

RISCOM II DELIVERABLE 4.1

Stakeholder Dialogue: Experience and Analysis

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1 Introduction

This report forms part of a programme of work undertaken under RISCOM II, the overall aim of which is to seek to enhance transparency and public participation in nuclear waste management. Within the RISCOM II is a specific work package evaluating public dialogue processes (WP4), which includes comparison and analysis of different forms of dialogue, as well as experimentation with a web site designed to encourage and enable young people to engage in debate.

The first stage of this work package is to review and analyse existing European and North American experience in conducting dialogue in relation to radioactive waste management, and this is the main focus of this report.

The report begins with a consideration of the factors which have led to a growth in the use of dialogue processes, a clarification of key concepts and a classification of dialogue processes. A description of recent and current activities in Europe and North America is followed by discussion of the relationship of processes and contexts. This then leads to an identification of the key aims and evaluation criteria which will be used in the design of dialogue processes to be conducted in subsequent phases of the project.

2 Background

2.1 Why dialogue?

The move towards engaging in dialogue, particularly between traditionally opposing parties, is the product of a number of converging factors. The ‘democratic deficit’¹ has prompted attention towards developing the role of the citizen. Hotly contested environmental disputes have highlighted the inadequacy of existing decision making structures for achieving resolution, and the growth of multi-national companies has generated a need for information and interaction that cannot be satisfied through purely market mechanisms.

Dialogue is just one of a suite of terms which include consultation, participation and deliberation, which are defined below. These have become associated with a collection of practices which have developed from a hybridisation between participatory rural assessment in less developed-countries (e.g. Holland 1998), techniques used in management learning and in teaching, existing models of review and decision-making, as well as a host of other influences and resources. This whole arena often contains amalgams of practise which draw from a wide range of sometimes contradictory antecedents, but which share in common a loose commitment to discussion between stakeholders (including the public) as a vital component of decision making.

Petts and Leach (2000) identify the roots of public participation in the UK in land-use planning, regeneration initiatives, sustainable development initiatives, the ethos of “customer facing” service delivery, and the democratic deficit. More recently, Participatory Technology Assessment (PTA), involving a similar suite of methods, has become another arena where dialogue and consultation is developing (Jamison 1998). Added to this should be the commercial world where dialogue has been adopted, most famously between Greenpeace and Shell after the Brent Spar occupation by Greenpeace activists (Murphy and Bendell 1997).

Dialogue has political associations in theories of participatory democracy and deliberative democracy (Bohman and Rehg 1997). These political models question the assumptions of elitism and pluralism, which represent the political process as the playing out of conflicts between competing interests. Instead, exponents of the model of deliberative democracy claim that:

“...the political process involves more than self-interested competition governed by bargaining and aggregative mechanisms” (1997: xii)

and that

“...political engagement requires citizens to adopt a civic standpoint, an orientation towards the common good, when they consider political issues in the “forum” (1997: xii)

¹ This term has entered common usage to indicate a lack of public participation in, and public legitimacy of, institutions of democratic governance, indicated, for example, by low electoral turnout.

Deliberative democracy thus has a transformative nature, enabling citizens, through deliberation, to adopt an ideal of the common good, rather than the self-serving norms of consumerism. It is transformative, too, in the way in which spaces are provided in which 'new political identities' (Healey 1997) can emerge. It is this which is perhaps the most important challenge of the deliberative ideal: that, instead of assuming that opinions are in some way fixed and even measurable, it encourages the development (and change) of positions and even values through debate between equal partners.

Dialogue and consultation, broadly speaking, are thus seen from a range of perspectives as supporting democracy and generating better decisions (whether these are defined as increasing profits or enhancing the common good). A variety of practices has been adopted by a wide range of institutions. Yet these practices, although sometimes fully institutionalised, remain largely experimental: what counts as good dialogue, why, and for whom, remain questions with many answers.

2.2 Framing

One of the key concepts used in much analysis of environmental (and other) controversy is that of framing or problem definition (Royal Commission on Environmental Pollution 1998; Stern and Fineberg 1996). Framing can be understood as the lens through which an issue is seen – different lenses provide different ways of seeing. Another commonly used explanation of framing is that paying attention to the way a problem is framed is paying attention to the question of 'what is this issue about?' For example, radioactive waste can be about narrowly technical issues such as:

- migration of radionuclides in ground water,
- issues of the certainties and uncertainties of hydrogeological modelling, or
- the dominance of scientific forms of knowledge over other forms of knowledge.

It can also encompass broader issues such as:

- who has the right to make decisions
- how can future generations and non-humans be represented
- whether or not society should be producing such wastes at all.

Some framings are clearly associated with particular social groups and their values and worldview. For example, scientific experts working within nuclear institutions commonly frame the problem as being one of 'controllable risks' amenable to technical and regulatory management. The public, by contrast, may see the problem as to do with issues of responsibility for the risks and the interests of those groups, and the ethical parameters of where waste is placed and the distribution of associated risks (which include social risks such as stigma and which societal groups are affected).

In the UK, a classical public inquiry process will include a number of framings, such as traditional planning concerns (traffic, disruption), pollution, and, under the Environmental Impact Assessment process, evaluation of alternatives. However, concerns that fall outside this framework for defining what the issue is about have generally been excluded. The continuation of the production of wastes has usually

been excluded even from more innovative processes. Statements such as that of the production of waste being essentially wrong are so far removed from the dominant framings and their associated institutional practices that they are frequently ignored.

One explanation for the widespread public antipathy towards radioactive waste repositories is that institutional framing and public framing are at odds (RCEP, 1998; HL). That is, the public are concerned about a range of issues (such as their confidence in the disposal company, or the elitist process of decision making) that are left out of traditional consultative and decision-making processes and institutional thinking. For this reason, attention is now being paid to the ways in which consultative and dialogue processes can enable different stakeholders to voice their concerns, and how these concerns can be taken into account.

2.3 Distinctions and definitions

The ‘consultation and dialogue vocabulary’ has taken on a number of meanings and terms are often used more or less interchangeably. Behind each term, however, lies political theory, social and philosophical analysis, and a range of practice, adding to the complexity of understanding exactly what is meant. For the sake of clarity, relatively simple definitions are provided below:

Dialogue

Dialogue can be defined as interaction and mutual learning, as a ‘conversation with a centre, not sides’ (Isaacs 1999:19). Agents (often traditionally opposing) are brought together for the purpose of finding common ground, redefining the terms in which they operate, identifying areas of agreement and disagreement, and, crucially, developing enhanced understanding of each other and of potential ways forward.

Consultation

Consultation is the opportunity for stakeholders (variously defined) to comment upon issues and proposals during the course of their development. Crucially, consultation implies that the power to make decisions, and the extent to which comments are taken into account, remains at the discretion of the authorising institution.

Deliberation

Deliberation is a form of discourse, theoretically and ideologically requiring ideal conditions of equality of access and justification of arguments. Deliberation involves reasoned debate between relevant actors. It draws on a notion of procedural legitimacy, that is, if the conditions for deliberation are fulfilled, then the outcomes are the best possible. Deliberation is largely associated with models of deliberative democracy, as outlined above (Dryzek 1990; Nino 1996).

Participation

The degree of public participation in decision-making depends on the amount of power transferred from the responsible authority to the public. Although the word is used loosely to indicate taking part in a process, and although participation can take place solely through taking account of a wider range of views, the strong sense infers participation in taking decisions, not merely in consultation on those decisions.

Social Intelligence

Social intelligence is information about the public/society, such as that gathered in survey data purporting to measure public values or opinions. Social intelligence can be gathered purely to serve the interests of the sponsoring organisation, or can be used in an attempt to reflect public preferences. Dialogue, consultation and deliberation can all offer means to gather social intelligence.

Stakeholders and the Public

The terms ‘stakeholder’ and ‘public’ need attention if not definition. ‘Stakeholder’ is used widely, and variously, to mean everyone who has an interest in an issue, or those directly affected, or the institutional parties involved. There is no over-riding definition, but in practice what has been called stakeholder dialogue often includes only institutional representatives, sometimes using bodies such as the National Consumers’ Council or environmental non-governmental organisations (NGOs) to ‘represent’ the public interest.

‘Public’, too, can be a complex term, and it is key to recognise that there are multiple groups within the ‘public’, individual members of whom may also be members of other groups. In terms of consultation and dialogue practices, it is crucial to consider who the relevant publics are, and how they might best be represented within a process.

2.4 Classification of processes

The distinctions between stakeholder dialogue, public consultation and public deliberation are presented below, in order to emphasise the different purposes, and worldview, implied by each, and to assist in the selection of processes for further examination. It is important to note that some of the processes utilised (such as a citizens’ jury) can be used in different ways (e.g. a citizens’ panel can be used for public consultation and public deliberation).

	Stakeholder dialogue	Public consultation	Public Deliberation
Who is involved?	Generally involves representatives of interested organisations meeting together for discussion of identified issue Can include members of public, but to date has done so only rarely Organisations who do not usually meet/communicate brought together	Involves members of the ordinary public, self-selected and/or selected as demographically representative or representative of relevant groups	Usually interpreted as involving members of the public, but can be interpreted as deliberation by elites taking place in the public eye
Issue characteristic	Issue is often contentious, and opposing parties are brought together	Issue may not be contentious, but involves some development or appraisal	Not necessarily bound to a particular issue, and in any case allows related issues to be considered
Purpose	To share knowledge To identify areas of agreement and disagreement To develop possible ways forward	To elicit public views on issue	To develop, through engaging in debate, considered responses and reasoned decisions
Interaction between agency and public	Very limited unless public included as stakeholders	May be distant, usually mediated by convenor of consultation process	Dependent on way in which deliberation is organised
Relationship with decision making	Often provides useful input but is open to manipulation or misunderstanding by decision maker	Theoretically provides authority for decisions, but in practice dependent on interpretation of outcomes by decision maker	May have no relationships with decisions, but in principle provides the basis for making the best decision
Examples	Any form of meeting between stakeholders where interaction and discussion takes place	Range from traditional forms of consultation (consultation papers, questionnaires) to more innovative forms (local forums, citizens' panels)	Few if any examples of deliberation under ideal conditions, but citizens' juries and other debating forums with full access to information partially fulfil requirements, and many processes have deliberative elements

Table 1. Differences and distinctions between stakeholder dialogue, public consultation and public deliberation.

2.5 Why is dialogue relevant to radioactive waste?

Historically, attempts to create permanent repositories for radioactive waste – and even new storage sites – have been plagued with difficulties. Analysis across countries and institutions has come to a similar conclusion: that public acceptability is essential to proceeding with waste management initiatives.

Integral to this analysis is the recognition that the ways in which publics and stakeholder groups think about radioactive waste is essentially different from the ways in which the nuclear industry thinks about the issue (see discussion on framing, section 2.2). The nuclear industry is characterised as having a technocratic, scientific, managerial, political and economic perspective, whilst the public are concerned with moral, social, and relational aspects, and with how issues interact with their everyday lives. Jamison and Ostby (1997) identify four domains and describe their approaches:

Table 2. Domains and approaches to thinking about the nuclear industry, after Jamison and Ostby (1997).

Policy domain	Bureaucratic	Economic	Academic	Civic
Doctrine	Order	Growth	Enlightenment	Democracy
Steering mechanism	Planning	Commercial	Peer review	Assessment
Ethos	Formalistic	Entrepreneurial	Scientific	Participatory

One way, then, of understanding the problems of developing radioactive waste management options is to understand the very different world views and associated values of different groups. Thus, to enable acceptable strategies, it is necessary for the nuclear industry and its associated bodies to find out what other views exist, to accept the legitimacy of these, and to integrate them into management proposals.

Processes for engendering public acceptability vary but have in common the necessity for public and stakeholder involvement. As above, there are differences in the ways in which different processes are conceptualised, but they share the ability to find out what other parties think, and to engage in some way with taking account of these views in policy development. It is then theoretically axiomatic that a policy based on the views of the public will be acceptable to that public. In practice, however, the variability of different publics/stakeholders, the history of the relationship between the nuclear industry and publics and the mistrust that has resulted from this, and the interconnection of the radioactive waste issue with many other issues outside the control of the industry mean that matters are unlikely to be quite so straightforward.

However, the principle of entering into dialogue as a means of engendering mutual understanding and more acceptable outcomes remains valid.

2.6 General application of dialogue in the UK

Over the last few years extensive experience in processes involving consultation and dialogue has been gained. Much of this has been within local government, driven by the government programme for 'Best Value' in conjunction with a desire amongst many government officers to introduce more participatory practices (Summers and McKeown 1996; DETR 1998), and building on and developing Local Agenda 21 initiatives (LGMB 1997). Much, too, has been done in the Health Authorities, where service users are increasingly being included in decision-making procedures (Ling 1999; NHS 1998). National agencies, such as the Food Standards Agency, the Environment Agency, and the National Radiological Protection Board, are exploring different mechanisms of public consultation and stakeholder dialogue. The third – and on the face of it, most relevant – arena has been in technology assessment (TA), although this remains underdeveloped in the UK to date (Jamison 1998). A further dynamic has been the recognition by large businesses that they are out of touch with their key stakeholders. For example, Shell's experience with Brent Spar is commonly cited as a key turning point in this respect, although there are numerous other examples of what are claimed as successful business/stakeholder interactions (Murphy and Bendell 1997).

A host of consultation and dialogue techniques have been developed in these respects, many with common components. These have been adequately described in a number of reports (e.g. NEF ; DETR 1998; LGA and LGMB 1998; LGMB 1998; Audit 1999; Petts and Leach 2000) and there is little point in reproducing these descriptions here.

Overall, though, it is fair to say that the need for better and wider consultation has undoubtedly been recognised in the UK. The Cabinet Office, for example, recently issued a Code of Practice in written consultation (www.cabinet-office.gov.uk/servicefirst/index/consultation.htm), and is instituting civil service training in consultation. However, the purpose of consultation, the distinctions between consultation, dialogue and deliberation, and the integration of outcomes with the current systems of decision making remain ill-defined in practice. RISCOM II provides the opportunity to refine those understandings through a theoretically informed analysis of different processes.

3 Experience in Radioactive Waste Consultation and Dialogue

3.1 Experience in the UK

Prior to the late 1990s, the dominant forums for radioactive waste consultation remained the traditional consultation paper, the Public Inquiry, and Select Committee deliberation. Less traditional practices were generally marginalised; one of the significant factors in the recent increase in a range of forms of consultation and dialogue is that these have been recognised as legitimate processes involving legitimate voices. As above, the upsurge in new methods relates to both the realisation that public acceptability is a key requirement for successful radioactive waste management, and to a broader context of the reconstitution of democratic practice.

In 1999, the UK Department of Trade and Industry (Office of Science and Technology), the Natural Environment Research Council, and UK Nirex Limited funded a consensus conference (Joss 1995) on radioactive waste organised by UKCEED (http://www.ukceed.org/consensus_conference/contents.htm). This was recognised by the Minister for the Environment and others, including some parts of the nuclear industry, as valuable in several respects, including:

- Demonstrating that ordinary members of the public were capable of engaging with a complex technical issue and reaching a set of reasoned recommendations
- Substantially influencing the acceptability of the concept of retrievability, at least at Nirex
- Persuading many members of the nuclear industry that the public held legitimate views
- Broadening the range of issues considered relevant to radioactive waste management

However, given the lack of formal linkage between the consensus conference and central government decision making, its value was limited. Further, this lack of a clear route of uptake or response to the panel's recommendations led to some members of the panel being disappointed. It is not yet clear how, especially at the national level, the UK's tradition of representative democracy will be able to assimilate more deliberative and participative procedures.

Nirex are also experimenting with a variety of forms of dialogue and consultation. Recent workshops involving a range of stakeholders from a variety of sectors, and including members of the UKCEED panel, have considered the issues of monitoring and retrievability. The report of the first workshop is available at <http://www.nirex.co.uk/inews.htm>. These workshops were particularly interesting as they a) brought (informed) members of the public together with experts, and b) did not pre-define the concepts of monitoring or retrievability, but instead opened them up for consideration by participants. A workshop and possible citizens' panel on partitioning and transmutation are planned, and current activity includes a review of

the principles and practice of peer review and peer preview². Experience to date suggests that, notwithstanding the previously poor relations between Nirex and a range of stakeholders, dialogue is welcomed by a wide range of parties and is proving effective in re-building relationships and in enabling Nirex to develop policies which include a wider range of views and are more generally acceptable.

BNFL has sponsored the Environment Council (an independent registered charity operating as a consultancy) to conduct a process of 'stakeholder dialogue' involving a range of stakeholder groups. This is based on a series of meetings and working groups addressing particular aspects of the radioactive waste problem. Participation in the process, however, is at the discretion of BNFL, and several keen potential participants have been excluded. The stakeholder dialogue process as conceived by the Environment Council rests on a model of identifying areas of common interest and agreement, and finding ways forward from the area of commonality. It appears to pay little or no attention to the ways in which identities, meanings, and positions can change through participation in the process itself. Environmental NGO participants – a key stakeholder group if problems are to be resolved through dialogue – largely express negative responses to the dialogue, and have not found it useful other than as a source of technical information. Greenpeace have recently withdrawn from this process.

The Environment Council also undertook stakeholder dialogue for BNFL regarding the marshalling of spent nuclear fuel transports in a yard at Cricklewood, London. BNFL regard the outcome of this dialogue as successful, and have changed from using the Cricklewood marshalling yard to using one at Willesden. However, residents of North London remain concerned about the nuclear fuel transports and the Greater London Authority has announced that it will conduct a public inquiry (which starts in March 2001) into the issue. This need for further dialogue in a different forum illustrates the way in which the 'success' of a process can be seen differently by different parties.

The Environment Agency has been paying considerable attention to the development of consultation processes over the last two years. It has recently conducted a comprehensive consultation on the BNFL application for radioactive waste disposals, including discharges, from the eight Magnox power stations. The consultation comprised placing documentation on the web with invitation to comment, distributing the consultation package to relevant local authorities and public libraries, and sending the consultation package (hard copy) in response to requests. Public meetings and surgeries (face to face discussions between Agency staff and members of the public) were held at each site. The Agency is now considering the consultation responses, and intends to thoroughly review the consultation process.

The Ships Support Agency of the MOD has recently commissioned a consultation comprising stakeholder workshops, focus groups and a citizens' panel, with the potential addition of a website, on the topic of the interim storage of laid-up submarines (Project ISOLUS).

² Peer preview is the practice of peer consideration of projects before, rather than after, they are undertaken.

The contamination of nuclear and defence sites is being considered by the Safegrounds Learning Network, who have undertaken consultation using a questionnaire as well as stakeholder workshops. Safegrounds primarily involves nuclear liability holders and the regulators, contractors and consultants to the nuclear industry, but is intended to extend the network to involve a wider range of stakeholders representing public and environmental concerns.

The DETR are planning a consultation paper on the future of radioactive waste management generally thought to focus on the means of consultation, i.e. a consultation on consultation. However, this paper has been anticipated since spring 2000, and has not yet been published.

There have also been a number of traditional consultations recently in the form of consultation papers issued by government departments, or others, with an invitation to respond in writing. These include:

- the DTI consultation on how to deal with spent fuel at Dounreay, and the subsequent UKAEA Dounreay Site Restoration Plan with its intention to take account of stakeholders' views via responses to presentation of the Plan;
- Environment Agency consultation on the Scope and Methodology for their review of Sellafield Discharge Authorisations;
- DETR consultation on the UK Strategy for Radioactive Discharges 2001-2020 (response to OSPAR);
- DETR has also consulted on the Proposals for The Radioactive Substances (Basic Safety Standards) Regulations and Direction;
- three (with a fourth anticipated) Environment Agency consultations on the authorisation of the Sellafield MOX Plant;
- DETR consultation on its Draft Guidance to the Environment Agency on Radioactive Discharges;
- Environment Agency consultation on Technetium-99 discharges from Sellafield; and
- Environment Agency Sellafield Discharge Review Consultation.

Most of these consultations tend to follow the 'decide – announce – defend' model which has been subject to substantial criticism. This traditional consultation process tends to allow little scope for any re-characterisation of the issue, or for concerns outside the instigator's frame of reference to be included. The UKAEA Dounreay Site Restoration Plan, in particular, has been criticised for failing to support consultation prior to the development of plans, as opposed to the presentation of plans after decisions have been made.

Overall, then, the UK nuclear industry has started to generate experience with dialogue and consultation. However, the premises on which this move is based are unclear, and substantial suspicion of the motives of a highly unpopular and mistrusted sector remains, most vocally in relation to the perception that such consultation represents a 'paper exercise' to legitimate predetermined decisions. For further progress to be made, it will be necessary to build relationships, and crucially, trust, between the relevant parties. It is important in this respect to note that trust is two

way, that is, it is important not just for the nuclear industry to be trusted by other parties, but for the nuclear industry itself to learn to trust others.

Gaps in experience

Although many different forms of process have been used, some are better developed, better analysed and better documented. The literature on citizens' juries and consensus conferences is substantial, as is that on local forms of consultation and participation. However, national level consultation is less well developed. For example, the UK central government, despite promoting innovative practices in local government, itself relies heavily on the traditional consultation paper, at least in the nuclear domain.

Coupled with this relative lack of experience at the national level is a very limited experience of stakeholder dialogue practices where this brings together members of the public as equal stakeholders with institutional representatives. Nor is there any substantial example of a dialogue not controlled by a major player, but with relatively open and inclusive access.

A number of recent studies commissioned by Nirex and by HSE (<http://www.nirex.co.uk/inews.htm>; Harris 2000) in conjunction with the 1998 Eurobarometer survey (European Commission 1999), provide reasonable social intelligence on public opinions regarding radioactive waste. However, with the exception of the UK consensus conference and the first stage of the MOD Project ISOLUS consultation (neither of which attracted widespread public attention or input), there has been no recent consultation or dialogue involving the public on long-term future radioactive waste management.

The importance of framing, described above, has led to the argument that 'front end' consultation is imperative. The front end is intended to identify the different problem definitions espoused by different stakeholders, as well as to discover what constitutes a legitimate decision process. Apart from the current Project ISOLUS study, which goes some way towards providing a front end, and the anticipated DETR consultation, there is no experience of front end consultation in the UK, and little in Europe (although EIA can incorporate some elements of front end consultation in the scoping phases) in relation to radioactive waste.

However, there is a generally positive response to wider stakeholder dialogue and to front end consultation, and there is an identified need for public participation in radioactive waste management decision processes.

3.2 Experience in the rest of Europe and North America

The purpose of this section of the study is to provide an overview of methods of public consultation and stakeholder dialogue that have been employed in various national programmes for the management of radioactive waste. The information has been derived from a number of sources, some published and some provided directly by the radioactive waste management agencies, in the countries concerned. Given the

complexity of the different political, legal, cultural and historical contexts of each country considered, the report provides no more than a “snapshot” review.

An obvious limitation of this type of study relates to the inherent difficulty in seeking to evaluate a consultation process “from the outside”. It is acknowledged that it is easier to obtain information via the industry and regulators, whereas the opinions of NGOs and other external stakeholders are generally less accessible. The review of available information has been as extensive as practicable within the time available, although it has not been possible to directly seek the views of participants. Inevitably there will be a range of views regarding the suitability and success of different consultation methods. There is a consensus, however, that for all forms of radioactive waste, site selection is both a technical and a socio-political process, whether this is in relation to the identification of candidate areas or specific sites for deep disposal, for shallow disposal, or for storage. While the technical aspects of site selection may be said to follow relatively uniform methods and criteria, the socio-political processes vary considerably.

Country by country overview

Table 3 presents information collated regarding the proposed radioactive waste management facilities and consultation methods used in each of the countries discussed. A brief comment on the decision making aspects is also included. While the issues and concerns raised in relation to radioactive waste management and proposed sites in each country are identified in the table, this should not be regarded as a comprehensive listing and reference should be made to the relevant country by country sections in Appendix 1. The recent NEA Nuclear Waste Bulletin No. 14 (<http://www.nea.fr/html/rwm/bulletin/bulletin14.pdf>) provides further details.

Table 3: Country by country summary of site selection consultation processes.

Waste category and proposed sites	Consultation process	Comments / status in relation to decision-making
Belgium		
LLW & ILW: Mol and Dessel	<p>Local partnerships are encouraged in areas interested in hosting facilities. Membership of partnership is representative of all stakeholders and interest groups and communication is facilitated by an independent mediator. Working groups form the active basis of the partnerships.</p> <p>Two partnerships have been signed with the community of Dessel (September 1999) and the community of Mol (October 1999). Potential partnerships with Fleurus-Farciennes, Huy and Beveren.</p>	<p>Partnerships in Dessel and Mol are currently developing proposals that will have to be approved by local councils prior to submission to the Federal Government in 2001 – 2002.</p>
HLW: Boom clay formation in the Mol-Dessel area	<p>Expert report on safety issues (SAFIR I) to be followed by a further report (SAFIR 2) in 2000/2001, to be submitted to the NEA for independent peer review.</p>	<p>It is intended that a strategic document accompany the technical report (SAFIR 2) on research undertaken to date, by 2000/2001. The strategic document will address potential approaches for stakeholder dialogue regarding disposal of HLW.</p>
Canada		
LLW (historic): Deep River, Ontario	<p>An independent Siting Task Force was appointed to carry out a volunteer siting process for LLW. A Community Agreement in Principle was negotiated with Deep River township but lapsed in 1996.</p>	<p>Local communities volunteering to participate were dependent on the nuclear industry for employment. Local political factors appear to have stalled the siting process.</p>

Waste category and proposed sites	Consultation process	Comments / status in relation to decision-making
Spent fuel: Canadian Shield (northern parts, including Ontario)	The Federal Environmental Assessment Review Panel 1988 – 1995 oversaw a range of consultation activities. Public hearings in 1996 and 1997 held prior to submission of EIS. Intervener and participant funding were made available. New Nuclear Fuel Waste Management Agency to be established but no decision is expected before 2004.	Extensive consultations with a wide range of stakeholders, largely based on an EIA framework. Lack of decision-making power for stakeholders became a problem. Public funding made available to encourage participation before an “expert panel”. Panel chairman concluded that proposals did “not have the required level of acceptability to be adopted...”
Czech Republic		
LLW & ILW	It is the responsibility of RAWRA (the Radioactive Waste Repository Authority) to manage the disposal of all radioactive waste. They seek to develop active co-operation with local communities affected by waste repositories, as well as with the general public and NGO’s. RAWRA have held meetings with representatives from local communities, published information on disposal and developed a website.	In 1997, RAWRA was set up to manage all waste disposal. Since then, meetings with local stakeholders have been held in relation to existing LLW repositories.
HLW & Spent fuel	The Czech Energy Board in Prague is responsible for the programme dealing with the management of spent fuel and waste from Czech nuclear power plants. Research institutes e.g. Nuclear Research Institute (NRI) and universities support this programme. Between 1993 and 1997, NRI conducted opinion polls with different social groups to aid the public relations arm of RAWRA. Research is aimed towards a ‘National Concept of Radioactive Management’, a strategic document to outline future activities. This document will be subject to EIA evaluation including a public hearing.	An intended strategic document is due. The document will address future activities relating to disposal and investigation of a deep repository. A deep geological repository is planned for ~2060. International collaboration with underground tests with Switzerland and Spain, by 2002.

Waste category and proposed sites	Consultation process	Comments / status in relation to decision-making
Finland		
<p>Spent fuel: Deep geological repository in Finnish bedrock at one of the following sites: Romuvaara, Kivetty, Eurajoki (near Olkiluoto) or Loviisa.</p>	<p>Choice of site reliant on volunteering by communities. A “Decision in Principle” (DiP) is required in terms of the Nuclear Energy Act. EIA undertaken as part of DiP followed by a series of public hearings. EIA addressed four candidate sites. Consultation methodologies included open meetings, printed materials, videos, opinion survey, theme interviews and small group discussions. Ministry of Trade and Industry approved EIA and the Eurajoki council approved the DiP application in January 2000. STUK’s positive safety appraisal, accompanied by an international review, was also submitted in January 2000.</p>	<p>EIA generally considered wide and thorough by the authorities and municipal bodies. Public concerns included potential deterioration of the “image” of the municipality.</p> <p>Government expected to make a decision soon. The first emplacement of spent fuel could take place by 2020.</p>
France		
<p>HLW: Underground Research Laboratories (URLs) at:</p> <ul style="list-style-type: none"> • Bure site (border of Meuse and Haute Marne) Departments • Yet to be identified granite site 	<p>A mediator was appointed to manage public involvement prior to site selection for URLs. Three sites identified through a volunteer process followed by technical screening. Submission of requests to develop URLs accompanied by public hearings (January – May 1997).</p> <p>A five stage consultation programme has been initiated for selection of a second site in granite geology. An Advisory Committee has been set up to manage the process. The mediator has recommended formation of local information committees, public joint ventures and financial compensation for the volunteer Departments selected for detailed investigations.</p>	<p>ANDRA has been granted permission by the government to continue investigations at Bure. A local information committee has been established to facilitate consultation with stakeholders.</p> <p>The first stage of the consultation programme for the selection of a granite site was to seek consensus through consultation by June 2000. However, this process has failed and further work is now stalled. It was originally intended that the final stage of the programme, i.e. a decision by government to authorise construction of the URL, take place by 2003.</p>

Waste category and proposed sites	Consultation process	Comments / status in relation to decision-making
Germany		
L/ILW: Konrad mine	<p>A licensing process for the Konrad site was initiated in 1982 and public hearing arranged by the Lower Saxony Ministry of Environment to consider objections. Modifications to the licence application were subsequently required.</p> <p>Federal government subsequently established a Working Group Committee on Site Selection, membership of which includes environmental groups. Techniques such as use of the internet and workshops have been employed to encourage stakeholder participation. The Committee has also reviewed existing criteria and international practice.</p>	<p>The licensing process for Konrad has been hampered by disagreements between BfS and the State Government. Waste emplacement could begin in 2001 provided that the licensing procedure is successfully concluded. It remains to be seen how the national political changes and policy commitments on ending the nuclear power programme in Germany will affect programs on radioactive waste management. An interim report has recently been issued by the Committee on Site Selection.</p>
HLW: Gorleben salt dome	<p>The Gorleben site for the disposal of HLW was proposed by Federal Government in 1977. Technical investigations have been ongoing. Following consultation with the State Government of Lower Saxony, an annual grant of several million DM was offered to the State by the Federal Government, but the payments have been refused.</p>	<p>It was intended that a long-term safety assessment be completed at a date between 2003 and 2005 but there is currently a moratorium on further detailed investigations at Gorleben. The earliest a repository could be operational by is 2015.</p>
Netherlands		
LLW: A centralised storage facility is currently operational which allows for 100 years of storage of waste.	<p>A site selection committee (LOFRA) was established in the 1980s and was required to consider the willingness of provincial and local authorities. Following technical screening, the Sloe area was identified in 1985. An EIA was undertaken for two sites which included public meetings and formation of working groups. The facility was licensed and constructed between 1990 and 1992.</p>	<p>The meetings and workshops held during the EIA were poorly attended. A subsequent inquiry revealed a number of grievances related mainly to the location of the facility in proximity to the village and lack of integrated planning (perception that Borsele is a national dump site). No complaints were received, however, during construction or since operations began.</p>

Waste category and proposed sites	Consultation process	Comments / status in relation to decision-making
Spain		
L/ILW: Disposal facility operational at El Cabril	Began operating in 1992 following local authority approval of planning application. Decrees issued in 1988 and 1989 authorise ENRESA to compensate hosting communities on the basis of social and economic needs. “Good Neighbour” policy pursued for EL Cabril including training workshops and use of local services and skills.	The disposal facility was developed at an existing storage site in an area with a low population density. The existing structures will be sufficient to meet Spain’s needs until 2010.
HLW: Deep geological disposal	Policy identifying options for disposal of HLW included in Fifth General Radioactive Waste Plan (1999).	Decisions regarding site selection will not be taken before 2010.
Sweden		
L/ILW: Disposal facility (SFR) operational near Forsmark	Offshore sub-seabed site chosen following an open negotiation process between the government and the community. Local authorities did not object.	Repository operational since 1988.
HLW: Deep geological repository	Site specific investigations initiated by SKB in 1992. National co-ordinator appointed in 1996 to promote information exchange. Government approved a transparent siting process proposed by SKB in January 2000. Sites selected on the basis of volunteering. Monetary compensation offered by government. Investigations suspended at two sites following negative result of local referenda. Feasibility studies conducted at sites within four municipalities, including Oskarshamn, where a comprehensive consultation process has been underway. Key features of this process include use of the EIA framework, early involvement of stakeholders, formation of an EIA forum, task groups, local reference group, working groups and public hearings.	Consultation process at Oskarshamn came to be known as the Oskarshamn Model and is generally regarded as one of the most comprehensive and progressive processes currently being undertaken for radioactive waste disposal sites. Criticism from the environmental movement (Waste Network) mainly in relation to disposal methods and decentralised decision making. SKB has recently proposed that surface-based characterisation activities, including deep drilling, should proceed at three of the sites (Oskarshamn, Östhammer and Tierp). If regulator reviews are favourable, and the municipality and the government agree to the work, then drilling could commence as early as 2002.

Waste category and proposed sites	Consultation process	Comments / status in relation to decision-making
Switzerland		
L/ILW: Mined repository	Following technical screening, Wellenberg proposed by NAGRA as preferred location for a repository in 1994. In June 1995 the community voted in favour of repository but the Canton voted against. Federal Government are yet to make a decision. If the outcome is favourable, an advisory committee will be established to liaise between residents and NAGRA. A further Cantonal referendum will be held to decide on the construction of an exploratory drift in 2001.	NAGRA considers that the wording of the Cantonal referendum had an adverse effect on the result. Cantonal politics in Switzerland play an important role in that perceived procedural fairness between Cantons is essential for the legitimacy of the site selection process.
HLW & TRU wastes: Deep geological repository	An expert committee (EKRA) established by Federal Government in June 1999 to investigate long-term geological disposal.	Site selection report expected in 2002 but operation of a facility is not expected to commence before 2020.
United Kingdom		
<p>LLW: Facilities operational at Cumbria (Drigg) and Caithness (Dounreay)</p> <p>ILW: Deep disposal siting programme on hold</p> <p>HLW: Deep disposal but current policy is to store waste for at least 50 years.</p>	<p>In March 1999 a report by the House of Lords Select Committee on Science and Technology emphasised the need to build public consensus. In October 1999 the Government announced its intention to undertake wide public consultation on future management of all types of radioactive waste. Consensus Conference held in May 1999 created a forum for a Citizens Panel. The Panel's report at the end of the Conference identified nine issues for debate by government and the public. One of their key conclusions was that public awareness must be raised and decision making must be open and transparent.</p> <p>A Government Green Paper is due in 2001, setting out options for public consultation. Nuclear industry expected to initiate open dialogue about the state of scientific research.</p>	Processes and methodologies currently being employed by the UK government are referred to as "Front-End" processes designed to enable consensus regarding the manner in which consultation should proceed. A Government White Paper is expected in due course which will outline a generic strategy, general principles and an organisational framework. A requirement for new legislation may be a key recommendation. During the period of policy review and consultation, it is expected that NIREX and other stakeholders will be invited to give input on a wide range of issues.

Waste category and proposed sites	Consultation process	Comments / status in relation to decision-making
United States		
LLW: State-run disposal facilities for commercially generated LLW.	LLW Policy Act of 1985 makes disposal of LLW a State responsibility. States encouraged through legislation to form “compacts” and develop joint facilities. Voluntary siting has been encouraged in some states (e.g. Northeast Compact) while a Decide-Announce-Defend approach has been used in others (e.g. Southwest Compact). Financial incentives also offered by some States.	Although the Act of 1985 specified that new facilities should be operational by 1992, none of the compacts have yet licensed a new site.
TRU Waste: Disposal facility operational in New Mexico (WIPP)	Extensive public consultation process initiated in February 1997 following the submission of a Compliance Certification Application to EPA. Process included wide dissemination of scientific safety evidence and public hearings. Conditional approval by EPA in October 1997 was followed by a 120-day public consultation period involving further hearings. The facility opened in May 1999.	The details of the consultation and permitting process are extensive and complex. Important features include the use of innovative and transparent methods of stakeholder review.

Waste category and proposed sites	Consultation process	Comments / status in relation to decision-making
<p>HLW: Yucca Mountain, Nevada</p>	<p>Nuclear Waste Policy Amendments Act of 1987 directed DOE to investigate only the Yucca Mountain site, despite a number of locations having been previously identified. In 1988 DOE initiated the formulation of “Public Participation Plans” a number of which were drafted but never finalised. Viability Assessment published in 1998 to be used as a basis for future investigation of the site. Transparency and traceability identified as key goals. Documentation aimed at different levels of understanding was developed. Expert panels used to assist in characterising uncertainty. It is possible that the site will be recommended for approval by the President in 2001. The State enjoys veto powers over the President’s decisions. If exercised, however, State veto can be overturned by two-thirds majority vote in the US Congress.</p>	<p>Public scepticism remains significant despite efforts to ensure transparent investigations. Previous incidences of radiation exposure in the 1950s following government’s assurance of guaranteed safety has resulted in lack of trust and perceptions of “victimisation”. Such problems cannot be easily overcome through dissemination of scientific evidence, particularly since the suitability of the site has been questioned. A decision by government to proceed with the repository is likely to severely test the constitutional framework of the US.</p>

Summary of European and North American dialogue developments

The country reviews set out in Appendix A, provide a summary of the different methods, stakeholders and themes that have been central to radioactive waste management programmes internationally. The study indicates that there is no explicit international consensus regarding which principles and processes are the most effective. We have attempted to draw out the essential features of each country's experience and to generate some meaningful insights. An important way of reviewing the country by country experience is to examine any trends in the methods, stakeholders and themes which have been most apparent. In brief, we can say that:

- There is evidence of continuing innovation in the methods of dialogue and procedures for engagement with stakeholders on radioactive waste management, and that these innovations are welcomed by politicians and public alike.
- Public and stakeholder involvement in determining the guiding principles is increasingly recognised as essential for establishing the legitimacy of the overall management process.
- The opportunity to address societal values which lie behind radioactive waste management solutions is essential for progress.
- Longer timescales for public discussion and debate are now accepted as both inevitable and important, reflecting increased social awareness and concern for issues of intergenerational equity and environmental sustainability.
- The Environmental Impact Assessment (EIA) procedure (and potentially Strategic EIA) is based on sound principles and still has an important part to play in the site selection process. The effectiveness of EIA is also determined by country specific guidelines for EIA design and implementation. Countries that have drawn societal values into the process through forms of dialogue and community involvement, such as Finland and Sweden, appear to have made more consistent progress.
- Site selection processes have to be seen as a comprehensive package of measures, specifically tailored to meet the socio-political history, culture, and needs and expectations of the communities involved. Volunteer processes and the use of a local veto are undoubtedly closely related conditions for an effective process, but they must be seen to be part of a wider package of procedural measures.
- Stakeholders, including the public, have brought valuable information, opinions and guidance to the dialogue. They are capable of tackling complex technical issues. Important methods have been developed to increase the transparency and accessibility of technical reports and other material so that it can be fully tested and “stretched” in this way.

4 Designing Stakeholder Dialogue Processes for RISCOM

The review material above provides the foundation for selecting and developing the stakeholder dialogue processes to be examined in RISCOM II WP4. However, the further analysis included in this section is needed before the experimental processes can be fully identified. Below, we consider a variety of factors – context, the use of outcomes, and the relationship between issues and processes – before going on to present key aims and evaluation criteria to be utilised in the WP4 processes.

4.1 The importance of context

It is necessary to consider whether processes which have been productive in one context will necessarily be useful in another. The method/process itself does not guarantee outcomes. However, it is worthwhile identifying the characteristics of particular contexts which make particular processes more or less useful. Although a comprehensive review of this is beyond the scope of this report, some characteristics are apparent. For example, the pre-existing relationships and history of these are relevant. Where there is substantial mistrust, and/or historic disagreement, between parties, then processes will need to take account of this in their design,

Other issues which are linked in the public mind – although they may not be apparent to the institutional mind – are also significant. For example, the BSE issue was highly relevant to the ways in which the GM food debate progressed. Issues of scientific uncertainty and consequent reversals of policy, coupled with unsubstantiated claims of controllability and suspicions of the motives of private companies, undermined public confidence. In terms of radioactive waste, the Front of the Front End study recently completed for Nirex (Hunt and Simmons, 2001) showed that members of the public drew on their knowledge of waste disposal more generally in making sense of the issue of radioactive waste management. This was particularly evident with respect to associations between landfill and underground disposal, and through relating the waste management approach of waste minimisation, reuse and recycling to radioactive wastes.

There are also particular social conditions for effective dialogue. Chief amongst these is that the outcomes of a process need to be seen to have genuine influence on future decisions. In relation to radioactive waste management, one key condition is likely to be the association between waste disposal/storage, and the continued production of such wastes, and it may be that, as is clear from the connection made between production and management by both environmental NGOs and many members of the public, that a satisfactory and consensual solution cannot be reached unless production of wastes – at least in the military and energy sectors – ceases (<http://www.nirex.co.uk/inews.htm>).

The point, then, is that it is necessary to be both aware of factors in the larger social context which are relevant to the selection of a process and to acknowledge that there are particular social conditions under which consultation and dialogue are likely to be more or less effective.

4.2 Relationship with formal processes and uptake of outcomes

The point that the outcome of a process needs to be, and to be seen to be, influential, is problematic in the context of the experimental design. There may well be problems recruiting participants, and in any case, the experiment is compromised by not being 'plugged in' to real decision-making (Hunt and Szerszynski 1999). For these reasons, it may well be necessary to identify 'real' aims for the processes under examination (such as relationship building, information exchange) which are preferably related to the topic under discussion as well as the effectiveness of the process.

4.3 Establishing dialogue issues

The literature on the suite of consultation and dialogue processes available generally makes little distinction between the issues to which they are applied, although suitability for purpose is a constant theme. Key distinctions are between national and local issues, between the particular characteristics of an issue, between issues that affect entire communities or sub-populations, and between particular issues and their socio-cultural resonances. Thus, radioactive waste management is both a national issue (to do with e.g. policy, institutional organisation and responsibilities, and options) and a local issue (to do with e.g. siting and options), a hazardous waste issue, a flagship issue for environmental NGOs, and, to judge by recent qualitative research commissioned by Nirex on public perceptions, an issue of secrecy, mistrust and horrific risk (Hunt and Simmons 2001).

It is recognised that the majority of members of the public will only be motivated to participate when issues start to have local relevance. To elicit the responses of the public when an issue is non- or pre-local, it is therefore necessary to encourage particular members of the public to participate in specific forums such as a consensus conference or focus groups (in this instance, a web based consultation is likely to be dominated by responses from those who have strong, pre-existing opinions) or to otherwise raise the level of interest in and/or concern about the issue to generate participation. Attempting to generate higher levels of public interest and participation may well be appropriate – and necessary – in terms of national decision-making, but is obviously outside the remit of the RISCOM experimental processes, which will therefore have to rely on targeted recruitment of public participants.

A well-recognised characteristic of the radioactive waste management issue is its technical complexity, a characteristic which it shares with other issues such as genetic modification. Given that information provision is itself not a neutral activity, but always presents an issue in accordance with pre-existing framing (however well intentioned), and that publics respond to information partly in terms of the perceived interests of the information provider, technical complexity implies that some processes are more suitable than others. A citizens' jury or consensus conference, for example, where panel members can request particular information from specific sources, is likely to be more robust than one where information is provided from a single pre-determined source.

In sum, issue characteristics such as the location of decision making and policy development, the nature of affected communities, and technical complexity, as well as the political context and existence of a strong or weak sense of citizenship, and the history of relationships, need to be taken into account when selecting and designing dialogue and consultation processes. Such processes are not simply transferable from one context or issue to another.

4.4 Determining what constitutes a successful outcome

What counts as a successful outcome is obviously highly variable, especially when the range of potential evaluative criteria is considered. Not only are there different – and sometimes conflicting – criteria, but there are also different societal groups who may well see very different, sometimes opposing, outcomes as success or failure.

In the radioactive waste arena, it is quite clear that for agencies and institutions charged with developing management facilities, success equates to constructing such facilities. Even this clear objective, though, is complicated by considerations such as the degree and extent of opposition and societal discontent, demonstrable compliance with regulatory requirements, and gaining the respect, or at least agreement, of peers.

For others though – including environmental NGOs, affected communities, and some political and economic actors– success may equate to preventing a proposed facility going ahead. For some, radioactive waste cannot become a solvable problem due to the impetus this would provide for the construction of further nuclear plants. For others, it may be particular proposals or their locations which are resisted. Whatever the particular case, it is quite clear that what counts as success is itself open to dispute. How then can we establish criteria to evaluate different forms and processes of dialogue?

One approach is to aim to generate the circumstances under which individual and institutional interests are subservient to the idea of trying to establish what is in the best interests of society as a whole. Through this approach, differences in values and in visions of what society should and could be can be made explicit. If, as is often the case, these values and visions are incommensurate, then this needs to be addressed before progress can be made, otherwise subsequent developments are likely to founder on these fundamental differences.

A second, not incompatible, approach, is to find agreement on what the criteria for success are – and thus what a process should comprise - between the involved parties. This implies at least a two stage process, the first part of which establishes the aims of the second stage. The need for such a two stage process is part of the justification for using front end consultation.

A third approach is to agree on procedural legitimacy. That is, if all parties agree that the procedure for reaching a conclusion is valid, then they are, in principle, bound by the outcome. This point is likely to be of great importance when evaluating the WP4 experimental processes: is the process itself seen as valid by the participants?

In any case, the ways of reaching agreement on a management option and the location of any facilities is unlikely to be something which can be agreed in the early stages of dialogue. Prior to even addressing such questions, agreement on the aims of a particular process, in relation to the temporal context, is a prerequisite. For WP4, producing outcomes related to options or siting is not directly relevant, providing the opportunity for a necessary focus on the legitimacy of the processes themselves.

5 Evaluation

5.1 The purpose of evaluation

The evaluation culture is growing alongside the norms of accountability and transparency. Estrella (2000) suggests four factors influencing the increasing interest in evaluation in relation to participatory assessment in developing countries; these appear equally appropriate in the West:

- “i) the trend in management circles towards ‘performance based accountability’, with greater emphasis placed on achieving results and objectives beyond the financial reporting;
- ii) the growing scarcity of funds, leading to a demand for greater accountability and demonstrated impact or success;
- iii) the shift towards decentralisation and devolution of central government responsibilities and authority to lower levels of government, necessitating new forms of oversight to ensure transparency and to improve support to constituency-responsive initiatives; and
- iv) stronger capacities and experiences of NGOs ... as decision makers and implementers in the development process.” (Estrella 2000:3).

From these we can derive broad categories of purpose to evaluation:

- policing
- accountability
- learning

Policing refers to the way in which, by defining the aims and values implicit in a process, the initiator or sponsor constructs that process in a way which defines the roles and rules which participants must play to. Moreover, by defining what counts as success, and attaching this to satisfactory evaluations which meet these criteria, evaluation becomes the vehicle for policing the activities of the participants, especially when evaluation criteria have to be met to gain further funding, support, or influence. This interpretation of evaluation of course raises the question of who should set evaluation criteria, and whether, in a truly participatory process, they should be agreed by participants.

Accountability is not entirely separate from policing, as the requirements for accountability can be another method through which the process is policed. It includes other dimensions, though, such as the normative standard of clear attribution of responsibility, and the implied standard of decision-makers having to justify their decisions. Evaluation is a mechanism through which the conduct of a process can be made accountable.

Learning means the enhancement and/or increase in knowledge and understanding of both participants and organisers/sponsors. Evaluation in this case can most usefully be addressed towards identifying the changes in knowledge and understanding that have occurred, and considering whether these should be viewed positively or

negatively. Crucially, learning does not only refer to technical knowledge, but to social, political, personal, tacit, lay, and cultural knowledge, including the knowledge of what is useful about the process. Thus, this form of evaluation in particular needs to be reflexive and iterative. In this case, the evaluative practice needs to be able to reflect what it is within a particular process that has affected learning.

5.2 Evaluation criteria

Developing evaluative criteria presupposes that aims have been identified; the evaluation process essentially asks the question of whether aims have been met. For this report, and hence for WP4, therefore, there is a convergence between the notion of evaluation criteria and aims (Rowe and Frewer 2000).

Potential criteria can be divided into three categories: instrumental, procedural, and constitutive. Instrumental criteria are those concerned with outcomes, such as reaching a consensual decision. Procedural criteria are concerned with the conduct of the process, for example whether it is inclusive, transparent, and accountable. Constitutive criteria refer to the developments implied by participation in the process itself, such as the enhancement of a sense of citizenship, development of new meanings and understandings, and changing identity roles.

It is arguable that there is a retreat from the emphasis on procedural legitimacy in public culture, and a corresponding move towards higher values being placed on constitutive criteria. This can be read as 'hearts not heads', or the greater expression of an intuitive morality rather than a narrowly defined 'rational process'. This is apparent in the upsurge of references in a number of domains (including environmental protection and health) to both acknowledging and taking account of what get called 'public values' which fall outside the framework of instrumental rationality.

Evaluation often becomes compromised by the desire, need or assumption that quantitative results are required. It is extremely important not to constrain evaluation in this way, but to be able to also capture the more qualitative elements which are implicit in many of the potential aims. For example, an 'increase in trust between parties' may be measurable in some sense through questionnaires offering the opportunity to identify the degree of increase in trust on a scale of, say, one to five, but this tells us very little about how respondents interpret 'trust' or what enhanced or degraded a sense of trust. To gain a better assessment of the nature of trust, and what produces or destroys trust, qualitative methods such as interviews are more appropriate, and these will be used in gaining feedback from participants in the WP4 experimental processes.

A further complicating factor is that the aims, and associated evaluative criteria, are likely to be defined differently by different parties (see 4.4 above). For this reason, feedback from participants in the WP4 experimental processes will include an assessment of participants' expectations, and the extent to which these were met.

It is also important not to fall into the trap of assuming that a process which fulfils more criteria is necessarily better. Obviously, this will depend of the relative value of the particular criteria assessed against the aims.

5.3 Key evaluation criteria for the WP4 experimental processes

The WP4 team ranked a comprehensive list of potential criteria as of high, medium and low importance for the WP4 experimental processes. The ranking reflects the importance of the aim as it relates to the trial; importantly, as is noted, the significance of the aim differs in some cases in ‘real world’ situations. Below, we present those criteria which were identified as having high importance:

Table 4. Criteria regarded as having high importance for experimental processes

Criteria of High Importance	Notes
Process	
Transparency of the process and content of decision making	This is necessary for legitimacy of process
Formal and transparent accountability of decision makers; participants also held accountable by themselves and others	This implies that all participants, including decision-makers, accept responsibility for their inputs.
Framing is open to redefinition by participants	Within project constraints, it is important for RISCOM to see how flexible a process can be
Participants are not bound by the disciplining nature of the event	This means that the process does not dictate roles to participants
Discourse equality of access (being able to speak) and of providing an environment in which participants are willing to defend claims	
Deliberative production of views and positions	Deliberation necessitates discussion and debate and presumes that initial positions are open to change through participation in debate
Appropriate resources (including information and time) are available to all participants in order that they have the ability to participate	
Improves understanding between participants/avoids misperceptions of each by other becoming embedded	
Inclusiveness of all relevant/appropriate entities	
Representative	Recognising project constraints, and different theories of representation
Capture by inappropriate interest groups is avoided	The process should provide equal access and ability to participate
Framing	
Project initiators develop insight into a range of values	

A clearer definition of the issues at stake is achieved	
Alternative values are articulated	
Results/outcomes	
Initiators meet objectives	It is important that the RISCOM objectives are met, but less so that any individual party's objectives are met
Results are usable by institutions	
Results are justifiable with reference to legitimate process and procedural legitimacy is achieved in the view of participants	Participants views of the process will be important
Producing more acceptable/less contentious policies/strategies/plans	Although the outcomes are not 'real', gaining knowledge of how to achieve this aim is highly important for the RISCOM study
Knowledge	
New ideas/ways forward are elicited	
'Best knowledge' is elicited	
Knowledge is inclusive of expert, lay and critical domains	
'Sound science' is elicited	
Outcome is well supported by evidence and/or argument	
Truth/fact claims are challenged and verified or otherwise, assumptions and uncertainties are identified	
New meanings and understandings are generated	
Active sense making	
Participants learn	
Reflexivity is induced	Participants are able to reflect on the legitimacy of the process for generating valid knowledge, as well as on the validity of that knowledge
Efficiency	
The expenditure is worthwhile and intangible benefits are recognised (cost-effectiveness)	
The benefits could not have been obtained for less cost (participants time being recognised as a cost)	
Capacity building	e.g. in institutional ability to conduct dialogue and participants' ability to act as citizens
Relationships	
Increasing responsiveness and growing ability to listen meaningfully to participants	

Improves trust between participants	
Reduction of conflict	
Interest and engagement of participants	
Motivating	
Generating new meanings	
Developing sense of shared responsibility for problem and acceptability of solution (ownership)	Noting that RISCOM is not seeking solutions
Developing sense of the common good	A sense of commonality, and inclusion of interests beyond those immediately represented, are important

These criteria will be further refined in Phase 2 of WP4, especially in relation to identifying specific aims for the selection and development of trial processes.

6 Conclusions

There is considerable experience across Europe in public consultation with respect to the development of radioactive waste management policy. However, much of this experience is consultative rather than participatory or deliberative, and much also pays little attention to the ways in which the problem is framed, although this is beginning to emerge as significant.

Experience in the UK in a number of fields, including local government, the health service and the business sector, has focussed on developing and institutionalising new practices. Less attention has been paid to considering explicitly the key questions of why new forms of dialogue and consultation are appropriate, and under which conditions they are relevant. Nonetheless, it is apparent that the characteristics of the context and issue are of prime importance when selecting consultation and dialogue processes.

The aims of consultation are likely to differ between participants; institutional aims may not be consistent with participants' aims both in terms of the process and in terms of the outcomes. The aims and expectations of different groups need to be identified in order to ensure the legitimacy of a process and its effective evaluation.

When selecting processes for the RISCOM trials, attention must be paid to the aims identified, the issue characteristics, and the practical constraints. Stakeholder dialogue, as distinct from public consultation, is an under-defined field with little critical analysis available, and warrants further exploration.

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Appendix 1

Country by Country Overview

Countries included in the study are Belgium, Canada, Finland, France, Germany, the Netherlands, Spain, Sweden, Switzerland, Czech Republic, United Kingdom and the United States. Given the wealth of detail associated with various radioactive waste management programmes internationally, the study focuses on particular sites and aspects of waste management programmes that provide the most useful lessons with respect to stakeholder dialogue and consultation.

A1 Belgium

A1.1 Low-level and short-lived intermediate-level waste

Since 1999 the Belgian radioactive waste management organisation, ONDRAF/NIRAS has taken novel steps forward to address the question of public acceptability within its programme for establishing suitable sites for low and short-lived intermediate level waste. This has involved the development of local “partnerships” in areas where there is a measure of local interest in hosting a facility .

The partnerships depend upon independent mediators from a local University working with local stakeholders in the development of increased understanding of the issues surrounding proposals for disposal. Membership is specific to the individual partnership and including representatives of the local political parties, the various economic, social, cultural and ecological stakeholders, and local industry.

To date two partnerships have been signed. The first was signed on 30 September 1999, between ONDRAF/NIRAS and the local community of Dessel. The second partnership was signed on 9 February 2000 with the local community of Mol, where the national nuclear research centre CEN/SCK is located.

The partnerships have their own budgets provided by ONDRAF/NIRAS and operate at four levels:

- The “general assembly” (or Partnership Council), which involves all the parties and formally represents the “Partnership”;
- The management committee which is appointed by the general assembly;
- Project Co-ordination on a day-to-day basis; and
- Working Groups which are the active basis of the partnerships.

The working groups review and develop draft project proposals with the support of ONDRAF/NIRAS acting as “partner and expert”, but they also have access to independent expertise paid for by the company. The partnerships as a whole will:

- decide on priorities and take decisions;
- organise dialogue; and

- be responsible for keeping the local population informed.

Final proposals will have to be approved by the local councils concerned prior to submission to the Federal Government in 2001–2002.

A1.2 High-level and long-lived intermediate-level waste

ONDRAF/NIRAS are investigating Boom Clay and Yper Clays for the disposal of high-level and long-lived intermediate-level waste. The Mol/Dessel nuclear zone is regarded as a methodological R & D site and the Doel nuclear zone as an alternative R&D site.

ONDRAF/NIRAS intends to publish a report (SAFIR 2) by the end of 2001, on research undertaken to date. This report will be subject to independent peer review. An accompanying strategic document will address potential approaches for stakeholder dialogue on high-level waste and long-lived intermediate-level waste in Belgium.

A2 Canada

A2.1 Low-level waste

The LLW inventory in Canada mainly comprises historic wastes, consisting of contaminated soils (1 million m³) for which the original producer is no longer responsible. Most of this waste is located at two waste management sites in the Port Hope area of Ontario. In 1982, the Government established a Low-level Radioactive Waste Management Office to assume responsibility for these wastes. Subsequently, in 1988, the Federal Government appointed an independent Siting Task Force to carry out a voluntary siting process to find a disposal site. In 1995, the Task Force issued its final report to the Minister for Natural Resources, identifying Deep River in Ontario as a likely site.

Deep River's interest was supported by a 72% majority in a municipal referendum. It was based on a Community Agreement in Principle (CAP) negotiated between the Siting Task Force and the town. An important part of the Agreement was a guarantee for employment. The population of Deep River is heavily dependent on employment from AECL, and plans announced in late 1996 to downsize that organisation, as a precursor to privatisation, caused uncertainty about long-term employment prospects in the area.

In July 1996, the Minister for Natural Resources Canada announced the Federal Government's intention to proceed with negotiations to develop a legal agreement establishing the terms and conditions under which the town would agree to host the facility. The government's urgency to tie the community into a legal agreement was met with negative reaction. Negotiations subsequently ceased and the Community Agreement in Principle lapsed at the end of 1996. In late October 1997, the Deep River Council voted to withdraw from the process completely, although Natural

Resources Canada has still not ruled the community out. In August 1997, Hope Township asked to be considered as a potential repository host location.

A2.2 Spent fuel

Over the last thirty years, spent fuel from Canadian nuclear utilities has been stored at reactor sites in pools and concrete containers. It is likely that final disposal will take place in a deep geological repository. To meet engineering requirements, the facility must be sited in igneous rock of the Canadian Shield. The Shield is located in the northern parts of several provinces including Ontario.

In 1988, the Minister of Environment established the terms of reference for an environmental impact assessment (EIA) of the disposal concept proposed by AECL and Ontario Hydro. The results of the EIA were reviewed by a government appointed Federal Environmental Assessment Review Panel (FEARP) prior to the start of work on siting.

The terms of reference for the EIA comprised four key components:

- A requirement for review and evaluation of the safety and acceptability of the nuclear fuel waste disposal concept and a range of other nuclear fuel waste management issues;
- A requirement for comparison of the concept with other long-term management options and with the management of hazardous waste;
- Scientific review; and
- An instruction to the FEARP to refrain from discussing Canadian energy policy and the construction and operation of nuclear power plants.

Several stakeholder groups criticised the terms of reference on the grounds of lack of public input. Many also held the view that the proponent's credibility regarding future waste projects was inseparable from the safety and management records of current operations. The ability to consider and address this concern was denied through the limitations imposed in the terms of reference. Moreover, objections to the composition of the scientific review panel resulted in a stipulation by the panel itself that a peer review by social scientists and ethicists would be required to evaluate social acceptability of the proposed concept.

Over the course of the following seven years, opportunities for stakeholder participation in the EIA included numerous open houses, scoping meetings, hearings, written briefs and roundtable sessions. Public participation occurred throughout the five provinces of Saskatchewan, Manitoba, Ontario, Quebec and New Brunswick. Participants included invited speakers (both pro- and anti-nuclear), environmental professionals, engineers, Aboriginal groups, professional associations, industrial and technical specialists, government ministries, social and physical scientists, women's groups and private citizens.

One of the drawbacks of the public consultation process within the EIA framework is that the role of participants is limited in that they have no decision-making power. The extent of the influence of opinion is dependent on the will of those with political

authority. This was of particular concern to the Aboriginal inhabitants since the disposal facility would probably be sited on land claimed by them as their traditional territory.

The submission of the EIA by AECL in 1992 was followed by a series of *public* hearings between March 1996 and March 1997, covering a broad range of issues. The hearings, held in numerous communities across Ontario, took place before the FEARP as stipulated in the terms of reference, and was managed by the independent Canadian Environmental Assessment Agency (CEAA). Included in AECL's EIA were recommendations for the siting process, which included volunteerism and shared decision-making.

Stakeholders from organisations and individual members of the public who wished to make submissions to the panel were able to apply for 'intervener funding', for the use of external consultants and advisors. 'Participant funding', to allow individual stakeholders and members of community councils to attend hearings in their localities, was also made available.

The range of views that the FEARP attempted to balance represented a continuum from total endorsement by members of the nuclear community, to total rejection by various non-governmental organisations (NGOs). The latter contended that the existence of irreducible uncertainty in areas such as modelling and long-term predictions requires an inclusive political arena in which to debate and resolve issues.

The FEARP released its public report on 13 March 1998. The FEARP concluded that although AECL's plan appeared technically sound, "*in its present form it does not have the required level of acceptability to be adopted as Canada's approach for managing nuclear waste.*"

The FEARP recommended that a new Nuclear Fuel Waste Management Agency (NFWMA) should be established. By May 2000, the utilities had signed a Memorandum of Understanding to create a Waste Management Organisation. A draft plan for long-term options is being developed.

A3 Czech Republic

A3.1 Low-level waste and short-lived intermediate-level waste

LLW is currently stored in one of three near-surface repositories: Dukovany, Richard and Bratrství. Dukovany, being the biggest of the repositories can hold 30 000 m³ waste. It is the most modern repository – in operation since 1995 - and reportedly complies with advanced European standards. It is situated near Dukovany power plant in the Třebíč district. Richard is situated in a disused limestone mine, near the town of Litoměřice, and has been in operation since 1964. This repository has a total volume of 16 000 m³ but has a capacity of half that figure, due to waste storage in 100 litre drums. Bratrství is solely for the disposal of natural radionuclides and has been in operation since 1974. It is developed in a mining shaft with 5 disposal chambers from which discharged water is drained into retention tanks.

Disposal of all radioactive waste is the responsibility of RAWRA (the Radioactive Waste Repository Authority), who seek to develop active and responsive co-operation with the communities affected by the waste repositories, as well as with the general public and non-government organisations. To this end, they have had personal meetings with representatives from the communities and initiated publication of information as well as production of a comprehensive website. They have also organised visits for Swiss and French groups to tour processing and disposal facilities.

A3.2 High-level waste and spent fuel

The Czech Energy Board in Prague is responsible for the programme dealing with the management of spent fuel and wastes from Czech nuclear power plants. Research institutes, such as the Nuclear Research Institute (NRI) and universities participate in research supporting this programme.

The Czech Power Enterprise (EZ) has conducted several studies concerning spent fuel management in the Czech Republic. Alternatives include:

- interim storage followed by final disposal in the Czech Republic;
- re-processing in another country with return of the wastes to the Czech Republic, or
- final waste disposal in another country.

In 1993, development for a deep geological repository began, with the aim of producing at the end of five years, a plan for: a) a generic design for a repository in granitic rock and b) a generic plan for geological activities to be performed leading up to a siting consultation. Owing to the facility being the first site within the Czech Republic to be designed and organised under a democratic society, expectations are for a lengthy, complicated process. Procedures considering site selection have included technological development of engineered barriers, experimental data from selected test sites, natural analogue studies, and underground research laboratories for safety and performance assessments. The latter issue has included international collaboration with ENRESA (Spain) and NAGRA (Switzerland). Results from the individual projects will be compiled for the use of the National Concept of Radioactive Management, a strategic document that will direct future activities. This document will be subject to EIA evaluation including a public hearing.

Following on from the 'Concept', RAWRA plans to initiate public discussion on the matter of national policy for radioactive waste management. Firstly, RAWRA plan to disseminate information to the media, politicians and technical experts. Secondly, they plan to hold discussions with students from technical, economic, sociological, environmental and legal University departments. RAWRA plan to invite the media to monitor the discussions. The final stage of public consultation will conduct public surveys within different social groups.

Czech radioactive waste management is based on the Atomic Law approved by Parliament in 1997. This law established RAWRA, the state organisation charged with the mission of assuring safe disposal of all radioactive waste, present and future.

RAWRA took over the co-ordination of the development of a deep geological repository in 1998. Much of the development of a deep geological repository is contracted out to NRI who have extensive experience with repository development. Along with development of a national deep repository, RAWRA are also considering plans for long-term interim storage procedures, reprocessing, transmutation and the possibility of a European repository.

Public attitudes in the Czech republic have changed markedly over the last 10 years or more, from support in the early 1990's when people approved of the move away from 'dirty' coal-fired power stations, to anti-nuclear attitudes, emphasised by increasing pressure from near-by Austria, who are nuclear-free. In the period from 1993 to 1997 NRI conducted opinion polls with different social groups and began to aid the public relations arm of RAWRA. Following the Atomic Law, RAWRA have involved the public, including 4, out of 11, representatives from the public on the Board of members.

A4 Finland

A4.1 Spent fuel

Prior to the establishment of Posiva Oy, in 1983, TVO identified 101 potential disposal sites and undertook a consultation process with the communities affected. By 1985, 5 potential volunteer sites remained. It was proposed that further detailed investigations were carried out at these sites. In 1992, following further safety and geological assessments, TVO announced that further investigations would only be carried out at Romuvaara in Kuhmo, Kivetty in Äänekoski and Eurajoki (near the Olkiluoto nuclear site). Interim reports on these sites were produced at the end of 1996. An additional site at Loviisa (host to an existing nuclear site) was added to the list in response to indications by the local community in Loviisa, that they too wished to be included.

In terms of Finland's Nuclear Energy Act, the first authorisation step towards a final repository of nuclear waste is the *Decision in Principle* (DiP). This requires the Government to consider whether the "construction project is in line with the overall good of society". In particular, the government should consider the need for the facility, the suitability of the proposed site, and its potential environmental impact. Legislation subsequently requires that the Radiation and Nuclear Safety Authority (STUK) should make a preliminary safety appraisal of the DiP. The proposed host municipality must state its acceptance or rejection for siting the facility. The decision has then to be endorsed by the Finnish Parliament. The application for the DiP also includes an Environmental Impact Assessment (EIA) report for the planned facility.

An EIA report to the Ministry of Trade and Industry (MTI) and a DiP application to the Government were submitted by Posiva Oy in May 1999. The EIA covered the four candidate sites and incorporated a number of consultation methodologies including open meetings, dissemination of printed materials and videos, an opinion survey, theme interviews, small group discussions and analyses of written feedback. The submission of the EIA was followed by a series of public hearings. During the

hearing period, 15 authorities and public bodies, 5 civic organisations and communities, and 23 municipalities submitted their statements on the EIA report to the MTI. In November 1999, the Ministry gave its statement, which completed the EIA process

The authorities and municipalities were mainly positive and the EIA report was generally regarded as having been wide ranging and thorough. Of primary concern was the issue of social stigmatisation - the potential deterioration in the self and external image of a municipality. This was particularly in relation to the inland sites (Romuvaara and Kivetty), where there are no existing power utilities and small-scale tourism and agriculture are regarded as important components of the local economy. The possible impact on health associated with the transport of spent fuel and potential transport accidents were also of concern.

Private individuals' and civic organisations' opinions on the EIA, as well as on the whole disposal project, were critical and opposing. Their viewpoints tended to focus on issues outside the scope of the EIA. There appeared to be some confusion regarding the purpose of the EIA, which was to assess the impacts of the programme rather than to identify a specific site.

Nevertheless, the MTI concluded that the EIA was sufficiently comprehensive and detailed and fulfilled the requirements set by the EIA legislation. The MTI did request however, that a construction licence application for the disposal facility, scheduled to be submitted by 2010 at the earliest, should include an updated EIA report.

Posiva Oy plans to construct an investigation shaft at the chosen site in 2003, and to apply for a construction permit in 2010. The first emplacement of spent fuel could not take place before 2020.

A5 France

A5.1 High-level waste

The 1991 Waste Act redirected the French deep site investigation process following the abandonment of an earlier high-level waste (HLW) programme which sought to identify promising disposal sites primarily by reference to geological considerations. This methodology resulted in strong opposition and, in 1990, a moratorium was declared on drilling activities by the Government. The 1991 law contains several provisions aimed at a more equitable siting process including a requirement that local officials and members of the public from the affected sites be consulted before any site investigations begin preliminary to Underground Research Laboratory (UGL) construction.

The creation of URLs is a key requirement of the 1991 law. M. Christian Bataille was appointed as a mediator and specifically charged with leading public involvement prior to the selection of URL sites. His mediation mission had three objectives:

- information provision to the public,

- open dialogue, and
- decision facilitation.

The siting process for the URLs began in January 1993. By December of that year some 30 sites had volunteered for consideration. Ultimately, four potentially suitable sites were recommended by M. Bataille. Two were subsequently merged so that three locations were then under consideration:

- a clay geology in north-eastern France on the border of the Meuse and Haute Marne Departments (the Bure site);
- a clay geology beneath the Marcoule nuclear site in the south of the country in the Gard Department;
- and a granite geology in the Vienne Department in western France.

Surface-based investigations at these sites, including drilling between two and four boreholes and geophysical measurements, were completed in April 1996.

The Council of Ministers authorised ANDRA to submit requests for the installation and operation of URLs at each of the three sites in May 1996,. Authorisation of the URLs was scheduled to have been completed in 1998, following review of the submissions by the Division of Nuclear Safety (DSIN) within the Ministry of Industry, and the Ministry of Research. The reviews were to take place in conjunction with public hearings and local consultation. The hearings at the sites ran from January to May 1997. The following December, the Government advised that investigations should continue at the Bure site and that further research should be undertaken towards identifying a suitable site in granite. A decree was issued in August 1999 allowing ANDRA to commence construction of the Bure URL, providing for the establishment of a Local Information Committee at Bure, and launching a consultation exercise to select a granite site.

The selection process for a granite site was initiated with a geological screening process that began in February 1999. This resulted in the identification of 180 plutons in the country and, by July 1999, this number was reduced to about 15 sites following consideration of hydrogeology. As a result of further screening, the number of potentially suitable sites was narrowed down to seven in February 2000. The next phase of the programme is divided into five stages and is being managed by a Granite Advisory Committee comprising two international experts, two government appointees, and four members recommended by the Academy of Sciences and approved by government. The stages are as follows:

- 1 - seek consensus through consultation;
- 2 - selection by government of a site or sites where the community wishes further consideration;
- 3 - confirmation of geological suitability (by ANDRA); confirmation of safety factors by DSIN; and setting up of Local Information Committees made up of environmental groups, government officials, local community representatives, farm councils, professional associations, etc;

- 4 – *enquetes publiques* (public enquiries) and endorsement by local authorities within a 10 km radius of a site.
- 5 - decision by central government to authorise construction of a URL .

It was originally intended that the granite site selection process would be completed by 2003. However, the process is stalled at Stage 1, the objective of which is to seek consensus through consultation with the communities in proximity to geologically suitable sites identified during the Phase 1 screening exercise. A government delegation sent to consult with the affected communities was strongly opposed in all communities that were visited. The negative attitude of the community leaders could have resulted from a range of factors, including a ratcheting up of concern by NGO representatives from outside the communities, a perception that the government delegation was not sufficiently representative, and the nature of the screening phase with consultation coming too late in the process.

A6 Germany

A6.1 Low-level and intermediate-level waste

At present a number of sites exist but are not licensed largely due to disagreements at government level. A Working Group Committee on Site Selection has been established by BMU (Federal Ministry for the Environment), membership of which includes environmental groups and nuclear experts. Use of the internet and workshops for MPs, NGOs and unions are amongst the techniques used to encourage stakeholder participation. The working group will review existing criteria and will look at international practice before proposing the “relatively best site” in the country. We understand that an Interim Report by the Committee on Site Selection has recently been issued. The sites under investigation include Konrad, Morsleben and Asse. The most detailed consultation programme has taken place in relation to Konrad.

The Konrad mine in Lower Saxony was investigated by GSF (Federal Research Centre) from 1976 to 1982 to determine its suitability as a radioactive waste repository for L/ILW. The site was found suitable for the disposal of L/ILW and, in 1982, an application was made, initiating a licensing procedure. The compliance report for the Konrad project was submitted in 1986.

In 1991, a revised version of the compliance report was made available for public comment. Due to a strong political campaign in Lower Saxony and by the Green parties, approximately 10,000 objections were raised on the compliance report.

The Federal Office for Radiation Protection (BfS), responsible for the construction and operation of repositories, consequently started an intensive preparation period prior to the public inquiry in September 1992. A team of 11 representatives with expert knowledge regarding all aspects of the project was assembled and coached by psychologists to improve their understanding of stakeholder concerns and prepare them for discussions with the public. The public inquiry ran for 75 days and is the longest atomic law debate ever held in Germany. In the first few days of the inquiry,

formal procedures were established for raising objections and discussions. Issues were categorised and an agenda was devised stipulating time frames and who would be allowed to participate in discussions.

A range of issues were debated, many of which were not directly relevant to the licensing procedure but were, nevertheless of public interest, for example, risks associated with the transport of wastes and reasons why the Konrad site was selected. These issues were dealt with in detail by BfS. Other key issues included safety aspects, waste origin, waste amount, and how the waste acceptance criteria for waste returned from other countries would be met.

Despite a highly charged atmosphere during the inquiry, the public appeared to trust the proponent's team and were generally satisfied with the manner in which issues were addressed. The licensing process is still continuing but a stand off exists between BfS and the State Government.

A7 The Netherlands

A7.1 Low-level and short-lived intermediate-level waste

LLW and ILW are currently stored at COVRA's central facility. In 1982, a Committee (HVRA) was established to investigate the issue of long-term storage of radioactive waste. The HVRA Committee included representatives from environmental and industrial organisations. Following a report by the HVRA Committee to government, a Radioactive Waste Storage Facility Site Selection Committee (LOFRA) was established and asked to identify suitable sites where all types of radioactive waste could be processed and stored. LOFRA was asked to give particular consideration to the willingness of provincial and local authorities to co-operate.

Twelve sites were initially identified by LOFRA and discussions held with local and regional authorities, planners and politicians. Following further screening, the number of technically feasible sites was narrowed to three.

In 1985, LOFRA identified the Sloe area as the most suitable location and a site close to the nuclear power station at Borsele was chosen. A second site was subsequently identified by the Tijdens Committee (named for the alderman of the municipality of Borsele). This was the site already occupied by COVRA at Vlissingen Oost. An EIA was produced for each site. Although public meetings and working groups did form part of the process, communication with stakeholders was not effective (see below). A licence for the second site was, however, granted and the storage facility was constructed between 1990 and 1992. Compensation for the host community by COVRA was restricted to employment, benefits from the sale of land, and purchasing of local goods and services.

Recently an inquiry into perceptions around the establishment of the COVRA storage facility has revealed a number of stakeholder issues and concerns. Four categories/groups of stakeholders were identified: directly aggrieved parties,

indirectly aggrieved parties, advocates and environmental lobbyists. The concerns of these groups are briefly summarised below:

Directly aggrieved parties

This group is still actively objecting to the COVRA facility. Their grievances are based largely on issues around safety, location of the facility on the river-banks, and the effect on property values. The specific objections of this group tend to focus on the consequences of events, such as an accident or flooding of the river, rather than the likelihood of occurrence of the events. Concern was also expressed with regard to compensation and liability issues.

Indirectly aggrieved parties

Indirectly aggrieved parties are mostly concerned about the fact that the COVRA facility is yet another example of a development which affects the community without, as they see it, community members being adequately involved in decision-making. They are satisfied that it is in COVRA's own interest to meet requirements and standards that would minimise the likelihood of accidents, but would like to see an integrated approach to planning of future developments and possible expansion of the facility.

Non-aggrieved parties / advocates

Many of those whom were not necessarily against the establishment of the facility followed the argument that it is logical to have a storage location in the vicinity of a nuclear power station. However, this group has also criticised the procedure followed and lack of consultation in decision-making. Some claim that at one time people in Borsele took pride in the presence of the power station and people's perceptions and regard for COVRA have subsequently changed.

Environmental lobbyists

In their objections to the storage site, the anti-nuclear movement have disassociated themselves from the local community's perceptions and grievances. Anti-nuclear and anti-COVRA demonstrators come from outside the community and many local residents feel that the presence of lobbying groups enhances a negative perception of the area.

A8 Spain

A8.1 Low-level and intermediate-level waste

L/ILW waste was initially stored at a facility sited at El Cabril near Cordoba. Characterisation work to assess the suitability for disposing of waste there began in 1986. In 1989, the local planning authority approved a disposal application and the facility came into operation in 1992. The area surrounding El Cabril has a low population density.

The Spanish radioactive waste management organisation, ENRESA, pursues a "good neighbour" policy with the local villages and has studied social and economic needs in the area around El Cabril. Training courses have been held, and locals are

employed as contractors. ENRESA has also stated their willingness to help improve the local road infrastructure in order to encourage investment in the area.

Interestingly, for high level waste and spent fuel, Spain's General Radioactive Waste Plan of 1999 states that research on separation and transmutation of radioactive waste should be supported in addition to geological disposal options.

A9 Sweden

A9.1 High-level waste and spent fuel

A programme to site a deep repository for high-level radioactive waste and spent fuel was initiated by SKB in 1992. It was envisaged that first-stage operation would begin in 2008. The concept suggested for disposal is abbreviated to KBS-3, and comprises a bedrock repository at a depth of approximately 500 m where spent fuel will be encapsulated in copper-steel canisters surrounded by layers of bentonite clay.

The Government gave broad approval to the initial proposed siting process but emphasised the importance of a well-defined and transparent programme that incorporated the following steps:

- publication of siting factors, covering safety, technology, land and environmental impact, and societal aspects;
- content and publication of countrywide siting studies;
- undertaking largely desk-based feasibility studies of between five and ten sites, followed by more intensive surface-based investigations at two or more sites;
- a final application for construction of a shaft and/or tunnel for detailed investigation at a preferred site.

The updated R&D programme presented to the government by SKB in 1998 was reviewed by a large number of national organisations, including the Swedish Radiation Protection Institute (SSI) and the Swedish Nuclear Power Inspectorate (SKI). In April 1999, SKI delivered its recommendations to the government, following which the government stated, in January 2000, that the programme fulfils the requirements contained in the Act on Nuclear Activities.

Feasibility studies have been conducted at eight sites chosen on the basis of municipalities volunteering to allow the study and subsequently being provided with up to Euro 250,000 per year from the waste funds for its own costs related to relevant activities. In addition, a National Co-ordinator was appointed by the Government in 1996 to promote information exchange and co-ordinate liaison between local authorities.

The first two feasibility studies were conducted for sites at Malå and Storuman, both situated in the far northern part of Sweden. Following completion of the studies, both the communities held a referendum and voted against continuing with the next step in the programme, namely site characterisation. An overview of the referenda timetables is provided in Table A1 below.

Table A1: An overview of referenda for Storuman and Malå.

Procedures	Storuman	Malå
Decision, overview study	June 1993	November 1993
Decision, referendum	February 1995	November 1993
Referendum	September 1995	September 1997
Interviews	November 1995	November 1997

Despite the absence of specific legislation governing siting in Sweden, SKB has agreed to respect the results of local referenda in municipalities. Any local veto, however, has no statutory force and the Swedish Government could override local objections and grant permission for further studies to be carried out. This did not happen with respect to Malå and Storuman and no further investigations have been undertaken at these localities. KASAM has requested the Government to specify the circumstances in which local objections may be overridden.

Feasibility studies have now been undertaken at sites in six other municipalities, namely Nyköping (with the nuclear research centre at Studsvik), Östhammar (with the Forsmark nuclear site), Oskarshamn (with three reactors and encapsulation research laboratory), Hultsfred (neighbour to Oskarshamn), Tierp (neighbour to Östhammar) and Älvkarleby (in the same region as Östhammar and Tierp). Each of these communities had volunteered to take part in the process. SKB has recently proposed that surface-based characterisation activities, including deep drilling, should proceed at three of the sites (Oskarshamn, Östhammar and Tierp). If regulatory reviews are favourable, and the municipality and the government agree to the work, then drilling could commence as early as 2002.

Of the six municipalities, the consultation process at Oskarshamn provides the most useful example of community involvement in decision making. This process is referred to as the Oskarshamn Model and is described in more detail below.

A9.2 The Oskarshamn Model

When Oskarshamn was identified as a possible site for the encapsulation plant, the municipality announced two prerequisites to its acceptance as a candidate site. The first was that the participation of the municipality in discussions and investigations was to be paid for from the Nuclear Waste Fund, and the second was that the key parties (SKB, SKI, SSI and the county) accepted the idea of an EIA Forum chaired by the Lt. Governor of Kalmer County. The municipality specifically chose EIA as the lead process for its involvement as the philosophy behind EIA, according to the municipality's understanding, provided the key elements of public involvement, i.e. openness, early involvement and identification of alternatives.

One of the first tasks of the EIA Forum was to set up a local reference group. The EIA Forum felt that the municipality council with 51 elected members should fulfil this

function. Efforts were subsequently made to engage the local population through public meetings, seminars and local study organisations. Each of the neighbouring municipalities was also asked to identify a contact person. Six working groups were established to monitor the various aspects of the investigation. The elected representatives had full autonomy in terms of using external consultants and advisors when required.

The municipality was formally asked by SKB in 1995 whether they would accept a feasibility study for the siting of the deep repository. The municipality took one year to investigate the programme and engage as many stakeholders as possible in the decision-making process. To aid the discussion, two task groups were established by the municipality council, and were asked to report back to the full council with recommendations. One group consisted of the most experienced politicians in the council and the other group comprised the youngest members of each political party. Following positive feedback from both groups, the council voted to accept a feasibility study in October 1996 with certain conditions.

To monitor the feasibility study, six working groups were set up with different areas of focus. Each group comprises two council members, one civil servant, two local citizens and one external expert. Numerous meetings have been held with SKB and various consultants and scientists involved in the feasibility study, and all the minutes of these discussions are available on request or via the internet. The main questions and concerns raised by the working groups are forwarded to the EIA Forum for further discussion with representatives from SKB, SSI and SKI.

The structure of the EIA consultation process is presented in Table A2, followed by a list of the key features of the Oskarshamn Model.

Table A2: Structure of the EIA process.

Phases in the EIA process	Participants	Activities	Product
Phase 1 EIA Scoping Study	All stakeholders	Meeting with EIA Forum Meetings, hearings at local level	Advice on EIA document
Phase 2 Proponent's work	Proponent	Project work	Licence application
Continued EIA process	All stakeholders	Hearings, seminars	Understanding
Phase 3 Final phase of EIA = 1 st phase of licensing	Regulator interacting with community	Review and decide followed by hearings	Improved licence application

Notes: Stakeholders would include the proponent, regulator, county, municipality and the public. The EIA Forum comprises a group of representatives for each stakeholder.

Key features of the Oskarshamn Model:

- Commitment to openness and participation;
- The EIA process as a framework for interaction and stakeholder involvement;
- The municipality council as reference group as a means of increasing knowledge of political decision makers;
- Local involvement through task groups and working groups;
- Regulator involvement;
- Participation by environmental groups;
- Transparency and challenging SKB.

A10 Switzerland

Currently, all licensing procedures are within the remit of the Federal Government whilst the Cantons and Communities grant building licences. The Federal Commission on the Safety of Nuclear Installations (KSA) and the Federal Office of Energy, Nuclear Safety Department (HSK) draw up guidelines for disposal. Federal law also requires that Cantons be consulted before a licence is granted. This means that the public are consulted through a referendum, a ballot or a Cantonal Assembly, although the outcome is not legally binding on the Federal Government. Cantonal politics in Switzerland, nevertheless, plays an important role in that perceived procedural fairness between Cantons is essential for the legitimacy of the site selection process.

In June 1999 the Federal Government's Expert Committee on Disposal Concepts for Radioactive Waste (EKRA) was established. The Expert Committee's membership included a specialist on ethical issues and was chaired by a geologist who was known not to be in favour of disposal. EKRA presented their final report in February 2000. They proposed monitored long-term geological disposal, which combines final disposal with the possibility of retrievability of waste.

A10.1 Low-level and intermediate-level waste

The Swiss radioactive waste management organisation, NAGRA, has developed a concept for the disposal of short-lived L/ILW in a repository mined into a mountainside. NAGRA began the process of site identification as long ago as 1978. By 1993, one hundred locations had been identified as having potential from a geological perspective. As a result of further screening processes, the initial number of sites was narrowed down to four in three different host geologies. In 1994, NAGRA sought the opinion of the Government inter-agency body AGNEB when it proposed Wellenberg to the Government as its preferred location. AGNEB agreed that the process had been transparent and that the site was a "good choice". As a result, NAGRA made public that it recommended siting a repository at Wellenberg (in the community of Wolfenschiessen within the Nidwalden Canton). However, in June 1995, the Nidwalden Canton voted narrowly against the development of a L/ILW repository at Wellenberg, despite an outcome in favour of further investigations from the local Wolfenschiessen community.

EKRA however has indicated that it supports NAGRA's choice of the Wellenberg site and a final decision by the Federal Government should follow a Cantonal referendum which is expected to be held on the construction of an exploratory tunnel in 2001. Should approval to proceed be obtained, a Technical Group will be then be formed together with an Advisory Committee established by GNW (a daughter company of NAGRA).

A11 United Kingdom

A11.1 Low-level waste

LLW waste is disposed of in near-surface disposal facilities by BNFL at Drigg, Cumbria. LLW has been disposed of in shallow pits by UKAEA at Dounreay in Caithness.

Long-lived ILW and HLW are currently in long-term storage, pending the outcome of a Government review to establish a new national waste management policy. The House of Lords' Select Committee on Science and Technology, having undertaken an investigation spanning 15 months, published a report dealing with the Management of Nuclear Waste in March 1999 (HL Paper 41). Its main recommendation was that the Government should seek to build public consensus before attempting to implement its chosen policy.

In October 1999, the Government responded to the report of the House of Lords' Select Committee on Science and Technology on the management of nuclear waste. The Government announced its intention to undertake wide public consultation on the future management of radioactive wastes, including consideration of the options, such as whether to continue storage above ground or move to deep storage underground and eventual disposal. Whilst the House of Lords' report was prepared independent of Government, Ministers have indicated that its findings will provide the foundation for subsequent Government consultation.

A11.2 Citizen's Panel

Although not formally a part of the Government consultation process, a "Consensus Conference" on radioactive waste management, held in London in May 1999, provided a further input. Consensus Conferences are a method of involving the public in the assessment of key issues of science and technology. Pioneered in Denmark, Consensus Conferences create a forum for a Citizen's Panel, made up of lay members of the public, to take part in an informed debate with expert witnesses of their choice.

The panel of fifteen citizens, recruited from throughout Britain, came together in London to debate the issue of radioactive waste management, following two weekends of intensive preparation. At the end of the Conference, the Panel produced a report on its views as to what are the key issues for circulation to the Government, media and other interested parties, thus opening up the debate in an area which is usually dominated by scientists and specialists.

The key issues/questions identified include:

- 1 What do you see as the primary advantages/disadvantages of deep disposal? What do you see as the primary advantages/disadvantages of shallow/surface storage?
- 2 What is the current/future policy with regard to companies other than BNFL who produce radioactive waste?
- 3 Currently, what research and development is there into nuclear waste treatment?
- 4 Would privatisation mean that an integrated approach to dealing with the problem of radioactive waste management would be more difficult? How can you guarantee that shareholders' profits will not become more important than preserving current safety standards?
- 5 What is the current/future policy with regard to informing the public about radioactive waste?
- 6 What benefits does the UK gain from importing spent fuel for reprocessing?
- 7 What is your opinion on the continuation of nuclear power? What are the financial, environmental and social costs?
- 8 Who supervises the military? How do we deal with decommissioned submarines? What research into "lost" waste is currently being undertaken (e.g. in the ocean, on Ministry of Defence land)?
- 9 What are your opinions on the current terminology used for the classification of radioactive waste?

The key conclusions of the Citizen's Panel were:

- Radioactive waste must be removed from the surface and stored underground, but must be monitored and retrievable. Cost cannot be an issue. We must leave options open for future solutions.
- A neutral body should be appointed to deal with waste management including site selection.
- Public awareness must be raised. Decision-making must be open and transparent.
- Research and development must be continued on a much larger scale.

A11.3 National Consultation

It is envisaged that the Department of the Environment, Transport and the Regions (DETR) will issue a Consultation Paper on future radioactive waste management in 2001, setting out options for public consultation. It is possible that the Consultation Paper may include a proposal for "consultation about consultation". This would be a so-called "Front End" process of consultation which is designed to enable all stakeholders to enter into early dialogue and potential consensus regarding the manner in which consultation about substantive and procedural/ planning issues should be undertaken.

In addition, it is likely that the nuclear industry will itself initiate an open dialogue process about the state of scientific research knowledge regarding radioactive waste management and disposal. This so-called “Science Review” is also likely to incorporate a “Front End” process.

A12 United States

A12.1 Low-level waste

A small number of essentially national low-level waste (LLW) repositories had been operating at Barnwell, South Carolina, and Richland, Washington, and at several other locations across the US prior to 1985. However, The Low Level Waste Policy Act of 1985 instructed each state to solve the problem of disposing of its own LLW. The legislation encourages States to join together and form so-called “compacts”, and to develop joint facilities. Although the Act specified that the new facilities should be operational by 1992, not one new facility has been developed to date.

Many compacts have engaged in detailed siting programmes. The most advanced programme at present is for the Southwest Compact in California, where a site selected by the Decide-Announce-Defend (DAD) method has met with intense public opposition.

Other compacts have introduced volunteerism, with detailed programmes around financial incentives. For example, in the Northeast Compact, it was announced that a town that decides to participate would be paid \$250,000, and that the first town to volunteer would receive an additional \$100,000. If the town stayed in the programme for six months, identified a site and continued negotiations “in good faith”, it would receive a further \$250,000. A town that approved a site and facility development agreement by referendum would then receive \$1 million. Despite these significant financial incentives, no final site has yet been selected in any State in the Northeast Compact.

A12.2 Transuranic waste

The Waste Isolation Pilot Plant (WIPP) for the disposal of transuranic (TRU) waste opened for disposal in May 1999. It was constructed between 1980 and 1990, following siting studies which commenced subsequent to a 1957 report by the National Academy of Sciences recommending disposal in salt formations. WIPP is located in a salt formation at 650 m depth, some 50 km from Carlsbad, New Mexico. Less than 100,000 people reside within an 80 km radius of the facility.

In 1996, the Department of Energy, (DOE) submitted a Compliance Certification Application (CCA) to the US Environmental Protection Agency (EPA) to demonstrate that the WIPP complies with the EPA criteria. EPA public consultation, including public hearings in New Mexico, began in February 1997.

The EPA concluded in October 1997 that, subject to certain provisions, WIPP complies with its disposal standards and should be certified. This action initiated a 120-day public consultation period involving further hearings. The details of the EPA CCA and the Resource Conservation and Recovery Act (covering hazardous waste components of the WIPP inventory) consultation and permitting processes, including the relationship between the State of New Mexico, Carlsbad and the US DOE, are extensive and complex. Suffice to say that the licensing of the WIPP facility was subjected to some of the most innovative and transparent methods of stakeholder review to have been applied in the US if not elsewhere. Key features of the approach included:

- Enhancing realism, reducing uncertainties and simplification of conceptual and numerical models;
- Responding to public concerns in terms that are non-technical and readily understood;
- Active encouragement and participation in joint international collaborative efforts in the USA and abroad.

A12.3 High-level waste and spent fuel

Following the Nuclear Waste Policy Amendments Act (NWPAA) of 1987, the US siting programme for high-level waste and spent fuel has been centred on Yucca Mountain in the State of Nevada. A number of locations in various geological settings across the US had previously been under consideration, but the Amendments Act directed the DOE to examine *only* the Yucca Mountain site. The 1987 legislation was criticised by the State of Nevada as unfair, although the Act specified that if studies showed the site to be unsuitable then investigations would cease. The legislation also provides for a benefit package for Nevada of \$10-20 million per year provided the State waives its right to object to the proposal, not surprisingly, this condition has not been accepted by the State.

Under US Law, the DOE takes title to the spent fuel from utilities prior to final disposal. For the interim, the DOE proposes to store the spent fuel at the surface in a centralised facility known as the Monitorable Retrievable Store (MRS). To enable the siting of the MRS, the 1987 NWPAA established the Independent Office of the Nuclear Waste Negotiator to try to find a willing host in exchange for certain benefits. However, although some progress was made with a number of Native American Tribes, the negotiation process was terminated without result.

Despite the assurances of the DOE that Yucca Mountain can never become a repository without reasonable assurance of its ability to contain and isolate the waste, the Nevada public remains sceptical. Much of this scepticism is based on previous experience where the government had assured stakeholders that there would be no adverse effects associated with weapons testing in the 1950s. Trust in the government was seriously undermined when people were exposed to radiation doses downwind of the atmospheric testing area. High-level nuclear waste disposal at Yucca Mountain is unlikely to pose the same threat, but the choice of a site with a history of radiation exposure does affect public opinion.

A “Viability Assessment” (VA) was published by the DOE in 1998. The purpose of the assessment was to provide Congress, the President, and the public with information on the progress of the Yucca Mountain Characterisation Project, as well as to identify critical issues that needed to be addressed before a decision is made by the Secretary of Energy on whether to recommend the Yucca Mountain site for a repository. The assessment comprised a collection of largely technical documents aimed at stakeholders with different levels of understanding.

The VA report identified the main advantages of the Yucca Mountain Site as being its previous use as a nuclear weapons testing area, and the desert environment (no significant water sources in proximity to the site). From a health and safety perspective the report predicted that maximum radiation exposure from the repository is expected to occur after about 300,000 years. People living approximately 20 km from the site at that time might receive additional radiation exposures equivalent to present-day background radiation.

Six months after the publication of the VA, an Environmental Impact Statement (EIS) was produced. The purpose of the EIS was to provide information on potential environmental impacts throughout the life cycle of the proposed repository at the Yucca Mountain site. As a baseline for comparison, the No-Action alternative was also considered in the EIS. Public input to the EIS included fifteen Public Scoping Meetings between August and October 1995. Of the issues identified, a number were addressed in the EIS, including aspects of the characterisation programme, construction, operating and monitoring, consistency with existing land-uses, effects of earthquakes and volcanism, health and safety, long term and cumulative impacts and possibility of sabotage. Other issues raised were considered to be unrelated to the proposed action. These included general statements in support of or in opposition to a repository at Yucca Mountain, geological repositories in general and nuclear power; lack of confidence in the Yucca Mountain Programme; perceived inequities and political aspects of the siting process; the constitutional basis for waste disposal in Nevada, perceived psychological costs and effects; risk perception and stigmatisation; and legal issues involving Native American land claims and treaty rights.

The EIS did not identify significant adverse effects associated with the long-term performance of the site. Peak doses of 1.3 millirem per year over 10,000 years are predicted to a maximally exposed individual hypothetically located 5 km from the repository.

The cultural issues associated with the Native American Tribes in the Yucca Mountain region were identified as an “area of controversy”. The tribes consider the intrusive nature of the repository to be an adverse impact to all elements of the natural and physical environment. In addition, one Native American ethnic group (the Western Shoshone) continue to claim title to land at Yucca Mountain.

In the next year or so, it is possible that the site will be recommended by the DOE for approval by the President of the United States. However, the NWPAA provides the State of Nevada with veto powers over the President’s decision. If exercised, however, the State veto can itself be overturned by a two-thirds majority vote of the US Congress.

If the site is approved, the DOE considers that a repository at Yucca Mountain could become operational by 2010. However, the siting issue, as indicated above, is as much a political issue as technical issue. A decision by the Federal Government to proceed with the repository at Yucca Mountain is likely to severely test the constitutional framework of the United States.