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# OBRA

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## Contents

# 1 Background

This report constitutes the deliverable for Task 3.2 of the OBRA project and is the report of a workshop designed to act as a trial of an information package intended to help inform community leaders and advisers about the geological disposal of radioactive wastes.

A draft version of the trial OBRA training package information document has been developed, reviewed and commented upon by the OBRA project partners. The package[1] was intended to assist local community representatives and their consultants and advisers who were faced with the possibility of hosting a geological repository for radioactive wastes and needed to understand all aspects of its implications for their community. The draft package formed a main topic of discussion at an internal OBRA workshop in Prague in October 2007. Following this input, the information package was extended and revised into a final version for use in Task 3.2, for which the present report is the Deliverable. In addition, other material was produced to form the information basis of a repository siting role-play exercise in Task 3.2. The final documentation package for the trial workshop comprised:

1. Siting a Deep Geological Repository: Trial Information Package for Interested or Involved Communities.
2. The Erehwon Repository Project: Background Information.
3. Programme and Participant Instructions.

The package of documentation was sent out to the participants in advance so that they could prepare for the exercise.

The workshop was held from April 7$^{th}$-8$^{th}$ 2008 (6th arrival, 9th departure) in Meiringen, Switzerland, and involved 4 tutors, a representative of the IAEA and 17 participants from Bulgaria (3), Czech Republic (2), Finland (2), Germany (1), Philippines (1), Romania (3), Sweden (3) and Switzerland (2). Seven participants were supported by the IAEA. Five of the participants were local community representatives, 4 were from Universities, 4 were from research institutes or NGOs and 4 from waste management implementing organisations. The list of participants is included in the Annex.

The workshop tested the basic information package, a presentation based upon it, an expert panel and a stakeholder role-play exercise on siting a geological repository in an imaginary country. The overall intention was to assess how useful each of these methods of accessing and using information was to typical users.

Views were sought from the participants on the process and outcome of the workshop so as to develop this report on the lessons learned from the trial.

# 2 Workshop Objective

The aim of the OBRA project within the EU FP6 programme is to assess the feasibility of creating an Observatory for long-term governance on radioactive waste management in Europe. If an Observatory is established after the OBRA project is completed, it will contribute to the better governance of radioactive waste by providing mechanisms for all stakeholders to have access to the knowledge that has been generated by successive EU programmes, and in the wider international context, in

[1] Deliverable 3.1: Training and Communication Interactive Package can be found on the OBRA website (www.obraproject.eu).

both the scientific and social sciences fields.

One objective of OBRA is to evaluate ways of providing access to information for communities that are, or might be, affected by radioactive waste management projects. This workshop was intended to act as a trial of two mechanisms for providing such users with access to information and experience, using geological disposal of radioactive waste as the basis:

- a 'classical' approach to technical information, based upon what was intended to be regarded as accessible documentation and presentations, backed up by access to experts who could answer all types of question about every aspect of geological disposal in an informal context;
- a role-play exercise that puts the user in the place of different stakeholders faced with responding to a proposed geological disposal project and endeavouring to find a solution.

The workshop lasted for two full days. Day 1 was a trial for the Information Package on geological disposal. A few short presentations were followed by an informal panel session where users could explore any issue to do with geological disposal (or other radioactive wastes, nuclear power, etc). Day 2 was devoted to a role-play exercise on siting a geological repository, set in the imaginary country of Erehwon.

Participants were asked to look into the Information Package document to see whether it answers the kind of questions that they had about geological disposal, in a suitable format. They were asked to be prepared to ask questions and join in discussions on geological disposal and to complete a questionnaire on the usefulness of the Package.

Participants were also asked to read thoroughly the short role-play background document so that they would be familiar with and have views on the siting of the Erehwon repository, allowing the workshop to move quickly into the exercise.

Finally, participants were asked to introduce their own concerns and experiences. An informal session at the end of Day 1 was set aside where participants could describe their own situation and join in discussion on shared experiences.

After the workshop, an OBRA project meeting was held on the following morning where the future of the observatory was discussed. Some of the participants attended this meeting to give their views.

The programme of the main workshop is provided in the Annex. The following sections report on the discussions for each topic at the workshop.

# 3 Initial Comments on the Information Package

Participants were invited to give their first impressions on the information package on the basis of their reading prior to the workshop and before the package was presented. The following points were reported:

**On the target groups**:

- There were mixed views as to whether the package was either not detailed enough or too detailed, with the view that this would depend very much on who the specific users were to be. The intended target is both a technical advisor with limited experience of radioactive waste management (RWM) and technical people with no experience of RWM. The concept is that there would be a local advisor for different countries to explain the context and material to users. It was suggested that the package is probably too detailed for the general public. However, some participants did feel that it could also be interesting for some groups of the general public. It was suggested that some groups may need someone who will tell them what is meant; to interpret this for the public and

perhaps to make comparisons with other types of wastes (hazards, volume). However, readers need not understand everything in the document. In particular, this documentation is interesting for people with technical backgrounds but no experience in RWM. There may be a need for a glossary to explain scientific terms. Prior to this workshop, the package had not been sent to people with no technical background, to get their ideas. One participant suggested that it requires some specific section to attract younger people (e.g. implementing games, as tried in Japan and the UK).

**On the information and language**:

- Mention should be made that all of the information is not completely 'black-and-white', there is uncertainty attached to some aspects and this needs to be explained.
- A participant from Finland noted that the package comes too late for the Finnish people, which is a pity, as it is quite easy to understand (from experience of being involved in such projects and personal interest in the topic), the language is understandable and readable, and there are not too many unknown terms. Perhaps the documentation is too global for specific local users.
- The participants from Bulgaria noted that a referendum on a RWM project at the end of 2007 drew almost unanimous opposition from the local population. OBRA is becoming very important to provide information in an understandable language to people to help them make up their minds on the basis of good information. However, the Information Package would need to be rewritten in a less technical, simpler way to serve for Bulgaria.

**On information missing:**

- Participants were asked whether there were new things in this document that they did not know before. One reader stated that she learned a lot, but it did not give answers to economic questions. If the package is developed further, a section about the economics of RWM, short-term and longer term, could also be integrated. Safety aspects are, however, still seen as the most important questions, so treatment and explanation of risk is critical.

Summarising, it was observed that such a document could not fulfil the requirements of every problem. Depending on the level of the questions asked, different materials would have to be produced to supplement the current document. When doing this, it should also be borne in mind that not every country has decided about geological disposal and there are a lot of people who are pro-nuclear, but against wastes.

The present document is only part of the total package that would be needed and, in using it, presenters have to explain the details very carefully in order not to lead to misinterpretation of facts. For example, a series of 'single question' brochures would be very useful. The current information package is probably most useful and interesting for people with a technical background (not necessarily in RWM). It could be revised, or other material could be developed to accompany the existing document, in order to make the overall package more attractive to a wider group of users.

# 4 Panel Discussion on General Repository Siting Issues

This introductory session was aimed at identifying general issues and problems with geological disposal programmes and stakeholder involvement before looking in more depth at the Information Package.

The panel was introduced with two short presentations on past national experiences (positive and negative) with geological repository siting and on stakeholders – who they are and how they are involved in programmes and decision-making.

Almost all national programmes now plan for geological disposal of longer lived, higher activity radioactive wastes (the only 'alternative' being postponement and longer storage) and there is now a strong focus on stakeholder issues in almost all countries. Worldwide, there are more similarities than differences when comparing different disposal programmes. The IAEA TECDOC on 'Factors affecting public and political acceptance for the implementation of geological disposal' (2007) aims to identify conditions which affect public concern and political acceptance for developing and implementing programmes for geological disposal of long-lived radioactive waste. Other related publications on requirements for geological disposal (e.g. Safety Standard WS-R-4) can be downloaded from the IAEA website.

In the subsequent discussion, participants brought forward the experiences in their own countries:

- In Sweden, national level decision-makers do not really communicate directly with the local level, leading to a rather weak link with some stakeholder groups, like NGOs. On the other hand, stakeholders are involved by the regulators who meet regularly with local community groups to discuss the status of the geological disposal programme.
- In Spain, the interaction between national authorities and municipalities is developed through the Spanish Association of Municipalities in Nuclear Areas (AMAC). Although AMAC has established links with all the stakeholders involved in nuclear issues, the mayors are not conferred an institutional role in the decision-making process.
- In Bulgaria, the government is seen as the main stakeholder in the current national waste management project and will make the decisions. The media currently has limited interest.
- In the Czech Republic, NGOs only communicate with local people: they do not go to stakeholder meetings to become involved jointly with both local people and experts in open discussions. At present, the regulator has no formal role in stakeholder discussions.
- Romania is at the beginning of a democratic decision process and the government wants to see good practices (such as the OBRA approach) established: the development of safety criteria that parallel those of other countries is an important current topic.

# 5 Information Package: Part 1

The first section of the Information Package contains a comprehensive technical description of radioactive wastes destined for geological disposal and of the concept, evaluation and implementation of disposal. As noted in Section 2, this material is intended largely for people with some technical background (although not necessarily in nuclear power and wastes) and is presented at a level that does not require specific knowledge of the field. It was envisaged that much of the material could be assimilated by a senior-level school science-track student and certainly by a university science student.

In preparing the material, it was envisaged that it could be presented at a more simplified level to a general audience and this part of the workshop comprised a 90-minute presentation along these lines. Having heard this, the participants were then asked to comment again on the technical part of the Information Package material and its use in such a style of presentation.

The following points were made by the audience:

- The role of underground research and demonstration facilities is not sufficiently

dealt with, especially as experience shows that these have an important role for public communication. Being able to demonstrate engineering concepts as well as introducing (many people) to the underground environment for the first time is very valuable. People can get an impression of what a repository looks like and this is much more important to many than the technical research that is done in Underground Research Facilities (URFs).

- More could be included on the actual hazard of the waste –why does it have to be managed so carefully; exactly why and how is it hazardous? The document needs to show that the hazards can be technically controlled (e.g. by shielding) and that once the waste is disposed of it is not the radiation that is a hazard but the radiotoxic hazard potential of any small quantities of material that might be released. Consequently, more information on the transport of radionuclides is warranted.
- Why is HLW waste so hot at the beginning? This needs to be explained, along with the fact that the waste is not getting hot; it is actually cooling down. Proper thermal design of a repository to limits thermal load and it needs to be noted that thermal design is quite easy to handle and calculate.
- The document does not address a common community concern: what might be the worst consequence what could happen to a repository? Although the concept of geological disposal is that nothing catastrophic can happen after sealing, when the repository is a passively safe system, there is a general concern about accidental disturbance by people that is not discussed. For example, it would be useful to have more information on identifying the site for future generations using markers: at and away from the site, to avoid people excavating near the site. Also, it would be useful to discuss things that could go wrong before sealing and backfilling, during control and operation of the repository, such as a power supply failure over a long period. There has also been much discussion about terrorist attacks on other types of nuclear facility, which needs to be discussed in the context of a repository. Operational period safety should thus be covered by the document, as this period is of high concern to communities.
- The whole issue of confidence in long-term safety could be more broadly addressed. While the use of analogues is described, a wider discussion of what provides confidence to technical people and especially of how uncertainties are identified and addressed is important. For example, how do assessors know that they have not missed some important unknown factor? In the methodology of formal safety assessments, this process can be very difficult to explain to the public.
- There is a possibility that, in future, people may wish to retrieve and recycle waste. Retrieval, for which there are several possible motives (most importantly, something goes wrong or someone wants to recycle the waste), is not covered in the package. It was noted that anything could be retrieved; it only depends on the cost and effort available (e.g. experience from mining). But people have concerns about whether we know about the conditions in the repository thousands of years into the future. Discussion of the possible use of monitored ‘pilot facilities’ would be of interest to many readers. It was noted that there is a common misconception of ‘close and walk away’, without control. The type of control that will be done after closure and for how long should be identified as a topic for local decision makers.
- One participant felt that the inclusion of information on the potential use of very deep boreholes makes the document a bit complicated and confusing, as the concept is by no means widely agreed upon. It could be placed into a section entitled ‘alternatives’ (to conventional geological disposal).

- More information could be included on what happens in the natural environment around a waste repository and how the system evolves naturally: where does water come from and go to; what chemical reactions occur in the material after closure.
- A separate section addressing frequently asked questions (FAQs) would be useful. This could be included in a wider-based set of OBRA information. A fully implemented Observatory would need to expand the range of materials available to users. The current information package only fills one part of the requirement. Simple brochures, internet interactive games and quizzes, items for young people, were all identified as important. It was felt useful to have both simple and complex materials to hand. Even where complex material is difficult to comprehend or give direct access to, the Observatory should provide route maps for expert users readily to access what they are seeking.
- Generally, language is a major issue in the preparation of all types of material and provision of access to experts. This is not a problem that can easily be resolved. Some of the higher-level materials could be prepared in multilingual versions, but deeper levels of detail are out of reach of many potential users.

# 6 Summary of Discussion on National Programmes

Following the discussion of the technical section of the Information Package and issues arising from trying to present such information, participants were asked to outline specific matters that had arisen in their own countries in communications between communities and other stakeholders. A participant noted that a common feature in several countries was the lack of involvement of either government or regulator, or both, at critical stages in repository programmes, which was not beneficial for local communities.

**Czech Republic**

In the Czech Republic a general observation is that the public shows limited interest in participating in solving environmental problems, with many people more interested in immediate business and material improvements, rather than the distant future. The biggest issue is encouraging the active participation of the public. Even after about 20 years of democratic government, many people's everyday life has changed little and the last 50 years has taught people that society can change rapidly and could change again: this imbues a distrust in governmental and political bodies. Outside their own communities, finding partners from other concerned communities is hard to achieve and it is often the case that only the protestors are heard.

It was suggested that maybe people are not interested because the goal is set too high: that every inhabitant should know everything about nuclear issues.

**Sweden**

Sweden has two siting options in two municipalities. The NGOs have made a focal issue of the need to evaluate alternatives to the geological disposal option being pursued. It is important that national politicians know about repository issues and it has been observed that many people outside the two sites do not know anything about repository issues, which could be a problem for a national debate. Another very important issue is that the criteria for decision-making (choosing between the two sites) are not yet determined. The regulatory agencies have an active role in Sweden, although they are principally advisory bodies for the government. In general, the Swedish system is based on a continuous negotiation process. The regular R&D review process is seen as a good thing and very positive for the public.

### Finland

A central concern in Finland is that people are afraid that nuclear waste from all over Europe could be transported to Finland, as it is likely to have the first operational geological repository. The operator is a private company and people fear that they may decide to make a profit out of offering disposal services. It was observed that this topic was also a discussion point in Sweden during the EU accession referendum, when it was suggested that a country might not be able to refuse to take wastes. Even with strong statements from the EC and the national legislatures not to force/allow this, people are still concerned.

It has been found that people in Finland do not answer questionnaires; they appear to be generally confident with the proposed geological disposal system. Consequently, there is not much discussion on RWM at the moment. Most interest is centred on considerations surrounding building a new reactor. Non-nuclear environmental impacts are important issues. A specific discussion topic at present is what will happen during excavation of the repository (e.g. lorries, noise etc). One participant lives close to the Finnish repository site: when excavation started there was much noise but now work has progressed to greater depth there is no noise problem. The implementer provided good information on environmental impacts and the community was always well informed, although there are no agreements at present about addressing possible environmental or building damage. Local vacation cottages owners around the site have also been worried that their land might be taken or that the value of property may go down due to the presence of a workforce and new buildings and industrial development.

### Philippines

The Philippines has one NPP that has never been operated. The government wants to bring up this NPP option again, so a safe waste disposal programme is important. Siting work is done by five government agencies. An information programme has been established and seems to work well so far. The first siting option was turned down by local communities because it was in a tourist area. The second site considered is not in a tourist area and on an undeveloped island. the concerned communities appear to welcome the proposal and they will get same benefits as those affected by other nuclear facilities (NPPs). The consideration of tectonic factors (volcanoes, earthquakes) is an important technical issue.

### Romania

In Romania, the regulations for repository siting are expected but not yet developed. A repository is planned to be in operation by 2049. A siting programme has been underway since 1993, looking at three different host rocks; granite, salt and greenschists, with much information available for the first two rock types (e.g. from constructing hydropower plants, exploring in salt) but only little information on greenschists. So far, there has been no siting work involving specific locations or communities. The environmental ministry takes into account public concerns and the law does not allow for much public involvement, except via an EIA process. For the near-surface repository more work was carried out, with the target of talking with communities before work commenced. The mayor of the community which owns the land for the repository was invited to El Cabril in Spain, where he was impressed that the local mayor was sufficiently informed as to be able to answer RWM questions himself. The mayor now works with the Romanian implementer because of the perceived positive future for the community. The project is now ready for siting, has applied for and received a partial siting license. A lesson also learned from other countries is for the implementer to talk to politicians. One problem is the cut-off in benefits received by neighbouring communities. The current approach is slow, stepwise, involving stakeholders progressively – so far, successfully.

### Switzerland

Switzerland has a new siting process for geological disposal. The potential host canton for an earlier LILW disposal repository turned down the Wellenberg project twice. Cantonal rights are now reduced. The new concept for the 'sectoral plan' to set up the siting process is now published. It allows for participation and the process has to be organised within the siting regions by the communities. There are two new bodies: a cantonal committee and a technical safety board, with the former including neighbouring states (including Germany) and cantons. The implementer has to propose two sites for HLW and two for LLW on geological grounds, narrowing down in a three-step process from rock formation to region to site. Communities have a right to be involved at the 'region' stage, but the federal government has the final decision (although nominally by a national referendum). The implementer has said it would withdraw if a community objects.

### Bulgaria

In Kozloduy (Bulgaria), the view of the municipality is that problems started last year because they had no information about the siting progress. The population thinks there is a secret agenda and a referendum was organized in the municipality. Local people know a lot about the nuclear industry and there is no fear about repository safety. The main problem is the exact location of the repository, which is in an agricultural area. No information was given about benefits for the community or what would happen to the land.

In Bulgaria, neither the regulator nor the government take part in the debate – only the state nuclear enterprise, which has no power to give any financial benefits: therefore the public said no. The community representatives accept the decision and are keen to learn about practices in Europe. In principle, they would be happy to accept a project, but not on agricultural land. Last year they wrote to the government and asked for some initiatives but no answer has yet been received. The community thinks that the problem can be solved and hopes that the government will take a role and some responsibility in this project – the inactivity of government is not appreciated. The community would like an analytical programme in national research laboratories for their agricultural products to reassure buyers and a programme, including several social projects, co-financed by government and the municipality.

# 7 Role Play Exercise Feedback

The role-play exercise on siting a geological repository took up the whole of the second day of the workshop, with the participants breaking into three separate 'stakeholder groups' for part of the work (an 'implementer group', a 'community group' and an 'anti-nuclear green group'). The groups (each of about 5 people) were selected by the workshop organisers so as to have different viewpoints represented in each group.

The objective was to identify a preferred site from a group of six volunteer communities, using a multi-attribute analysis (MAA) tool to inform the decision-making. For the purposes of the exercise an imaginary country was described (Erehwon), with its own geological, social, industrial, land use, political and economic situation. Data and maps to elaborate the description were provided to the group. An extract from the introduction to the background material is reproduced below:

> *This exercise is based upon the proud, but reclusive and little known country of Erehwon, which is thought to lie somewhere in the northern hemisphere – or maybe the southern? Erehwon has suddenly found itself with the problem of managing HLW and has decided to build a deep geological repository. The objective of the exercise is to participate in the site selection process, both as technical experts and as non-technical stakeholders, and try to decide what might be the optimum site from among a group of volunteers, based upon a mixture of*

*technical, societal, economic and political considerations.*

*Erehwon has three nuclear power stations to supply a population of 3.5 million people. Most of the electricity is used by the cities of Oxterville, the national capital (500,000 people, supplied mainly by Westerby NP), and Thule (700,000 people, supplied mainly by the White River NPP) and their associated industries. The Sogoma NPP supplies mainly the coastal tourist and casino resort towns of Sodom and Gomorrah which are intensive users of electricity, especially in the summer when desert temperatures are high.*

*Erehwon Nuclear (EN), the power generator, stores its operational ILW on the three NPP sites in surface stores. Through its majority owned subsidiary company, Erehwon Nuclear and Environmental Management Inc (Enemi), it has developed a near surface repository for LLW at the Sogoma NPP, taking advantage of the arid conditions of the south coastal desert.*

*The national government has long had a policy of reprocessing, carried out abroad. All spent fuel produced to date has been reprocessed. Now, the reprocessing country has said that the Erehwon HLW must be returned and the government has launched a HLW repository development project, instructing Enemi (in which it has a small but controlling shareholding) to find a suitable site. The government is also concerned about the costs and commitments of reprocessing, but has not developed any policy about its place in the future Erehwon energy programme. Nor has it developed a policy as to whether to replace the existing NPPs when they begin to be phased out in 2020.*

*Enemi launched a volunteer programme and, surprisingly, received positive interest from seven small communities. Not all of these communities have the goodwill of their neighbours, or of their regional authority.*

*Enemi has now decided to evaluate the communities for comparative suitability using an MAA approach, with which it hopes to explore technical and non-technical aspects and different stakeholder views. There is considerable debate and disparity of views in Erehwon about the need for and the viability of the project.*

Technical, operational, societal, economic political and environmental factors affecting site selection were taken into account and weighted according to the three stakeholder views. At the end of the exercise, the teams made presentations to explain their MAA results and to justify the decision that they had eventually reached – including whether they had used their MAA results or not in reaching the decision. The objective was to provide a brief taste or experience of the many drivers that affect different stakeholders and the complexity of making and justifying siting decisions.

Following the exercise, feedback was provided by the participants on the overall utility of such an activity in helping understand the issues underlying siting. The feedback and reflections from the participants included:

- Most participants found the exercise useful and informative. One participant felt it would be a good idea to translate the documents into their own language and to apply the exercise in a group in their community. It was a good experience to play the role of a Green and the lively discussions were enjoyable as well as informative. The technical information was not too difficult and at an appropriate level.
- In public discussions the terms and criteria are not like those used in the exercise and there could be a problem due to language (‘expert’ language vs. ‘lay’ language), but this could actually enhance discussions.
- Owing to time constraints, the participants were not allowed to define the goals and sub-goals in the MAA themselves and several felt that this was a key aspect of such an exercise that should feature in a longer version. The process

for arriving at criteria is considered critical and users might be invited to start with the 'baseline' (what the measures should be, how the scoring models should be set up). One suggestion was to assemble all the stakeholders in an exercise and have them agree on measures, scoring models and deeper level weights on a common basis, before subjective higher-level weights were defined by each group. This was, of course, not possible in such a short exercise.

- One participant felt the need for a discussion on environmental safety and security. It was also noted that many societal issues are likely to be country-specific.
- It was suggested that OBRA could develop the exercise as a much-simplified internet 'game', allowing people to adopt different roles and experiment with factor weightings. With such a tool, younger generations and students could be reached.
- An aspect not included in this specific exercise is that of stakeholder negotiation. This could be the basis of a separate or a linked exercise. For example, having experimented with this role-play, stakeholders could explore their differences and enter a separate negotiation role-play to explore and resolve issues. This could be part of an extended OBRA observatory.
- In the role-play, no-one played an unwilling, intransigent, uninvolved, uncooperative or difficult role. Including such 'non-players' could give a more realistic feel to the exercise, although perhaps making it difficult to achieve a result.

# 8 Questionnaire Feedback

Each participant was asked to provide written comments on the trialing of the information package at the end of the workshop and to assign scores out of 5 for the aspects questioned. Eleven of the participants completed a simple questionnaire on the topics below. They were also asked to score the level of success achieved in the workshop by giving a mark out of five. The responses received and the average 'success' scores are collated and summarised below.

**The usefulness of the Information Package (score: 78.2%)**

- Depends on target group and stakeholder knowledge level; more versions or one compromise for all?
- As OBRA is designed as an exchange platform emphasis should be placed on stakeholder needs and not standard technical expert information. Start with their needs (which have to be revealed) and, based upon that, structure the information format and content.
- Information is quite complete for the public within the community; more information is better than less; a need for someone to explain the facts and their meaning; good information source for local 'experts' and – with interpretation – for all users.
- More information needed on alternatives, on hazards, risks and health issues. To be able to be an objective document, all 'sides' have to be shown.
- Length is OK. Some parts are quite technical (e.g. isotopes, half-lives etc.), but overall it is understandable; maybe it could be started with something different and not with isotopes; parts about natural analogues and the overview of different programmes are useful.
- Very helpful.

- Difficult to understand the geological information; active links and health effects of radiation is missing.

**The usefulness of the Role-Play Exercise (score: 86%)**

- Other stakeholder views and change of point of views are interesting → common consensus on language and criteria is needed first (before the exercise).
- Along the same line, participants should be engaged in setting up rather than answering a prepared exercise, this might illustrate non-expert perspectives and generate scenarios.
- Role-play is a perfect idea to practise siting, People will explore many other aspects and the complexity of siting. It is very important to think about criteria; best way is let the players create their own criteria and score scaling because criteria are different and it is important to meet the local/country needs. Also the roles could be more specified: I need more information about my role preferences and background. The money value is missing. A game will need more time, otherwise it is not reasonable to carry it out. Possibility to cooperate with government (?) and educate them: they will be more interested in this game than other people
- Even more instructions could have been given for the role play; sometimes I felt that the exercise was going too much along old 'paths' and that not much new was learned. If OBRA is mainly for siting, the wider picture is missing, especially for environmental organisations. Discussion on alternatives, safety, health, environmental safety etc. is still ongoing. Why not allow such discussions to take place instead of saying that "this is totally safe – I can bet my life on it". In the role play, sub-goals were missing and a lot of issues that we work as an NGO was only to weigh for the implementers. Due to lack of time not every sub-goal could be weighted by all groups, but it did not make environmental organisations justice.
- Exercise made people think for themselves and was helpful. Participants could see how difficult it is to weigh different criteria, but it might also be useful to see how to proceed from there with the decision-making process.
- This information is very useful in my work.

**Time allocation overall and between the trial workshop components (score: 85.5%)**

- Great, within the time available.
- Too much in one day; top-down expert info; too little weight on knowledge exchange and integration; framing is important (assumptions) as well as process.
- Sometimes too long time without a break, but otherwise perfect.
- Good, maybe more discussions in small groups would be good.
- Two days is a short time for all the material but, for this kind of workshop, appropriate.
- Programme was too busy.
- Course was very 'condensed'; more time would have been beneficial.
- Time was generally too short, topics could not be fully developed.

**Answers to technical questions from the experts (score: 88%)**

- After 40 years of technical information, questions by experts as to how to get understood should be in the centre, not vice versa.
- Very complete.
- There could have been more people there answering questions; maybe someone from the environmental movement? Just to get things more objective, maybe there should be representatives from municipalities, environmental movement etc. Maybe then the outcome of OBRA will seem more objective and easier to adapt.

# 9 Conclusions and Recommendations

The trial workshop took place over a short period of time and briefly explored three different ways of providing information and experience to users. Consequently, it should be seen as only a preliminary and experimental test of the material and approaches. It was clear at the outset of the OBRA project that it would only be possible to develop and test a small subset of the required materials and techniques. A fully implemented Observatory would need to expand the range of materials available to users. The current information package only fills one part of the requirement.

In addition, it was intended to receive feedback principally from community representatives or their expert advisers but, in the event, less than one third of the participants fell into this category. The remaining participants came from NGOs, academia or RWM organisations. Whilst this spread resulted in very useful discussion, input and comments, the results are not considered to be wholly representative of likely community reactions. Nevertheless, a large number of exceptionally valuable pointers was received, which will make the construction and testing of more developed information transfer tools more achievable.

Some key recommendations emerging from the trial, which should influence the establishment of an OBRA observatory and the way it is structured, are:

- All of the information access mechanisms were useful but they need to be part of a wider spread of materials that would include brochures, FAQ answers, visual materials and interactive activities.
- Materials should be accessible by the internet and some of the higher-level materials must be available in several languages.
- Further exploration of community concerns would be valuable to help develop FAQ answers, although many of these concerns will inevitably be community-specific.
- A layered structure of information would be appropriate when developing an internet-based information access tool. In addition, clear ‘route guidance’ should be built-in at the top level, aimed at different types of user.
- Route guidance should lead to every type of supporting documentation – including very technical information. It should be sufficiently flexible to guide a user, for example, to simple discussions of the hazards or radioactivity or to complex documents on materials corrosion.
- Arrangements would need to be made with data providers to allow open (non-commercial) access to documents, so far as possible. The use of automatic links to other sites would be valuable.
- Given the overall objective of allowing access to independent information

sources, the observatory would need to provide clear advice to users would on the status of the sources being accessed so as to identify possible biases. This would not be an easy task.

- Role-play exercises are clearly of considerable interest and value. One aspect was tested at this workshop, but other critical steps in decision-making for RWM facilities were also identified for the future, including the important issue of stakeholder negotiation. Providing 'mock' experience of this could be vital for affected communities.
- A goal that could not be tested at this early stage of observatory development was evaluating how a local expert adviser would use the information to work with a community.
- An observatory would need to be kept up-to-date, which would require a significant resource input. There are clear overlaps with experiences gained from siting and living with other environmentally sensitive, non-nuclear facilities that could provide extremely valuable analogues for communities. Including this information would be a major task.
- The networking aspect of an observatory was tested only by direct interactions at a workshop. Efficient means of facilitating networking among remote users of a web-based system would need to be developed. The value of workshops for an observatory was clear and direct access to other communities and to experts is essential.

# Annex
# Workshop Programme and Participants

| Monday April 7th | |
|---|---|
| 0900 – 0930 | **Orientation**<br>Participants introduce themselves |
| 0930 – 1000 | **The OBRA Project: present and future** |
| 1015 – 1045 | **Introduction to the Information Package** |
| 1045 – 1230 | **Panel Discussion on Repository Siting issues: General problems and stakeholder roles**<br>• What are stakeholders and what is their role (Information Package Part 2)<br>• Some national experiences<br>• Discussion |
| 1230 – 1400 | LUNCH |
| 1400 - 1530 | **Technical Basis of Geological Disposal:** information package Part1<br>Origin of radioactive wastes, hazard of radioactive wastes, options for waste management, deep geological disposal (design, construction & operation), siting criteria |
| 1600 – 1730 | **Panel discussion on technical siting issues**<br>Informal panel of three technical experts answer any questions |
| 1800 – 1930 | **Informal evening session: Participant's Issues leading to a general discussion**<br>Each participant (or group) explains what their situation is and what their chief problems and concerns are |
| **Tuesday April 8th** | |
| 0900 – 1000 | **Siting a Geological Repository**<br>Beginning of the role-play exercise<br>Break into three stakeholder groups – implementer, local community and concerned environmental group – and begin to site a deep repository that uses an imaginary country |
| 1015 – 1230 | **Siting a Geological Repository**<br>Continue the exercise |
| 1230 – 1400 | LUNCH |
| 1400 – 1530 | **Siting a Geological Repository**<br>Continue and complete the exercise<br>Each group presents their findings |
| 1600 – 1730 | **Siting a Geological Repository**<br>Analysis of exercise results by mock 'hearings' with organisational stakeholders to explore the sensitivities of decisions, sticking-points and options |
| 1730 - 1830 | **Workshop Feedback**<br>• How useful were the material and the approaches?<br>• How participants plan to use what they have learned and maintain contacts and build upon the workshop |
| **Wednesday April 9th**<br>**OBRA Project Meeting (all workshop participants welcome to attend)** | |

# Participants

| Country | Participant | Organisation Type |
|---|---|---|
| Austria | Shaheed Hossain, IAEA | International Agency |
| Bulgaria | Ventsislav Goranov, Kozloduy community | Local Community |
| | Ivo Simeonov, Kozloduy community | Local Community |
| | Nikolay Peychev (assisting Kozloduy participants) | Local Community |
| Czech Republic | Jan Honza, local community | Local Community |
| | Lucie Steinerová, RAWRA | Implementer |
| Finland | Elisa Vahteristo, Posiva | Implementer |
| | Marja-Leena Blomroos, Olkiluoto community | Local Community |
| Germany | Beate Kallenbach, OEKO Institut | Research Institute |
| Philippines | Maria Palattao, PNRI | Government Institute |
| Romania | Veronica Andrei, ANDRAD | Implementer |
| | Stela Diaconu, ANDRAD | Implementer |
| | Alice Ionescu, ANDRAD | Implementer |
| Spain | Meritxell Martell, Amphos XXI | OBRA Coordinator |
| Sweden | Jan Fidler, KTH | University |
| | Lisa Hedin, MKG | NGO |
| | Stefan Anderberg, Lund University | University |
| Switzerland | Berit Junker, ETH | University |
| | Thomas Flüeler, ETH | University |
| ITC School | Neil Chapman | OBRA Organisers |
| | Petra Blaser | |
| | Charles McCombie | |