options in view of the specifics of their relevant fields.

Taking into account this broader context, the Nuclear Energy Agency has an obligation to take up the challenges of understanding the needs of stakeholders and to provide a neutral forum where the various actors can communicate and analyse their experience and draw lessons. The NEA strategic plan, approved by the Agency’s Steering Committee early last year, provides a broad framework for initiatives in this area within the context of providing society with a sustainable choice of energy sources, of which nuclear is one part. In this context, it is worth remembering that our Agency intends to be:

- (i) An objective and non-promotional international instrument dealing with issues of nuclear power.
- (ii) A centre of competence and a repository of scientific and technical know-how and practices.
- (iii) A global source of qualified information, rigorous analyses and policy advice on key aspects of nuclear energy.

Several initiatives are underway at the NEA on the issue of interaction with stakeholders and confidence building. The one with which this meeting is associated is under the aegis of the Radioactive Waste Management Committee (RWMC) and it is meant to become an ongoing activity of that Committee. Other initiatives are being pursued under the Agency's Committee on Radiation Protection and Public Health, Committee on Nuclear Regulatory Activities, and Nuclear Development Committee.

The RWMC is concentrating on societal decision making for repository development utilising its broad base of regulatory, implementing, policy making, and R&D expert members. Since the decision-making process and avenues for stakeholder's involvement differ from country to country, it is important to identify similarities and differences, understand the key concerns of various stakeholders, and identify means to interact effectively with the different audiences.

The Committee on Nuclear Regulatory Activities, which deals with the operational safety of nuclear installations, is concentrating on the issue of accountability of, and trust in, nuclear regulatory bodies. A workshop is scheduled at the end of November – beginning of December this year.

The Committee on Radiation Protection and Public Health, which is concerned with the principles and application of radiation protection, is organising a workshop in January 2001. This workshop, which will be co-sponsored by the RWMC, aims at examining the role of radiation protection in controversial or emergency situations, and will focus on the engagement and needs of stakeholders in the context of modern society.

The Nuclear Development Committee, which is concerned with the economics and resources of nuclear power and developing nuclear technologies, is about to set up an expert group on the socio-political aspects of nuclear energy with the intention of gaining a better understanding of the relationship between nuclear technology and society and the implications for national nuclear policies and practices.

While these initiatives are at the level of the individual committees, it is clear that they do have in common some basic issues and concerns, and co-ordination with overall OECD goals and activities will be considered. We plan to review all these initiatives next Spring, with a view to developing possible initiatives at the level of the Agency as a whole in addition to ongoing specific work at the level of individual standing technical committees.

We believe that the RWMC Forum on Stakeholder Confidence is the first such regular forum of its type worldwide, and we are looking forward to its full establishment and future evolution, including helpful products.

The suggestions by the invited speakers at this inauguration event will represent advice from a wide-range of experience, backgrounds and institutions. They will be valuable to the further discussion within the workshop and to the further development, within the Forum, of a common understanding of the issues at hand and the elaboration of the future programme.

At the same time, the invited speakers to the workshop will provide for three days their expertise to the members of the Forum. Hopefully, they will also be associated, in the future, with other activities of this Forum. In any case, we look forward to their active participation in the workshop.

Several observers are also attending this event. We feel honoured that they have chosen to be here with us. We will appreciate their feedback, including practical suggestions for future improvements. Of course, the FSC members will have the difficult task of drawing conclusions and carrying on the work.

On behalf of the Nuclear Energy Agency, I wish you all success in developing your ideas over the next three days and half, and beyond.

I also wish invite you to a reception this afternoon, after the round table, at about 6 where you can meet with the speakers at the inauguration event, and get to know your colleagues from the workshop.

Again, thank you very much for coming to the Inauguration, First Workshop and meeting of the NEA/RWMC Forum on Stakeholder Confidence, and for sharing your experience.

Welcome Address

Sören Norrby

Swedish Nuclear Power Inspectorate (SKI), Sweden

The Radioactive Waste Management Committee (RWMC) assists Member countries by monitoring progress in, and providing guidance on, the solution of radioactive waste problems, and promotes safety in the short- and long-term management of radioactive waste. The RWMC is a forum of senior operators, regulators, policy makers, and senior representatives of R&D institutions in the field of radioactive waste management. The cross party representation of industry, safety authorities, and governmental policy bodies and the wide range of expertise it musters amongst the NEA Member countries, make the RWMC a uniquely placed international forum to address issues in radioactive waste management. The NEA provides the needed neutral ground where dialogue amongst national and international institutions can take place.

Since its inception in 1975, the RWMC has addressed both strategic and technical issues in waste management, especially disposal in the more recent years. In a recent document¹, which has been made available to all of you, the RWMC identifies and describes strategic areas where progress would be most beneficial towards further development of radioactive waste management, and particularly disposal programmes. Public perception and confidence is identified as one of the strategic areas where the Committee intends to promote common understanding and further dialogue.

Issues of public perception and confidence have been most critical in gaining approval for development of repositories for long-lived radioactive waste at specific sites. This is clearly shown in a recent study by the committee that reviews progress in geologic disposal in the last decade². This, in turn, raises the question how best to achieve confidence regarding the ethical, economic, political and technical aspects of a waste management strategy, and disposal in particular. The “public”, however, is not a homogeneous group, and its various components and the concerns they have need to be better identified and understood. This is one important task of the Forum on Stakeholders Confidence.

It is important to note that the process by which proposals are brought forward must be trusted, and decisions need to be made with sensitivity to local concerns and stakeholders. The needs of these audiences may not always be anticipated and dialogue with stakeholders needs to be sought, so that the public is afforded opportunities to interact as early as possible in the process of repository development. Thus, an additional, specific issue for consideration is how to elicit more meaningful public involvement in the decision-making process.

A large amount of information and experience has been accumulated on the issue of stakeholder confidence in OECD countries. This is true both in the field of nuclear waste management and in other contentious areas. The discussion of how decisions are reached in modern society on contentious issues will help place waste management in a societal perspective and remove it from the strict boundaries in which many place it.

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1. *Strategic Areas in Radioactive Waste Management: The Viewpoint and Work Orientations of the NEA Radioactive Waste Management Committee*, NEA 1999
 2. *Geologic Disposal of Radioactive Waste – Review of Developments in the Last Decade*, NEA 1999.

In its strive to be useful to its members in their obligation to take into account the input of various audiences in their respective countries, the RWMC has thus launched the Forum on Stakeholder Confidence (FSC). The decision of launching this workshop has not been taken lightly, and much is expected from it. In particular, the RWMC recognises that this is a topic that needs much more than a workshop, or a meeting, to be tackled successfully, and a full, standing working party will be operating with its own dynamics on this topic. This first workshop will be important for identifying the key areas that will benefit from joint attention, both for the exchange of information and for the identification of new initiatives.

The RWMC expects the FSC to keep under review the experience of outreach programs of its world-wide participating organisations, to identify and examine stakeholder confidence issues, and to take action and become the preferred international neutral ground for dialogue across the several boundaries that separate the different stakeholders.

It is inspiring to witness the wide expertise and backgrounds of the participants in this workshop and of the invitees to this inauguration event. It bodes well for the future.

Special thanks go to Mr. Y. Le Bars who accepted the task to chair this workshop and to the NEA Secretariat who took up this difficult and new challenge.

To all of you I bring the heartfelt welcome by the RWMC and the wish of a successful workshop.

The View and Needs of Implementers

Alan Hooper
United Kingdom Nirex Limited

In the United Kingdom, the focus for work on deep geological disposal has been on intermediate-level waste (ILW) from nuclear power plants and from the reprocessing of spent nuclear fuel (TRU waste). There is some discussion of the UK programme but then a broadening to consider the views and needs of implementers dealing with all types of long-lived waste worldwide.

Nirex initiated a site selection process for a repository for ILW by a nation-wide consultation “The Way Forward” in 1987. Feedback was obtained from a wide range of stakeholders and taken into account in a subsequent multi-attribute decision analysis to identify sites for investigation. As an outcome of that process it was decided in 1989 to investigate two sites, at Sellafield and at Dounreay, which appeared suitable and which were associated with existing nuclear operations. This latter consideration was to take account of a measure of public support for nuclear activities within the local community. In 1991, work was focused on the Sellafield site on the basis that about 70% of the waste destined for disposal were produced from the ongoing operations at Sellafield.

The investigations at Sellafield included 28 deep boreholes and thousands of line-kilometres of geophysical surveys at a cost of approximately £220 million. It was concluded that an underground “Rock Characterisation Facility” (RCF) would be needed before there could be sufficient confidence to propose the disposal of radioactive waste at the site.

In 1994 Nirex sought planning permission for the proposed RCF, which was refused by the planning authority Cumbria County Council. Nirex appealed against this refusal which resulted in a public inquiry being held between September 1995 and February 1996. This was conducted on an adversarial basis under English Planning Law with Nirex being opposed by Cumbria County Council, environmental groups and others. The inquiry covered a wide range of issues including the site selection process and “the safety case” for a prospective repository at the site. Following the recommendations of the Inspector who led the Inquiry, the relevant government minister refused the appeal (and so the application to develop the RCF) on the grounds of:

- Unacceptable environmental impact of the RCF.
- Flawed site selection process.
- Too great uncertainties over repository safety (in effect, the application to develop the RCF was premature).

This decision by a senior government minister, announced on 17 March 1997, the same day as the announcement of a (national) General Election, effectively halted the implementation of the government’s own radioactive waste management policy. Many stakeholders, including Nirex, believe the decision has raised procedural issues which need to be addressed before any national site selection and characterisation programme can be re-established, should a policy of deep disposal be re-affirmed. An immediate outcome, which demonstrates the danger of seeking a standard international approach, is the advice to Nirex that it should have applied for the RCF (or underground research laboratory (URL)) as an initial stage of repository development. This contrasts with the proposals in Switzerland that NAGRA should apply to develop only a URL initially at the Wellenberg site and apply for a repository at a later time if appropriate.

There have been encouraging developments in the United Kingdom since 1997, regarding:

- The House of Lords Select Committee on Science and Technology recommended “phased disposal” of radioactive waste following a detailed and length enquiry.
- A National Consensus Conference recommended storage of radioactive waste below the dynamic ground surface.
- The government has proposed wide-ranging public consultation on all aspects of future policy.

Similarly there are encouraging developments internationally in terms of progress towards an acceptable deep disposal solution, regarding:

- The Waste Isolation Pilot Plant in New Mexico (USA) is operational for the disposal of TRU waste.
- Siting programmes are well advanced in Finland and Sweden.
- Site-specific investigations are proceeding at Yucca Mountain (Nevada, USA) and Bure (in France).
- There are a number of operating facilities for the disposal of low- and intermediate-level waste where issues of public acceptance have been addressed.

Turning to the requirements for the implementation of deep geological disposal, there is no doubt that there has to be a public feeling that it is “the right thing to do”. This demands that we present the options for the long-term management of radioactive waste in an objective and accessible manner which makes sense to the public. We need to have a good justification of why we should proceed now and why this is not “rushing” a very important decision. These points are often addressed by pointing to the possible or even probable instability of future societies, in effect that rock is more stable than society, but we must be aware that this could be interpreted as a judgement on human behaviour and so produce an unfavourable reaction from our fellow-citizens. We may have failed to produce an honest picture of disposal, appearing to promise a “zero-release” solution when this is not a credible claim for any man-made or natural system over the relevant timescales.

When stakeholders are asked to consider disposal of radioactive waste, the relationship to future nuclear power generation must be very clear. The question appears much broader than waste disposal itself and can variously be considered as dealing with the legacy of past nuclear activities or giving options for the future. It is very significant that demonstrations of the theoretical feasibility of waste disposal provided support for continued nuclear power generation in Sweden and Switzerland in the 80s.

Turning more directly to topics that could be considered by the Forum on Stakeholder Confidence one can identify immediately the importance of institutional arrangements. Here it is important to consider the following:

- The degree of separation of the disposal programme from power generator interests.
- The positioning as a service to society.
- The arrangements under which the power generator (“the polluter”) pays.
- The role of the regulatory authorities.
- Financing arrangements.
- Longevity of arrangements.

Another issue which emerges as important to address is that of the long timescales relevant to deep geological disposal. We need to understand how stakeholders are concerned with the long time frames involved and to examine whether there are merits in thinking about and presenting the project as broken down into different periods.

The increasing emphasis on long-term environmental protection strengthens the role that should be played by an Environmental Impact Statement. There are valuable lessons to be learned from programmes where a process of environmental impact assessment has been developed as a framework for dialogue with stakeholders, particularly with communities living local to prospective sites. The assessment process is capable of evolving alongside and indeed supporting the stepwise process

towards repository siting and development and can subsume the stylised radiological safety assessments and safety cases which many stakeholders find inaccessible.

Whereas a repository development programme is very amenable to a stepwise process, little has been recorded about the involvement of stakeholders in the process and the way in which agreement can be reached to proceed to the next step. Similarly, although there is widespread recognition of the importance of retrievability of waste and reversibility of decisions, there is a lack of clarity on what this should offer and whether this is determined by national social considerations or even different types of waste or repositories. There are extremes of approaches whereby one could seek to achieve a reversible demonstration of the disposal of waste, including their backfilling and sealing (for example the SKB proposal for incremental disposal of spent fuel), or one could seek to achieve protracted underground storage of the waste in controlled environmental conditions. A key question seems to be to identify how the chosen approach informs the next decision that society would have to take after its implementation.

Finally, it is very necessary to explore the behaviour that would be required of an organisation to implement a disposal solution with public acceptance. Effective organisations can be characterised as follows:

- Affording the necessary time to consult at key decision points.
- Researching how to consult.
- Making its programme accessible and amenable to influence.
- Being honest about uncertainty, yet not destroying confidence in the ability to make any progress.

Overall the waste management organisation must be trusted and it can win trust by being seen to be competent and honest.

In summary, it would be valuable to implementers if the Forum on Stakeholder Confidence could address the following topics:

- How to look at options for the long-term management of waste to achieve a meaningful benchmark for deep disposal.
- The characteristics of a good institutional framework to deliver deep disposal.
- How to deal with the long timescales.
- A definition of retrievability of waste and reversibility of decisions in terms of building stakeholder confidence.
- Documented definition and support for the stepwise process to develop a repository.

The View and Needs of Regulators

Alexander Nies

Federal Ministry for the Environment, Germany

Background

The foundation of the FSC by OECD/NEA and its RWMC did not happen by chance. It is a reaction on the fact that disposal projects or sites internationally have had to be abandoned or postponed or, at least, were considerably delayed. For instance, German plans in the 70s were to have Gorleben available as a repository for all kinds of radioactive waste by the end of the nineties. The fact is that we are farther away to achieve this goal than ever before. Other countries had to survive similar experiences. World wide there is no repository for HLW or spent fuel elements licensed, in fact there is none even near to licensing.

Tomorrow we will hear more about the general trend of the changing requirements for public involvement at all levels of decision making. The key question in our case is how to find a safe site that is accepted in the public? And it is the second half of this question, which should be thoroughly tackled in the FSC. Connected with this, questions of a more general nature also arise, and I mention two examples here:

1. If a repository is accepted as safe, why is it so difficult to accept waste from other countries to be disposed of there?
2. Can people be convinced to co-operate in the solution to the waste disposal issue independent from their view about the proper future of nuclear energy? We must be aware of the fact that antinuclear stakeholders may consider that solving the waste disposal problem amounts to their losing their strongest argument against the continuing operation of NPPs.

Issues like these should be discussed in the FSC.

A discrimination is recommended between institutional stakeholders like waste management agencies, safety authorities, regulatory bodies etc. on the one hand, and concerned people, citizens initiatives, local communities and their elected representatives on the other hand. Also discrimination is recommended between site selection and licensing, and I will comment further on this.

Although this presentation is entitled “The View and Needs of Regulators”, my understanding of this Workshop is that it should provide the FSC with as much input as possible. I note therefore that the thoughts I have included on this topic may apply also to others than strictly the regulators.

Role of regulators

Responsibilities of the regulatory body must be clearly defined. For instance, in Canada, the *Nuclear Safety and Control Act* gives the Canadian Nuclear Safety Commission the mandate to regulate the use of nuclear energy and materials to protect health, safety, security and the environment. It is not the responsibility of the regulator to actively promote nuclear industry in Canada, nor to determine government energy policy, nor the role of nuclear energy in that policy.

Independence, competence and effectiveness are crucial for the perception of the regulators in the public eye. Regulating radiological safety must be clearly delimited from nuclear politics, the interests of the industry, etc. A primary objective is to gain public acknowledgement that the regulator is working for them and their safety, and is not working for the welfare of the nuclear industry.

This does not mean that the regulator should remain silent in all general questions of debate. On the contrary, at least in my opinion, the regulator should participate in public discussions on the safe feasibility of disposal, retrievability, appropriateness of host formations, etc. It should be visible to the public on which technical evaluations and assessments the regulator's positions are based.

The FSC should discuss the interaction between regulator, licensing authority, license applicant and stakeholders in the various phases of site selection and licensing of a disposal facility.

Who are the stakeholders?

Identification of stakeholders is a central issue for the FSC. It has at least two important dimensions: the dimension of representativeness and the dimension of time.

Some countries are at, or have been reset to, the beginning of a site selection process. If this process, like in Germany, is not preceded by a decision on host formations, the selection process starts with a white map of the country and hence virtually everybody is potentially concerned. How can a proper and generally accepted representativeness among stakeholders be achieved in this situation?

It is only later in the process that concerned citizens in the vicinity of selected sites are clearly identifiable. This is the reason to discriminate between site selection and licensing when considering stakeholder confidence.

Another point is the long time frame. I am not talking about the longevity of radionuclides, but of the long process of site selection, licensing, operation and decommissioning of a facility typically lasting for many decades. How to deal with changing stakeholders? Those who have accepted a site may not be the same ones who will represent the public during licensing. This is one reason to discriminate institutional stakeholders and concerned citizens, although experience shows that even institutions change during the process.

Public participation

The German situation is as follows: Public Participation is relatively formalised and advanced during licensing, but less formalised and defined during site selection.

It is, however, clear by now that Public Participation is needed from the very beginning. More specifically, Public Participation should be organised not only during site selection and licensing, but already when the procedure of site selection is being developed and decided upon.

Initiatives to intensify Public Participation and to specifically address the views of the opponents are important in order to get better feedback on people's values and interests.

This is also important in the context of taking some fundamental decisions, such as:

- Is disposal the right way to proceed?
- Is the chosen host formation a good choice?

Regulations

Ideally, the general public should perceive the system of regulations as being impartial and equitable, and the process of rule making and its application to site selection and licensing should be transparent and comprehensible. It is a challenging task to the FSC to give recommendations how to achieve this both objectively and in the perception of stakeholders.

It is evident that the public requires having the opportunity to participate at the time when the "rules of the game" are defined. On the other hand, there are issues on which stakeholder input can have no impact because they relate to a responsibility that the regulator cannot delegate. A clear discrimination is therefore necessary of areas with stakeholders' co-determination and areas that must remain the regulator's responsibility.

Regulators need to determine and then communicate to their stakeholders where, when and how public and other stakeholders input can be accommodated.

Experience shows that it is particularly delicate if regulations or other requirements are changed during the site selection or licensing procedure. On the other hand, there may be good reasons for such changes. FSC is encouraged to discuss this issue.

Further questions to the FSC

Coming back to the key question of how to get public acceptance for a safe site and concept, the FSC could devote some thoughts on the following questions:

- What is the public perception of risks and benefits in radioactive waste management?
- How to increase perception of benefits?
- How to improve perception of risks?

If, in the perception of the concerned public, the benefits do not clearly dominate the risks, acceptance is in danger. This is particularly true if the risks are at the disposal site while the benefit is somewhere else.

FSC could therefore also discuss the question of how to make radioactive waste disposal “the baby” of the concerned people, *i.e.* part of an attractive accepted regional development plan. The Federal Ministry of the Environment in Germany has recently launched a research project to deal with this topic; and we would be glad to exchange our developing views with FSC.

Let me terminate this short note by stating that plenty of work is waiting for the FSC, implementation of this forum is highly appreciated and its work deserves strong support from the member countries.

Acknowledgements

The author wishes to thank Peter Flavelle from the Canadian Nuclear Safety Commission for his contribution to this note.

The Political and Public Perspective on Radioactive Waste Management in Oskarshamn, Sweden

Torsten Carlsson
Mayor of Oskarshamn, Sweden

Chairman, Ladies and Gentlemen:

It is an honour for me to talk to you about my home municipality, Oskarshamn, and to the title of my paper: “The Political and Public Perspective on Radioactive Waste Management”.

My name is Torsten Carlsson and I am the mayor of Oskarshamn.

Public confidence is very important when discussing siting of nuclear waste facilities. I do not think there will be any final solution before the public has confidence in the individuals and organisations responsible for nuclear waste programmes.

I think the initiative of the Radioactive Waste Management Committee to launch the Forum on Stakeholders Confidence is very important.

Hopefully my talk can raise some thoughts that can be used in your future work.

Introduction

The Oskarshamn municipality with 26,500 inhabitants is located on the Swedish Southeast coast.

The municipality economy is strong and employment is high. In total the municipality has 13,000 jobs and the largest employers are the truck factory Scania with 1,700 employees and the nuclear power company with 1,100 employees.

Oskarshamn is hosting three reactor blocks. The first reactor went on line in 1972, the second started in 1974 and the third in 1985. These three reactors produce 10% of Sweden’s total electric power consumption.

We are also hosting:

- The CLAB facility, for the interim storage of spent fuel.
- The Äspö hard rock laboratory for underground research on disposal technologies.
- The Canister Laboratory where the industry is developing welding technology for the copper canister.

Since 1995 Oskarshamn is also one of six municipalities studied for a possible final repository for spent fuel.

Decision making in relation to controversial facilities

During the first half of this century large industrial facilities did not meet much opposition. Industry was equal to a prosperous future with opportunities.

Up to the 60s a majority of siting decisions were still taken behind closed doors. It was then announced publicly and when “surprising” opposition arose the decision was defended. This is often referred to as the DAD phenomena (Decide, Announce and Defend).

Initially information was seen as the solution. Also this strategy failed because it was still “we and them” and no sharing of values or participation by the concerned people in the decision-making process.

After adversity and failed projects, – *complete openness and participation by the public* – has evolved as a new concept.

Complete openness and room for active participation has however still not been fully accepted and is still often seen as a threat.

Nuclear waste repositories are probably one of the most controversial siting projects we are currently facing. It is a problem everybody wants to see solved – but elsewhere.

The model of complete openness and participation was *fully* adopted by myself and my colleague politicians in Oskarshamn as the governing method when participating in studies for eventual siting of nuclear waste facilities. Consider that the initial phases of the siting process from a political perspective will last at least four electoral periods before we even have a formal license application.

A system for national dialogue

Every third year the reactor owners in Sweden must present their plans for Research and Development. By this rule, the Swedish Nuclear Activities Act has formed the basis for a national dialogue how we shall take care of our spent nuclear fuel.

In the R&D Plan 1992 the nuclear industry proposed siting their planned encapsulation plant for spent fuel in Oskarshamn

Their proposal forced the political leadership in Oskarshamn to discuss and determine the role and participation of the municipality in the nuclear waste programme. The municipality role needed to be defined in relation to the other parties – mainly the nuclear industry and the licensing authorities.

During our internal review of SKB’s R&D Plan 1992 the political foundation for the work in Oskarshamn was laid.

The main components were:

- Request for an Environmental Impact Assessment (EIA) process to be initiated early.
- A defined and clear decision-making process.
- A systems approach to the various components of the final disposal system.
- Openness and clarity in all information and communication from all parties.
- Economical resources to cover the municipality participation.

The municipality review on the R&D Plan 1992 where our policies was first laid out was sent to Stockholm with an unanimous council vote and the content had a large impact in particular on the company SKB and the regulators SKI and SSI.

Initially the government avoided to take a firm national stand on the nuclear waste issue but we and other municipalities – involved in the programme – have strongly insisted that the government must be clear in its policies in order to legitimate the programme. *That is not a municipal responsibility.*

During the latest years we have seen an improvement in this respect. With a municipality veto in my back pocket I think it was wise of all parties involved to listen to our terms and comments.

Development of the Oskarshamn model

In 1994 we initiated an EIA forum with participants from SKB, SKI, SSI, the Kalmar County and the Municipality.

The County Lieutenant Governor chairs the forum and the county also provides the secretary. To date 31 meetings have been held by the forum.

Forum activities are:

- Completion of the EIA-work for the extension of the CLAB facility.
- A scoping report for the encapsulation plant.
- Initiation of a scoping process for the proposed geological repository.

In 1995 SKB sent a request to Oskarshamn where they wanted to carry out a feasibility study for a deep geological repository. All six current feasibility studies in Sweden are conducted after approval by each municipality – a volunteer process.

After one year of internal discussions the municipality council approved the feasibility study with certain conditions.

The municipality then formed its own organisation with 40 participants – in six groups – to follow SKB's work and to make sure that all relevant issues were addressed by SKB.

The study was formally initiated in August 1997 and completed by SKB in June 1999. The Draft Final Report has been subject to an extensive review and the municipality working groups initiated an extensive dialogue with the public.

The municipality policy developed 1992 in co-operation by all seven political parties represented in the municipality council can be described under *five key elements*:

❖ **First**, an active municipality participation.

A municipality proposed for siting of a nuclear waste facility can take one of the following positions:

- Object.
- Be passive.
- Be active.

Oskarshamn has taken the decision to be active – this decision is supported by all political parties – also those against the participation in the project.

Oskarshamn has a particular situation, as the spent nuclear fuel from all the Swedish reactors will be stored in the CLAB facility. If no solution or site is found the fuel will remain in this temporary facility. For us the nuclear waste can not simply be voted away.

We strongly believe that active participation contributes to a better programme.

The industry and licensing authorities may have numerous experts mainly in *natural* sciences but their understanding of public reactions and what forms the local society is limited. The local political leadership and the public themselves are far more suited to evaluate their current and future needs. Only through active participation can this knowledge be shared by the other parties and included in the overall basis for future decisions.

The active participation taken by the political leadership has resulted in an increased respect for the political system in general.

A passive approach is not an alternative!

❖ **Second**, forcing clear roles of the key parties (industry, competent authorities, municipality and government) in the decision-making process.

One of the factors identified early in the process was that the parties must act clearly in their roles. In short we have defined the following roles for the participating parties:

- The government must be clear in its policies in order to give legal status to the programme .
- The industry has the responsibility by law to develop *proposals* for disposal methods and siting.
- The licensing authorities are *the* independent experts who review and approve or disapprove the proposals put forward by the industry. Very important – they also have the role to aid the

- municipality throughout the process – from review of plans to various results presented. An authority approach where they are waiting on the sidelines until the license application is available is not acceptable and puts unfair burden on the municipality to take technical decisions.
- The public is the experts on local conditions and how they like to form their future.

❖ **Third**, the Environmental Impact Assessment (EIA) as a tool for local participation and real influence.

We have selected the EIA as the overall method for an organised participation in the programme.

The EIA legislative framework allows us to work together with the industry and licensing authorities in order *to develop the best possible basis for the decisions to come*. The actual decisions are then taken independently by each party. This is a key element to the success of the EIA process, as for the Oskarshamn model as such.

The EIA framework also contributes to documentation of the work and a clear track record how various questions have been treated throughout the scoping process.

The fact that the county provides a neutral chairman and secretary puts further emphasis on a well-structured and transparent process.

Both the industry and the licensing authorities are strongly supporting the organisation of the EIA-work as implemented by us.

❖ **Fourth**, complete openness and broad participation: democracy in practice.

Real public participation is probably the most difficult issue when it comes to practical implementation. Numerous projects have had ambitions to include the public but the public does not show up – why?

We have heard that the public:

- Does not have an opinion.
- Does not have time and interest.
- Does not trust the political system.
- Can not influence, etc.

We argue that the public definitely has very clear opinions.

We know from our project that a clear decision-making process is of utmost importance. People must understand:

- What phase we are in.
- What the result is going to be from this phase.
- What the next phase is going to be.
- How the decision will be taken before the next phase.

We suggest that there are two particular factors that are of ample importance in engaging the public:

- If you want to communicate with the public you must come to them!
- When you come to the public you must have clear information, clear questions and be prepared to seriously address their questions and concerns!

The Oskarshamn municipality has for example therefore demanded that the feasibility study shall result in well defined sites for the repository surface facility and sites where the site investigation can start in the form of deep drillings. It has not always been clear to the industry why we demand such concrete results.

❖ **Fifth**, engagement of neighbours in the dialogue.

The interest and sometimes fears about the final repository is not only limited to the directly concerned municipality. It also has many regional aspects and the administrative borders are therefore of limited importance.

We have decided from the start that this type of a programme must be seen in a regional context.

The regional efforts are taking place on two levels:

- On the first level the county administration has taken a leading role in making sure that all the county municipalities have direct information about the programme.
- On the second level Oskarshamn has identified the six direct neighbours as target municipalities for a closer dialogue.

Each one of the municipality councils in the six neighbour municipalities have received direct information from Oskarshamn on how we work and how their questions and concerns can be included in the programme.

The Oskarshamn model in brief

The Oskarshamn model for public involvement as described above, can be summarised in the following seven points:

Openness and participation:

- Everything on the table – real influence.

The EIA process:

- Development of basis for a decision by parties together – decisions independently.

The council as reference group:

- Competent elected officials responsible towards the voters.

The public – a resource:

- Concrete plans and clear study results is a pre-requisite for public engagement and influence.

The environmental groups – a resource

- Their members and experts give us valuable contributions.

Stretching of SKB to clear answers:

- We build competence so we can ask the difficult questions – we ask until we get clear answers.

The competent authorities our experts:

- The authorities visible throughout the process. Our decision after statement by the competent authorities.

A wider perspective

Confidence, public participation and transparency are certainly important not only for nuclear waste programmes. They are relevant in a much wider context – on the local, regional, national, and even global level.

Maybe our experiences can contribute to positive development in other areas as well. In a recent pre-study we have explored how this can be done. A “Decision Institute” – called DECI – could combine research and development on public decision making in complex issues with practical applications in the Baltic Sea region.

The pre-study describes problems in today's society that DECI would address, explores methods for the enhancement of transparency and public participation, identifies research areas, and indicates suitable applications. Kjell Andersson, who is the project leader, will talk about this later this week.

Summary of experience and conclusions

The Oskarshamn model has so far worked extremely well as a tool to achieve openness and public participation. The municipality involvement has been successful in several aspects, for example:

- It has been possible to influence the programme, to a large extent, to meet certain municipality conditions and to ensure the local perspective.
- The local competence has increased to a considerable degree. The activities generated by the working groups with a total of 40 members have led to a large number of contacts with various organisations, schools, mass media, individuals in the general public and interest groups.

Out of the current six feasibility studies at least two municipalities will be selected for site investigations.

The result of the work so far and the final report from the feasibility study will form the basis for how our municipality will decide about the next phase – site investigations – if the question comes.

Together with my political colleagues in Oskarshamn I am well prepared to address this question.

L'expérience et la position d'un législateur et décideur politique

Christian Bataille

Député du Nord et membre de

l'Office parlementaire d'évaluation des choix scientifiques et technologiques, France

Pour achever la présentation de Yves Le Bars, je veux préciser que je suis, comme tout parlementaire engagé, actuellement d'un côté, celui de la majorité de l'Assemblée Nationale pour ce qui me concerne. Cependant, dans le travail de parlementaire que j'ai réalisé, cet aspect des choses n'a aucune importance puisque je me suis trouvé en charge de ce dossier sous des gouvernements de gauche et sous des gouvernements de droite. Je me suis trouvé devant un processus qui dépassait très largement les clivages politiques traditionnels. Je vais donc vous retracer le contenu de cette démarche, l'histoire et la manière dont la France a choisi le processus de la loi et ses conséquences aujourd'hui.

La France a une particularité : elle a développé l'industrie nucléaire la plus importante en Europe, ceci quasiment sans processus législatif. En effet, l'élaboration et le plan de développement de l'énergie nucléaire dans les années soixante, leur réalisation, leur concrétisation se sont traduites sans loi, sans vote du Parlement. Il y a eu une décision de l'exécutif, du gouvernement, de mettre en place – notamment sous la pression des événements au moment de la première crise pétrolière – un dispositif massif de centrales nucléaires. Ceci n'a soulevé, du côté de la population, de l'opinion, des partis politiques eux-mêmes, que peu de tensions, peu d'objections ; ce processus autoritaire s'est réalisé dans un relatif consensus politique. Des problèmes ont surgi ensuite concernant la construction de quelques rares centrales et concernant l'aval du cycle nucléaire, surtout la gestion des déchets nucléaires.

Nous avons été confrontés à un phénomène historique dans l'opinion à la fin des années soixante-dix. À la fin des années quatre-vingt, le gouvernement de l'époque, celui de Michel Rocard, a décidé un moratoire interrompant les processus de recherche en ce qui concernait le programme de stockage souterrain des déchets à haute activité. Nous sommes en France dans un pays qui donne la priorité à l'exécutif, au gouvernement. Ce dernier s'est tourné vers l'Assemblée pour demander un avis sur le problème de la gestion des déchets à haute activité. Imaginez quel pouvait être le désarroi du pouvoir exécutif. C'est à ce moment que j'ai été chargé de ce dossier en raison de l'intérêt que je porte aux questions scientifiques et de mon appartenance à l'Office parlementaire d'évaluation des choix scientifiques et technologiques qui rassemble les deux chambres, l'Assemblée Nationale et le Sénat. Concerné par de nombreux dossiers, j'ai été, il y a quelques mois, rapporteur sur des questions assez importantes telles que l'ouverture du marché de l'électricité ou encore de Superphénix ou, plus récemment, d'un sujet lui aussi passionnel : la chasse. Lorsqu'on touche aux questions nucléaires, toutefois, on est très remarqué du fait du caractère particulier de cette question.

Parti d'une démarche d'élus distant de l'expertise et de la prééminence de la science, de la technique, par rapport à la *vox populi*, je me retrouve aujourd'hui presque renvoyé à une position d'expert sur ces questions, différent donc du député moyen pour exprimer ce que pense le peuple ; vous pouvez constater que c'est un cercle infernal qu'il est difficile de rompre. Du point de vue de la responsabilité que doit assumer le gouvernement, nous avons, par le processus de la loi, mis en évidence le fait que la génération d'aujourd'hui est responsable devant les générations futures des choix qu'elle fait ou qu'elle ne fait pas, des choix qu'elle refuse de faire, qu'elle renvoie à plus tard ou qu'elle accepte de faire. Élu d'une région minière, je peux vous dire que nous avons sous les pieds, ou

encore sur le sol avec les terrils, le résultat de la gestion désastreuse, par le 19^e siècle et la première partie du 20^e siècle, d'un dossier énergétique qui lègue les inconvénients aux générations futures. Nous sommes responsables pour notre génération, pour notre pays aussi. L'une des préoccupations de l'AEN est une vision européenne et internationale du dossier, mais nous avons dit à l'époque plus simplement que nous devions nous occuper des déchets produits par ce pays, chez nous, et ne pas imaginer que nous pouvions évacuer les déchets dans d'anciens pays coloniaux français, ou encore dans des déserts internationaux. Toute la logique de la loi qui a suivi est bien une responsabilité sur le territoire français pour ce qui est des déchets produits par la France. Le mot « transparence » a été bien galvaudé depuis 10 ans. Comme on sait agiter à tout propos le principe de précaution, de même, le terme de « transparence » est devenu un mot magique qui empêcherait la décision politique. Il n'en reste pas moins que les décisions pour le nucléaire civil, ont été inspirées par une logique militaire et imprégnées de la culture du secret. Il est difficile de se défaire encore aujourd'hui de ce péché originel.

J'en viens à la description du processus de la loi : la nécessité de faire fonctionner les institutions de la démocratie. Nous nous trouvons dans un contexte démocratique et sur une matière qui échapperait ou en tout cas qui échappa pendant un certain temps à la décision démocratique. Le Parlement était consulté sur nombre de questions et, parallèlement, les collectivités territoriales, les municipalités, qui prennent des décisions de détails, n'étaient pas sollicitées sur ces questions fondamentales ; il fallait donc faire appel aux ressources de la démocratie. Dans ces conditions, nous avons proposé d'initier une loi qui fixe, pour les déchets à haute activité, un certain nombre de principes, une règle à appliquer, qui, dès lors qu'elle serait votée, ne serait plus remise en question. Cette loi a fait l'objet d'un large débat. Elle a permis aux partis politiques représentés au Parlement de s'exprimer. J'insiste bien sur le « représentés au Parlement » puisque les écologistes ont certes été consultés mais n'étaient pas représentés au Parlement lorsque la loi a été votée en 1990, il y a presque dix ans maintenant. Cette loi n'a fait que traduire la nécessité d'avancer sur ce problème et en même temps l'ouverture que nous voulions montrer quant aux solutions. La loi n'affirme aucune solution qui serait décidée à l'avance mais dit que les recherches doivent être poursuivies dans toutes les directions. Nous avons fait récemment un bilan de ces recherches.

Tout d'abord, la loi fait état de la recherche fondamentale sur la transmutation, le retraitement poussé. Avec les pays qui, ont choisi le retraitement, nous avons des déchets nucléaires à haute activité qu'il faut essayer de réduire. Personne ne sait aujourd'hui si cette recherche aboutira dans 20 ans, 40 ans, 50 ans, plus peut-être, à une élimination par incinération de ces déchets nucléaires. Bien qu'on ne sache rien de l'aboutissement de ces recherches, il n'y a pas de raison pour qu'elles ne soient pas poursuivies. L'opinion publique doit savoir qu'il n'y a pas une voie unique qui serait le stockage souterrain profond, choisie à l'avance.

La deuxième voie précisée par la loi concerne le stockage en surface ou en faible profondeur. En réalité, c'est une voie de recherche déjà à l'œuvre, mais qui s'avère très utile y compris dans ce pays puisqu'un tiers des combustibles irradiés ne font plus l'objet d'un retraitement. La France n'a pas choisi exclusivement le retraitement, toutefois le retraitement des combustibles usés reste une solution très majoritaire. Le non-retraitement qui est la solution américaine, plus imposée par l'effet que véritablement choisie, concernera en France un tiers des combustibles usés. Nos spécialistes ont évidemment cherché toute une série de termes rassurants comme « retraitement différé » ou « retraitement dans l'avenir » ; tout cela est un peu artificiel. En réalité, il y a bien nécessité d'envisager dans certaines proportions l'entreposage en surface ou en faible profondeur.

Il y a une troisième direction de recherche qui est la recherche souterraine, dont je vais vous dire quelques mots puisque la loi fait allusion à plusieurs laboratoires. La loi dit que les recherches pour le stockage profond en site souterrain des déchets nucléaires doivent être menées ou peuvent être menées dans plusieurs laboratoires. Le pluriel est employé dans la loi. Pour répondre à l'esprit de la loi, il faudra que nous ayons au moins deux laboratoires en fonctionnement. Le premier a été décidé, c'est celui qui se trouve dans le département de la Meuse, dans l'est de la France, à Bure, qui est en cours de

construction. Le deuxième a été différé, pour employer les termes un peu hypocrites qui sont ceux employés par le vocabulaire officiel. Pour que la loi conserve son équilibre, il faudra que les autorités gouvernementales décident le plus vite possible de la création d'un deuxième laboratoire.

Cependant, la loi ne dit pas, contrairement à ce que la presse a affirmé, dans quels matériaux géologiques doivent être les laboratoires. La loi a laissé la question ouverte, elle ne dit pas qu'il faudra un laboratoire dans l'argile, l'autre dans le granit, ou pourquoi pas dans le sel ou encore dans le schiste comme cela avait été envisagé au départ. Il peut y avoir deux laboratoires dans l'argile car il y a des argiles et non pas une argile. Dans ce pays, nous sommes donc en attente d'un deuxième laboratoire qui devrait permettre au Parlement de se prononcer quinze ans après le vote de la loi, c'est-à-dire en 2006.

Le Parlement peut décider ou ne pas décider la construction d'un centre de stockage, et il peut aussi considérer que sa décision prendra encore quelques années puisque le programme que je vous décrivais a été un peu retardé. Nous sommes dans une situation où le stockage souterrain n'est pas décidé. Les antinucléaires aiment laisser entendre que tout est décidé et que rien n'a fait l'objet d'une concertation. C'est faux. Il y a une loi qui fixe les paliers successifs de la décision et l'étape prochaine de la décision sera 2006. Le Parlement sera alors consulté. Dans six ans, il ne sera pas très différent du Parlement que nous avons en l'an 2000. Il y aura un débat, mais derrière ce débat, il faut distinguer, d'une part, la volonté politique claire de l'Allemagne et de la Suède d'arrêter les centrales nucléaires et, d'autre part, l'attitude de la France qui n'a aucunement décidé d'arrêter son programme nucléaire. Le rendez-vous de 2006 est aussi un rendez-vous décisif qui indiquera par voie de conséquence s'il est envisageable ou non de construire une deuxième génération de centrales nucléaires pour le créneau 2030-2100. On ne peut imaginer que ce pays puisse décider de construire une deuxième génération de centrales nucléaires sans avoir présenté un programme de gestion complet en ce qui concerne la première génération de centrales et les déchets de la première génération. Aujourd'hui, ceux qui refusent le nucléaire jouent en quelque sorte la constipation, l'occlusion intestinale de la filière nucléaire existante pour empêcher la possibilité de continuer. Derrière la gestion des déchets, c'est bien la pérennité des choix nucléaires pour une deuxième génération, et jusqu'à la fin du 21^e siècle, qui est posée.

Quelle est l'utilité de la loi ? La loi a un sens, elle ne prend pas parti pour les défenseurs de l'énergie ou pour ses opposants, elle fixe une règle. Effectivement, on peut considérer que la règle peut être rediscutée continuellement ; mais le fait d'avoir voté une loi verrouille bien les choses car la loi aujourd'hui votée ne peut être remise en question que par un nouveau débat la supprimant ou l'amendant. L'équilibre trouvé en 1991 est décisif et il n'est pas imaginable qu'un gouvernement vienne devant le Parlement remettre en question l'équilibre trouvé par la loi avec l'esprit tranquille. Ce que la loi a fixé une fois, c'est sans doute plus durable qu'on ne l'imagine, et la loi a le mérite d'obliger le gouvernement, s'il change la donne, à prendre position. Les gouvernements ont tendance à jouer les Ponce-Pilate et à ne pas prendre position. Le seul fait de revenir devant le Parlement pour modifier la loi est déjà une prise de position.

Quelques remarques pour terminer. D'abord l'importance des mots : selon que l'on emploie le mot « stockage souterrain » ou « enfouissement », ce ne sont pas les mêmes réalités que l'on qualifie. Il faut prendre garde au vocabulaire que l'on utilise. On ne lit pas souvent le mot « stockage souterrain » dans la presse, mais on lit continuellement le mot « enfouissement », qui est totalement péjoratif et fait de l'acte de gestion des déchets nucléaires un acte irresponsable qui caractériserait une société industrielle jetant ses déchets à la poubelle.

La deuxième question importante est le problème des ressources économiques affectées aux régions, aux territoires, sièges d'un centre de stockage ou même d'un laboratoire. C'est une question essentielle, et on entend aujourd'hui dans les débats confondre loi et morale. On entend dire qu'il serait immoral de proposer aux habitants d'un territoire de les acheter pour leur faire accepter un laboratoire de recherche ou un centre de stockage. La question ne se pose peut-être pas tout à fait en ces termes. Une industrie nucléaire, une centrale nucléaire ou une autre industrie, automobile,

aéronautique, génèrent une certaine prospérité pour les populations qui accueillent ces activités. Il n'y a pas de raisons pour que, en ce qui concerne la filière énergétique, un créneau de cette filière, celui des déchets, n'entraîne pas une prospérité et un développement économique pour les territoires.

Enfin, on peut observer avec perplexité que la détermination des gouvernements qui se succèdent est essentielle. Nous sommes les uns et les autres dans des démocraties qui se caractérisent par l'alternance et ce dossier ne peut être imaginé que dans le long terme. Par conséquent, il y a un slalom politique entre les échéances électorales, les échéances politiques dans nos divers pays. Pour prendre l'exemple français, nous sommes toujours, après une élection ou avant une autre, dans la préparation des présidentielles ou après les municipales ou encore dans la préparation des législatives, des régionales, des cantonales. Si le gouvernement a cette obsession de la préparation et des résultats électoraux, la plus forte tendance, malheureusement à l'œuvre, est de ne rien faire. Or, par une observation précise des sites pressentis pour être sièges de laboratoire de recherche souterrain, on peut observer que ces questions n'ont que très très peu d'influence sur les résultats électoraux, contrairement à une idée reçue. En ce qui concerne les sites français, l'incidence est très très faible. Par conséquent, nous avons plus affaire à un fantasme qu'à un résultat électoral. Nous avons affaire à des gouvernements, quels qu'ils soient et quelle que soit leur tendance, angoissés par une question à laquelle ils n'ont pas de réponse spontanée.

J'ai voulu vous faire part de ce qu'était le vécu d'un législateur confronté sur le terrain à la réalité d'un problème controversé.

The Experience and Viewpoint of a Legislator and Policy-maker

Christian Bataille

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To round off Yves Le Bars' presentation, I would like to say that, like any committed party MP, my allegiances currently lie on one side of the debate, which in my case is that of the majority in the National Assembly. However, in the duties that I have performed as an MP to date, such allegiances are of no importance since I have been given responsibility for this area by governments of both the Left and the Right. What I found myself dealing with was a process that far transcended traditional party lines. I would therefore like to give you a brief account of the way in which France opted for the process of law and the implications of that process for us today.

France differs from other countries in that it has developed the largest nuclear industry in Europe with virtually no recourse to any form of legislative process. The design and planning of France's nuclear power programme in the 1960s, and subsequent implementation of that programme, took place in the absence of legislation and with no vote in Parliament. In response to the pressure of events during the first oil shock, the executive – that is to say the government – decided to embark upon a massive nuclear power plant construction programme. There were few objections to this decision from either the population, public opinion or even the political parties themselves; it was an authoritarian approach that enjoyed a relatively high degree of political consensus. However, some problems did arise subsequently over the construction of one or two power plants and over the bottom-end of the fuel cycle, particularly the management of nuclear waste.

A sea change in public opinion occurred in the late 1970s. At the end of the 1980s, the government then in power, that of Michel Rocard, introduced a moratorium on research into the geological storage of high-level waste. In France, priority is given to the executive, to government. On the issue of high-level radioactive waste management, however, the latter sought the opinion of the Assembly, a telling indication of the depth of the disarray into which the executive had fallen. It was at this point that I was given responsibility for this particular issue by virtue of my interest in science and my work for the Parliamentary Office for Scientific and Technological Option Assessment, whose members are drawn from both the National Assembly and the Senate. My work embraces a wide variety of areas and a few months or so back I was *rapporteur* for a number of fairly important issues such as the liberalisation of the electricity market and Superphénix, and more recently another equally challenging issue namely hunting. However, as soon as the nuclear sector is involved, one is immediately struck by the distinctive nature of the problem.

Having set out as an elected representative unfamiliar with expert opinions and the gulf between science and technology and public opinion, I now find myself cast in the role of an expert on such matters, unlike the average MP who simply expresses the opinion of his constituents; as you can imagine, this is a vicious circle and one that is not easily broken. In terms of the responsibility that must be assumed by government, we have demonstrated, through the process of law, that the present generation will be held accountable to future generations for the choices it has made or failed to make and for the choices that it approves, postpones or refuses to make. As MP for a mining region, I can tell you that the galleries beneath our feet, and the waste tips above ground, bear eloquent testimony to

the disastrous results of an energy policy which, during the 19th century and early part of the 20th century, left its problems to future generations to solve. We are responsible for our generation, and also for our country. One of the major concerns of the NEA is to foster a European and international approach to such issues. Back then we simply said that waste produced in France should be disposed of in France and not simply shipped off to former French colonies or buried in international deserts. The entire rationale underpinning subsequent legislation was clearly to take responsibility in France for all types of waste produced on French soil. Over the past ten years the concept of transparency has been completely debased. Just as the “precautionary principle” has become a kind of mantra in debates, so too “transparency” has become the magic word that can bring policy making to a standstill. In fairness, however, decisions over the civil use of nuclear energy were originally based on the military way of thinking and are deeply immersed in a culture of secrecy. It is still difficult today to rid ourselves of this original sin.

Let us now look at the process of law, the need to make democratic institutions work. We find ourselves within a democratic context addressing a subject that apparently is not a part of the democratic decision-making process, or at any that has not been part of it for some time. Although Parliament was consulted over a number of issues, the territorial authorities and municipalities responsible for working out measures in detail were not asked to discuss these fundamental issues; in view of this, recourse was needed to democratic process. We therefore proposed to introduce legislation which, in the case of high-level waste, would establish basic principles, a rule to be applied that once adopted could no longer be challenged. This Act was debated at length and allowed all political parties represented in Parliament to express their opinion. I must stress the words “represented in Parliament”, because although the ecologists were consulted they were not represented in Parliament when the Act was passed in 1990, almost ten years ago now. This Act simply reflected the need to make progress on this issue and at the same time demonstrated the open approach we wished to adopt towards possible solutions. The Act does not endorse a solution already decided upon in advance, but states that all avenues of research must be explored. We have recently drawn up a progress report on the advancement of this research work.

Firstly, the Act takes note of basic research into transmutation and advanced reprocessing techniques. Like other countries which have opted for reprocessing, France possesses a given quantity of high-level nuclear waste which we must attempt to reduce in volume. At present, nobody knows whether the research work currently in progress will lead, within the next 20, 40, 50 years or more, to development of a technique for the incineration of nuclear waste. But although we have no idea whether this research will be successful, there is no reason why it should not continue. Public opinion must be informed that we are not following a single, pre-determined line of approach, namely deep geological disposal.

The second line of research specified in the Act is surface storage or storage underground at shallow depths. In practice, this is a research avenue already being pursued and one that promises to be invaluable, even in France where a third of the irradiated fuel produced is no longer reprocessed. France has not opted exclusively for reprocessing, although the reprocessing of spent fuel remains the option most frequently adopted. The non-reprocessing option, which is the solution adopted in the United States and which is due more to circumstances than deliberate choice, is applied in France to a third of spent fuel elements. Obviously our experts speak in reassuring terms of “deferred reprocessing” or “future reprocessing”, but all that is somewhat artificial. In reality, we clearly need to give serious consideration to the use of surface or shallow depth storage for a certain portion of the waste produced.

The third line of research open to us is that of deep geological disposal, about which I shall say a few words given that the Act refers to several laboratories. The Act states that research must be conducted, or may be conducted in several laboratories, into the feasibility of deep geological disposal of nuclear waste. The Act specifically says “laboratories” in the plural. To remain consistent with the spirit of the Act, we therefore need to have at least two laboratories in operation. The site of the first has already been chosen in the Meuse *département* at Bure, in the East of France, where it is already

under construction. Construction of the second has been “postponed”, to use the somewhat hypocritical term employed by officials. To keep the Act on an even keel, the authorities must reach a decision over construction of a second laboratory as soon as possible.

However, contrary to claims made in the press, the Act does not specify in what type of geological formation these laboratories must be built. The Act leaves this question open; it does not say that one laboratory must be built in shale formations and the other in granite or, for the sake of argument, salt or schist formations, as originally envisaged. There could well be two laboratories in shale formations, since there are several different types of shale. In France, we are therefore still waiting for a decision on a second laboratory which would allow Parliament to give an opinion fifteen years after the Act was first passed, *i.e.*, in 2006.

Parliament may or may not decide to give the go-ahead to construct a storage centre; then again, it might feel that its decision will take another few years given the delays to the programme I have just described to you. As you can see, no decision has yet been taken on deep geological storage. The anti-nuclear lobby would like people to think that everything has already been decided and without public consultations. This is simply not true. The Act provides for successive stages in the decision-making process and the next stage is set for 2006. At that point Parliament will be consulted. In six years’ time Parliament will not be very different to the one we have now in 2000. There will be a debate, but among the forces driving this debate we need to distinguish the firm political resolve of Germany and Sweden to halt their nuclear power programmes and the stance adopted by France which has no intention of halting its nuclear programme. The rendezvous in 2006 is also a decisive one whose outcome will determine whether or not the construction of a second generation of nuclear power plants to meet our energy needs for the period 2030-2100 is a genuine possibility. It would be unthinkable for our country to decide to proceed with the construction of a second generation of nuclear power plants without having drawn up a comprehensive management programme for the first generation of plants and waste. Those who currently reject nuclear power are suffering from a form of constipation, refusing to digest the reality of the nuclear power industry in order to preclude its continued existence. The underlying issue beneath nuclear waste management is clearly that of keeping our options open for a second generation of nuclear power plants that can take us to the end of the 21st century.

What is the utility of the law? The law has a rationale, it does not take the part of either those who defend nuclear energy or those who oppose it; it simply establishes a rule. While it is fair to say that this rule is constantly open to discussion, the very fact that legislation has been enacted resolves a fair number of issues in that the Act now in force can only be challenged by a new debate aimed at either rescinding or amending it. The balance struck in 1991 is a decisive one and it would be unthinkable for a government to come before Parliament to challenge the balance struck by the law after careful and due reflection. What has been enshrined in law once is doubtless more lasting than one might imagine, and the law has the merit of obliging government, should the latter want to make changes, to adopt a given position. Governments are rather like Pontius Pilate and would rather not take sides. Returning to Parliament to seek an amendment to the law, however, means that government has already taken sides.

In conclusion, I would firstly like to say that words are important. “Underground storage” and “disposal” do not have the same connotations. Care must be exercised over the choice of words. We do not often see the term “stockage souterrain” (underground repository) in the press. What we do see all the time, however, is the word “enfouissement” (burial), a term that is wholly pejorative and that portrays the management of nuclear waste as an irresponsible act typical of an industrial society which simply dumps its waste in the garbage bin.

A second issue is the allocation of economic resources to regions where a storage centre or laboratory is located. This is a crucial issue, but one where law is confused with morality in the mind of the public. We are told that it would be immoral to offer a financial inducement to the local

population in order to persuade them to allow a research laboratory or storage centre to be built in their region. This is perhaps a slightly one-side way of expressing things. The nuclear industry, a nuclear power plant, or any other kind of industry, be it car-manufacturing or aeronautics, creates a certain amount of wealth in the region where it activities are located. In the case of the energy sector, there is no reason why one given branch of the power industry, namely waste management, should not create wealth and drive economic development at the territorial level.

Lastly, it might seem odd that the determination of successive governments should be so important. We all live in democracies where opposing parties succeed each other in government, and the issue of waste management can only be considered in the long term. As a result, in all our countries, policy directions change from one electoral term to another. In France, for example, after one election or before another, we are always preparing for the next presidential or municipal elections, or preparing for legislative, regional and cantonal elections. Because government is obsessed to such an extent with preparations and electoral results, the tendency that unfortunately seems to prevail is simply to do nothing. However, careful scrutiny of candidate sites for underground research laboratories in France show that, contrary to public opinion, the impact of these electoral results is practically zero. What we see here, therefore, is not so much concern over election results as tilting at windmills. What we are confronted with are governments, regardless of their composition and persuasion, which are terrified by an issue to which they have no ready answer.

I hope that in these few words I have able to give you some idea of the everyday experience of a legislator confronted with the realities of a controversial issue.

The Canadian Experience with Public Intervenors on the Long-term Management of Nuclear Fuel

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Background

Much research has been conducted in Canada to develop a disposal solution for nuclear fuel waste. In 1977, the Minister of Energy, Mines and Resources engaged a group of experts led by Dr. Kenneth Hare to provide the government and the public with views on nuclear fuel waste disposal. In their report entitled “The Management of Canada’s Nuclear Wastes”, the authors considered various waste disposal options and concluded that the burial in geologic formations had the best potential for Canada. The governments of Canada and Ontario formally accepted the proposal in 1978 and launched the Canadian Nuclear Fuel Waste Management Programme. The Programme was conceived to be generic rather than site specific, and was developed to meet national criteria.

The concept of geological disposal is based on burial of the bundles of nuclear fuel waste, at depths of 500 to 1,000 m in plutonic rock of the Canadian Shield, using a multi-barrier approach with a series of engineered and natural barriers. This concept translates into a major undertaking which would cost about \$10-13 billion over up to 70-100 years. The development of the nuclear fuel waste disposal concept programme involved the co-operative research and development efforts of Atomic Energy of Canada Limited (AECL) as the federal agent, and Ontario Hydro as the provincial agent. It took place over 20 years at a cost of about \$700 million, largely funded by the federal government.

In 1988, the Minister of Natural Resources referred AECL’s concept for deep geological disposal to the Minister of the Environment for a public review by an independent Panel, pursuant to the Environmental Assessment and Review Process (EARP) Guidelines Order. The review lasted eight years during which the panel consulted the public at three different stages: the identification of issues and preparation of Environmental Impact Statement guidelines, 1990-92; following AECL’s submission of its Environmental Impact Statement (EIS); the verification of the proponent’s EIS and its conformity with the panel’s guidelines, 1994-95 and; public hearings held in three phases, 1996-97.

In March 1998, the Panel reported to government and concluded that:

- “From a technical perspective, safety of the AECL concept has been on balance adequately demonstrated for a conceptual stage of development, but from a social perspective, it has not”.
- “As it stands, the AECL concept for deep geological disposal has not been demonstrated to have broad public support. The concept in its current form does not have the required level of acceptability to be adopted as Canada’s approach for managing nuclear fuel wastes”.

As a next step, the Panel recommended that a waste management organisation (WMO) be established at arm’s length from the nuclear industry, entirely funded by the waste producers and owners, and that it be subject to oversight by the government.

Panel public hearings: Key concerns of public interveners

Safety

During the public hearings, discussions on the safety of the disposal concept were marked by a deep divergence of opinion on the ultimate limits of science and the ability of society to adequately protect its members and future generations for periods lasting thousands of years into the future.

Those who viewed safety from a technical perspective relied on factual information obtained from the application of science and scientific models that can be used to construct analytical linear arguments to prove safety. They generally believe that today's science and human knowledge should be able to meet the challenge of building a waste facility that would guarantee the protection of human communities for a period lasting at least 10,000 years. No known successful institutional control has lasted for such a long period of time, therefore it is preferable to trust the natural protection offered by deep geological formations and the natural environment combined with a disposal system designed by humans that could be sealed in complete safety forever. This would remove from unstable societies the responsibilities of managing this hazard in the long term.

Those who regard safety from a social perspective rely on historical experiences, examples of similar projects and social values. They do not have confidence in the ability of science and engineering to resolve problems such as nuclear waste disposal. The risk such problems represent transcends scientific predictions. They consider it presumptuous to believe that current scientific tools are exempt from major failures. Science, they believe, cannot predict everything and safety is not just a matter of probabilities and meeting standards and regulations. Rather, safety is the opposite of danger; it is protection against harm. Hence, as imperfect as society may be, it must keep surveillance and control over the by-products resulting from its lifestyles in order to intervene in the future, implement solutions it deems acceptable to the problem and apply corrective measures to unforeseen events that could become catastrophic.

Safety must be viewed from two complementary perspectives, technical and social. Safety from a social perspective could be improved with better monitoring technologies and more effective retrievability possibilities. This would go some way towards addressing a fundamental issue – public control – as well as striking a balance between passive safety and active institutional control.

Equity, retrievability and funding

The public hearings highlighted that the single most important factor influencing the selection of a technical option, after health and safety, was that of intergenerational (*i.e.* this current generation's interests versus the next), and intragenerational fairness (*i.e.* interests among different groups of a same generation). The responsibilities of current generations towards future generations can be viewed from two ethical perspectives. On the one hand, it is considered inappropriate to pass on to future generations the burden of looking after the waste we have created by leaving them the responsibility to look after their security, monitoring, and maintenance. On the other hand, it is considered unethical to prevent future generations from looking after the waste if they choose to do so and hence we, as a society, should not do anything to prevent them from making that decision. These two views were a point of contention between participants at the public hearings when discussing the merits of retrievability in fulfilling the responsibilities of this generation.

Those who shared the first perspective tended to judge disposal as a means of protecting future generations. They argued it was unlikely that existing institutional and social frameworks would survive far into the future and certainly not as far as the geological formations contemplated for disposal. Hence it is important to rely on what we, as a society, know and are capable of doing today. They considered retrievability to be an issue of less importance and shared AECL's view that it would always be possible to retrieve the waste at a greater or lesser cost depending on whether retrieval took place before or after the disposal facility had been closed and decommissioned. For them, delaying a decision to proceed with

disposal was equivalent to absolving the current generation, which is responsible for producing the waste, of the responsibility to implement a solution to a problem it had created.

Those who shared the second perspective tended to support both long-term retrievability and continued monitoring, concepts they considered almost inseparable. These would provide future generations with better control over their destiny. They argued that the disposal concept was an unproven technology and that the waste would remain hazardous for unimaginable periods of time. They had confidence in the safety of present storage practices, if improved. They believed that options should be kept open for future generations, and hence that we should proceed with caution on a step by step approach to find a permanent solution to the waste. Moreover, they felt it would be unethical to remove from future generations the control over decisions concerning their health and their future.

There was overall support for the view that those benefiting from a technology must assume the cost of solving problems created by it. Bearing the cost of finding a solution also meant setting aside sufficient funds today for the long-term management of that waste. The funds should be a proportion of the rate paid by those who consume energy produced from nuclear technology. These funds would be used exclusively in finding and implementing a safe and acceptable permanent solution to the waste problem.

In general, many public interveners felt that waste monitoring and timely long-term retrievability would be less of a burden to future generations than the lack of a permanent solution for the waste. The availability of funds to research waste management options would allow for more flexibility in making decisions with regard to an acceptable solution.

Need to compare options

Participants in the public hearings were preoccupied with the choice of the best technology to meet the intended objective: safe long-term management of nuclear fuel waste. The proponent's justification for deep geological disposal did not enjoy unanimous acceptance.

In response to questions from Panel members and interveners about the current management of the nuclear fuel waste, AECL and the nuclear utilities stated that current above ground storage practices are safe, widely-accepted and provide sufficient capacity for many years into the future. This was sufficient for some interveners to argue that there was sufficient time available to improve the existing storage technology and the proposed disposal technology while keeping an eye on the development of new technologies. Focus should be kept on technologies that would improve health and environmental protection or that could eliminate that waste forever. Some even argued that with the speed at which technology is progressing, society may soon be provided with the means to destroy that waste as opposed to disposing of it.

Certain participants felt that the years of research and funds spent on developing an option recommended twenty years ago were sufficient to proceed. They argued that, since financial resources are limited and society is challenged by many other priorities, it is time to commit to the implementation of a permanent solution for nuclear fuel waste. Other participants, using the same argument, felt that failure to achieve stronger scientific consensus and greater public confidence after all these years and the money spent on developing the disposal concept had led to the conclusion that a mistake had been made in pursuing disposal. Hence they were of the opinion that this initiative should be abandoned in favour of other alternatives.

In the absence of comparisons with other options, some interveners were reluctant to endorse a technology that still remains unproven, as no project of a similar nature existed anywhere in the world. It is their view that people generally are more likely to judge a risk acceptable if they can compare the risks resulting from all other alternatives and conclude the alternatives to be more risky. An evaluation of the risks associated with AECL's concept could not be compared as no comparative information was presented on alternatives. The Panel determined that acceptability would be difficult to assess in the absence of comparison with other options.

In light of repeated assurance by the nuclear utilities and AECL that storage above ground was safe, it appeared to some that there is no urgency to move to permanent disposal. As a result, one intervener suggested that it might be preferable to choose storage with its inherent retrievability as the least bad option, while improving the proposed concept and searching for a better alternative technology.

The Panel observed that the Canadian public no longer found it acceptable to be asked to make a decision based on one option only. “A choice of one is not a choice”, stated the Panel in its report. On the basis of the information received, the Panel pointed out that the concept of deep geological disposal could be accepted only if it compared favourably with other alternatives. As there did not appear to be any urgency to move to disposal, the Panel suggested that better technologies for safe post-closure monitoring and retrieval must be developed and incorporated into the concept. Such modifications to the disposal concept could provide the level of security required to earn public confidence and would also satisfy the need to strike a balance between minimising the responsibility placed on future generations and maximising their choices.

Panel public hearings: Lack of public participation and media interest

As indicated previously, the Panel deemed AECL’s concept for nuclear fuel waste disposal “technically safe” but lacking the demonstration of broad public acceptance it believed necessary to proceed towards a solution for the disposal of nuclear fuel waste. The Panel arrived at this conclusion following public hearings on the disposal concept that it held from March 1996 to March 1997. The hearings were held in five provinces, drew 500 participants, and received about 500 submissions. The Panel noted that it could not assess broad public support in view of limited participation of the public at large during the hearings. The lack of public involvement may have resulted from the repeated assurance by the utilities and AECL and the regulator that storage above ground was safe, and hence it appeared to some that there was no urgency to move to permanent disposal. This instilled a certain nonchalance and may explain why the public was not motivated to participate. There is a clearly a need to highlight why we need to act now to find a solution for the long-term management of nuclear fuel waste.

Participation at the hearings was limited. A few long-standing and well-known special interest and aboriginal groups were the most active participants at the hearings. The scientific community expressed its support but in a more subdued manner. Media and general public interest were generally low.

However, the Panel seemed to be of the view that the concerns expressed to them by interveners, while representing only a small proportion of the Canadian public at large, should be given weight given their continuous commitment to the nuclear fuel waste issue.

A number of recommendations for increasing the extent and quality of public participation have been made:

- hearings should be properly publicised well-ahead of time, giving sufficient time to the public to review documents;
- pre-hearing workshops should be organised to generate public interest;
- in addition to scientific, technological and engineering information, an equal amount of information should be provided on social, cultural and ethical considerations, including intergenerational fairness;
- the roles and responsibilities of all stakeholders in industry, government and the public should be clearly explained;
- several solutions should be studied and offered to the public so that it may compare and determine its preference;

Conclusion

Public support is of the utmost importance in making effective progress towards long-term waste management solutions. The goal should not be one of “attaining broad public acceptance” but one

which is more realistic and transparent, *i.e.* the goal of “increasing public confidence”. Confidence that the proponents are competent in safely carrying out waste operations and will live up to their financial responsibilities; confidence that the nuclear regulator will look after the health, safety *and* environment; confidence that the long-term management of radioactive waste will also include the consideration of social, cultural and ethical issues for the current and future generations of Canadians.

Suggested work priorities for the FSC to progress toward attaining this goal could include:

- On the “Public Information/Communications” front:
 - To develop a guide on effective ways to distribute information which might help increase participation.
- On the “Public Consultation/Interaction” front:
 - To develop a guide on ICT (Information and Communication Technologies) which could lead to more effective interactions; and,
- On the “Public Decision making” front:
 - To develop ethical guidelines for host service/compensation benefits.
 - To develop guidance on illustrating to the public what the role, responsibilities and duties of all stakeholders are within the decision-making process.

WORKSHOP

Introduction

The Objectives of the FSC and of the First Workshop

Yves Le Bars
Chairman of the Board, ANDRA

I am very pleased to have been involved by NEA in this Forum on Stakeholders Confidence (FSC).

I am quite new in the radioactive waste management, but our topic needs to associate different knowledge and experiences: my former experiences in urban planning, in rural development and in applied research for the environment could be useful.

In yesterday's inaugural session, we heard from five speakers representing regulators, implementers, elected representation and administration. The round table brought up a number of points. These confirmed the interest of the five Topics our secretariat has prepared for this workshop.

First, **sharing knowledge** is very important. Participants welcome the idea of this Forum and the opportunity to compare experience and understand what can be exported to other countries, and what cannot. Mayor Carlsson of Oskarshamn pointed out that "local decision makers", and both local and national "publics", also must be able to inform themselves in order to become competent and truly active in decisions.

We must become more sophisticated in **political science**. A classical question is how can balance be found between national needs, and local prerogatives? what kind of stand must be taken by central government to support the waste management process? and what about the balance between local autonomy to refuse an unwanted waste facility, and, the inability of "de facto" host communities to rid themselves of unwanted spent fuel or waste? Decision structures are very different from country to country. These could be compared, in order to understand how elected representation will become involved and take responsibility.

Funding is another point on which we may want to carry out comparisons. In Sweden, the municipalities have secured funding for their process of competence building. This is also a form of recognition of the legitimacy of their work. How are the different "implementing organisations" funded in member countries?

Another question we may address is that of **public consultations**. There was agreement in this room that policy can no longer be made, or implemented, without input from the public. What are the different consultation formats available? In what contexts may they be used? Who should organise them? What constitute a "representative" population at different points in the decision process?

Finally, many comments yesterday concerned **trust**. What are the foundations of trust? Competence and honesty were mentioned. In Oskarshamn, regulators are trusted because they have worked side by side with the local population and accepted the role of "peoples' expert". Trust may be based on the clarification of roles, on responsible behaviour, and also on constancy. When rules are changed, trust is lost, and is very hard to build up again. In fact, there are many elements in trust, and no recipe to develop it. We may need to study the relationships between trust among stakeholders, and confidence in the waste management process overall.

As we all know from the international meetings we attend, geological disposal is considered by a large majority of scientists as the best adapted form of radioactive waste management over the long term as, among others, the Canadian forum concluded. However, that solution is only implemented very slowly in the world. It is rejected *a priori* by those who could authorise it at the local level, and a national opposition movement is often ready to develop. That is exactly what happened in France recently to the consultation mission appointed by the government to determine a study site in a granitic formation.

We are quite frequently caught in the overwhelming debate around the opposition to nuclear energy, whose implications go way beyond us. The leaders of that opposition tend to neglect the basic objectives of protecting human health and the environment in favour of solutions that are not very efficient from an environmental standpoint (such as keeping the waste where it was generated) or contrary to a sound application of the precaution principle (such as storing the waste pending future scientific developments). I assume it is a tactical proposition.

Negotiations on collectively-acceptable risks are not easy, since the impact involved is both unclear and extending over the long term, with all sorts of implications at the local, national and international levels.

With the safety analyses, we deal with social and even metaphysical concepts at the very core of the interrogations raised by our developed societies: survival in the long-term, human impact on natural balances, etc. And our reputation as planning engineers taking decisions against citizens certainly does not help.

Those are all the problems we are confronted with.

I would like to emphasise the strategic significance of our task... And we must be thankful to the NEA radioactive Waste Management Committee for creating this strategic forum that is unique in its kind.

About the next few days

Let us therefore discuss our five topics one by one. First, I would like to mention the main characteristics of each of them.

Topic 1: The changing environment for waste management programmes

The end of the energy-shortage period in most countries has reduced not only the need for planning, but also its credibility. Moreover, a larger participation is sought by:

- Consumers with requirements for quality and a positive image of the service provided by electricity generation.
- Citizens who are very vigilant about collective risks relating to human health and the environment.

The progressive privatisation of the electricity-generation sector (still partial in France) will provide citizens and consumers with more participation opportunities.

Disposal sites are often located in rural environment that has benefited from a strong positive value over the last 20 years, particularly in Europe, in relationship with quality agriculture (encouraged by accidents resulting from the intensification of farming methods: bovine spongiform encephalopathy, genetically-modified organisms, nitrates, etc.) and rural tourism.

The rejection of the nuclear-energy option by several countries is probably more credible ever since Germany has moved in that direction. That may help us to define better the stakes in terms of danger resulting from the waste, of action priorities and of necessary efforts.

Topic 2: Trust and the institutional framework

Confidence in the institutional structure as a whole is essential. It may be worthwhile to mention a certain number of conditions:

- Multiple expertise sources are indispensable and there is definitely room for joint expertise.
- The short and long-term financial mechanisms of each protagonist in the system must be clearly defined, as well as decision-making mechanisms. That concerns the political authority, the safety authority, the operator(s), the financial sector, waste generators, etc.
- Guaranteed access to basic data and documents.
- The capability of each protagonist to express himself/herself independently and to listen, as well as the capability to learn from one's own failures or problems.

Reversibility, along with its monitoring component thus allowing each generation to control the process over the long term, represents an element of that confidence.

Topic 3: Stakeholders and the public: Who are they?

By simply observing the social interplay around the radioactive-waste issue, two remarks stand out:

- A confused national debate, often at a standstill, seems to serve various interests: environmentalists keep demanding the rejection of the nuclear-energy option, before take-over of the waste in accordance with environmental principles, while the nuclear-generation sector continues to use the existing funds. That confusion prevents actual risks, responsibilities and people concerned to be identified properly.
- An often-overburdened local discussion, both compensating for the absence of a national debate and demanding a strong sense of responsibility from elected officials and local economic organisations.

Topic 4: Is there a new dynamics of dialogue and decision making?

It is essential to set out clearly the key steps of the decision-making process, starting from the initial review of the problem up to the end of the controlled lifetime of the repository. The following items should be taken into consideration:

- The phase of the specification negotiations at the national level.
- Site investigation and definition.
- Qualification work of those sites.
- Safety demonstration and building authorisation.
- Demonstration of process control, monitoring and reversibility, etc.

Topic 5: Are waste management institutions set up for achieving stakeholder confidence over the long term?

The aim should be to set out a certain number of criteria, such as:

- Guaranteed existence of available funds over the long term (control of deposits, implementation of necessary adjustments in the future, etc.).
- The integrated approach ensuring that all waste is taken over in specified facilities with a view to preventing the transfer of waste to inadequate facilities.
- A quality system (see Topic 3).
- The technical capability to re-intervene and, therefore, to observe in order to decide whether it is necessary to intervene and under what conditions, etc.

About our practical aims

Our group has a clear mandate that may be defined as follows: first to clarify the issues affecting the confidence of stakeholders in the different forms of radioactive waste management and, second, to exchange ideas in response on the various solutions under study. The FSC members will take the

indications and suggestions from this workshop and “will carry the ball forward”. We are, in advance, *extremely grateful* to all colleagues that are providing their expert advice from so many fields of knowledge and with so much experience. Hopefully, this will be the beginning of a fruitful co-operation over time.

Among the different forms of waste management, we must focus our work on solutions involving geological disposal and we must give precedence to long-lived waste.

Our work schedule extends until 2002, since our mandate is valid until the first RWMC session in 2003, at which time the RWMC will decide whether to extend the mandate of FSC or to address the issues by other organisational means.

We must hold at least a yearly plenary meeting and we also have the possibility of organising workshops.

By the end of our first meeting, we must be in a position to establish the foundations of a work programme after having identified the key issues involved.

We have already defined with the NEA team a grid that should prove useful in our reflection. That grid consists of the five topics and the related working groups. Let us therefore work on that basis and we shall see at the end of our session what we might keep and what we might add.

Thanks to NEA Hans Riotte and Claudio Pescatore for the efficient preparation of our workshop.

I wish all of us an insightful and productive workshop!

Ten Years of Siting Studies and Public Dialogue: The Main Lessons Learnt at SKB

Claes Thegerström

Swedish Nuclear Fuel and Waste Management Company (SKB)

Background

It is more than 20 years since a co-ordinated nuclear waste management programme was set up in Sweden. Deep geological disposal of spent nuclear fuel in crystalline bedrock is the preferred option and an extensive R&D programme has been performed. A step-wise approach is being applied to development, technical demonstration and implementation of the disposal system.

A key element of the programme is siting of the deep repository, which started in a focused manner almost ten years ago. Before that time a study-site drilling programme was performed 1977-85 and facilities for intermediate storage of the spent fuel (CLAB), final disposal of low and medium-level waste (SFR) and underground research (Äspö Hard Rock Laboratory) were sited during the 1980s [1, 2]. Thus, siting-related experiences to date within SKB encompasses:

- Deep-drilling programme at about ten study-sites (1977-85).
- Siting of CLAB, 1976-79.
- Siting of SFR, 1980-83.
- Siting of Äspö HRL, 1986-90.
- Feasibility studies on a voluntary basis in two municipalities in northern Sweden, Storuman and Malå, including local referenda 1995 and 1997.
- Feasibility studies on a voluntary basis in six municipalities, Östhammar, Nyköping, Oskarshamn, Tierp, Hultsfred, Älvkarleby, 1995-2001.

By the end of this year SKB will present a comprehensive plan for the continuation of the siting programme at a few sites selected from the six municipalities where feasibility studies are now being finished.

Some general observations and experiences

The past record of siting-related activities includes a wide variety of experiences. There are failures as well as successes, shortcomings as well as accomplishments.

- A general trend is that siting activities has gradually become more and more demanding. CLAB and SFR, some 20 years ago, could be quite easily sited, in a process of a few years, involving mainly SKB, safety authorities and the directly concerned municipality. The siting of the deep repository has already been going on for some 10 years and it involves, on a much broader scale, many sectors of the society and the interested public. The result is that in today's society siting has become much more complex, resource- and time-consuming. This, in turn, has probably increased the risk of extensive delays or even failure but at the same time it is probably the only way to reach broadly accepted and implementable solutions.
- A consequence for SKB has been a substantial change in size and in the composition of the personnel and its competence's. While still keeping a high scientific and technical competence level SKB has over the last few years recruited much new personnel with a background in social science and with communication skills.

- A clear division of responsibilities between the stakeholders, with the responsibility of the producers as a key component, has been of fundamental importance for the stability and transparency of the system for R&D, critical review, licensing and decision making regarding nuclear waste issues. Within this system there is a noticeable shift over the last five years towards a more explicit and comprehensive involvement and influence of the municipalities in the siting regions. That has in turn resulted in local demands for a more visible support for the siting programme on the national political level.
- From the implementers perspective a successful siting of the Swedish deep repository has to continue to build upon the following main pillars:
 1. Continued good performance of already existing operating facilities and of R&D work to guarantee high quality in technical systems. This is also a prerequisite for keeping and increasing broad social trust in the nuclear waste management programme.
 2. A transparent siting process based on voluntary participation by municipalities fulfilling the geoscientific, technical and social criteria that are set up for each phase. An active dialogue between SKB and all parties concerned must continue with focus on the development of a comprehensive environmental impact assessment as a basis for decision making.

A set of “guidelines”

Siting of such a special and potentially controversial facility as a deep repository for nuclear waste is a very special project. Mistakes in some part or phase of the project are inevitable. The important thing is that they are not jeopardising the whole process and that you learn from them. The following “guidelines” constitute a condensate of experiences gained so far by SKB:

1. *Have a project.* We believe that it is indispensable for an implementing organisation to have a clear and understandable plan and concept for waste disposal. Communication should first focus on why rather than on how.
2. *Be ready to have your project questioned.* There must, on the part of the implementer, be room for possible change or improvement of the project. Nobody expects you to know everything from the beginning. Constructive criticism must be welcome.
3. *Put priority on individuals and small groups.* Large meetings are normally failures for everybody. Try to meet with many small groups, only then is it possible to listen-discuss-and provide understandable answers.
4. *Put priority on actions.* Words can not replace action. Trust or distrust will mainly be based upon the judgement of the way an organisation is behaving.
5. *Respect other opinions, anxiety and fears.* Radioactivity and nuclear waste is dangerous. They generate anxiety and fear, sometimes justified sometimes out of proportion. Listen to and respect expressions of anxiety and fear. People are themselves the experts on their own feelings, their own local conditions and they know what is of most importance to them and their neighbours.
6. *Demand respect in return.* There is no possibility to satisfy everybody. If you act in an open and fair way and with integrity you have the right to get respect in return.
7. *Push forward and don't resign.* There has to be an engine for any siting-programme in order to arrive at a decision and it is the role of the implementing organisation to fulfil that role. It is a difficult, sometimes frustrating, sometimes stimulating task. To succeed one will need flexibility and firmness, patience and impatience all of it tuned to the specific circumstances encountered during the process.

Topic 1

The Changing Environment for Waste Management Programmes

Civil Landscapes and Changing Modes of Participation

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The culture of citizen involvement is rapidly changing in most European countries and it has to be proved, if this will be true for other post-industrial societies, too. The philosopher Jürgen Habermas argued, in the 80s of the last century, that State bureaucracy and economic organisations will colonise the *lebenswelt* and jeopardise the basis of social innovation and democratic involvement. *Lebenswelt* in this context means the level of self-organised knowledge and pattern of communication people have in their own control.

This paper argues that this has been true in the period of Fordism, but does not properly reflect the present situation and the trends we can observe now. The regime of flexible regulation makes the *lebenswelt* a more important factor for social and economic development than fordistic regulation has done.

The rediscovering of *lebenswelt* in creating social and economic activities and welfare is strengthening the position of informal social groups like friendship groups, clubs, informal networks, regional milieus, etc.

There are four important aspects which are correlated with this growing importance of *lebenswelt*:

- (a) The potential of self-organisation is rising due to the accumulation of experience gained in defending individual or collective interests.
- (b) The potential of communication is growing due to new communication techniques.
- (c) More scientific and professional skills enrich the *lebenswelt* knowledge, so it becomes more and more equivalent to the knowledge one can find in organisations.
- (d) Regionality becomes more important as an arena of socio-economic development. It is exactly the economic and cultural globalisation which enforces regionality as a basis for success in the competition for resources and geographical status.

All this will change the pattern of social involvement at all levels of decision making, especially on local and regional issues. In this context, the mode and the modality of participation is changing and will change even more in future. It will be insufficient to create acceptance of and confidence in so called professional and formal decisions.

Two main trends can be hypothesised:

- bargaining about interests; and
- involvement of people in the process of designing future development.

To bargain means to accept people's differing interests. Conflicts are normal and may be productive in looking for solutions. We have, by now, a well-developed body of experience to mediate complex fields of conflicts.

To involve people in the design of the future mainly means to give people an active role in local and regional development. In the context of nuclear waste, this means that the handling of nuclear waste will have to be better integrated in the general regional processes. The whole set of instruments like future conferences, open space methodology, etc. will get a dominant role in handling nuclear waste.

In our just finished research project in this field we found people can contribute very effectively to planning, if they are allowed to participate continuously in small groups over a period of about one year. This collaboration of professional planners and the citizens we named “deep participation”. Deep participation will be successful if one can find a agreement on the level of general values. This may be one important point in handling nuclear waste as well.

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Trends in Decision making for the Siting of Waste Management Facilities

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Background

Over the last two decades a number of research studies on waste management facility siting have been produced. A Facility Siting Credo exists (Kunreuther *et al.*, 1993). It identifies a comprehensive set of criteria for successful siting, but relationships between them (complementary, conflicting) have not been investigated.

An attempt has been made to identify a conceptual framework which helps to structure siting criteria based on Competing Values Approach (CVA) to organisational analysis (Quinn and Rohrbaugh, 1983). Competing values include goal-centred, data-based, participatory, and adaptable processes, as well as efficient, accountable, supportable, and legitimate decisions.

Case studies: Analysing LLRW disposal facility siting processes in the US (California, Illinois, Nebraska, New York, and Texas), Canada, France, the Netherlands, Sweden, and Switzerland (1980-1993) by using the CVA framework (Vári *et al.*, 1994). Analysis of L/ILW siting processes in Hungary (1985-99) (Juhász *et al.*, 1993; Ormai *et al.*, 1998; Ormai, 1999).

General findings

It is impossible to satisfy simultaneously all the desirable, competing values of an idealised siting process. However, in a highly developed, democratic country all criteria should be met to a certain degree.

The major weaknesses of most siting efforts were lack of public support and perceived legitimacy. Successful processes focused on participation, supportability, adaptability, and legitimacy.

The prospects for supportable and legitimate decisions are enhanced if:

- The siting process is integrated with broader policy regarding energy production, esp. the future of nuclear energy.
- The problem of nuclear waste disposal is considered important by the public and the planned facility is the preferred solution to the given problem.
- The political leaders of national and State governments display long-term commitment to siting the facility.
- The goals of the waste management programme are clear, the source, type, and amount of waste to be disposed of at the facility are well defined.
- There are guarantees that no additional types and amounts of waste from additional sources will be shipped to the facility.
- Responsibility for waste management is shared by generators and government.
- The goal of the site-selection process is to identify a licensable site with host community support, rather than trying to identify the optimal site. A voluntary process in which communities are allowed to withdraw from consideration further improves the chances for community support.

- The goal of the method-selection process is to identify a licensable method with host community support, rather than trying to identify the optimal method. Guaranteeing stringent safety standards and providing for mitigation, independent monitoring, and public control over the facility further improve the chances for community support.
- A tailor-made compensation and incentive package is negotiated with the host community.

Trends: Shift from technical-hierarchical approach (focus on data and accountability) to individual-rights approach (focus on participation and supportability). Issues of fairness raised – shift toward distributive justice approach (focus on legitimacy).

The case of Hungary

Trends in siting approaches are similar to those of Western European and North American countries:

- First round (1985-89): Emphasis on technical data and optimisation. Siting process failed due to local resistance.
- Second round (1990-92): Emphasis on local acceptance. Siting process suspended by authorities to facilitate the thorough preparation of the National Project.
- Third round (1993-): Emphasis on legitimacy (waste management problem defined as a national problem rather than the problem of the nuclear power plant) and broader acceptance (association for public information and control established). Goals of the National Project are challenged by environmentalists and some legislators. Candidate site is accepted by host community and some neighbouring communities, but opposed by other nearby communities.

Problems of trust

- Low trust in central government and big business:
 - Lack of a coherent and transparent national energy policy. Consensual policy abandoned, privatisation of the energy sector without public control.
 - Future of nuclear energy uncertain. government changes may lead to major changes in national policies.
 - No guarantees for fulfilling agreements, contracts (*e.g.* hazardous waste incinerator).
 - Western firms export risky technologies to CEE – no liability (*e.g.* cyanide contamination).
 - Lack of enforcement of environmental regulations – small, weak communities especially vulnerable.
- Factors strengthening the trust in the Paks Nuclear Power Plant and the Public Agency for Radioactive Waste Management:
 - Voluntary process.
 - Public Association for Information and Control.
 - Economic incentives.
 - History of personal contacts.

But economic incentives are effective only in poor communities. More affluent communities worry about perceived long-term health risks. Those living from tourism or agriculture do not compromise because of anticipated stigma effects. Conflicts between communities, conflicts between politicians. Broader support (legitimacy) questionable

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Challenges in the Transition from the Site-selection to the Site-investigation Phase

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Background

In Finland, POSIVA OY is responsible for the management of spent nuclear fuel. In the spring of 1999, POSIVA filed an application to the Council of State for a policy decision on the building of the final disposal facility in Olkiluoto in the municipality of Eurajoki. This application has by now been supported by STUK, Radiation and Nuclear Safety Authority as well as the municipality of Eurajoki. A complaint has been filed to the Supreme Administrative Court regarding the decision of the municipality of Eurajoki. This complaint is still being processed. After the ruling of the Court has been passed, the Council of State will make a policy decision on final disposal, and this decision will also have to be separately ratified by the Finnish Parliament. At the moment it looks like POSIVA will obtain the policy decision permission for the final disposal facility during the winter of 2000-2001.

The policy decision permission will in practice mean that the final disposal of spent nuclear fuel from the Finnish nuclear power plants will comprise embedding of the fuel at a depth of 500 m in the bedrock of Olkiluoto. The policy decision permission will make it possible to concentrate POSIVA's investigations in Eurajoki, with an underground research laboratory built in Olkiluoto at a depth of 500 m. The building work of this facility will probably start in 2003. POSIVA's staff and head office will be gradually moved to Olkiluoto so that by the summer of 2002 all of the Company's activities will take place there. The planned starting time for the construction of the final disposal facility is year 2010 with the operation of the facility started in 2020.

In this presentation I will describe the challenges faced by POSIVA's communication operation with regard to the various stakeholders as a result of moving the company's activities to a new location and starting a new phase in the research activities. At this point the opinions are my personal views and do not necessarily represent official company policy.

Objectives of stakeholder activities

In order to ensure POSIVA's operating possibilities in the long run, we must understand and accept the fact that our operations have to be accepted by both the public and the decision makers at all times. In practice this means, that in addition to meeting the safety criteria, POSIVA's activities shall also meet also in the future all the criteria specified by the surrounding society. As we are talking about a time frame of several decades, it is obvious that the society's values and expectations will change. These changes may be crucial from POSIVA's viewpoint.

It is almost impossible to predict how people's behaviour will change, so POSIVA's stakeholder activities have to be based on being able to meet the current needs of the various stakeholder groups. People's values and attitudes change slowly, making it possible for POSIVA to keep up with the change. This, on the other hand, requires that sufficient sounding methods are developed and deployed. Even after a positive policy decision POSIVA cannot isolate itself from the rest of the society, but will have to prove itself every day. In the future, POSIVA will have to establish its credentials again to obtain a permit to start the building of the final disposal facility in 2010 and to start the operation of the facility in 2020.

Major stakeholders in Eurajoki

After POSIVA's relocation to Eurajoki, our most important stakeholder groups will include:

1. The municipality of Eurajoki, the decision makers and inhabitants.
2. The inhabitants of neighbouring municipalities and in the economic zone of the town of Rauma.
3. Mass media (local/national).
4. Environmental movement/opponents.
5. Decision makers at national level.
6. Scientific community.
7. Authorities.
8. Owner companies.

All of the various stakeholders expect POSIVA's operations to be of good standards, high quality and in compliance with the plans, with safety the most important criterion. POSIVA's actions shall be based on openness and communicated actively, openly and in an understandable manner to all stakeholders. From POSIVA's point of view, in an ideal situation the various stakeholders will consider POSIVA the best and the most reliable source of information in matters related to final disposal. POSIVA is also looking to appear as a modern, dynamic expert organisation, constantly searching for the best solutions and capable of implementing final disposal in a safe manner.

Different stakeholders have different needs

POSIVA faces different expectations from different stakeholder groups, even from within the groups. In the case of the municipality of Eurajoki, for example, the expectations of the decision makers and the inhabitants differ from each other to some extent.

For the decision makers in Eurajoki, the important thing is to ensure that the agreement between POSIVA and the municipality regarding the Vuojoki Estate (POSIVA's new head office) will be realised and the Estate becomes a significant part of life in Eurajoki. They will also expect POSIVA to honour the promises of new employment opportunities and pay taxes as agreed. From the decision makers' viewpoint, the most essential thing is that the decisions they have made will look good also in retrospect. POSIVA can ensure fruitful co-operation with the municipal decision makers by fulfilling these expectations.

The inhabitants of the municipality see things differently. What matters to them is how things influence their everyday life. Local people expect POSIVA to be able to offer employment and income opportunities to the inhabitants of Eurajoki. As a recognised expert organisation, POSIVA will also have to take part in other aspects of the municipal life, *e.g.* through various associations. POSIVA will have to support the civic projects under way in the municipality, both financially and in spirit. POSIVA's personnel play an important role in municipal participation. It is in POSIVA's interests to ensure that the inhabitants of Eurajoki will find POSIVA's influence on the everyday life of the municipality positive.

Opposition possible from neighbours

Several international studies as well as POSIVA's own experience show that the possible opposition against POSIVA's activities will probably arise from areas in close vicinity of the final disposal facility but outside the municipality. There is a very obvious reason for this. The neighbours may feel they will be affected by the possible negative aspects of final disposal, but will not gain anything from it. What would be the right course of action in this situation?

First of all, it is important to ensure that the final disposal investigations will not cause any inconvenience to the inhabitants of the surrounding areas. Secondly, POSIVA has to proactively inform people about the company's activities in such a manner that things do not come as a surprise to the inhabitants of the neighbouring municipalities. All kind of secrecy has to be avoided. Thirdly, POSIVA must make efforts to establish co-operation networks also with the decision makers and inhabitants of the neighbouring municipalities in order to dialogue frankly with them and avoid the development of controversial positions.

Media want drama

The major objective of the media is to sell their own product to the public. Drama provides the best tool for this. From the media's point of view, bad news is the best kind of news. However, experience shows that thanks to the high integrity of Finnish press, sensational stories not based on facts are hardly ever published. For POSIVA, this means that the operation of the company should be as "plain" and transparent as possible. Communication must be open and active at all times to maintain the trust of the press and to avoid a "communication vacuum" round POSIVA that might be filled in by somebody else. At the same time, we must prepare plans for communication activities in a crisis situation. It is quite certain that during the several decades of operation we cannot avoid situations that are unpleasant to POSIVA and we have to be able to get them quickly out of the headlines.

Dialogue with the environmental movement

About one third of the inhabitants of Eurajoki oppose the building of the final disposal facility in the municipality. There is no actual environmental movement in Eurajoki, but there are a few active opponents. We must try to start an active dialogue with the environmentalists and POSIVA must be prepared to also make allowances. The concerns and fears of the local people have to be listened to carefully and taken into consideration whenever possible.

Due to lack of time I have not discussed all the various stakeholders of POSIVA. I have rather tried to describe the approach that in my opinion might be fruitful in stakeholder activities. I hope these few examples have given some idea of how POSIVA has felt and feels about stakeholder management.

Deliberations of Working Group 1:
The Changing Environment for Waste Management Programmes

Chairperson: *Hideki Sakuma*

In order to share the baseline with the participants who were not able to attend the inaugural session, the working group Chairman gave his brief summary of invited presentations on Monday afternoon.

The floor was then turned to O. Kurki (POSIVA, Finland) for his presentation entitled “Why has geologic disposal been so well accepted in Finland?”. This promisingly titled presentation reminded participants of the fact that there is no shortcut to achieve a sufficient level of public acceptance. An incremental approach, learning by doing and time were reconfirmed as important factors. This presentation together with the two presentations in plenary session in the morning: “Civil landscapes and changing modes of participation?” (D. Ipsen, Universität Kassel, Germany) and “Trends in decision making for the siting of waste management facilities” (A.Vári, Hungarian Academy of Sciences), served as a basis for the later discussions in the working group. Prior to the discussion, the Chairman recommended that:

- The working group should not stay too long in the domain of terminology.
- Since the current status of the programmes in the NEA Member countries differ from one another, the working group would focus on the early stages of site selection phase and/or its proximate stages.

Overall, deliberations of the working group can be summarised as follows.

Changing environment

At the departure point of discussion, there was a shared view amongst the participants that it is not only the waste management programme whose environment is changing but the world at large that is changing. Therefore, it was agreed appropriate to have a wider range of vision to discuss the subject issue. The changing environment from such a wider viewpoint was defined as follows:

- Decline of deference: Public are no longer confident in authority, in science as infallible.
- Loss of technological enthusiasm: Technology is no longer perceived as the bright future.
- Generation change in decision makers: Protesters of ‘70s are decision makers in today’s society.
- Change in decision level: From centralised decision to stronger involvement of local authority.
- Change in decision methods: No more opaque, top-down choices by a limited group of “experts”.
- Change in framing: Before, only the technical tasks were of prime importance. Now communication is considered equally important.
- Change in youth (future decision makers): Higher educational level, more pragmatism.

In later plenary discussion of the working group report, it was suggested that as well, we are no longer in a context of economic downturn and energy shortage. The absence of such pressures may influence the priority assigned by members of the public to resolving energy-related problems.

Current public climate

In the environment portrayed by working group observations, members of the public refuse in general to accept projects when they have not been actively involved in creating them and developed a sense of responsibility for them. More specific to the subject issue of the forum, there is no perception that radioactive waste is a shared social problem. Here, the question arises for the FSC “Under what conditions will local and regional stakeholders start to develop a sense of responsibility for radioactive waste management?”

More specific to the climate of geologic disposal, there is a trend worldwide for persons to prefer some kinds of extended institutional control of the repository rather than counting totally on “passive safety”. This reflects the fact that people prefer to judge alternatives and/or options in a comparative manner, rather than being offered a single alternative which they must approve or reject.

Need for dialogues

The new environment creates a need for two-way communications (or dialogues). Here we face a series of questions such as:

- Who can take on the role of communicator in each organisation? In other words, which actor is most credible in each setting?
- What skills are needed? In other words, which is more feasible, to train a communication officer as a technical expert or the other way around?
- How to build that competence within the organisation? Training needs, selection of the right staff for different contexts, insights on dialoguing and hints on information materials should be duly identified and used.

In order to prepare for such a new phase of communication, the waste management organisations and other relevant players should make sure that the following key issues are sufficiently taken into account.

Clarification of role and responsibility

It is obvious that a higher degree of confidence can be expected when you know all of the capable players are at right positions in the field and recognise their roles and responsibilities. It should be recognised that proposers are not decision makers; experts only deliver facts and policy-makers representing the public then judge what is acceptable; it should be clear for everyone whom to talk to if one wants answers. The key messages can be summarised as following:

- Each actor should clearly recognise his role and responsibility.
- The map of roles and responsibilities should be transparent to the public.

Credibility and use of mediators

As noted earlier, there is a trend worldwide favouring an extra margin of control (*e.g.* Long-term Monitoring and Retrievability) in the expectation that this might enhance the level of public support for repository projects. Waste management organisations should be prepared for this issue in their dialogues and make sure that such a public preference is based upon sufficient information. It is also very important the local elected officials act as prime mediators between waste management organisations and *lebenswelt*. Most working group participants shared the view that local officials play a crucial role when the waste management programme steps into the site-specific phase.

Proposed FSC emphasis

As a conclusion, the working group agreed to recommend the following to FSC as issues of higher priority to discuss further in its future activities:

- Learn about modes of function and engagement by local and regional governments: perhaps no other stakeholders are so well placed to mediate among regulators, implementers and the public.
- Two-way traffic: how can we integrate information obtained from dialogues into our organisational outlook and operations?

- Is there more potential for building a higher degree of public confidence when alternatives and/or options are kept available?
- What are the new trends and attitudes among future decision makers?

Chairman's remarks

Reflecting the wide range of expertise represented by the participants, the discussions were, in general, quite inspiring and even provocative from time to time. Among others, dialogues between the technological perspective and the social scientific perspective were of prime interest to the participants. Thanks go to the NEA secretariat who recommended and initiated pre-forum interactions amongst the participants; almost all of the participants were well prepared for the active, reactive and constructive debate in the working group. It was a shared view of the participants that the presence of this forum itself is a vital example of the changing environment.

Topic 2

Trust and the Institutional Framework

Legal and Institutional Frameworks for Government Relations with Citizens

Joanne Caddy

OECD Public Management Service (PUMA)

Context

Unacceptably low or declining confidence in public institutions in OECD Member countries has led governments to view the issue of government-citizen relations with growing concern and to take initiatives to strengthen this fundamental relationship. Governments have begun to realise that they can better anticipate citizens' evolving and multiple needs by pro-actively involving them in the policy-making process in order to develop solutions to issues as they first appear, and not when they become pressing problems. When government succeeds in anticipating citizens' needs and aspirations, it earns currency in the form of trust. The price of failure is a loss of legitimacy.

The conditions for trust in government include a well-educated citizenry, transparent processes and accountability. Government needs to establish a "level playing field" so that citizens can see that their interests are being treated fairly. Citizens, for their part, need to learn to value fairness in government over special favours for well-connected groups. Transparency in government helps to assure citizens that they are being treated fairly. Accountability helps ensure that government failures are corrected and that public services meet expectations.

- **Governments increasingly realise that they will not be able to conduct and effectively implement policies, as good as they may be, if their citizens do not support them.**

The OECD project on "Strengthening Government-Citizen Connections"

This activity aims to support government efforts to strengthen public participation, transparency and democratic accountability, and ultimately, policy effectiveness, through development of comparative information, analysis and advice in three inter-related areas:

- Comparative analysis of government policies and practices in support of citizen access to information across the 29-country Membership of the OECD.
- Exploration of how public participation in policy making is changing, examining government policies and practices for consulting with individual citizens, stakeholders and non-governmental organisations (NGO) in policy making.
- Analysis and development of comparative information on how the explosive growth of the Internet and the emerging information society is impacting citizen access to government information and services.

The PUMA Working Group on Strengthening Government-Citizen Connections was established in early 1999 to conduct this work. To date, a significant amount of information has been collected by means of two comparative questionnaires (on general frameworks and on the use of IT) and five in-depth country case studies – data which reflects a great diversity in terms of country experiences and policy sectors.

Laws, policies and institutions to improve government relations with citizens

Most OECD Member countries had adopted Freedom of Information legislation guaranteeing citizen access to information by the 1980s, while most have also adopted sector-specific legislation granting citizens rights to information (*e.g.* environmental data, health data, and consumer protection). It appears, however, that most countries have yet to update laws to take into account differences between electronic and paper records. Many have adopted policies to make government information available on the Web.

The majority of laws and policies adopted by Member countries in support of consultation and citizen participation have occurred relatively recently, within the past 15 years, including many in the 1990s. Virtually all countries cited legislation favouring relations with citizens on environmental policies and land use planning. Many mentioned participation policies regarding decisions at the local level as well as in sectors such as education and housing – subjects which directly relate to the daily lives of citizens.

The national or local referendum is a frequently accepted technique permitting the direct consultation of the citizen in coexistence with a representative democracy, and has already been in long-standing use in certain countries such as Finland and France.

Polling research is also growing in popularity as a tool for broadening consideration beyond stakeholder groups and seeking to identify the broader public interest. A growing number of countries are relying upon this technique to determine citizens' views on government and public services

Most questionnaire responses cited the use of ombudsmen – sometimes also taking the form of commissioners – appointed to represent citizen rights and to ensure implementation of various laws and policies dealing with government-citizen relations.

Emerging policy tools

Many initiatives to improve the use of new information and communication technologies (ICT) in connecting government to its citizens are currently underway in OECD member countries. All countries have now acquired experience in providing information on-line, many have made significant efforts to put administrative procedures and services on-line while on-line public consultation for policy making represented a new frontier for all countries. The main issues identified so far include:

- The growing use of Internet in providing information to the public and its role in enhancing access to information and promoting greater government transparency.
- Initial experience with on-line consultation, its potential in engaging citizens (*e.g.* in rural communities), its limitations (*e.g.* low levels of access, willingness of citizens to participate and the need to combine the use of new technologies with traditional measures for consultation and participation in policy making).
- Need for policy measures to address an emerging “digital divide” through investment in infrastructure, training and lower telecommunications costs.

Policy lessons

The potential for disappointment and frustration on the part of both governments and citizens during the formulation and implementation of sensitive policy decisions is high. It can be reduced by:

- *Clearly defining expectations, “rules of the game” and limitations* of a given information or consultation exercise from the outset.
- *Using a “mix” of different tools and approaches* in the provision of information and opportunities for consultation in order to reach a sufficient range of stakeholders in a given policy-making or decision-making process.
- *Improving the capacity for evaluation* of efforts to improve government-citizen connections which is currently limited in all OECD countries.

OECD governments are seeking to develop new models and approaches for better informing and involving citizens in the decision-making process. At stake are the legitimacy of public policies and the capacity of governments to implement them effectively, with the support of an informed public.

Scope for future collaboration

The PUMA Work Programme for 2001-2002 includes activities to follow-up work done to date on “Strengthening Government-Citizen Connections”, including the analysis of the role of civil society organisations (CSO) in policy making. Given the issues of common concern, there would appear to be significant scope for exploring forms of co-operation with the newly-established Forum on Stakeholder Confidence (FSC) of the NEA. Measures for consideration by the respective groups are:

- Information exchange.
- Periodic updates on work in progress.
- Links between Web pages.

The first meeting and workshop of the Forum on Stakeholder Confidence (FSC) represents a good opportunity to discuss, and develop further, the options outlined above.

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The Role and Experience of Technical Oversight Bodies

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The function of supervision and scientific and technical assessment organs depends first of all on the conditions in which they are created, and on the mission which is officially assigned to them. Their composition must be adapted to this particular mission.

These organs can be closely linked to specific organisms, the actions of which they revise, the way scientific councils do. Their competence can also be linked and limited to a particular project. At the other end of the competence spectrum, surveillance bodies may have a very wide competence, including even the watch over the definition of study and research actions, and not only over their results. The scope of this competence still depends on the scientific and technical field covered. In France, the *Commission nationale d'évaluation* (National Review Board), created by law, carries out its mission in a field of research which includes all the possible modalities concerning long-lived radioactive waste management. In the United States, the National Technical Review Board, instituted by the 1987 amendment to the 1982 Nuclear Waste Policy Act, enjoys a very wide competence on a field limited to the very object of the Nuclear Waste Policy Act, *i.e.* the study of civil nuclear waste storage, packaging, transportation, and site characterisation for final disposal. The Swedish KASAM has a mission comparable to the NTWRB, but it also expresses its collective opinion on the questions of society linked to scientific research.

The action of these supervision and scientific and technical assessment organs also depends on the modalities of their seizing. It seems that the organs we have just quoted enjoy the widest autonomy to define on which subjects to focus their attention, without having to limit their examination on questions they would be asked. The case of scientific councils set up by research organisms is quite different, in the sense that they express their opinion upon the formal request of the organisms for which they are created.

The independence of the supervision and scientific and technical assessment organs is an essential condition to their usefulness. This independence must be ensured first of all by the rules stating the appointment of their members. However, it is not enough for them to be independent, intellectually, from the organisms the results of which they assess: all appearances must also show this independence.

The scientific authority of a supervision and scientific and technical assessment organ depends, of course, on the personal scientific competence of its members, but it would be regrettable to have it limited to their mere juxtaposition. Such a body fully draws its worth through collective thinking, confronting and bringing together the individual opinions of the personalities it is made of. This internal debate makes it possible to correct the initial effects that can result from the particular modalities when appointing members. Having experts of different nationalities may also exert a favourable influence, although hardly predictable.

The functioning of the supervision and scientific and technical assessment bodies is put to the test as soon as they have to choose their level of analysis and intervention: they may prefer to focus on the detailed examination of a limited number of subjects, or on the contrary, embrace the whole plentiful and teeming content of their field of action. Through their first choices, they may durably enlarge or limit the trust that will be granted to them after their first interventions. We shall note for instance, in

the United States, the influence that the NTWRB was able to exert through its observations on the design choices of the Yucca Mountain geological disposal, and in France, the way Public Authorities took into account the CNE assessments in the choice of the sites for the underground laboratories.

Finally, the supervision and scientific and technical assessment bodies are required to fulfil a function of mediation between scientists and engineers on one hand, public authorities and the general public on the other. They must explain in straightforward terms the studies and research being implemented, the advances that are noted and the inadequacies they might notice. This mission of information is aimed at contributing to the public debate.

Lessons Learnt from the Conduct and Release of the EKRA Study in Switzerland

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Introduction

Nuclear waste management has a long history in Switzerland. In 1957 the first article on atomic energy was inscribed in the Constitution. The National Co-operative for the Disposal of Radioactive Waste (NAGRA) was founded in 1972, and to date Switzerland disposes of two waste disposal programmes:

1. High-level and long-lived intermediate-level waste (HLW/TRU)

Since the 70s and as part of the “Kristallin” project, NAGRA investigated disposal options in the crystalline basement of Northern Switzerland. The suitability of this rock type was demonstrated in the 1985 “Gewähr” project. Investigations on sediments in the northern part of the *Canton* of Zurich began in 1994 and, since 1997, NAGRA has been studying the area known as the Zürcher Weinland. Seismic measurements and the results from the Benken borehole, drilled in 1998/99, confirmed their expectations. Future work will focus on the Opalinus clay, which is a roughly 100 m thick formation deep underground the Zürcher Weinland.

2. Short-lived low- and intermediate-level waste (L/ILW)

Following a comprehensive site evaluation in 1993, NAGRA proposed Wellenberg as the site for a geological repository in marl host rock. The project has been blocked since 1995 because of the negative outcome of a public referendum on the siting in the *Canton* of Nidwalden.

Technical, economic and political working groups

As a consequence of the negative outcome of the referendum on the one hand, and the positive judgement of the general licence application for the Wellenberg repository by the Swiss safety authorities on the other hand, technical and economic working groups were set up in 1997. At a political level, the “Energy Dialogue” working group was set up by the Head of the Federal Department for the Environment, Transport, Energy and Communication a year later. The latter was asked to consider fundamental aspects of nuclear waste management. The final report, compiled by the chairman of this group at the end of 1998, recommended bridge-building between the opposing positions of the operators of the nuclear power plants and the environmental organisations. One of the recommendations in this report was to look in more detail at the concept of “monitored retrievable long-term storage”.

At the beginning of 1999, talks between the Federal Council, the siting *cantons* (*cantons* in which nuclear power plants are located and *Canton* of Nidwalden), the environmental organisations and the nuclear power plant operators on the lifetime of the existing power plants and the solution of the waste management problem, failed to reach an agreement. As a consequence, the Expert Group on Disposal Concepts for Radioactive Waste (EKRA) was set up by the Federal Government in June 1999.

Expert Group on Disposal Concepts for Radioactive Waste (EKRA)

EKRA was responsible for providing the background for comparison of different concepts for disposal of radioactive waste. In particular, the group considered and compared final geological disposal, monitored and retrievable long-term disposal and interim storage in the light of:

- Active and passive safety.
- Monitoring and control.
- Retrievability of waste.

As part of its mandate, EKRA investigated the scientific and technical aspects of safe waste disposal, taking into account sustainable development as well as socio-political aspects. Based on a list of criteria, EKRA formulated a set of conditions for safe disposal of radioactive waste in Switzerland and developed the concept of “monitored long-term geological disposal”. Evaluation of the different waste management concepts led EKRA to reach among others the following conclusions:

- *Geological disposal* is the only method for disposing of radioactive waste which meets the long-term safety criteria (up to more than 100,000 years).
- Social expectations in terms of waste disposal are oriented towards the principle of reversibility. EKRA has therefore developed the concept of *monitored long-term geological disposal*, which combines elements of final disposal and reversibility.

EKRA recommendations and future implementation

Given the terms of its mandate, EKRA recommends a programme of action. Important steps towards the realisation of a repository are:

- Public debate on the issue of nuclear waste management.
- Project planners should be required to document, in ongoing projects, aspects of the monitoring, control and the facilitated waste retrieval.
- The Wellenberg project should be pursued. The possibilities for monitored long-term geological disposal should be investigated from the point of view of location and layout of a pilot facility. The first action at Wellenberg, however, is to take the necessary steps towards construction of an exploratory drift.
- A time table for realising both, L/ILW and HLW/TRU disposal projects should be prepared and progress should be monitored at regular intervals.

Many of the recommendations have been accepted and are being implemented since the appearance of the EKRA-report. Requirements for monitoring, retrievability and control have been included in the draft nuclear energy law. As a next step towards disposal of L/ILW an exploratory drift is to be constructed at Wellenberg. A group of experts deals with questions concerning the inventory of this repository, possible modifications of the originally proposed concept as well as information as part of the public debate. Further work is in progress.

Deliberations of Working Group 2: *Trust and the Institutional Framework*

Chairperson: *Daniel Metlay*

The meeting of Working Group 2 (WG-2) was preceded by two presentations in the plenary session: “Legal and Institutional Frameworks for Government Relations with Citizens” and “The Role and Experience of Technical Oversight Bodies”. The first identified trust and legitimacy as key resources for effective policy making and democratic governance as well as the current progress and difficulties at OECD governments’ level in promoting public trust and participation. The second described the use of technical oversight bodies to provide a function of mediation between scientists, public authorities and the general public, in order to facilitate communication and understanding of technical issues and research.

Dr. Aebersold gave a presentation to WG-2 on the results of Switzerland’s Expert Group on Disposal Concepts for Radioactive Waste (EKRA). This group was established to bridge between nuclear power plant operators and environmental organisations, who had opposing views of radioactive waste disposal in general, and the choice of the Wellenberg site for a geological repository in particular. The success of EKRA in having its recommendations accepted and advancing the long-term waste management programme was attributed to, among other things: the popular acceptance of the EKRA chairman; the competence, independence and commitment of the EKRA members; the responsiveness of their recommendations to public concerns and social issues; and the openness and transparency of their work (including broad media coverage).

Dr. Metlay, who chaired WG-2, described field studies that he has undertaken dealing with trust in specific institutions in the US. This initiated the discussions, which ranged from a general understanding of the nature of trust, to why it may be important in the successful siting and development of a repository.

Nature of trust

The *Concise Oxford Dictionary* defines trust as a “firm belief in reliability, honesty, veracity, justice, strength, etc., of person or thing”. The working group observed that having trust implies that an individual is willing to give up a certain measure of control to another individual, an institution, or a set of institutions (a system). Trust is usually (but not necessarily) a two-way relationship: it is difficult for one party to give trust to another if trust is not being received in the first place.

Trust can be given, but it cannot be taken – it must be earned, typically by verification through actions and meeting commitments. Trust is easier to win if there are shared understanding, interest and responsibilities between the parties involved. There is an asymmetry inherent in trust: it is much easier to lose trust than to earn it.

Three degrees of trust can be distinguished: trust, mistrust and distrust. Mistrust is taken to be scepticism or lack of belief, but still amenable to trust being earned, whereas distrust is a stronger disbelief, so firmly held that verification of being trustworthy is unlikely to alter the distrust.

Dr. Metlay used his studies to identify measurable bases for trust: competence, caring, integrity, fairness, credibility, reliability and openness. His work illustrated that (technical) competence is

necessary but insufficient in itself to earn trust. The remaining factors (which he referred to collectively as “affective” components) are inter-related, and failure in one of these will result in failure of the entire set and a loss of trust. There was broad agreement on the general applicability of these findings.

Why is trust important?

In today’s society, we cannot control every aspect and detail of our lives. This means we need to have some level of trust in bus drivers, police officers, the courts, the legal system, and other persons, institutions and systems. This raises two questions: “Can we trust institutions the same way that we trust individuals?” and “Is it possible for institutions to trust individuals or groups of individuals?”

Institutions can demonstrate their trust, mistrust or distrust of individuals (or groups) by the policies they adopt and how they are implemented. Policies are set by individuals with authority in the institution (or within the system of which the institution is a part) and are also implemented by individuals. Hence, trust in and by institutions may reduce to trust in their representatives. The reverse is also true, and the Swedish regulator identified interpersonal trust as the initial seed for trust between the local community and the regulatory authority.

One can develop an interpersonal relationship leading to two-way trust with an individual, but if that individual is representing an institution then they are constrained by that institution’s policies, programmes and goals. Similarly, institutions are part of a system, and so are constrained by that system. This may introduce a dilemma for multi-functional organisations: their behaviour on a particular issue (*e.g.* waste management) may be constrained by their responsibilities in other areas (*e.g.* power generation, financing). Any trust they earn on waste management issues may be undermined by their performance in other, unrelated areas.

There was general agreement that trust is important in the current democratic ethos. Trust is necessary to establish a genuine dialogue to air contentious issues, and is a necessary intermediate step in conflict resolution. In the “new politics” of response to social concerns, trust could be considered as “social capital”. It is easier (and less expensive) to accomplish things if there is public trust than if there is mistrust or distrust.

In the field of radioactive waste management, trust is part of the issue of stakeholder acceptance of waste disposal programmes. Trust is not the same as acceptance or agreement, especially when applied to questions of siting a waste disposal facility. In northern Sweden it was found that the public denied SKB’s siting programme not because of a lack of trust, but because it would result in an unacceptable change of lifestyle. Direct political intervention, *e.g.* in situations where the communities do not have a veto right, is also a possibility, but that may prove unwise in a long-term perspective of project management and development. Indeed, one peculiarity of radioactive waste management is the long time frames involved in siting, operating and then closing a waste management facility, whether it is a disposal or storage facility. This time period will span several generations, which adds importance to the need for trust within the wider community of stakeholders. It would be difficult to achieve a multi-generation project through coercion rather than co-operation.

Factors other than trust play a role in gaining acceptance of a waste facility, either to supplement the trust or to compensate for a lack of trust. Institutional mechanisms can be used to compensate for mistrust: enhanced oversight by authorities and stakeholders (to provide additional “defence in depth”); and retrievability of the waste and reversibility of programme decisions (to alleviate mistrust in technology and its implementation). Sharing of responsibility and control with affected stakeholders and providing concrete compensation to the affected stakeholders are also confidence-building actions which may make a waste facility more acceptable.

Sharing responsibility and control with stakeholders (power-sharing) requires that the implementing institution demonstrate a willingness to trust the stakeholders, in keeping with our understanding

of trust as a two-way relationship. However, it is not a trivial task to engage the public in meaningful consultation, as evident from the lack of public participation in the attempts to do so in some countries before a waste facility was sited (Canada and the United Kingdom, for example).

The national systems of governance make a difference in the way different audiences are brought into the debate and for taking decisions. Switzerland and Sweden have held referenda. France and Germany are engaging in politically directed debates. The US is holding institutionally directed debates. These differences add to the difficulty in trying to generalise “recipes” from one country’s experience to another.

Where next? Observations, recommendations and implications for the FSC

1. The issue of trust, its importance and how to earn it is a relevant area for further consideration by the FSC.
2. There is a large body of published work and a number of current projects on the issue of trust, institutions and technological development (including waste management). The FSC should undertake to assemble and consolidate this information into a form useful for the group, to identify lessons that have already been learned elsewhere and to achieve a common understanding of the state-of-the-art for planning future work.
3. The FSC could devise a framework to systematically report experiences in different countries/programmes, to explicitly take into account differences in systems of governance, social values, legislative/legal/economic constraints etc., when comparing and contrasting those experiences. This would allow: analysis of the exceptional success of the Oskarshamn model, for example, vis-à-vis other experiences in Sweden and experiences in other countries; development of network diagram(s) of stakeholder interactions to identify where trust has been important and at what stage of repository development; and compilation of a set of “best practices” from the collective experiences to translate the lessons learned into desirable actions and behaviour for an organisation
4. Other issues that the FSC should explore include:
 - Can institutions be trusted when the system is not?
 - How can management affect institutional trust?
 - Do organisational characteristics make a difference towards achieving the trust of stakeholders?

Topic 3

Stakeholders and the Public: Who Are They?

Who are the Stakeholders in Environmental Risk Decisions?¹

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Abstract

In this talk, I discuss the concept of “stakeholder involvement” in environmental decisions, including but not limited to radioactive waste management decisions. As a prelude, I mention ways in which public participation opportunities have been expanded but still remain deficient in two key respects. These deficiencies have opened the door for stakeholder involvement. Stakeholder involvement has, over the past decade, been touted as an approach (perhaps the approach) to more egalitarian, interactive environmental decisions that take into account different interests and perspectives.

After mentioning two key dimensions of environmental decisions – their spatial and temporal reach – I consider the extent to which different types of stakeholders can and should be centrally involved in various decisions. I conclude with a plea for the need to downplay the notion of “stakeholders,” especially on decisions whose impacts will extend far across space and time. Instead, especially on such decisions, we need to cultivate the notion of our shared responsibility to serve as trustees, putting aside our vested interests and deliberating together iteratively on the best ways to achieve the long-term common good.

Over the past few decades, public participation opportunities have been significantly expanded. In the United States, as in other nations, opportunities for members of the public to contribute to the decisions of various national, State, and local agencies have been amplified – for example, by more open *access to documents*, by earlier and more widespread *notification of public meetings*; by *question-and-answer sessions* at some public meetings; by *scoping processes* early in the decision process, to clarify the issue at hand and how it should be considered; by formal *responses to public comment*; by *administrative review* if objections are raised, so that citizens do not need to immediately resort to the judicial system; and, within the judicial system, by *broader standing to sue*.

In other words, public participation in environmental policy decisions has come a long way. It used to be limited to public hearings concerning decisions that were often “done deals.” Overturning public agency decisions could be accomplished only through costly, protracted, often futile court cases, and then only if the issue was justifiable. Today, decisions are often made in much more open and interactive settings.

Nevertheless, public participation has two inherent deficiencies. First, it fails to differentiate among members of the public, and second, it preserves an us/them distinction between the decision-making agency and citizens. As a remedy, stakeholder involvement, which is intended to overcome these deficiencies, has become an increasingly popular supplement, especially on controversial issues concerning various types of environmental issues, including but not limited to radioactive waste management.

Before shifting to a discussion of stakeholder involvement, I should emphasise that radioactive waste management is only one of many environmental issues facing society. The following clusters of issues, which

1. This summary and presentation are based on a paper presented at the “Values in Decisions on Risk” (VALDOR) symposium held in Stockholm, Sweden, in June 1999. The full paper appears in the proceedings of that conference and is being reprinted in *RISK: Health, Safety and Environment* (forthcoming).

are derived from English *et al.* [1] and are similar to other taxonomies of environmental issues (*e.g.*, [2], [3], and [4]), indicate the range of environmental decisions currently being considered in the US and elsewhere:

- *Waste cleanup and management.*
- *Air quality.*
- *Water quality and supply.*
- *Natural resource management.*
- *Critical natural areas.*
- *Energy production and distribution.*
- *New technologies.*
- *Urbanisation and land use.*
- *Historical, cultural, and aesthetic resources.*

Regardless of the type of issue, each can be characterised as having a spatial and a temporal dimension. I first encountered this basic point in an article by Clark Bullard [5], and it continues to be helpful in thinking about environmental risks.

The spatial dimension of an environmental issue can range from highly local (*e.g.*, a solid waste collection centre) to highly diffuse (*e.g.*, global climate change). Similarly, the temporal dimension of an environmental issue can range from very short term (*e.g.*, a chemical spill that is quickly mopped up) to very long term (*e.g.*, permanent storage of highly radioactive waste and spent nuclear fuel). While it may not be absolutely clear where an environmental issue falls on these spatial and temporal continua, thinking in terms of the issue's spatial and temporal dimensions can help to clarify both who is likely to regard themselves as stakeholders and who should be regarded as stakeholders.

Before explaining this point, I should briefly discuss what it means to be a stakeholder. In doing so, I draw upon a much more extensive discussion of stakeholder involvement in environmental policy making [6]. Originally, a stakeholder was someone holding the stakes during a wager; someone neutral and trusted. As currently used (in the US, at least), the term means something quite different: It refers to someone with a vested interest; someone who stands to gain or lose. Even within the US, the term "stakeholder" does not have a universally accepted definition (see, *e.g.*, [7] and [8]), but typically it has been adopted – especially by federal agencies – to refer to interested and/or affected groups or individuals within what traditionally has been called "the public." For example, this restricted usage has been employed by the US Department of Energy (DOE), which routinely distinguishes stakeholders from DOE and its regulators.

Yet "stakeholder," strictly speaking, includes those who are responsible for environmental risks, either because they caused it or because it is their duty to manage it. Their stakes are different – they may involve jobs, funding, profit, a sense of mission – but they are stakes. Particularly with elected officials and public agencies, whose responsibility it is to serve the public interest, the term "stakeholder" is often avoided. We tend to reserve the term for those whom we assume are acting from self-interest or personal values; we are reluctant to relinquish the notion that our public agencies speak solely for the public interest, untainted by personal values or concerns. Yet they are, in fact, stakeholders as well. And as their decision-making authority is questioned and they turn to negotiation and other forms of conflict management, they increasingly rely, not only on their own judgement, but also on other stakeholders to make decisions.

I first started thinking about distinctions among stakeholders while writing an article in which I examined different perspectives on environmental risk decisions and their outcomes [9]. Here, I will mention four broad categories of stakeholders:

- *Risk losers:* those who may be adversely affected by an environmental risk decision, in terms of their health, economic, or social well-being, and possibly their deeply held values;
- *Risk gainers:* those who may be favourably affected by an environmental risk decision, typically through economic gains;
- *Risk perpetrators:* those who create the risk (assuming it is not a wholly natural, unexpected hazard);
- *Risk managers:* those responsible for preventing or minimising the risk (anthropogenic or natural).

These categories are not mutually exclusive. For example, a risk loser may also be a gainer in some respects (*e.g.* through new employment opportunities); a risk perpetrator may be a gainer as well and may also be expected to be a risk manager. And in the environmental risk decisions, there may be at least as much concern about the process of reaching the decision (on this point, see, *e.g.* [10] and [11]) as about the decision outcomes. But despite these potential overlaps and ambiguities, the four categories help to remind us that stakeholders are likely to bring not only radically different perspectives to the decision process and its outcomes, but also different abilities to participate.

Using the two sets of theoretical constructs laid out above – the spatial and temporal dimensions of environmental issues, and the four broad categories of stakeholders – I argue that all stakeholders cannot participate equally in all environmental risk decisions. Instead, their ability to participate in a meaningful, central way will depend on the spatial and temporal dimensions of the environmental issue and also on the type of stakeholder. This argument is summarised in Table 1.

Table 1. Possibility of stakeholder participation in environmental-risk decisions

Risk Category	Type of Stakeholder			
	<i>Losers</i>	<i>Gainers</i>	<i>Perpetrators</i>	<i>Managers</i>
1. <i>Local and short-term</i>	Yes	Yes	Yes	Yes
2. <i>Local and long-term</i>	Partially	Partially	Partially	Partially
3. <i>Diffuse and short-term</i>	Minimally	Minimally	Partially	Partially
4. <i>Diffuse and long-term</i>	Very minimally	Very minimally	Very partially	Very partially

I reach these conclusions through the following reasoning:

1. *Local and short-term risks*: If the risk is sufficiently local and reasonably short-term, it is plausible to conceive of bringing together all stakeholders to deliberate about the risk decision.
2. *Local and long-term risks*: If, however, a localised risk is likely to extend far into the future, then the stakeholders can be only partially represented in the deliberations, since stakeholders who in the future must deal with the consequences of the current decision process cannot be involved in that process.
3. *Diffuse and short-term risks*: If the risk is diffuse but short-term, then risk losers and gainers can be consulted only minimally because they are numerous and scattered. In contrast, the perpetrators and managers, if only because they are fewer and more easily identified, can more readily participate in the risk decisions, but they too may be somewhat scattered and decisions must be made quickly.
4. *Diffuse and long-term risks*: This is the hardest case of all for stakeholder involvement. Both losers and gainers are not only numerous and scattered; most are not born yet. And while key present-day perpetrators and managers can sometimes, with difficulty, be identified and engaged in deliberations, the longevity of the risk means that their successors will inherit the consequences of past decisions without having had the opportunity to “weigh in” on those decisions.

Clearly, what I’m alluding to is an age-old problem; one not restricted to environmental risks. We all have inherited the consequences of decisions by those who have gone before us, and we cannot avoid making decisions that will have consequences for those who come after us. The question is not whether to make those decisions, but how?

This leads to a key question: When should stakeholders participate centrally in environmental risk decisions? In other words, when should they drive the decision process and its outcomes? In considering

this question, one needs to consider normative criteria. Below are four fairly common, widely accepted criteria for an ethically sound environmental decision-making process in which stakeholders are placed in a central, decision-making role:

- *Adequate* representation of the interests and concerns of each stakeholder type.
- A *roughly* equal balance among the types of stakeholders in the decision-making process.
- A *rough* equality of knowledge, or of access to information and ability to learn.
- A *roughly* equal ability to devote the time to participate.

These criteria can be met much more readily with local, short-term environmental risk decisions than with the other three categories of environmental risks. As the spatial dimension of the risk becomes more diffuse and as its temporal dimension becomes more long-term, satisfying these criteria – especially the first two criteria – becomes increasingly unlikely. The plausibility of true, robust stakeholder involvement diminishes. If only for this reason, the role of stakeholders and, especially, stakeholder-based deliberations in the decision-making process should then become less central, although stakeholders may (and should) still have opportunities for input. This point is summarised in Table 2.

Table 2. **Appropriateness of stakeholder-centred environmental decision making**

Temporal dimension of environmental risk	Spatial dimension of environmental risk	
	Local	Diffuse
Short term		
Long term		

In conclusion, I would argue that as we move toward diffuse, long-term environmental risks – especially those with large uncertainties and potentially grave consequences, such as those typified by high-level radioactive waste disposal – we need to move away from a stakeholder-centred model of environmental decision making. Instead, we need to move toward a model that (1) draws upon the concept of collaborative learning, and (2) emphasises the long-term common good. Collaborative learning (which also has been referred to as adaptive work [12] or transformative facilitation [13]) is

especially appropriate when values are diverse and the dimensions of the problem and its possible solutions are not well-understood [14]. Emphasis on the long-term common good calls upon people to think of themselves, not simply as self-interested stakeholders, but also as trustees for the well-being of other people and the environment [6].

Together, the concepts of collaborative learning and the long-term common good suggest that, especially on decisions involving diffuse and long-term environmental risks, the decision process should challenge prevailing knowledge and values without being adversarial. It should be deliberative and iterative, with incremental steps revisited as needed. And it should have as a goal a sustainable future for all, rather than focusing on satisfying the interests of stakeholders who happen to be present. This ideal is far easier to prescribe than to implement. Nevertheless, it should not be abandoned as an ideal.

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Participation of Stakeholders in Waste Management Decisions: The German Experience

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Definitions

- Participation here means different kinds of public involvement in decision-making processes finally resulting in a licence.
- Waste management here means final disposal of radioactive waste.
- German experience means the author's experience.

Responsibilities and actual situation

According to the Atomic Act the German Federal Government, represented by the Ministry of Environment, Nature Protection and Reactor Safety is responsible for the final disposal of radioactive waste. Licensing authority for disposal facilities is – acting on behalf of the Federal Government – the Ministry in charge of the State, where the (potential) disposal site is situated. In the case of the Gorleben and Konrad sites, discussed here, this is the Ministry of Environment of Lower Saxony. Applicant for (and later operator of) the repository is the Federal Agency of Radiation Protection (*Bundesamt für Strahlenschutz*).

Four (potential) sites for the final disposal of radioactive waste are actually under discussion in Germany. Two of them, the Gorleben and the Konrad sites, are the main sources of German experience in stakeholder participation. Gorleben is a salt dome, which was under investigation since 1979. Konrad is a former iron mine being in the last phase of the licensing procedure. It is planned as repository for negligibly heat generating waste. Both sites were (and are to some extent) in dispute between the Federal and the Lower Saxony government as well as between stakeholders with different interests.

Recently a consensus between the Federal government and Nuclear Power Producers was achieved about the phase out of nuclear power production in Germany. As a part of this, a three to ten-year moratorium of the further underground investigation of the Gorleben salt dome and the disclaimer of the immediate execution of the Konrad license, after it has been granted, was agreed upon.

A working group “Methodology of Disposal Site Selection” was established by the Federal Ministry of Environment to develop a new siting procedure for a repository able to hold all types and amounts of radioactive waste accumulated during the remaining operating period of the nuclear power plants.

Stakeholder participation

So far, there is no general approach in Germany to risk communication and public or stakeholder participation in decision making. According to the *Atomic Act*, however, formal public participation with a public inquiry is required as one of the final steps of licensing procedures for disposal facilities. At this step all important decisions related to the disposal concept, siting and site investigation have already been made.

Beside this formal participation the responsible organisations are undertaking different actions to inform the public about their activities in final disposal. Most of these actions were or are only information, such as the presentation of investigation results in information centres near to the Gorleben and Konrad sites.

A few more extensive actions with some similarity to participation were undertaken during the early 80s within the Gorleben licensing procedure (see Section 4.).

Phases of stakeholder participation

Most of the German experience with public and/or stakeholder participation was gained during the siting and licensing processes of the Gorleben salt dome and the Konrad mine. These processes can be divided into several phases which are related to decisions defining the continuation of the processes. Some phases are described with respect to the decision made, the kind of public participation and special aspects:

Strategy development

In the 60s and early 70s the German final disposal strategy was developed.

Decisions: Final disposal of all types of waste in deep geological formations; host rock: rock salt in salt domes.

Public participation in decision making: None.

Information of the public during the decision-making process: None. The interest of the general public and even the scientific community not involved in the discussion was rather poor.

GORLEBEN

- *Nuclear Disposal Centre (1973-1975)*

On behalf of the Federal government the salt domes in Lower Saxony were evaluated for their potential as sites for the – at that time – planned Nuclear Disposal Centre (including reprocessing of spent fuel).

Decision: Three salt domes were identified for investigation and comparing evaluation (Wahn, Lichtenhorst and Lutterloh).

Public participation in decision making: None.

Information of the public during the decision-making process: None or poor.

The start of the investigations surprised the people living in the surroundings of the selected sites. Sudden increase of interest in final disposal and (local) opposition against investigations. The Minister-President of Lower Saxony asked the Federal government to stop the investigations and suggested that Lower Saxony itself should propose a salt dome.

- *Nomination of Gorleben (1977)*

The government of Lower Saxony carried out its own site-selection process on the basis of paper studies.

Decision: The Gorleben salt dome is to be investigated.

Public participation in decision making: None.

Information of the public during the decision-making process: None.

Immediately after the nomination arose local and regional opposition against the decision. In the public and parts of the scientific community the geological arguments named for the Gorleben salt dome were estimated as an excuse of a politically motivated decision (low population density in county of the site): The arguments did not (and do not) fit properly with the relevant characteristics of the salt dome; other salt domes seemed as good (or better) than Gorleben.

- *Decision for underground investigation (1983)*

Between 1979 and 1983 the salt dome was investigated from the surface. In the early 80s the (then responsible) Federal Ministries of Research and technology and of the Interior presented information about site specific activities to the public within an information programme (“Energy Dialogue”) generally aimed to transmit the efforts in the field of energy evolution to a broad public.

In 1981, 1982 and 1983 three meetings in the Gorleben area were organised to inform the local and regional public about the results of the surface bound investigation and methodological approaches and preliminary results of safety analyses for the disposal project and their relevance for further site investigation and the potential site suitability. The meetings in 1982 and 1983 and their results were announced as being fundamental for the Federal government’s decision making on the underground investigation.

Decision: Underground investigation of the Gorleben salt dome is to be carried out.

Public participation in decision making: Kind of, but no real participation (representatives of selected stakeholder groups): Decision on underground investigation was not open. Funding of “non-official” speakers, but not sufficient to prepare for intensive discussion on the results of investigations.

During the first meetings in 1981 and 1982 lectures were held by scientists and technicians belonging to the organisations involved officially in the “Gorleben process” and scientists from universities and environmental organisations. The latter were invited by the Ministries on recommendation of an organising committee. Members of the committee were (among others) representatives of the German Federation of Unions (*Deutscher Gewerkschaftsbund*, DGB) and the Lower Saxony Evangelical Protestant Church, local and regional politicians and some scientists. The representatives of the Federation of Unions and of the church had a function similar to what we would call today mediators.

The meetings’ schedules were designed to allow for controversial discussion under broad participation of the audience. Therefore extended time was reserved for discussion after the lectures. This approach may be interpreted as a kind of participation of stakeholders.

At the third meeting (“Before sinking the shafts”) only representatives of the organisations responsible for final disposal or involved in site investigation as contractors were presenting the results of recent investigations and their interpretation with respect to the decision on underground investigation.

During all meetings there was an extended controversial discussion between the “officials” and the audience (including the invited speakers from not-involved organisations). During the third meeting divergent assessments of the investigation results within the group of investigators became obvious. To many people it seemed clear that the results did not really suggest the underground investigation. Instead, they saw a discrepancy between the real geological situation at the salt dome and the expected future results of safety analyses. Concerned scientist interpreted this discrepancy as the result of an insufficient methodology for the assessment of the investigation results.

Especially the last meeting was widely interpreted as a trial to convince the public of a decision that has been taken before. This confirmed many local people in their distrust of the “officials” which was provoked by the politically motivated but scientifically justified decision for Gorleben. This distrust did and does not only hit the politicians responsible for the decision but – to some extent – the scientific Agencies and their representatives too.

KONRAD MINE

The nomination of the Konrad mine as a disposal site for negligibly heat generating waste was not the result of a site selection procedure but of the search for a follow up use for the unprofitable iron mine. Between 1975 and 1982 investigations were carried out, resulting in a general suitability statement and the license application in 1982. Continued investigations were aimed to the preparation of the safety assessment to be presented within the licensing procedure.

During the 80s some efforts were undertaken by the applicant to inform the public about the investigation results. The information meetings, however, did not contribute to public confidence in the procedure, because from the beginning its basis was judged as not justified. This procedural mistake was never healed during the licensing procedure.

In 1991 the required public participation began. Between September 1992 and March 1993 the required public inquiry took place, organised by the licensing authority, the Lower Saxony Ministry of Environment. 10,000 objections against the Konrad project were presented from about 290,000 objectors, amongst them not only individuals and non-governmental organisations but also several communities. Main topics of concern were the justification of the repository, waste characteristics, long-term safety and transport of the waste. In general, the discussion was detailed and comprehensive, even about topics without or with minor significance.

The inquiry was strongly influenced by the fact that the Federal government and the Lower Saxony Ministry of Environment had (and have) different positions on the mine. In several procedural questions the licensing authority was overruled by the Federal government. An open discussion about the justification of the project was not possible anymore.

The German experience

- Credibility is based on confidence in the responsible institutions. Confidence in institutions is depending on their long-term behaviour and acting.
- It is very difficult, if not impossible, to heal early procedural mistakes affecting credibility. The only way is to go back to a point before the mistake was done.
- The most critical phases of the decision-making processes Gorleben and Konrad were the site selections/nominations. At that moment many individuals, different stakeholders and institutions with special interests in the site became involved. In both cases the decision was not accepted by a larger part of the public due to lacking justification of the site decision and/or the project in all.
- A comprehensive disposal strategy, related technical concepts and proven siting and assessment methodologies are needed. Changes in strategy, concepts and methodologies must be convincing and have to be discussed in detail prior to implementation.
- Scientific arguments can be misused as tactical elements in politics. That may reduce not only the politicians' but also the site-selecting scientists' credibility.
- Before starting a licensing procedure the discussion about benefits/risks and justification of the project and its alternatives has to be initiated. In all phases of the decision-making process is public participation essential.
- In different phases of a decision-making process different parts of the public and different stakeholders will participate in the process. As well will the kind of participation change during the process?
- So far there is no approach to phase related stakeholder and public participation during decision making in final disposal of radioactive waste. The Working Group on Methodologies for Disposal-site Selection, therefore, will develop not only a procedure for site selection but also new approaches to public involvement into the stepwise process of decision making.

SKI's and SSI's Experiences from Their Participation in the Siting of a Final Repository for Spent Nuclear Fuel

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Introduction

This paper summarises some experiences gained by the SKI and SSI during the ongoing process for siting a final repository for spent nuclear fuel. The focus is on activities in the municipalities involved in the siting process. In order to give the proper context some basic elements in the legislation, which are important for public participation and confidence in the siting process, are outlined. The importance of clearly defined responsibilities and early participation of the regulators in the siting process are emphasised.

It should be pointed out that this paper is not a comprehensive review of the Swedish situation but only contains a few selected issues and personal remarks from the authors. Thus, the views and opinions do not necessarily coincide with those of SKI and SSI.

Division of responsibilities

The Swedish legislation stipulates that the holder of a licence to conduct nuclear activities shall adopt the measures necessary to “in a safe manner, handle and dispose of waste generated by the activity or [...] nuclear substances which are not re-used”. Thus, the nuclear power plants have the technical and financial responsibility for siting, developing and constructing a final repository. The task for SKI and SSI is to ensure that the nuclear power plants live up to their responsibility. The authorities must also clarify in their regulations the safety and radiation protection requirements for final disposal and the required facilities.

The nuclear power plants have assigned their legal obligation to develop and implement final disposal measures to the jointly owned company, the Swedish Nuclear Fuel and Waste Management Co., SKB.

The siting process

An important step in the nuclear waste programme was taken by SKB in 1992. SKB then initiated an active siting programme by informing all Swedish municipalities (about 280) about the programme and invited them to participate in the siting process, on a voluntary basis. It can be said that municipalities at this point become stakeholders in the Swedish nuclear waste programme.

There are currently six municipalities involved in so-called feasibility studies for a final repository for spent nuclear fuel. These studies are entirely based on existing material, *i.e.*, no drillings are made. In a second phase at least two sites will be chosen for careful site characterisation, including extensive drilling programmes. In the third phase one site will be chosen for detailed characterisation which in practice means construction of a first part of the final repository. Detailed characterisation requires a license from the government, based on extensive regulatory review. A licence application might be submitted in the period 2005-2010 and initial operations of the final repository could then start in the 2010s.

The feasibility studies will be concluded during the year 2000. Preliminary final reports for all six municipalities have been published by SKB. The municipalities have reviewed (or are currently reviewing) SKB's preliminary reports and the final reports will account for the review. Typically the municipalities have submitted the reports to 50-150 different organisations (*e.g.*, local and regional administration, political parties, neighbouring municipalities and interest groups of all kinds), mostly locally/regionally based but often also some academic institutions.

SKB's plans to suggest at least two sites for site characterisation in December 2000. At the same time SKB will also present amendments to the latest research programme according to certain conditions defined by SKI and the government.

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.*, 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.

Stakeholders

A discussion on stakeholders in the Swedish nuclear waste management programme must first of all recognise that there is not a formal definition of a stakeholder and that the concept is rarely used at all. 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.
- Affected individuals.

In addition to these parties the County Administration Boards have important functions. They are requested to assist the implementer in identifying stakeholders and to facilitate consultations and exchange of information.

The stakeholders are active to varying degrees and in different ways depending on the actual phase in the siting process. Some brief comments on each stakeholder are given below from the SKI and the SSI perspective.

SKB

SKB is of course one of main stakeholders and has many tasks in the siting processes. According to the legislation SKB must *e.g.*, both provide information on their activities and consult those affected of the siting. Although there is a clear division of responsibilities between SKB on the one hand and the authorities on other hand there is frequent confusion among the public about the difference between *e.g.*, SKB and SKI.

Thus, an important lesson learned for SKI and SSI as well as for the SKB, is that it is of great importance to spend a lot of time to clearly explain the roles of each organisation. In the early phase of the siting it is at least equally important to discuss roles and responsibilities, as it is to describe basic technical aspects of the disposal concept.

Since the start of the active siting process in the 1990s SKB's attitude to public participation has evolved from an "information approach" towards a more transparent and communicative approach.

SKI and SSI

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 1980s 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.

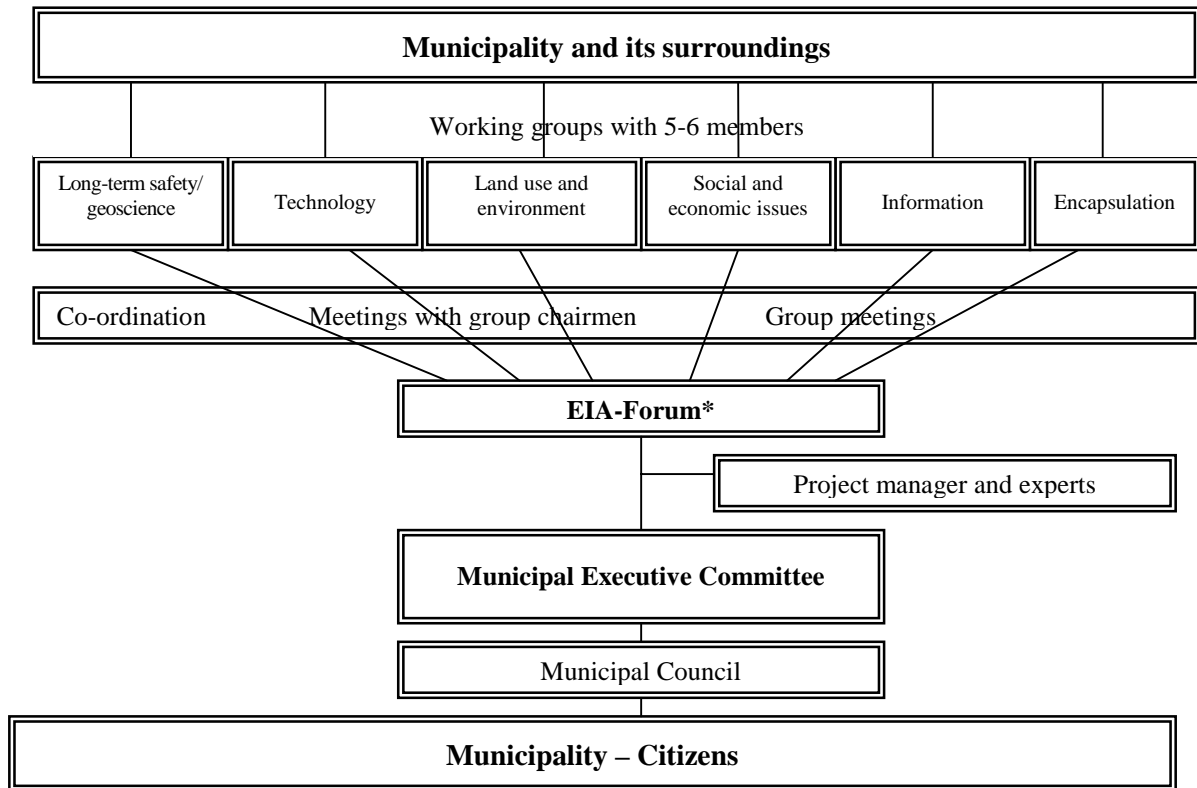
The experience is clear that regulators both can and should participate in the siting process and that it can be done without compromising integrity, independence and credibility. This is for example supported by the fact that good co-operation has been established between SKI/SSI and the municipalities, *e.g.*, public meetings, seminars and the development of the decision process.

Municipalities

All municipalities have established organisations for monitoring and providing input to SKB's studies. However, the most important task for the municipal organisations has been to inform the local populations about the feasibility studies and to engage in dialogue with people. There are at least two purposes (more or less explicit) for establishing this dialogue. In the dialogue issues emerge which provide input to the feasibility studies so these become as comprehensive as possible. Furthermore, the dialogue provides a good basis for the municipal reviews of the feasibility studies and the subsequent decisions.

The municipalities all have different organisations for their participation in the siting process. However, in all cases the municipal council has decided the tasks and mandate for the organisation and in all cases dialogue with the local populations has the highest priority.

The figure below illustrates the organisation used for the feasibility study in Oskarshamn.



* EIA-Forum: A group of representatives from implementer, regulators, County Administration Board and municipality.

Oskarshamn's organisation for the participation in the siting process

National environmental organisations

The national environmental organisations rarely engage in the siting process. This is to large extent based on their fundamental criticism of the siting process. They for example claim that it is not acceptable to start siting before a firm decision has been taken on the method to be used. Most of them also opposes the concept of disposal, which they consider unsafe, and claims that alternatives have not been given the proper attention. There are also financial limitations for their ability to engage extensively in the siting process. Therefore it has been recommended to the government to consider whether it possible to provide funding but no decision has yet been made.

Local interest groups

Most of the parties involved in the siting process consider participation of the local groups important and beneficial to the siting in general and to the critical review of the feasibility studies in particular.

Local interest groups are very active in some municipalities and are virtually absent in others. It is more or less impossible to make a general characterisation of these groups; they are individual and must be respected as individuals.

Affected individuals

In the feasibility studies it is usually not possible to identify individuals that might be directly affected by a final repository (*e.g.* land owners). When the siting process proceeds and possible areas for site characterisation etc. are identified it will be possible to identify those directly affected.

The approach taken by both SKB and the municipalities is to reach out to the public widely in order to prepare for the forthcoming phases in the siting. Also SKI and SSI participate, in collaboration with the municipalities, in activities directed towards the public.

Volunteerism and funding

As described above 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. Even if volunteerism means that a municipality can say no to a new stage in the site selection process, it is a fact that the municipalities concerned feel that the commitments towards accepting a final repository in the municipality become greater with each new stage that they approve.

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 NGOs should receive stakeholder funding. In the review of SKB's latest research programme 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. It should however be pointed out that the municipalities could fund activities of the local NGOs. This is also done in practice. Typically the municipalities have paid certain activities arranged by the NGOs. In one municipality an NGO controls ca. 10% of the municipality's budget for the siting process. This has for example allowed the NGO to have a part-time employee.

National concern with a local solution

A dilemma in the debate on the siting of a final repository for spent nuclear fuel is the fact that it is a national concern requiring a local solution. The political leadership in the municipalities has repeatedly asked for better support from the government and politicians active on the national level. The government has on the other hand maintained that it should not engage too much since it will make the final decision.

The government cannot grant a licence for a final repository without the consent of the concerned municipal council. However, under certain circumstances there is a theoretical possibility for the government to overrule the municipal veto. Although this possibility has never been used and would in practice be essentially impossible to use, the mere existence of the possibility has occasionally caused debates and controversies in the municipalities. Even if there are good formal reasons for the government to be able to overrule a municipal veto it is clearly an obstacle in a siting process based on volunteerism.

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 RISCOP 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.

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.

However, the factual statements and the values held by the regulators also need to be evaluated by the public as well as their authenticity. For example, radiation protection criteria are one important area where the principles of transparent decision making should be applied. In fact the criteria are the starting point for the safety analysis that SKB will have to present for a final repository. The criteria identify the questions that the safety analysis needs to answer. The development of radiation protection criteria may thus be as important as the safety analysis itself regarding the evaluation of value statements.

The following sections describe two channels for stretching, which were viewed as particularly useful by the RISCOP project.

Environmental Impact Assessment

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 municipality of Oskarshamn in Kalmar County, which is used as an example here. As a background it should be mentioned that there are three nuclear power reactors, as well as the Swedish central interim storage for spent fuel (CLAB) in Oskarshamn. Thus, the municipality has long experience of interaction with both nuclear industry and nuclear regulators.

In 1994 an EIA-Forum in Kalmar County was created at the initiative of Oskarshamn. The Forum was originally created because SKB proposed to localise the encapsulation plant for spent fuel to CLAB. However, the Forum has since expanded to include also the enlargement of CLAB's storage capacity and SKB's feasibility study for a final repository for spent fuel in Oskarshamn.

The EIA is structured into three phases (see table below) and all of them have actually been carried out for the enlargement of CLAB. Of particular interest for the regulators were the two "hearings" that were held after SKB had submitted the application for the enlargement (further discussed below).

The framework for the EIA in Kalmar County

Phases in EIA	Actors	Activities	Product
Phase 1 Pre-study	All stakeholders ¹	Meeting with EIA-Forum ² . Local meetings, hearings etc.	Advice on the EIS
Phase 2 Implementers work	Implementer	Project work	Licence application
Continued EIA	All stakeholders	Seminars, hearings etc.	Understanding
Phase 3 Final phase of EIA ≈ first phase of licensing	Regulators interacting with municipality	Review and decide. Hearings	Improved licence application

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.

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1. Stakeholders include implementer, regulators, County Administration Board, municipality and the public.
 2. EIA-Forum: A group of representatives from each stakeholder.

A key ingredient for the success has been that the procedures are flexible enough to accommodate new needs as they appear during the process. It has also been very valuable to be able to “test” the framework on the enlargement of CLAB. Since all phases were carried out for CLAB it has given the stakeholders confidence in the procedures.

Hearings

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. As exemplified above 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.

As already mentioned hearings were tried in the decision process for the enlargement of CLAB. SKI and SSI held a first hearing when SKB had submitted their application. At the hearing the application was presented by SKB and SKI/SSI presented the framework and scope for the review. A second hearing was held together with the National Licensing Board for Environmental Protection (responsible for the review of “conventional” environmental protection) when SKI and SSI had published preliminary review reports. Using the RISCUM terminology these hearings served the twofold purpose of stretching SKB as well as the regulators.

A second example was a hearing, arranged by Oskarshamn municipality, aimed at stretching SSI and SKI. In 1997 SSI submitted draft regulations for disposal of nuclear waste and spent nuclear fuel. At the same time SKI submitted premises for complementary safety regulations. The purpose of the hearing was to test the basis for the criteria as well as the authenticity of SKI and SSI. Furthermore, it was an attempt to engage the public in a dialogue about regulatory criteria. Even if the hearing did not lead to any significant changes in the actual criteria it led to greater understanding at both SKI and SSI for the need of close co-operation when developing and presenting radiation protection and safety criteria.

Conclusions

- The regulators must be independent and have the capacity to review the safety assessment of the implementer.
- The regulators also have the challenging task to be people’s experts in stretching the implementer.
- The regulators should be exposed to stretching by other stakeholders.
- Experience shows that regulators should engage early in the pre-licensing phase, *e.g.* in EIA and siting, and that this can be done without compromising the independence and integrity needed in the licensing phase.
- EIA appear to be an efficient “vehicle” for public participation.
- The EIA should be complemented with hearings, in both the pre-licensing and licensing phases, since these increase the transparency of the decision-making process.
- Hearings should be designed to avoid adversarial relations, which would otherwise make the stakeholders act more strategically than communicatively (in order to “win the case”).
- The State funding of the municipalities’ activities in the siting process has been extremely important.

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Deliberations of Working Group 3: *Stakeholders and the Public: Who Are They?*

Chairperson: *Simon Webster*

The working-group deliberations opened with a general discussion centred primarily around the issues introduced in the two papers presented that morning in plenary session: “Who Are Stakeholders in Environmental Risk Decisions?” (M. English, University of Tennessee, USA) and “Participation of Stakeholders in Waste Management Decisions: The German Experience” (D. Appel, *Arbeitskreis Endlagerstandorte*, Germany). In general, the interventions by the group were open and frank and adequately covered the key issues of the subject. This was followed by a presentation on the views and experience of the current siting debate in Sweden from the perspective of the regulatory bodies (M. Westerlind, SKI) and a brief summary by the Chairman of the definition of the public in EU legislation and International Conventions. The majority of the working-group members contributed actively to the debate, and the discussions were conducted in an informal and open-minded manner. Hereinafter are the main observations made during the working group deliberations.

Stakeholders

- The term can mean different things to different people, for example it can mean someone who has a vested interest or a preconceived view, or simply someone with a role to play in the process.
- With this in mind, the question was raised whether or not the regulator should be regarded as a stakeholder. The majority view was that because the regulator has a clear role to play then he should be considered a stakeholder. However, it is clear that in one or two countries this view is not universally shared.
- It is relatively easy to define a list of “stakeholders” (*i.e.* people or groups with a clear role or interest). For example, there are lists in the background information for the FSC workshop. However, it should be appreciated that the involvement of any one group will vary over time and depend on the stage in the process (*i.e.* the procedural step defines who the most relevant stakeholders will be). With this proviso in mind, we can draw up a general list of possible stakeholders (in no particular order of importance):
 - Developer/operator.
 - Local community representatives/elected officials (NB the structures & roles of local government differ markedly from country to country).
 - National/regional government ministries/departments.
 - Regulator.
 - National/local NGOs.
 - Local pressure groups (could be either for or against the project).
 - International organisations; these should not be overlooked since there are important international obligations in this field, *e.g.*, Article 37 of the Euratom Treaty¹ (EU Member

1. Treaty establishing the European Atomic Energy Community.

States) and International Conventions such as Espoo¹, Aarhus² and possibly the Joint Convention³.

- As an example of how the stage in the process will determine which of the above stakeholders will be most concerned, consider the difference between a Strategic Environmental Assessment (SEA) affecting general “policies, plans and projects” and an Environment Impact Assessment for a specific project proposal. In the former case there will be involvement of national and/or regional government as well as likely involvement of national NGOs. It is unlikely that local groups or even the regulator would be involved at this stage, though both these stakeholders will become increasingly involved as the process moves to the stage of EIA of projects proposed at specific sites.

The public

Unlike the term “stakeholder” there is often a definition of “the public” or “the public concerned” in legal texts on the environment. For example:

- The EIA Directive(s)⁴ simply mention(s) the “*public concerned*”.
- The Espoo Convention defines the term “the public” as “*one or more natural or legal persons*”.
- The Aarhus convention defines “the public” as “*one or more natural or legal persons, and, in accordance with national legislation in practice, their associations, organisations or groups*”.
- In addition, the Aarhus Convention defines “the public concerned” as “*the public affected or likely to be affected by, or having an interest in, the environmental decision making*” and it specifies that for the purposes of this definition “*non-governmental organisations promoting environmental protection and meeting any requirements under national law shall be deemed to have interest*”.

It should be mentioned that the main legislative vehicle for involving the public in the siting process is EIA legislation (for example the current siting debate in Sweden). The importance of EIA legislation in this regard should be stressed.

Conclusions

- The term “stakeholder” is at best a convenient label to cover all persons or groups with an “interest” in the project, though it is open to misinterpretation.
- The majority view in the working group was that the term should be understood as somebody with a role to play in the process.
- The stage in the process will often define who the most relevant stakeholders are.
- In the debate over stakeholder participation, the most important and difficult aspect is not the identifying of the persons/groups involved but the defining of the interactions between these groups and their respective roles/responsibilities/rights.
- Not all stakeholders in one particular group will necessarily have the same opinion (*e.g.*, the local population will often be divided on issues, either along age lines or because of employment issues).

1. *Convention on Environmental Impact Assessment in a Transboundary Context.*

2. *Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters.*

3. *The Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management.*

4. *Council Directive 97/11/EC of 3 March 1997 amending Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment*

- Regarding “future” stakeholders we can only do what we think is best for them (though this could lead to conflicting priorities, since if we allow them a possibility of still “playing a role” then the waste must be left in an “accessible condition”, but this would not conform to a passively safe situation).
- EIA is the main legislative instrument assuring public involvement in general in the siting process. This is to be encouraged and developed, and is a means of treating radioactive waste siting issues on a par with other environmental projects of a controversial nature.

Implications for the FSC

- It is recommended that the membership of the FSC be reviewed by the RWMC at regular intervals to ensure that as many of the interested parties (stakeholders) as possible are included and all the procedural steps are covered (or at least the steps that are currently the most relevant).
- The question of whether the FSC is the most appropriate name should also be reconsidered. For example, does the term “stakeholder” alienate certain groups (in certain countries)?

Topic 4

Is There a New Dynamics of Dialogue and Decision making?

Lessons Learnt from the DECI Project on Different Processes for Public Participation and Transparency in Decision making

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Introduction

This study emanates from the work in Oskarshamn to build a process for public participation related to the site selection for a nuclear waste repository (the “Oskarshamn model”). The idea was to see how these experiences could be useful in a broader context of decision making in complex issues, especially considering issues of common interest in the Baltic Sea Region.

A pre-study for a “Decision Institute”, DECI, was initiated to describe problems in today’s society that DECI would address, explore methods for the enhancement of transparency and public participation, and to suggest approaches for research and application.

The study was financed by Swebaltcop (a EU Baltic Sea Co-operation Programme), the Regional Council in Kalmar County, and the Municipality of Oskarshamn. It was conducted by an interdisciplinary research group from Karinta-Konsult, the Royal Institute of Technology and the University of Gothenburg. Besides the work in Oskarshamn, results from the RISCOP Pilot project and current developments in Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA) were in particular taken into account.

This presentation:

- Addresses problems with decisions on complex issues.
- Discusses reasons for public participation.
- Gives a framework for transparency.
- Describes a number of procedures aimed at public participation and transparency.
- Gives a framework for how procedures can be structured.
- Gives some conclusions with regard to present status and future work.

The problem context

- There is wide recognition that participation by citizens in the decision processes is good for the quality of decisions and democracy as a whole.
- For this, it must be possible for the public to see how decisions are made, their factual basis and the value arguments.
- The increasing complexity of today’s society, the complexity of decision processes and the complexity of the underlying factual basis are all factors that work against transparency and participation.
- The complexity makes possible the framing and fragmentation of issues by stakeholders and concerned groups.
- Nuclear waste management, as one example, was early framed as an expert area, and value-laden issues have often been hidden in seemingly objective expert investigations.

Why public participation?

Three rationales for public participation:

- 1) *Political*: stability of decisions, broad responsibility, legitimacy;
- 2) *Knowledge*: wider knowledge base, the public has knowledge that complements experts and politicians;
- 3) *Ethical*: The public is the ultimate source of values in society. The environment, the tax-funds etc., usually at stake in decision making, belong to the public.

A public participation process can be either be a means for direct democracy (decision making) or a support to representative democracy (informative, advisory or part of decision making).

What is transparency?

The RISCUM model for transparency

- To achieve transparency there must be appropriate procedures in which decision makers and the public can validate claims of truth, legitimacy and authenticity.
- Another element in the transparency model is the concept of “stretching”, which means that the environment of the implementers (of *e.g.* a nuclear waste management programme) is sufficiently demanding and that critical questions are raised from different perspectives.
- The values involved in complex issues do not automatically become apparent. Therefore, transparency must be secured by public involvement – and meaningful public involvement can not take place without transparency.

A map of procedures

The study included both overall decision processes (“umbrella processes”) , that eventually can host a number of specific procedures as components, as well as a number of specific procedures. Umbrella processes described are:

- UK Planning Inquiry.
- Strategic Environmental Assessment (SEA).
- EIA Forum, as defined by the Kalmar County, Sweden).
- The Oskarshamn model.

Specific procedures included in the study:

- Expert Committee.
- Science Court.
- Team Syntegrity.
- Dialogue.
- Science Shop.
- Consensus Conference.
- Lay People’s Panel.

The report describes each one of the processes and procedures. Then they are “mapped” in the following dimensions:

- 1) Potential to provide transparency: capacity to evaluate facts, values and authenticity and stretching capacity.
- 2) Extent of public involvement; if the procedures are interactive with the public, if they allow the public to set the agenda.
- 3) How “the public” is represented (*e.g.* with individual stakeholders, open to all, or with political decision makers).
- 4) The role in the decision-making process: purely informative, advisory or part of formal decision making.
- 5) Consensus building or adversarial in character.

Ortwin Renn *et al.* (see reference list) have described in more detail the following models for public participation:

- Citizen advisory committees.
- Planning cells.
- Citizen juries.
- Citizen initiatives.
- Regulatory negotiation.
- Mediation.
- Dutch study groups.

Their map has two dimensions: Intensity of conflict and Degree of complexity. It contains three areas of environmental conflict: (1) knowledge and expertise, (2) experience and trust, and (3) world views and values.

Conclusions

There are many processes and procedures – and more to come

- All of the procedures studied in the DECI report aim to clarify factual issues, but only few address clearly the values involved.
- Only a few (the UK inquiry system and, partly, the Oskarshamn model) have capacity to evaluate the authenticity of experts and stakeholders and stretching capacity.
- None of the procedures is ideal for the sake of transparency.
- Most of the procedures have an advisory function. Only the UK inquiry (and to some extent the Oskarshamn model) is actually in itself a formal decision process.
- A proper balance is needed between adversarial and consensus building elements.
- With proper procedures it is possible to get engaged involvement from the “ordinary” citizens.
- Public participation can have clear impact on the outcome (*e.g.* consensus conferences).
- Broad public participation can take place within the normal framework of representative democracy.
- Which method(s) to use is a matter of matching to the specific type of situation at hand. Furthermore, it will be possible to adjust most of the methods to different circumstances.

Some possible research items:

- How can we evaluate different procedures? What would be the criteria¹?
- How can we develop a systematic framework for the matching of procedures with type of problem and situation in the decision process?
- What should be the role of information technology? This is a new instrument with great potential, but how should it be used?
- How can EIA and SEA as “umbrella processes” be further developed and use specific tools and procedures for enhancing transparency?

1. Renn *et al.* have “fairness” and “competence” as metacriteria. In the DECI report “transparency” is used as metacriterion with its four elements as subcriteria.

Ongoing developments related to the DECI and RISCOP projects

- The RISCOP II Project (Transparency in nuclear waste programmes):
EC – research project, In negotiation with the EC.
- Hearing on site selection in Sweden (Transparency in site selection):
A critical phase in the Swedish programme.
- VALDOR 2001 (Values in risk related decisions):
Symposium – Stockholm, June 10-14, 2001.
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Pre-study finalised, next phase being discussed.
- The VALDOC group: (VALues and rationality in Decisions On complexity):
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**A New Siting Process in France for a URL in Granite:
Lessons Learnt from the Recent Consultation Mission
(January-June 2000)**

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In December 1998, the French government decided to authorise the construction of an underground research laboratory in a clay formation at Bure near the borders of the Meuse and the Haute-Marne *départements*¹, but rejected the selection by ANDRA of a granite site located in the Vienne *département* to build another laboratory. The government announced then that a new granite site had to be selected as the law of December 1991 requires that more than one underground rock characterisation laboratory has to be built and operated before a decision can be made whether or not to transform one of them into a real HLW deep repository.

In early 1999, following these decisions, the government asked ANDRA to conduct “*the work necessary for the preparation of a geological survey, on the basis of indisputable scientific criteria, which will identify the granitic sites worth prospecting to confirm their ability to host an underground research laboratory for deep geological disposal*”. With the help of the French Geological Survey (BRGM), ANDRA identified 15 granitic areas which could be prospected. This selection was made on scientific grounds and approved by the National Review Board (CNE) in September 1999. The 15 areas are located in rural areas of the Armorican mountain range west of Paris and of the western part of the Massif Central.

The law of December 1991 required that “*Any project for the installation of an underground laboratory, before any commitment of preliminary siting operations, shall be subject to a consultation with the elected officials and populations of the sites concerned, according to conditions set by decree*”. The government decided to entrust this consultation to a collegial body.

A three-member consultation mission was appointed by the government in November 1999. The mission was made up of a prefect and two engineers who do not belong to the nuclear generation industry. They had first to get acquainted with the project and to be briefed on the 15 preselected sites from both political and geological standpoints before meetings and discussions in each of these 15 areas could be scheduled. The aim of the mission was not to convince people to accept a laboratory, but to inform local populations on the project in order to gather their opinions. The government considered that an agreement on the largest possible number of areas would offer the best chance of being able to propose one or several of them after further studies.

At the end of January, anti-nuclear protest groups (Nuclear Phase-out Network) revealed the list of the 15 areas on the Net at a period of time devoted to preliminary contacts between the mission and elected officials on each of the 15 sites. As a result, elected officials protested both against this early announcement and the consultation method itself.

In February, the mission met without incident with the elected representatives of the *départements* concerned by the project. The first visit on site took place on March 8-10 in the Corrèze *département*, near Saint-Julien-le-Vendômois. A non-violent demonstration of about 100 protesters

1. A *département* is a subdivision of the French territory administered by a prefect named by the government.

had been organised. Although the demonstration was rather small, the mission couldn't even express itself because the protesters were making too much noise.

The visit in the Mayenne *département* was the second information trip that the mission had been able to schedule. When it arrived at Bais, a small town near Ize, it was greeted by a “violent and insulting” crowd of about 3,000 protesters. When the members of the mission finally reached the meeting hall, the chairman of the local associations announced that the meeting was off and they were then escorted to the borders of the *département* by protesters and farmers on tractors. It took over 5 hours before they were “set free” in the early hours of 14 March. They were then warned not to come back again. The demonstrations in Bais were among the most violent since 1989, when ANDRA attempted to carry out geological survey over the sites selected at the time. Facing growing protests around the sites, especially those in western France such as Neuvy-Bouin¹, then Prime Minister Michel Rocard ordered to stop working on the four sites and called the Parliament to find an issue to the problem. Later, MP Christian Bataille was appointed head of the “first mediation mission” after the vote of the law stipulating the process for setting HLW management policies.

The last official visit of the consultation mission was in Poitiers in the Vienne *département* where 200 citizens protested against it. The Vienne elected officials reaffirmed their consent to host an underground laboratory in their *département* but they required that the local population be largely informed.

In mid April, 10,000 people demonstrated in Quintin in the Côtes-d'Armor *département*. In the Creuse *département*, 34 000 people signed a petition against the project at Crocq-Fernoël. On 13 May, 7,000 people protested in Aurillac, in the Cantal *département*.

At the same time (February-June 2000), the national opposition to the underground laboratories, including the “Green” party, organised locally a number of meetings to protest both against the mission and the consultation principle. As a result, the mission has been unable to gather any opinion or even discuss with the local populations.

Elected officials, belonging to parties from right to left, protested strongly. General councils together with Regional councils carried motions against the URL project. Moreover, hundreds of mayors² within the 15 selected areas joined the opposition to the URL. This opposition is co-ordinated nationally by a coalition of groups that joined forces during the previous government attempt to select possible repository sites in four suitable sites (Meuse, Haute-Marne, Gard and Vienne). This coalition, known as the National Co-ordination against Burial of Radioactive Waste is based in Bar-le-Duc³, where groups are fighting the URL under construction in a clay formation. The National Co-ordination runs a very active Internet site.

In early June, the government ordered the mission to halt its consultations and asked for a final report by the end of June. This report has been made public on 27 July 2000.

Some lessons can be learnt from this consultation mission. Its three members emphasise the lack of information of the populations about the question of radioactive waste management, the 1991 Waste Act and the ensuing decisions made, and the need to increase the objective information about nuclear energy. For example, the concept of underground repository which is widely accepted by the international scientific community is not understood by the public. The general public as well as elected representatives would rather accept repositories underground or even surface disposal under the condition that the waste can be retrieved. They also sense the three directions of research (partitioning/transmutation; underground storage and surface disposal) as opposed rather than complementary. Also, the aspect regarding

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1. The Neuvy-Bouin granitic site (Deux-Sèvres, 100 km west of Poitiers) was already selected to host an underground research laboratory in 1987. Neuvy-Bouin is one of 15 sites selected in 1999 as suitable to carry out studies aiming at building a URL.
 2. Some 850 communities are involved in the 15 selected suitable areas to host a URL.
 3. Bar-le-Duc is the major town in Meuse near the URL under construction in a clay formation in eastern France.

the responsibility and the duties of our generation towards future generations have not made yet the way into the general public and have not been fully explored.

They describe the opponents as citizens who do not want to dialogue but just want the mission to record their refusal of the laboratories. They note the great difficulties encountered to hold an effective consultation. The members of the mission have been accused of being representatives of the “Nuclear Lobby”. This ambiguity has been used by the anti-nuclear opponents during a sensitive period due to the preparation of the name lists for future local elections. The report points out the big controversy which has existed in France for 25 years on the subject of radioactive waste which is now being stored, as it is produced by the nuclear power plants, in La Hague or Marcoule reprocessing plants.

The government restates its will to pursue the implementation of the 1991 Waste Act. Particularly, the government reaffirms the decisions made in December 1998 regarding the underground laboratories and the need for a laboratory in granite. How to go ahead with the research on granite has to be reconsidered. It will be necessary to think about the consultation method and ways to inform the public.

A new national debate including citizens, groups, elected officials and State representatives could be organised to define a new consultation method around radioactive waste management and public health concerns. Consultations for a URL in granite could then resume.

Working with Local Partners: The ONDRAF/NIRAS Approach to the Disposal of Short-lived Low-level Waste

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Abstract

Until the international moratorium of 1983, Belgium relied on sea disposal for its low-level waste. Since then, ONDRAF/NIRAS, the Belgian waste management agency, has launched studies to look for land-based solutions. These studies, which are still ongoing, have gone through various phases. The sometimes harsh reactions in public opinion and the recommendations of independent experts, however, progressively led ONDRAF/NIRAS to question its work methodology.

On 16 January 1998 a milestone was marked in Belgian nuclear waste management. On that day, the Belgian federal government opted for a final, or potentially final, solution for the long-term management of short-lived, low-level radioactive waste, a solution that also had to be progressive, flexible, and reversible. At the same time, the government entrusted new missions to ONDRAF/NIRAS – in particular that of developing methods to enable the integration of final repository project proposals at the local level – and restricted the number of potential sites for final disposal to the four already existing nuclear sites in Belgium and to possibly interested local districts.

The government's decision of 16 January 1998, forced ONDRAF/NIRAS to change its strategy. It set up a new work programme and worked out an innovative methodology. This new methodology aims to generate, at the level of the interested towns and villages, draft projects for a final repository supported by a wide public consensus.

Nuclear Belgium in a nutshell

Radioactive waste management in Belgium is taken care of by ONDRAF/NIRAS, the Belgian Agency of Radioactive Waste and Enriched Fissile Materials. ONDRAF/NIRAS is a public institution, responsible since 1980 for the safe management of all radioactive waste produced in Belgium, including the management of excess enriched fissile materials and the decommissioning of closed down nuclear facilities. Under the supervision of the competent authorities, it co-ordinates and manages various industrial and research activities that are carried out by third parties and aim to protect the present and future generations from the potential dangers of radioactive waste.

Most of the radioactive waste comes from routine industrial, scientific or medical activities. However, an increasing share of it will be generated in the future by the decommissioning of closed down nuclear facilities.

Routine radioactive waste comes for about 80% from the electronuclear sector, and primarily from the operation of the seven nuclear reactors of Doel and Tihange. With a nominal power of 5,7 GWe, these reactors delivered 55% of the national electricity production in 1999. Three other areas of the nuclear sector also produce waste: fuel fabrication (by Belgonucléaire and FBFC International), Belgian spent fuel reprocessing (by the French company COGEMA, for Synatom) and nuclear research (by SCK·CEN, the universities and the Institute for Reference Materials and Measurements). Finally, the non-nuclear industry, agriculture, scientific research and the medical world also produce

radioactive waste. At the end of June 1999, Belgium's stock of conditioned waste was as follows: 10,845 m³ of α waste (low-level and short-lived), 3 786 m³ of β waste (intermediate-level or long-lived low-level), 215 m³ of C waste (high-level and long-lived). That waste is in safe interim storage at Belgoprocess, the industrial subsidiary of ONDRAF/NIRAS, located in Mol-Dessel. ONDRAF/NIRAS evaluates the total volume of A waste that will be produced from now until 2060, *i.e.* the end of the dismantling activities, at 60 000 m³. This evaluation is based on the complete dismantling of each of the seven Belgian nuclear reactors after their exploitation period of forty years. It also implies that the non-nuclear industry and the medical world will continue to use radioelements at the present rate. The total volume of dismantling waste is evaluated at 26,000 m³. Even if Belgium would decide today to close the nuclear power plants immediately, 2/3 of the overall category A waste volume already exists.

Fifteen years of low-level radioactive waste management

Since the constitution of ONDRAF/NIRAS, low-level radioactive waste management has been at the centre of its major concerns. Not only was it the most important volume of radioactive waste concerned – even if this importance is relative with respect to the volumes of other waste produced by our industrialised society – but moreover, sea disposal of conditioned low-level waste, practised on a regular basis in Belgium until the early 80s, became indeed very uncertain, when Belgium decided to adhere to the international moratorium of 1983 agreed upon between the signatory countries of the London Convention on sea pollution. Since then, sea disposal has been banned within the frame of an international convention.

In 1983, ONDRAF/NIRAS had to ensure the continuity of the management of radioactive waste produced by the nuclear fuel cycle – nuclear power stations, nuclear fuel manufacturing plants, research – and by the applications of radioisotopes in the medical, industrial and agricultural sectors.

It soon turned out that no international solutions existed. At the time, the various European countries using nuclear energy had not decided yet which solution to adopt for the long-term management of their waste, except maybe France, that already operated the surface repository of the *Centre de La Manche*, adjacent to the COGEMA plant, Great Britain, that operated the trench repository in Drigg, and in a certain sense also Germany, that operated an experimental repository in a salt formation at Asse. Not only was none of these disposal sites accessible for foreign waste, but by all means, it was clear that the new long-term repository concepts would be very different: Soulaïnes (France), El Cabril (Spain) and Rokkasho-Mura (Japan) were indeed already either embryonic, or in the concept or project phase.

The first strategic choice ONDRAF/NIRAS had to make, as soon as sea disposal was interrupted, was a double one. Should the produced waste be stored in its crude form, awaiting the definition of a new final destination on land and the acceptance thereof by the authorities? If not, how should the waste conditioning processes, initially aimed at sea disposal, be adapted in view of ensuring a safe long-term waste management, that was however not known yet?

It soon turned out that the time needed for developing a final solution on land for waste that was earlier intended for sea disposal, was such that their interim storage in their crude, unstabilised form could not be considered.

Consequently, ONDRAF/NIRAS has developed and implemented a methodology of waste treatment and conditioning and of stabilisation of the treatment residues into concrete and bitumen matrices, and of packaging these matrices into quality standard drums. Once the stabilisation of the low-level and short-lived waste, as well as its interim storage was ensured for several decades, ONDRAF/NIRAS could concentrate on the development of solutions for the long-term management of that waste.

These solutions are not manifold. All along the research and study efforts that have been made ever since, four solutions emerged:

1. Surface disposal in a geologically and hydrologically favourable area for low-level waste of which the content of radioisotopes with a long half-life is sufficiently low, so that it may be considered that its harmful effects will die out after a maximum of 300 years. This solution might persuade ONDRAF/NIRAS to leave the existing nuclear sites, since these sites do not necessarily have a favourable geology or hydrology.
2. Surface disposal in a geologically and hydrologically less favourable area, for the same type of waste, on the condition that the integration of all technical actions taken during the treatment, conditioning and packaging of the waste, and in the facilities in which the waste is sheltered from aggression by air and water, will result in a safe and acceptable situation in the long term. This approach could be basically conceivable at some of the existing nuclear sites.
3. Disposal of the overall volume of low-level waste in existing underground cavities, *e.g.* the coal mines in Limburg that were closed at the end of the 80s.
4. Disposal in new galleries, excavated in deep geological formations, which are considered as a potential host rock for high-level radioactive waste. For Belgium, essentially deep clay layers are concerned, and more particularly the Boom clay layer, in which a laboratory was excavated at a depth of 220 m below the SCK·CEN site in Mol. It is the only laboratory in the world at this depth in clay. Research in this laboratory has been developed since the beginning of the 80s.

ONDRAF/NIRAS's first study on the final disposal of short-lived low-level radioactive waste considered three options: disposal in old coal mines or quarries, shallow-land burial, and deep geological disposal. The corresponding final report, the NIROND 90-01 report [1], published in 1990, concluded that shallow-land burial was the most promising of the three proposed options in terms of technical feasibility, safety, and cost. It rejected the mines or quarries option, which was in fact no more than a type of deep disposal, due to perturbations of the geological formations as a result of the mining activities. It furthermore mentioned that the studies on the Boom clay carried out in Mol demonstrated the need for additional research on the chemical compatibility of the waste with the deep underground. ONDRAF/NIRAS therefore decided, after approval by its regulatory authority, to focus its efforts on surface disposal.

The studies carried out between 1990 and 1993 aimed to assess the technical feasibility of the construction of a surface repository on various types of favourable geological formations. The results were recorded in the NIROND 94-04 report [2], published in 1994. This report concluded the feasibility of disposing at surface level at least 60 % of the short-lived low-level radioactive waste produced in Belgium, while strictly following the recommendations of the various relevant international organisations. It also identified 98 zones on the Belgian territory as potentially suitable, according to the bibliographical survey carried out, to host a surface repository for short-lived low-level radioactive waste.

The 1994 report was rejected unanimously by all the local councils concerned by the 98 zones. To its surprise, ONDRAF/NIRAS had caused a general outcry. And yet, had it not been given the responsibility to develop and propose, through an objective and rational approach, a safe solution to the radioactive waste problem?

Neither the political authorities nor ONDRAF/NIRAS had realised in due time what the implications were in the field of public consensus when it turned out to be necessary to look for a favourable geology outside the existing nuclear sites. As a result, the publication of the NIROND 94-04 report in April 1994 led to a public deadlock.

When technique is confronted with local sensitivities

The working method that ONDRAF/NIRAS applied in the past, aimed to select the future disposal site for low-level and short-lived waste on the basis of a scientific approach that had been carefully worked out by its experts. At that time, ONDRAF/NIRAS thought – maybe rather naïvely – that the actual implantation of a repository would cause no problems once it had conclusively been proven that the chosen site was, from a technical point of view, one of the best possible choices. ONDRAF/NIRAS looked for a solution for the radioactive waste problem in an objective and rational manner. Gradually, ONDRAF/NIRAS realised that important parameters were missing in its mathematical model. The implantation of a disposal infrastructure would inevitably have economic, social and ecological consequences. These parameters were, however, impossible to calculate within the modelling.

In 1995, anxious to unlock the situation, the federal government commissioned a study by ONDRAF/NIRAS on the possible alternatives to surface disposal. The final report, the NIROND 97-04 report [3], published in 1997, compared surface disposal with deep disposal and prolonged interim storage. It recommended that the federal government should base its decision on ethical considerations. Indeed, ONDRAF/NIRAS supports the view that the current generations are responsible to make sure that the future generations will not have to take care actively of the management of the radioactive waste they will have inherited.

All the disposal methods that are being considered nowadays all over the world, are based on two principles: the natural decay of radioactivity in time and the confinement of radioactive waste using successive artificial and natural barriers. The gradual decay of radioactivity is a well-known natural phenomenon that allows a precise prognosis of the time that is needed before the conditioned waste of a specific category no longer constitutes a radiological hazard. It is therefore important to isolate the waste from the environment and to prevent the radioelements it contains from entering the environment during this period. The succession of multiple barriers, as if it were a Russian doll, allows to isolate the waste from the environment. Independently from each other, these different types of successive barriers all help to limit the spreading of radioactive substances in the biosphere, so that the radiological effect of the buried waste is negligible and will remain so compared to the effect of natural radioactivity. The first two barriers are artificial: they are made up of the waste drum and its possible overpack and the disposal facility in itself. The third is, of course, the geological environment in which the first two barriers are incorporated.

The choice of the type of surface or underground disposal depends on the life of the waste it must contain. Short-lived waste can be disposed of at the surface since it is possible to build an infrastructure that remains sound enough during the period of about 300 years, when radioactivity will have decreased enough by natural decay to a level that is acceptable for public health. This infrastructure should, nevertheless, be closely controlled during that period. Disposal in deep geological layers was until recently studied for medium- and high-level or long-lived waste. Nowadays, it is also being considered for low-level and short-lived waste in conformity with the new missions the federal government entrusted to ONDRAF/NIRAS in January 1998. In principle, it does not need any long-term surveillance.

According to the concept developed by ONDRAF/NIRAS for surface disposal, the drums of conditioned waste will be encapsulated in concrete blocks in groups of two or more drums. These blocks will be buried in units also made out of concrete. Several layers of artificial and natural watertight materials will protect these units, since water is the only significant vehicle that can disperse radioactive substances into the environment. The repository units being filled up and buried under several protective layers, the site will be covered by a layer of vegetation that will return to the landscape its natural aspect. The repository will be equipped with drainage tubes allowing to trace potential radioactive leaks in the unlikely case that the artificial barriers would start to show a premature defect. After about 300 years, it will be possible to release the site for other uses.

A new work programme, a new methodology

On 16 January 1998 a milestone was marked in Belgium's radioactive waste management policy. On that day, the Belgian federal government opted for a final or potentially final solution for the long-term management of low-level, short-lived radioactive waste. The government also wanted this solution to be implemented in a progressive, flexible, and reversible manner. With this decision, the prolonged interim storage option was abandoned in favour of either surface disposal or deep geological disposal.

At the same time, the government entrusted new missions to ONDRAF/NIRAS, the aim of which is to allow the government to make, around 2001-2002, the necessary technical and economic choice between surface disposal and deep geological disposal. According to these new missions, ONDRAF/NIRAS has to develop methods, including management and dialogue structures, necessary to integrate a repository project at the local level. Furthermore, ONDRAF/NIRAS has to limit its investigations to the four already existing nuclear zones in Belgium, namely Doel, Fleurus, Mol-Dessel, and Tihange, and to the local towns or villages that are interested in preliminary field studies.

Begin 1998, ONDRAF/NIRAS set up a new work programme and developed an entirely new work methodology. As it was understood that the best way to take the interests of all parties into account is to involve them in the decision-making process of the project, ONDRAF/NIRAS developed the idea of local partnerships. Any party that could be directly affected by a collective decision, should have a say in it. Another innovative aspect of this new methodology is that of integration: an integration at the local level enabling the development of draft repository projects creating new perspectives for the regions concerned.

Extending over four to five years, ONDRAF/NIRAS's new work programme assumes the active participation of all the interested local representatives. The following procedure was adopted:

- Step 1.* Localities with nuclear activities or that show an interest in the project, are screened to ascertain that the construction of a safe repository is technically feasible on their territory.
- Step 2.* In the localities that pass this entrance exam, a local partnership is established with the mandate to work out, over a period of two years, plans for the local disposal project. The integrated project should fit into the development perspectives of the region, should reflect local needs and aspirations, and should secure safety. To ensure that such is the case, the partnership involves local authorities, representatives of local economic and socio-cultural agents and a representative of ONDRAF/NIRAS.
- Step 3.* The projects elaborated by the different partnerships are submitted to panels of experts who comment on the technical, economical, socio-cultural and ecological merits of the proposals.
- Step 4.* The national authorities (the federal government) make the final choice.

At present, partnerships have been formed with the municipalities of Dessel and Mol and another one is on the verge of being formed. In each of the municipalities involved, a university research team of the *Universitaire Instelling Antwerpen* (UIA) and of the *Fondation Universitaire Luxembourgeoise* (FUL) conducts interviews to map the local social and economic structure. This will lead to a proposal on how the partnership should be constituted and on who could be asked to participate in the different working groups that will do the bulk of the work.

The local partnerships are representative

The local partnerships proposed by ONDRAF/NIRAS bring together representatives from all the interested local actors and of ONDRAF/NIRAS. Except for the latter, who is an obligatory partner because of its legal mission and because it will take the final responsibility for the repository studies, potential partners have to be domiciled in the town(s) or village(s) concerned.

Local representatives are first of all the local councils, either of an isolated town or village, or of an association of two or more towns or villages. Other potential partners are local associations with an ecological, professional or socio-cultural character prepared to commit themselves to studying and developing a robust draft project, as well as the nuclear operators in the existing nuclear zones. Groups or individuals who do not belong to the circle of local representatives have the possibility to contribute as associated members, and the local representatives, who are not partners, are able to contribute through the working groups.

Local partnerships should ideally have comparable structures, although they might assume distinct legal forms because of differing local sensitivities. They total four levels, the precise designation of which will be determined by the partnership's legal form, and their functioning is entirely financed by ONDRAF/NIRAS, though within certain budgetary limits. These four levels are:

- The general assembly, that gathers all the partners, represents and legitimises the partnership.
- The management committee, the members of which are appointed by the general assembly, that gathers representatives of the various partners.
- The project co-ordination, which gathers two people appointed by the management committee, manages and co-ordinates the partnership's activities on a day-to-day basis.
- Finally, the working groups are the real activists of the partnership. They work out the project proposal in concrete terms, propose and discuss the possible options among themselves, weigh up the pros and cons, and collect expert opinion. It is at their level that non-partners are able to contribute if they want to.

The local partnerships are responsible for their projects

The local actors, who are given much freedom, serve as reflection and negotiation forums and encourage dialogue at the local level. They propose ideas and develop the corresponding draft projects. They are also responsible for ensuring that the developed repository studies are integrated in global draft projects, which will have to be supported by a wide social consensus and will have to benefit the town or village concerned.

Before each partnership will start to conceive its draft project(s) for integrated disposal, it will gather all the information necessary for a detailed evaluation of the town or village it represents and of its potential disposal site(s). It will do so with the help of the accompanying teams of the UIA, the FUL, and ONDRAF/NIRAS. Next, it will carry out an in-depth study of the technical, socio-economic, environmental, and cultural data thus gathered, before working out one or possibly more integrated repository draft projects.

Afterwards, the partners will negotiate among themselves the various draft projects proposed. They will only proceed with a project and develop it up to the model stage if it complies with two conditions: to be considered safe by ONDRAF/NIRAS and to be seen as a strong enough socio-economic asset in the opinion of the other partners. If one of these two conditions is not met, the case will be closed. The partnership will also work out financial assessments and will draw up recommendations for the realisation and the operation of its draft project(s). (If, because of their geology, certain towns or villages appear suitable for hosting both a surface and a deep repository, the partnership will indeed be entitled to develop two integrated repository draft projects instead of one.) ONDRAF/NIRAS will of course be responsible for the technical aspects of the draft projects and will ensure their safety, thus fulfilling its double role of partner and expert.

The partnership as a whole, and not just ONDRAF/NIRAS, will decide on the priorities and take the decisions all along the project. It will organise the dialogue and communication between partners and will be responsible for keeping the local population informed at all stages of its work, thereby reinforcing the consensus around it.

At the end of the process, each partnership will have developed one, or possibly two, draft projects for integrated disposal, together with their respective methods of implementation. After being evaluated by independent experts in terms of safety, socio-economic added value and cost, they will have to be approved by the local councils concerned. Afterwards, they will be submitted to the federal government, together with the corresponding advice, to enable the authorities to decide, around 2001-2002, which one(s) of the projects it wants to be developed further.

Conclusions

Because it has understood that any party that could be affected directly by a collective decision must be involved in this decision process, ONDRAF/NIRAS has accepted the need to question its past methodology. By proposing a work methodology based on local partnerships to come to a safe and acceptable solution for the long-term management of low-level, short-lived radioactive waste, more room is created to get local participants beyond the stage of boundless suspicion of anything that is “nuclear”. By doing so, the disposal project becomes an integrated development project with local interests at stake, rather than an externally imposed project.

ONDRAF/NIRAS now relies on the voluntary participation of the interested local communities. It wants them to be activists and not merely spectators, and will encourage them to be dynamic and innovative. In accordance with its legal mission, it will be responsible for the viability and the safety of the draft projects proposed and will provide its partners with the necessary financial means and technical support to develop their respective proposals. This approach should, as it is hoped, enable the Belgian federal government to select, around 2001-2002, the integrated repository draft project(s) that it wants to proceed with. ONDRAF/NIRAS will of course take the final responsibility for the safety of the concept, but the concept’s added value and integration at the local level will be the result of the contributions and efforts of everyone involved.

By proposing this new work methodology, ONDRAF/NIRAS acknowledges the possibility of a failure. It does indeed take the risk of ending up, in 2001-2002, without any viable draft project. Should the case arise, the Belgian federal government will have to decide on how to proceed on.

Acknowledgements

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Deliberations of Working Group 4:
Is There a New Dynamics of Dialogue and Decision making?

Chairperson: *Janet P. Kotra*

The context for the working group's discussions was set by two papers presented in the earlier plenary session: "Lessons Learnt from the DECI project on different processes for Public Participation and Transparency in Decision making" (K. Andersson, Karinta-Konsult, Sweden) and "A New Siting Process in France for a URL in Granite: Lessons Learnt from the recently undertaken Consultation Mission (January-June 2000)" (T. Merceron, ANDRA, France). Prior to commencing its deliberations, the Working Group set aside roughly 20 minutes to afford individual members the opportunity to introduce themselves, and to identify their expectations for the Forum, generally, and the working group discussion in particular (these issues and expectations are itemised, below).

As further evidence of change affecting the way waste managers and regulators communicate with their stakeholders, the group heard two presentations of specific case studies of waste disposal programmes encountering and responding to a new dynamic. Belgium's revised approach to siting a low- and intermediate-level waste facility was presented by Ms. Valentine Vanhove (ONDRAF/NIRAS). Key factors in the new approach adopted by the Belgian government were the clear separation of ethical and technical choices, and the pursuit of partnerships with local municipalities. Many members of the working group were clearly impressed with the extent of trust and reliance placed on the decisions of the participating communities (*i.e.* at any time, if they feel the process is not going to their liking, the local communities may withdraw; at the same time, the partner communities thus accept responsibility for defining the process and making it work). Thus far, two municipalities, at Mol and at Dessel, have been willing to enter into these partnerships.

Next, the group chairperson, Ms. Janet Kotra (US NRC/DWM) discussed recent attempts by the US Nuclear Regulatory Commission to encourage greater public involvement in the development of new regulations for the proposed repository at Yucca Mountain. To facilitate discussion and to encourage participation of the working group members, Ms. Kotra's topic was presented as a "point-counterpoint" dialogue with co-chairman, Ms. Claire Mays (SYMLOG), who identified, and in some cases challenged, underlying assumptions that may be leading the US NRC (and other FSC participant organisations) to expect that better communication, in and of itself, will necessarily lead to greater confidence and acceptance. This was followed by an active and lively discussion among all members of the working group. Frequently the "new dynamics of dialogue and decision making" were characterised as a shift from the traditional "decide, announce and defend" approach for which the focus was almost exclusively on technical content, to one of "engage, interact and co-operate" for which both technical content and quality of process are of comparable import to a constructive outcome. The session culminated with the identification of several possible means through which the FSC might contribute to and support member programmes as they endeavour to rise to the challenges posed by the new dynamics of dialogue.

Issues and expectations of Working Group 4 members

- 1) Are there more (or less) effective ways to communicate the need for radioactive waste management and disposal to the public?
- 2) Is it possible to articulate clear, concise, robust lines of argument or principles that would be of use to FSC members facing these new communication challenges?
- 3) How can NEA transform itself as an institution to embrace these issues?
- 4) How can we, as representatives of individual programmes, and as FSC members, recognise and involve different publics?
- 5) How can delegates from different programmes, at varying stages, learn from the successes and failures of other FSC members?
- 6) What is the role of mediation? How can or should it be used most effectively?
- 7) Are there more effective ways to initiate dialogue with a potential host community? How can dialogue be re-established when all communication has broken down?
- 8) Are there tools that can be developed that can assist FSC members as they engage in this evolving dialogue?
- 9) How can FSC members institutionalise sensitivity to stakeholder confidence issues in their respective organisations?
- 10) What are appropriate and meaningful measures of progress or success?

Ways in which FSC could support Member programmes

- 1) Develop guidelines for organising dialogue on key issues.
- 2) Develop a “Tool Kit” of materials that support dialogue on radioactive waste issues.
- 3) Develop guidelines with regard to the use and applicability of different formats for engaging stakeholders on radioactive waste issues (*e.g.*, formats for initiating relationships with stakeholders, formats appropriate for different stages of the process of disposal facility siting and development).
- 4) At some point, dare to invite, or even include, a broader range of stakeholders than currently represented on the FSC.
- 5) Address how best to stretch dialogue participants into sensitive areas (*i.e.*, consideration of the common good, importance or role of retrievability, consideration of the value of a community veto, etc.).

Topic 5

*Are the Waste Management Institutions Set Up for
Achieving Stakeholder Confidence Over the Long Term?*

Which Are Structural Requirements for the Effective Performance of Waste Management Institutions?

Raul Espejo

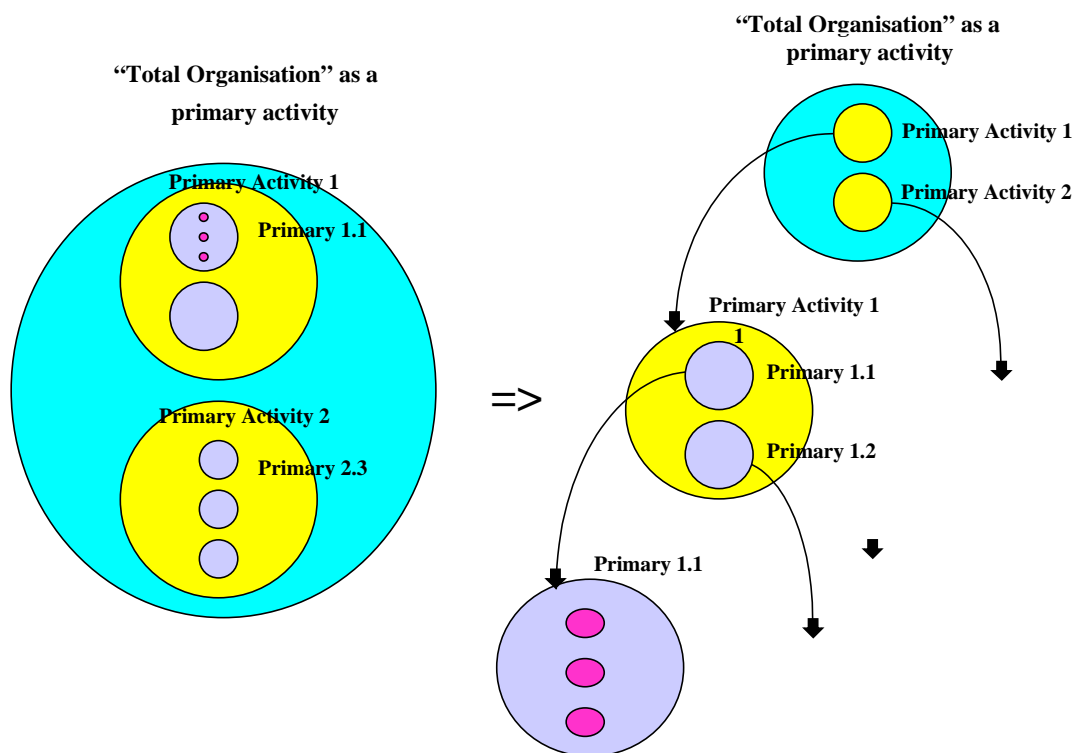
Lincoln School of Management, University of Lincolnshire and Humberside, UK
and Syncho Ltd., UK

In this talk I offer a structural interpretation of the issue of transparency. Transparency requires fostering, producing and maintaining distributed dialogues and communications between those affected by (“the stakeholders”) and those producing relevant expert knowledge (“the experts”) and those producing related decisions (“the decision makers”). The issues raised in these dialogues will not only refer to questions of technical efficiency, but also to questions of what is right and fair and whether the decisions and their implementation reflect what society considers to be good.

Social policies, particularly those of wide social significance, are in one form or another the outcome of multiple meaning creation processes, reflecting their multiple spheres of influence, from the global to the local. This complexity makes apparent that devolving responsibility for meaning creation in large tasks is unavoidable. The problem is to know how to do it effectively. An important strategy is creating the context for autonomous units to thrive within autonomous units. From the perspective of a total organisation I talk about *unfolding its complexity* (Espejo, 1999). This is shown in the next figure.

“Autonomous units within autonomous units” is above all the outcome of self-regulating and self-organising processes. In *social organisations* these units emerge as collectives achieve closure in their interpersonal interactions. From the viewpoint of management, it is apparent the value of understanding how to catalyse *self-organisation* in desirable directions. This is a critical strategy to enhance the performance of an organisation in its environment. Desirable organisations emerge from the interactions of autonomous units, or *primary activities*, producing their social purposes. This applies to each autonomous unit –primary activity- within the organisation, and to each autonomous unit within each autonomous unit, until the self-created complexity of the organisation’s task is fully absorbed. Autonomy should evolve throughout the organisation into smaller units so that each unit takes responsibility for co-evolving with its relevant outside world. Each has to pay attention to its short, medium and long-term. This is a requirement to enhance the organisation’s performance and to manage effectively the complexity of environmental issues. This autonomy is limited only by the need for each unit to respect the cohesion of the larger unit within which it is embedded. And this cohesion requires regulatory communications between the autonomous *parts* in the context of an autonomous *whole*. I call these organisations, based on autonomous units within autonomous units, within autonomous units, and so forth, *recursive organisations* (Espejo, 1989).

Unfolding of complexity



In order for us to see an autonomous system, we must 'see' interrelated resources with closure, capable of *creating*, *regulating* and *implementing* their own tasks. The most common observation, however, is that both in the public and private sector, in large and small enterprises, we create institutions which lack in wholeness. For instance, it is not uncommon to see in the public sector institutions producing policies whose regulation is the responsibility of other institutions and whose implementation is done by yet other institutions. This diagnosis would not be such a problem if people in these institutions saw the need for effective communications, that is, if they were able to see and produce the tacit system. But unfortunately, often this is not the case.

It is clear that in today's societies the rule is fragmentation rather than wholeness, hierarchies rather than respect for autonomy. We are far from recursive organisations, however we ought to be aware of the implications of this fact.

Organisational performance relates to the performance of each primary activity, including of course, the performance of each person. Each primary activity, starting from an individual or a team, has its own value chain, with its own stakeholders. All of them are producing products or services of one kind or another for them. But also these products and services should be aligned with those of the subsuming primary activities they belong to. These performance requirements make it apparent that for primary activities it is not enough to be efficient in producing well-defined products, they have to be effective in adapting to changing internal and external conditions. Primary activities, however small they are, are concerned not only with operational matters but also with strategic and normative matters; this is a hallmark of their autonomy.

This last point makes apparent that performance is much more than being cost-effective. As we become the citizens of a global village, organisations and society must develop far more sophisticated

forms of assessing performance than the traditional management accounting systems in use. Our accounting practices restrict the development of recursive organisations, by forcing them into short sighted performance measurements. For instance, how do we guarantee that the nuclear industry, today highly profitable, will not create global and local catastrophes in the longer run? Unless society develops more effective mechanisms to challenge the activities of such industries and finds ways of *stretching them*, we run the risk of unchecked nuclear activities (Espejo and Stewart, 1998, Andersson *et al*, 1999). They may produce profits in the short and medium term, they may even increase our standards of living, but they may make our world much more fragile.

Beyond cost-efficiency, our organisational activities need legitimacy and authenticity. Performance cannot be only a technical concern, it has to include *legitimacy and authenticity* as well. And, to make these criteria operational we depend on recursive organisations. Technical efficiency, legitimacy and authenticity apply to all autonomous organisations, that is, to all primary activities.

Legitimacy is an assessment made about the grounding of an organisation's actions in social norms; are these actions just and fair? If these actions are aligned with the norms shared by stakeholders they are likely to assess them as legitimate. On the other hand, authenticity is an assessment made about the coherence of an organisation's declarations with its observed identity and actions.

Its stakeholders grant legitimacy to an organisation. Authenticity is recognised in the organisation's actions. These assessments emerge from appreciating the relationships of an organisation's participants, both in its environment and within itself. It is the consistency of these relationships with stakeholders' expectations that produces assessments of legitimacy and authenticity.

An organisation's identity is produced by the relationships between its participants. People develop expectations about these relationships. These expectations are not fixed and indeed change over time. When they apply to the grounded meanings of our moment-to-moment interactions we are referring to operational (normative) expectations, whereas when they apply to our models of the world, we are referring to informational expectations. Breaks in operational expectations produce assessments of legitimacy and authenticity. Of course breaks in informational expectations may incrementally change our world models and with that our appreciation of relationships.

It is an organisation's actions that need to be seen and accepted as legitimate by stakeholders. By creating pressures and questioning their institutions people are often strengthening them. Unfortunately, often this task is left to unrepresentative pressure groups and not to responsible guardians of societal interests.

Legitimacy of an organisation's actions is grounded in its autonomy and, additionally, in modern societies, in the generative regulatory power of their democratic institutions. Legislation and norms often regulate the accountability of organisations to their stakeholders. Of course these regulations need to co-evolve as people's values and expectations change. If they don't, people perceive this mismatch as a gap reducing the organisation's legitimacy.

However, this problem of legitimacy may also be rooted in the way the organisation makes apparent its autonomy. A study of the Swedish Nuclear System, and in particular of its Nuclear Waste Management System, made apparent that the operator, responsible for waste management, (one of its primary activities) had a split identity (Espejo and Gill, 1998). On the one hand, it was an organisation dominated by the commercial ethic of a private enterprise, and on the other, an organisation dominated by the ethic of a public service. This split threatens the legitimacy and authenticity of the operator's decisions and therefore, from the public's perspective, its performance.

This is a particularly significant issue for transparency in decision making. If particular policies and decisions are inconsistent with the way people experience the organisation, people's assessment of the organisation may be that it is not authentic (Wene and Espejo, 1999). The effect of this assessment is far reaching. It makes difficult, if not impossible, the evolution of necessary trust between the

organisation and its stakeholders. Trust is a precondition for communicative action and therefore for people accepting expert views, without requesting full technical transparency. Authenticity is a fundamental attenuator of people's demands upon the organisation. When they assess an organisation as authentic, they are more likely to trust their views and decisions, thus reducing their demands for technical evidence. They trust that the organisation is dealing with their concerns to the best of its abilities. This is very different from a situation dominated by suspicion and mistrust.

Authenticity, in the way explained above, depends on people's ongoing assessments of the coherence of the organisation's moment-to-moment actions with its policies and decisions. Often the gap between the two emerges not from intentional deception but from the lack of organisational capacity for 'making things happen'. This view implies the need for effective organisations with the 'requisite capacity' to relate words and intentions to deeds. The quality of relationships often depends on the complexity that the participants can put in them. Lack of complexity to develop a relationship may produce a gap between expectations and actions, that is, a perception of lack of authenticity. This proposition has structural implications. For instance, the structural recursion of an organisation like a nuclear waste management operator, if it wants to give proper acknowledgement to the long-term effects of this management, may need to map the communities affected by its activities, however large the costs of this mapping might be. Structural recursion is a requirement for transparency (Wene and Espejo, 1999).

This requirement suggests forms of interaction among stakeholders, experts and policy-makers, in order to ground their debates and the implementation of policies in stakeholders values and concerns. The aim is increasing the demands on those responsible for policy implementation, stretching them to offer the best of themselves. I argue that this is the basis for a structural mechanism for transparency.

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Deliberations of Working Group 5:
***Are Waste Management Institutions Set Up
for Achieving Confidence Over the Long Term?***

Chairperson: *Torsten Eng*

Working Group 5 started with a presentation by Mrs Donna Pawlowski from Ontario Power Generation in Canada providing an overview of recent research on the issue of public acceptance of waste management. In its concluding remarks, she identified a trustworthy and credible organisation as one that could be also described as: Open, innovative, flexible, responsive, and fair. This presentation was followed by a discussion of the issues just raised and those raised by Prof. Raul Espejo from Lincoln School of Management, University of Lincolnshire and Humberside, during the morning session. In his talk “Which are structural requirements for the effective performance of waste management institutions?” Professor Espejo had given a structural interpretation of “transparency” and suggested forms of interaction among stakeholders, experts and policy-makers, in order to ground their debates and the implementation of policies in stakeholders values and concerns. In Professor Espejo’s words, the aim was to increase “the demands on those responsible for policy implementation, stretching them to offer the best of themselves.” Overall, these discussions were open and frank, though somewhat theoretical.

The WG continued then with a round around the table during which it was possible to compile the views of all participants on the question “What would characterise a organisation that would earn the trust from the stakeholders (a high reliability organisation)?”. In answering this question, each participant was also asked to consider whether there are differences to be noted according to whether the organisation is an implementing one, authority, municipality or a NGO. Most answers concentrated on the implementer’s role. It was concluded, however, that many of the items listed below are valid for the other actors and, especially, the authorities.

When compiling the list there was a need to structure the answers into 3 groups:

- Organisational aspects.
- Mission(s).
- Behaviour.

The following result was obtained. These are preliminary results that need to be refined further. Given the short time frame on which the exercise took place, inconsistencies amongst answers do occur. The aim here was to record all answers for later use.

What would characterise a organisation that would earn the trust from the stakeholders?

Organisational aspects:

Clear role in the institutional framework

Independent agency

- Independence from waste producer
- Independence from government

Publicly owned

Clear and sufficient funding

- Dedicated funding
- Independent funding

Non-profit organisation

“Learning” organisation

- Formal review process
- Awareness and capability to implement performance criteria at all levels of the organisation
- Measures to implement corrective actions
- Analyse and monitor societal trends
- Being capable to cope with changing environments

Institutionalise internal scepticism

High level of skills and competence in all relevant areas

- Well trained staff to deal with all types of social representatives

Effective and efficient management

Strong internal relations and cohesion

- Awareness amongst staff members of all goals and objectives

Mechanisms and structures for stakeholder interface

- Local organisations
- Mechanisms to implement advice from interested parties

Having an ethical chart/code of conduct

The outsiders must feel that “These folks have their act together”

Mission(s)

Clear role

- Clear mandate
- Clear objectives

A specific known management plan

Formulated articulated and grounded identity

Good operating record

Having the total responsibility for the back-end of the nuclear fuel cycle

- To include also decommissioning

Behaviour

Openness

- Availability to stakeholders' representatives
- Quick response to mass media
- Open and clear process

Transparency

- All items on Internet

Honesty

Consistency

Capability of being "stretched"

Free of arrogance

- Humble

Commitment to staff

Highly devoted and motivated staff

Actively searching for dialogue

Alert and listening organisation

Proactive

Stakeholder interfaces

- Flexibility and adaptiveness to stakeholder interfaces
- Identify stakeholders
- Understand the needs and concerns of the stakeholders

Continuous improvement

- Rewarding the discovery of mistakes

Work as hard as the NGOs

Share the interest of the public at large/potentially affected communities

Actions/behaviours of individuals should be consistent with organisation

Show caring interest

Use third parties to speak for you/allies

Knowing its own limits

Further work in the FSC

As the last point on the agenda the group briefly discussed how further work can be pursued by the FSC on this topic. The indications were:

- To improve the above list further in order to make it more clear and ready for use. In particular:
 - To develop the list into a tool that organisations could use for internal purposes.
 - To use the tool within FSC to identify weaknesses and strong points needing for further discussion.

Conclusions of the Workshop

Yves Le Bars,
Chairman of the Board, ANDRA

The FSC Working groups were set up in this workshop with the following goals:

- To know each other personally, network.
- To hear what each one has to say and learn about the specific conditions that may influence his or her position.
- To set the programme for upcoming meetings.

Five topics were chosen to create a working context for this networking and discussion. Chosen by whom? We had, Hans Riotte, Claudio Pescatore and I, at least, three meetings where we discussed these proposals which had already been considered and approved by the NEA Radioactive Waste Management Committee. Personally, I underlined the importance of the working groups one and five. OECD made a very good job to organise each presentation in this frame.

Here is a brief reminder of the content of the talks that set the scene for our workshop (summarised with the help of Mrs. C. Mays).

Claes Thegerström showed many photos of Swedish citizens during this plenary presentation, showing that SKB over the past ten years has learned to put a human face on what started as a technical exercise. SKB went from concentrating on bedrock to seeking dialogue. Mr. Thegerström stressed the importance of having a clear-cut project, with, at the national level, the recognition of the need to manage radioactive waste and of the government support for the process. Clear cut roles for the different players and acceptance of dialogue among the players are also outstandingly important.

Under *Topic 1*, “the changing environment for waste management programmes”, we heard from sociologists Detlev Ipsen and Anna Vári.

Professor Ipsen spoke about the changing modes of participation seen in the area of regional planning. After a period in which people showed confidence in authorities and science, we are moving to a less hierarchical setting with greater circulation of knowledge. There are more opportunities for non-experts to organise and weigh on life decisions. The universal search for the “good life” must be recognised and integrated in any planning development.

Is “acceptance” a valid word for us? Is not “intercommunication”, as a two way process, a better way to use the resources that lie outside traditional spheres of decision?

How to make public better aware of the benefits (locally) and of the risks?

Anna Vári presented a conceptual framework to compare siting processes. Through her case studies, we can see competing values represented in different siting approaches, as for instance a focus on data collection, or on consensus seeking. A shift is seen toward an approach balancing their different values with an emphasis on flexibility and adaptation. When participation and individual rights are accommodated in the siting process, then we see a further shift to seeking equity and legitimacy. Concerning that last point, two elements seem to be essential: a clear integration of the siting process within broad national energy policy and long-term commitment by political leaders.

Topic 2 addressed “trust and the institutional framework”. **Joanne Caddy** presented work going on in the OECD Public Management Service (PUMA), focused on how bridges are built between government and citizens. Policy-makers in all sectors are confronted with the challenge of informing and consulting citizens. Dr. Caddy showed us not only that many different tools exist, but also that these can be analysed and their results evaluated. It should be of value to the FSC to build links with PUMA, in order to benefit from their knowledge about governance.

Robert Guillaumont presented a framework for understanding the different roles, action and impacts associated with technical oversight bodies. Clearly there is a broad variety of possibilities for organising this function, which has definite potential for increasing confidence in the overall process.

With *Topic 3*, we tackled the difficult questions of “Stakeholders and the Public: Who Are They?”

Mary English pointed out that stakeholders in radioactive waste management decisions are not all present today. With environmental risks that are diffused and extend far into the future, the people most affected will come into play far away in time and perhaps in space. And, of course, these most affected stakeholders are the least able to participate in today’s decisions. In this context, Mary English urges us to leave behind our adversarial vocabulary and adopt the language of shared decision responsibility. We cannot avoid making decisions today, but we must do that with the perspective that we are not the principal stakeholders: we must in fact deliberate on the long-term, common good.

Detlef Appel presented a detailed chronology of the Gorleben siting process. He showed how big a gap there can be between a legal requirement for public participation and real stakeholder access and input. The perception of a gap between geological realities and expected outcomes of a safety analysis also contributed to a loss of confidence. Early mistakes affected the credibility of the entire process. Today, a scientific and technical working group is also asked to shoulder the task of designing public involvement in a stepwise decision-making process.

Topic 4 asked whether “there is a new dynamics of dialogue and decision making”. **Kjell Andersson** pointed out that values underlie decisions and that the values must be made apparent. Public participation is a way of ensuring that public values are represented in decisions. Dr. Andersson presented a framework for understanding transparency and for evaluation programmes and processes in that framework. He promised further work within the RISCUM project.

Thierry Merceron recounted the recent history of the Granite Mission or how France tried to create a new phase of dialogue with citizens about radioactive waste management and instead unleashed violent rejection. We learned that despite the careful national efforts to build-up a complete waste management system, many people are unaware of its very existence. Clearly that system, and the roles of each organisation within it, must be clarified to our citizens. ANDRA in particular, as part of the system, sees the need to clarify the understanding of the scientific part of its programme and better feed the national and regional debates.

Topic 5 asked whether “the waste management institutions are set up for achieving stakeholder confidence over the long term”.

Raul Espejo underlined the structural requirements for the effective performance of waste management institutions. Autonomous units must thrive within autonomous units. Primary activities are not only operational matters, but also strategic and normative matters. The developed legitimacy and authenticity as key factors. Action has to be aligned with norms shared by stakeholders and has to be coherent with declarations. What about the “stretch” concept, also? An unchallenging society leads to a lazy operator. The organisation must be able to learn from the dialogue. We must create a capacity to manage dialogue at each level of the organisation, at each level of the society.

The **working groups** made very successful work. Congratulations to the chairpersons and to all of you. These provided us with a grid for further important and proposed actions. I want to underline at this stage some of the lessons from the five working groups.

Working Group 1: The changing environment

The end of the cold war and of the shortage of energy cause the role of engineers and planners to change. The decline of deference in authority in science and a lower sense of responsibility create a need to communicate: a two-way traffic of information is expected.

The working group underlined the need of role clarification to enhance confidence and the use of mediators.

I was interested to hear these three propositions for further emphasis:

- Learn about modes of action and engagement by local and regional governments, which meets what the Working Group 4 “new dynamics of dialogue” noted also.
- How can we integrate information into our organisations and operations? This meets the conclusions of working groups 2 and 5 on “learning organisations”,
- Alternatives or options are to be kept available for building public confidence. But what kind of options?

Working Group 2: Trust and the institutional framework

The working group discussed first what trust is and noted that “affective” components play a more important role than technical competence: technical skills are necessary, but we must take into account the “affective package”. In any event, trust does not overwhelm other considerations, like community values or financial compensation.

The working group proposed further actions, among which I noted:

- How to learn about events or failures which have undermined trust? Collect these facts and analyse them.
- Can institutions be trusted when the system is not ...?

Working Group 3: Stakeholders and the public: Who are they?

The working group made a clear analysis and concluded it is “easy” to define the possible stakeholders: the procedure and the stage of the procedure define who the stakeholders will be.

The proposed Aarhus Convention could provide relevant methods. The questions were:

- Are all procedural steps adequately understood and “answered to” by stakeholders?
- What about future stakeholders? Could retrievability or storage be an answer?
- Is “FSC” the best name?

Working Group 4: New dynamics of dialogue and decision making?

This working group first listed “issues and expectations” amongst which: how to involve different publics, how to learn from success and failure, which use of mediators and other methods and tools for evolving dialogue?

The concept of “local partnership” was developed.

The links between the five workshops were very accurately designed: a changing environment asks for new dialogue dynamic, which can be achieved through a clear process and clear organisation and financial scheme and through “learning organisations”.

In conclusion, the working group proposed that the FSC establish guidelines for organising dialogue, tools to support it, and to address how best to “stretch” participants and their organisations.

Working Group 5: Are the waste management institutions set up for achieving stakeholder confidence over the long term?

The working group listed the needed mission, organisational and behavioural requirements.

I personally noted:

- Strong internal coherence (despite the fact that internal scepticism is necessary).
- Clear mandate and formulated strategy.
- Be proactive, but free of arrogance.
- Be responsible and responsive.

The FSC could elaborate a list of tools for internal use initially and for organisations to use later.

With the NEA, we have to find the way to carry on the initial task, having obtained now such an important amount of analysis, insights, and proposals.

Biographical Notes of Workshop Speakers and Organisers

Michael AEBERSOLD

M. Aebersold is a scientific expert official within the Swiss Federal Office of Energy. His main areas of responsibility include nuclear waste disposal policy, decommissioning and waste disposal fund, and nuclear fuel cycle and non-proliferation. He was Switzerland's representative for the preparation of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management. He has been and still is involved with the Federal Working Group on Nuclear Waste Disposal (AGNEB), the Wellenberg Technical Working Group, the Wellenberg Economic Working Group, the Energy Dialogue Working Group and the Expert Group on Disposal Concepts for Radioactive Waste (EKRA). His technical background is in inorganic and physical chemistry.

Kjell ANDERSSON

Kjell Andersson has a Ph.D. in Theoretical Physics. Between 1981 and 1990 he was responsible for nuclear waste research and safety analysis at the Swedish Nuclear Power Inspectorate (SKI), and became Director of Research at SKI. Since 1991, he has been a consultant in the field of safety assessments, decision processes and environmental impact assessments. His commitment is to work for improved decision processes in complex issues. His major milestones relate to his important involvement in the SKI Dialogue Project and the RISCOM Pilot Project. Current work include being: (i) member of the Oskarshamn Expert Group for High-level Nuclear Waste Issues for the Local Competence Building and Environmental Impact Assessment; (ii) Project Leader in pre-studies for a decision institute (DECI); and (iii) Scientific Secretary for the VALDOR Symposia

Detlef APPEL

Free-lance geologist working mainly in the fields of groundwater protection and final disposal of radioactive and "conventional" waste. More specifically in the radioactive waste area, he is: (i) consultant to communities, political parties, non-governmental organisations and authorities (German federal government and *Länder* governments) in licensing procedures or in hydrogeological questions related to final disposal; and (ii) member of the German Commission on Reactor Safety (Board on Supply and Disposal), the BMU Working Group on Methodology of Disposal Site Selection, and the Swiss Expert Group on Disposal Concepts for Radioactive Waste. Special interests relate to the methodology of site selection and assessment.

Christian BATAILLE

Christian Bataille has been Mayor of Rieux-en-Cambrésis since 1977 and Member of Parliament for the Nord Department since 1988. He has held and still holds several political functions at the regional and national levels. Most pertinent to technology and energy issues is his membership in the Parliamentary Committee on the Evaluation of Technological and Energy Choices (CETEC). On behalf of that Committee, he tabled before Parliament the draft law on the management of long-lived radioactive waste that was adopted in France on 30 December 1991. In 1992 and 1993 he led, on behalf of the governments at the time, a successful mediation mission on the siting of underground research laboratories for the disposal of long-lived radioactive waste. Within the CETEC, he is in charge, since

1994, of following up the progress in France about the management of radioactive waste of both civilian and military origins. Very recently, he tabled before Parliament the draft law on the modernisation and development of the public utility in the field of electricity that was adopted on 10 February 2000. Mr. Bataille's background is in the humanities, with a specific training as a French-language teacher.

Peter BROWN

Peter Brown is, since 1988, Director, Radioactive Waste and Radiation, Energy Sector, at Natural Resources Canada, with responsibility for policy, in Canada, on radioactive waste management, including high-level waste, low-level waste, and uranium mine tailings. The Division provides advice to Ministers on politically sensitive waste management problems and to develop safe, scientifically and environmentally sound, cost effective and publicly acceptable solutions to waste management and disposal problems. In 1997 his responsibilities were expanded to include the production and export of uranium, and the Division renamed to the Uranium and Radioactive Waste Division. Dr. Brown's background is in geology. He has been associated with waste disposal in Canada since 1976. From 1985 to 1988, as a manager of the geological research programme of Atomic Energy of Canada Limited, he supervised the compilation of the geological documentation of the concept for the disposal of high-level waste in igneous rock of the Canadian Shield.

Joanne CADDY

Joanne Caddy is currently Administrator with the OECD Public Management Service (PUMA), her work focuses on government relations with citizens and civil society, as well as on executive-legislature relations. Previously with the OECD SIGMA Programme for good governance in Central and Eastern Europe. She earned a B.A. in Natural Sciences at Cambridge University (UK) and defended her doctoral dissertation in Political Science at the European University Institute (Italy).

Torsten ENG

Torsten Eng is Deputy Director of the Siting Division at SKB and Project Manager for the Oskarshamn and Nyköping Feasibility studies. He is with SKB since 1986. He has been dealing with siting issues for the last six or seven years. Earlier, he worked within the international the SKB co-operation projects and with the safety assessment group (scenario analysis).

Mary ENGLISH

Mary English is a Research Leader of the Energy, Environment, and Resources Center (EERC) at the University of Tennessee in Knoxville – near to the mountains of East Tennessee in the US, and also near to the US Department of Energy's Oak Ridge Reservation, where work was conducted on the first atomic bomb. Over the past 15 years, much of her research has concerned open decision processes for environmental issues. She was a member of the National Research Council's Board on Radioactive Waste Management from 1995 through 1999 and also recently completed serving for three years as a member of the US Environmental Protection Agency's National Environmental Justice Advisory Council. She holds a Ph.D. in Sociology, an M.S. in Regional Planning, and a B.A. in American Literature.

Raul ESPEJO

After working in project management and research in Chile, United Kingdom and Austria, he entered the academic world in 1977. He has been Head of the Information Management Group at Aston University Business School, UK. Currently he is Professor of Information Management and Director of the Centre for Systems Research at the University of Lincolnshire and Humberside, UK. He has also undertaken numerous international consultancy assignments in organisational design, information management and

transformation processes. He has published extensively, including co-authoring the books *Organization for Program Management* (Wiley 1979) and *Organizational Transformation and Learning* (Wiley 1996), and co-editing the books *The Viable System Model* (Wiley 1989) and *Organizational Fitness: Corporate Effectiveness through Management Cybernetics* (Campus Verlag 1993).

Robert GUILLAUMONT

Former Director (1969-1990) of the Radiochemistry Group of the Institute of Nuclear Physics at Orsay; professor of radiochemistry in 1967, following his doctoral work at the Curie Laboratory; professor of physical and inorganic chemistry at the University of Paris-Sud from 1970 to 1998. His major fields of interest include protactinium and actinide chemistry, in particular thermodynamics and optical spectroscopy, and the development of partitioning and transport methods applied to the speciation of radionuclides. He is a corresponding Member of the French National Academy of Sciences (Chemistry) and a Member of the French National Scientific Review Board, instituted by the Law of 30 December 1991, with the task to monitor technical progress in high-level, long lived radioactive waste management research. He chairs, since 1985, the standing group of experts counselling the in French Nuclear Safety Authority on Radioactive Waste.

Björn HEDBERG

Björn Hedberg is with Department of Waste Management and Environmental Protection in the Swedish Radiation Protection Institute (SSI). He is presently the Programme Co-ordinator for Waste Repositories and Siting, including activities in the municipalities involved in the siting process, and other EIA-related areas. In the recent past, he has been the National Co-ordinator for Nuclear Waste Disposal, with the main objective to support communities affected by the localisation process for nuclear waste, and to facilitate contacts between concerned parties/stakeholders (1997-98). Earlier yet, he was, at SSI, the Programme Co-ordinator for inspection and licensing concerning use of radiation in research and industry. His technical background is in Systems Engineering.

Alan HOOPER

Dr. Alan Hooper is Deputy Managing Director of Nirex having been its Science Director until late 1999. He joined Nirex in 1988 at the early stages of the deep repository development programme and held progressively more senior positions, being responsible during that time for the geological investigations at Sellafield and Dounreay, the scientific research programme and the safety assessment programme. Dr Hooper has given evidence on behalf of Nirex to the public inquiry into the Sellafield Rock Characterisation Facility, to the House of Lords Select Committee Enquiry into Nuclear Waste, and to the National Consensus Conference on Radioactive Waste. He has represented Nirex at public meetings, such as the Sellafield Local Liaison Committee, and in national and local media (television, radio and press). He was a delegate to the NEA RWMC SEDE Group throughout its existence and was elected its chairman for the period 1992-1998. He joined the RWMC in 1999 and at the request of the RWMC chaired the inaugural meeting of the newly-created Integration Group for the Safety Case in June 2000.

Detlev IPSEN

Professor for urban and regional studies at the University of Kassel (Germany) since 1978. His major interests lie in the study of the regulation of urban and regional development in the context of the modernisation of society and in the empirical reconstruction of these processes. Prof. Ipsen has a varied background, spanning academic studies in sociology, psychology, and econometric statistics, and has carried out numerous research projects in several countries besides Germany. Namely: Mali, Senegal, Greece, Costa Rica, Ecuador, etc.

Janet P. KOTRA

Dr. Kotra holds a doctorate in nuclear and environmental chemistry. She joined the staff of the US Nuclear Regulatory Commission (NRC) in 1984 as a post-doctoral fellow with the NRC Advisory Committee on Reactor Safeguards and has served as technical assistant and policy analyst for two former NRC Commissioners. More recently, Dr. Kotra was a principal author of NRC guidance on the use of expert elicitation for assessing the performance of geologic disposal, and was a major contributor to NRC's proposed regulations for the potential high-level waste repository (HLW) at Yucca Mountain, Nevada. She is currently in charge of public outreach for the NRC's HLW regulatory programme.

Osmo KURKI

Osmo Kurki is POSIVA's Manager for communication since the inception of the company in 1996. For about 15 years before POSIVA he worked as a journalist in several Finnish newspapers. He holds a Masters Degree in Philosophy. His university subjects were journalism, adult education, economics and art education. He has also performed scientific research on communication about nuclear waste.

Yves Le BARS

Yves Le Bars is President of ANDRA, the French National Agency for Radioactive Waste. Before joining ANDRA in January 1999, he was Director-General of BRGM, the French Geological Survey Service. His background is in Water and Forestry Engineering. He specialised in this discipline at the École polytechnique, became Head of Urban Planning Services of the city of Grenoble, and was, for 11 years, Director-General of CEMAGREF the French national body for environmental and agricultural engineering research. He has also held the position of Technical Counsellor at the French Ministry of Agriculture.

Claire MAYS

Claire Mays is a social psychologist (Institut Symlog, Cachan, France). She has conducted research and intervention in NPP worker safety, risk communication in the radioactive waste field, and social and psychological impacts of large radiological accidents. Claire is a member of a U.S. National Academy committee on technical and policy challenges of geological disposition of HLW (1999-2001).

Thierry MERCERON

Ph.D. in geology/geochemistry. Mr. Merceron joined ANDRA in 1991, where he became the Head of the Geochemistry Group in the Science Division. Since 1995, he has been involved with the granite projects of ANDRA: first as Manager of the URL Project at La Chapelle-Bâton, and currently as the official representative of ANDRA to the "Mission Granite" undertaken by of the French government. Before joining ANDRA, he had a two year work experience in Japan: at the University of Tokyo, as research fellow of the French Embassy in Japan, and in Tokai Mura as research fellow of JAERI.

Daniel METLAY

Daniel Metlay is a member of the senior professional staff of the US Nuclear Waste Technical Review Board (NWTRB), an independent federal agency charged with evaluating the technical validity of the Department of Energy's (DOE) high-level radioactive waste repository programme. Dr. Metlay received a B.S. from the California Institute of Technology and a Ph.D. from the University of California, Berkeley. Dr. Metlay taught at Indiana University and the Massachusetts Institute of Technology. He was a research scientist at Brookhaven National Laboratory. He joined the US government as a member of the staff of former Energy Secretary James D. Watkins and later served

under former Secretary Hazel R. O'Leary. In that position, he directed a strategic planning task force on public trust and confidence in the DOE. He joined the NWTRB in 1994. He has prepared numerous books, articles, reports, and conference papers on organisational behaviour, bureaucratic politics, regulatory theory, and technology policy.

Alexander NIES

Alexander Nies is Head of the Radioactive Waste Disposal Division in the Federal Ministry for the Environment of Germany. His responsibilities include regulation of radioactive waste disposal, federal supervision on the licensing of disposal facilities, and oversight of their planning, construction and operation. He is the chairman of the German committees on a selection procedure for disposal sites and on a national radioactive waste management plan. Before Mr. Nies entered in the ministry, he has been educated in mathematics and has collected some 10 years of experience in long-term safety assessments and probabilistic uncertainty analyses. Presently his international obligations include membership in the French Standing Group on Radioactive Waste and in the OECD/NEA Radioactive Waste Management.

Sören NORRBY

Sören Norrby is the Director of the Office of Nuclear Waste at the Swedish Nuclear Power Inspectorate (SKI) and has more than twenty-five years experience in the field of radioactive waste management and disposal in his career both with SKI and SSI, the Swedish Radiation Protection Institute. He is engaged in the supervision, and regulatory and licensing reviews of operating nuclear waste facilities in Sweden, namely CLAB and the SFR, and he is engaged as in the review of the Swedish R&D programme on the final disposal of spent nuclear fuel. He has served on several governmental committees to review Swedish legislation on nuclear waste, and he has served on several international committees at the IAEA, the OECD/NEA and the European Commission. He is currently the Chairman of the NEA Radioactive Waste Management Committee (since 1998), and the Chairman of the Advisory Committee on (Radioactive Waste) Programme Management (ACPM) of the European Commission. His technical background is in chemistry.

Claudio PESCATORE

Claudio Pescatore is Principal Administrator for radioactive waste management at the NEA/OECD. Active at national (USA, Italy) and international level (OECD/NEA) in technical, strategy, and policy areas dealing with radioactive waste, he has over 20 years' experience in the field, and a multifaceted career as programme manager, consultant to industry, consultant to R&D agencies and safety authorities, university lecturer, and researcher. His background is in the physical sciences, with a doctorate in Nuclear Engineering.

Hans RIOTTE

Hans Riotte is, since 1998, the Head of the OECD/NEA Radiation Protection and Radioactive Waste Management Division. Before joining the NEA, he worked four years in the private office of the German Federal Minister for Higher Education and Research on general issues of research policy. Dr. Riotte's involvement in the field of radioactive waste management dates back to 1980, when he joined the *Gesellschaft fuer Reaktorsicherheit* (GRS) to work on regulatory and safety issues of the German waste management programme. In 1989 he moved to the German Federal Ministry for Research and Technology, where he was responsible for a large research and development programme for the direct disposal of spent nuclear fuel in salt. Dr. Riotte holds a Ph.D. in nuclear physics.

Hideki SAKUMA

Hideki Sakuma is Senior Research Co-ordinator at the Japan Nuclear Cycle Development Institute (JNC). His current responsibility includes co-ordination of JNC's national and international research, and

development of projects in both technical and non-technical areas. His involvement at the international level started in the mid-80s with membership in the Joint Technical Committee of the OECD/NEA International Stripa Project. His more experiences include membership in the OECD/NEA International Review of SR97 a safety study prepared by SKB for a geologic repository of spent fuel in Sweden. His technical education background is Oceanography.

Sam THOMPSON

Sam Thompson is the Deputy Director-General of the NEA. He came to the NEA in 1991, by way of the US Department of State, where he was Special Assistant to the Ambassador-at-Large for Nuclear Non-Proliferation and Peaceful Nuclear Affairs. Prior to that he was the Director of the Office of Arms Control at the US Department of Energy. He has been in the nuclear field for 34 years, most of it in the US government, with a two-year appointment at the IAEA in Vienna working on nuclear safeguards policy.

Valentine VANHOVE

Responsible for corporate communications at ONDRAF/NIRAS, the Belgian Agency for Radioactive Waste Management and Enriched Fissile Materials, since 1996, with a scientific background (Master's degree in Chemistry), a post-academic degree in Business Administration and experience in the political scene.

Anna VÁRI

Anna Vári, Ph.D. of Economics, is leader of the Division on Risk and Participation in the Institute of Sociology, Hungarian Academy of Sciences. Her main fields of interest include environmental policy, risk analysis, conflict management, public participation and decision support. She has been principal investigator of several Hungarian and international research projects sponsored by various funding organisations including – among others – the US National Science Foundation, the International Institute for Applied Systems Analysis, the Regional Environmental Center for Central and Eastern Europe, the European Bank for Reconstruction and Development, the PHARE Programme of the European Union, the United Nations Development Programme, and the Global Environmental Fund.

Simon WEBSTER

Simon Webster entered the European Commission as an Administrator in 1992, and spent the first five years as a Euratom nuclear safeguards inspector based in Luxembourg. Since 1997 he has been working in Brussels in the Directorate-General for the Environment, where he has specific responsibilities concerning Community policy in the field of radioactive waste management, both in the EU Member States as well as in the EU candidate countries of Central and Eastern Europe. His background is in Physics with spent several years experience in the nuclear industry in the UK, first in design and then commissioning/operation of the new generation of AGRs, before moving to Paris to work at the OECD/NEA. There he was responsible for data basing activities involving nuclear computer codes and nuclear library data, as well as international code inter-comparison exercises.

Magnus WESTERLIND

Magnus Westerlind, Ph.D. in physics, is since 1999 a senior expert at the Swedish Nuclear Power Inspectorate, SKI. Earlier he was with Swedish Radiation Protection Institute, SSI, where he coordinated the Division for Risk Reduction. Dr. Westerlind's current work involves the development of the decision-making processes and Environmental Impact Assessment (EIA), including public participation, in relation to the ongoing programme for the siting of a spent nuclear fuel repository in Sweden. He often represents the SKI locally, nationally and internationally when issues related to EIA, decision making and siting are discussed or debated.

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