Problems of an international repository for radioactive waste:

Political and legal aspects of international repositories

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1 Introduction

There are problems to be solved in many, diverse fields while implementing any repository for radioactive waste. An international repository for radioactive waste may encounter several problems and challenges in addition to those experienced in purely national repository projects. Some of these additional challenges are listed below

- technical: for an international repository, common standards acceptable to all users have to be defined for transport and handling requirements (e.g. means of transport, packaging), safety criteria for the repository, procedures for constructing, operating and sealing the repository, retrievability of radioactive waste, education and training of persons handling the radioactive waste.

- financial: a fair compensation has to be paid to the host country / community, long-term financing has to be secured (problems include inflation/ depreciation, continued existence of organisations and states, etc.) enormous differences in economic status of potential users;

- societal and political: ethical aspects of shared repositories, acceptance of export, import and transfer of foreign radioactive waste, diversity of views on the urgency of establishing repositories;

- legal: to applicable laws in connection with international repositories in the host country, and in the potential user countries, legal form of a company in charge of a repository, transfer of liability, enforcement of internationally agreed law (which is in general based on voluntary participation and application.

Within the framework of this paper, we will go into details only of political and legal aspects of international repositories. In addition, some proposed enhancements in the existing legal framework will be suggested and current initiatives for international repositories are briefly mentioned.

Before directly addressing the legal issues, we would like to make clear our understanding of the prime role of the legal profession in technical issues such as the implementation of multinational repository projects for disposing of radioactive wastes. It is not the job of lawmakers to decide on policies, strategies or applicable techniques; the primary role of lawyers is to grasp the given technical and societal aspects of any agreed policy option and to build a robust legal framework around this. This task has to be done in such a way that:

- the objective aimed at is feasible, the process to be followed is well defined and the boundary conditions are clear;
- this goal can be achieved without leaving scope for advertent or inadvertent divergence from the agreed principles and
- the procedures to achieve the objective are as simple as possible and clear enough that also non-lawyers understand them; the legal framework has to guarantee proper, auditable implementation in a way that is understandable to the public.

2 Policy Framework

It is commonly agreed that repositories for radioactive waste must be ethical, environmentally sound, safe, secure and economic. For these characteristics to be achieved some detailed conditions must be fulfilled.

Ethical: This implies that only willing host countries should be considered. No one shall be forced to host an international repository for radioactive waste. No advantage should be taken of less developed countries or areas. Fair compensation should be offered to the hosting country and community.

Environmentally sound: The net environmental impact should be positive, with global or national benefits being sufficient to outweigh any localized potentially negative effects.

Safe: The public and the environment must be protected from harmful effects of radiation. Regulations to ensure radiological and conventional safety must be developed and strictly enforced.

Secure: The term security is used in connection with terrorist and potential weapons States. There should be no enhanced risk of misuse of the radioactive mate-

rials for illegal, terrorist-type actions or for diversion of sensitive nuclear materials.

Economic: While meeting all the above mentioned conditions, a repository for radioactive waste should be as economic as possible. Although economic issues are to some extent separate from legal points, it is important that costs are not unnecessarily raised by unnecessarily complex legal procedures.

The nuclear community in general is convinced that shared international repositories can satisfy all of the above objectives, if properly implemented. The ethical issues have been debated at length and, for example, in the OECD/NEA a positive consensus opinion was formulated [Ref 1]. The arguments regarding environment, safety and security are for multinational repositories all directly analogous to those for national facilities. These arguments have been refined over some decades now. In fact, positive arguments are often stronger for multinational than for national repositories [Ref 2]. One important reason for this is, that the costs of a safe geological repository are very high – some billions of Euros ! – and only by pooling resources will small countries be able to meet the high standards that are set. The costs of a state-of-the-art geological repository might make purely national implementation in some small countries impossible.

The nuclear community accordingly agrees, that repositories for radioactive waste – whether national and international – are technically feasible with today's technology and can fulfil all of the above mentioned requirements. Experience, however, has shown that the largest obstacles on the way to repositories for radioactive waste are the political and sociological opposition.

The great majority of participants in the nuclear debate share the above views. Given the venue of the present meeting, however, one notable exception to this should be discussed in more detail – namely the current German government. The firm position taken by the responsible minister is that no radioactive materials should be imported to, or exported from, Germany [Ref 3]. The Minister justified his position by unsupported assertions that such transfers are unethical and that the necessary transports are hazardous and prohibitively expensive. The former point on ethics is very questionable and actually contradicts current German policies, given that Germany is a major exporter of nuclear technologies and is a major importer of hazardous chemical wastes. The opinion of the Minister also contradicts that of the majority of the German population. According to recent opinion surveys by the Karlsruhe Institute for Technology Assessment and Systems Analyses [Ref 4], only 31.5% supported a national disposal solution, whereas 55.6% favoured an international solution, with most of those assuming it would be implemented in an EU framework. The assertion that transport risks are high is disproved by the excellent safety record of the nuclear industries. A true statement of the German Government, however, is that transports in this country are enormously expensive. However, the high costs result primarily from the

need for massive police forces to control demonstrators (whose numbers included formerly the Minister now responsible for licensing transports).

There are also some other countries applying policies or even laws against international disposal concepts for their own radioactive waste. This is, however, mostly not done on grounds of any principles but rather as a pragmatic reaction to the concern that multinational initiatives might disrupt their national repository planning. Examples of such countries are Sweden, Finland and France. But even in these countries – as in most other countries today – there is in general acceptance that shared repositories can or must play a role in global waste management policy.

Summarising the above statements, it may be stated that properly implemented internationally shared repositories can meet all of the demands placed on radioactive waste repositories in general. Some of the requirements are met even more completely by shared repositories, e.g. the requirements on economics or security. The need for, and potential benefits of, internationally shared repositories are, as a consequence, generally accepted.

3 Legal Instruments

The legal framework will have to ensure that radioactive waste repositories fulfil all of the requirements noted.

3.1 International level

At the international level, there are various legal instruments addressing the general concept of multinational disposal facilities for radioactive wastes or regulating specific aspects of them, such as transport, liability etc. The two instruments that are most relevant and topical at present are:

- the IAEA “Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management” (IAEA JC) and

- the developing legislation of the EU, the so called nuclear package.

Given that the attendees of this conference are specialists in nuclear law, we assume that they are familiar with the IAEA JC. We therefore restrict ourselves to the parts of the IAEA JC with special relevance to multinational repositories. This is mainly the preamble, which keeps the door open for multinational repositories. Already during the drafting of the IAEA JC, there was debate about the weight to be given to multinational approaches. The IAEA itself had been an early supporter of such initiatives [Ref 5] and this support has recently been strengthened [Refs 6,7, 8], based largely on security concerns. At the end of the ‘90s, however during the drafting of the IAEA JC, opposition to shared repository concepts was

also being shown – primarily by countries with active national programmes in or close to a siting stage. The result was a compromise formulation. The preamble to the Joint Convention, records that signatory states should be "*convinced that radioactive waste should, as far as is compatible with the safety of the management of such material, be disposed of in the State in which it was generated, whilst recognizing that, in certain circumstances, safe and efficient management of spent fuel and radioactive waste might be fostered through agreements among Contracting Parties to use facilities in one of them for the benefit of the other Parties, …."*

In the EU, there is an on-going debate on the subject of binding EU legislation on nuclear safety on one hand and on waste disposal on the other hand. The two issues were coupled in a "nuclear package" of proposals, issued by the EC in November 2002, which contained a draft Directive on each topic. The proposed nuclear package initiated an intensive debate. Since this debate illustrates well the complexities involved, it is described in detail in Reference [9].

In essence, the original EC proposal – to implement binding legislation compelling all Member States to implement repositories for all types of radioactive wastes by fixed deadlines – has been hugely weakened. Opposition of many States removed the timetables, objections primarily by the UK removed the strong promotion of geological disposal and a blocking minority of States prevented agreement on binding legislation. However, the non-binding conclusions published by the Commission do represent a political statement about the importance of making progress in Europe with radioactive waste management. Moreover, the Commission has already formulated new proposals for a biding Directive.

In the context of the current paper, the positions taken with respect to international (or regional) repositories are of most interest. In fact, there is wide consensus on the subject of international repositories; the debate in the EC has been most controversial on issues of national sovereignty in nuclear legislation. With regard to international repositories, the original Directive text reflected fairly directly the Resolution 1157 passed by the European Parliament in 1998 [Ref 10]. This proposed that "*radioactive wastes should be disposed of in the territory of the state in which they are generated as far as is compatible with the safe management*" but also directly called on member states "*to study the technical, economic and political feasibility of the creation of international repositories for radioactive wastes*". In addition, the EC itself has become active in this regard with its provision of financial support to the SAPIERR project, which is designed to explore the feasibility of regional repositories in the EU [see Ref 11 and Section 4 below].

3.2 National level

At the national level, the issue of multinational repositories for radioactive wastes is addressed directly in the legislation of several countries and is the subject of policy statements in others. The positions established in selected countries are summarised in Table 1 [adapted from Ref 12].

Table 1: Export, import, transfer of RAW / SNF, attitude towards international repository

Country	Disposal Policy for HLW/SNF, Attitude towards international repository	Import of foreign RAW for disposal permitted ?	Export of RAW permitted ?
Austria	Return to USA (research reactor only)	No	Yes (conditions)
Belgium	Dual track 1st priority national	Yes (conditions)	Yes (conditions)
Bulgaria	Return to Russia	No	Yes
Croatia	No official policy	No	open
Czech Republic	Dual track 1st priority national	No	Yes (conditions)
Finland	National only	No	No
France	National only	No	Yes (conditions)
Germany	National only	Yes (conditions)	Yes (conditions)
Hungary	Dual track	No	Yes
Italy	No official policy	No	Yes (for treatment)
Latvia	Dual track	No	Yes (conditions)
Lithuania	Dual track	No	Yes (conditions)
Netherlands	Dual track	Left open	Left open
Romania	No official policy	No	Yes (conditions)
Slovakia	Dual track 1st priority national	Yes (conditions) for treatment, no for disposal	Yes (conditions)
Slovenia	Dual track	Yes (conditions)	Yes (conditions)
Spain	No official policy	Yes (conditions)	Yes (conditions)
Sweden	National only	Yes (small quantities, conditions)	Yes (conditions)
Switzerland	Dual track 1st priority national	Yes (conditions)	Yes (conditions)
UK	No official policy	Left open	Left open

Explanations:

Dual track:	options of national and international disposal facility are followed
HLW:	high level (radioactive) waste
SNF:	spent nuclear fuel
RAW:	radioactive waste

4 Requirements for enhancements in legal framework

Let us assume that a willing country, with the necessary geological conditions and technical abilities for hosting a repository, decides to do so and that an adequate number of partner countries decide they would like to use this facility. An important question is then, whether an adequate legal framework exists or whether additions or enhancements to existing laws are required. Several legal instruments already exist, especially in the fields of international transport of radioactive waste and liability. However, for an international repository, the current legal framework would require significant additions or enhancements. Selected examples of some desirable or even necessary developments are given below.

1. *Strengthening and clarification of the international legal framework*. For example, it would be useful if the current debate in the EU ultimately yielded binding Directives rather than non-binding resolutions. It would also be helpful if the IAEA Joint Convention and also the EC Directives would explicitly recognize that economic optimisation is also a valid justification for international repositories – provided this can be achieved with no negative impacts on safety.

2. *Establishment of international safety criteria for radioactive waste repositories*. Currently there is extensive international guidance on safety criteria– particularly from the IAEA and the International commission on Radiological Protection, ICRP. As this paper is addressed to an audience of nuclear law specialists, these criteria will not be listed and explained in detail. The important point is that each country is entitled to adopt the parts of this guidance that it chooses and to modify the numerical thresholds set. In a multinational situation, it is possible or even likely that each user country might insist upon the exported wastes being disposed of in a facility that would also satisfy its own national safety standards. Switzerland, for example, already has such requirements built into its legal system. Therefore, an international repository might be faced with the difficult task of simultaneously meeting many sets of national criteria. An internationally agreed, binding set of safety standards would clearly ease this problem.

3. *Clarification and standardisation of international and national legislation concerning transfer of long-term liabilities*. Since a host state might not be prepared to accept full liability on initial transfer of the waste or spent fuel, a longer period of shared liability may be considered. For the case of spent fuel, the issue of ownership or long-term liability is yet more complex since the fuel may, in fact, represent an energy resource in the long term.

4. *Clarification and establishment of long-term safeguards measures*. The spent nuclear fuel also contains fissile nuclear material that must be subjected to continuing safeguards controls. Even for national spent fuel repositories, the questions of if and when safeguards controls can ever be removed is still be-

ing debated. For multinational repositories this question is equally valid. For a multinational repository with spent fuel from many countries, however, the physical controls and safeguards may be simpler to organise than at many scattered sites. However, issues of allocation of responsibilities are still open.

5. *Clarification, unification and standardisation of transit rules*. Transfer of wastes through countries separating the repository host country and user countries should not in principle be a problem, since international transport of goods – including radioactive materials – is already well regulated. Transit shipping requirements are also specified e.g. in the IAEA Joint Convention. Nevertheless, in practice, any country that objected to becoming a transit corridor for radioactive materials en route to an international repository could place large or insuperable obstacles in the way. This must be avoided.

5 Current initiatives for international repositories

In spite of the existing – mainly political – barriers several initiatives and projects for international repositories have been launched. Some topical examples are:

1. **ARIUS**, Association for regional and international underground storage. Arius was set up in Switzerland by waste management organisations from several countries as a non-commercial body to promote the concept of regional and international facilities for storage and disposal of all types of long-lived nuclear wastes. Further information is provided on its web-site: www.arius-world.org

2. **SAPIERR**, Support action, pilot initiative for European regional repositories. SAPPIER is a project within the 6th framework programme of the EU, which is designed to explore the feasibility of regional repositories in the EU. It is further described on its web-site: www.sapierr.net.

3. **Ljubljana Initiative Group**. This is a group of representatives of mainly governmental organisations in central European countries interested in the concept of regional central European repositories.

4. **IAEA – Russia Initiative**. The Director General of the IAEA and the responsible Russian minister recently agreed that a special conference on the possibility of a Russian international repository would be held in 2005.

6 Conclusions

The principal conclusion of this paper can be concisely summarised as follows:

- International repositories are ethically justified and can bring global advantages in safety, security, environmental protection and economics.
- National policies and legislation differ greatly in their treatment of waste import/export.
- International organisations and most nations recognize the right of countries to collaborate in the development of shared repositories.
- There already exist international treaties and conventions that address the subject of multinational repositories.
- However, there are a several areas in which further clarification and development of legislation, especially international, affecting shared repository concepts are necessary.

Before closing the paper, two provocative illustrations are added, in order to make clear that multinational repositories must come to Europe in the future.

Figure 1 shows a map of the USA on the same scale as Europe. The USA is having huge problems implementing only two repositories. Does Europe really need more than 30 in the countries marked by stars? Of course not; this is spatial nonsense ! Figure 2 shows Europe 500 years ago. How will Europe look in 500, in 1000 or in 10 000 years from now, when the radioactive waste still has to be carefully looked after? Treating national borders as sacrosanct on the timescales of importance for repositories is obviously temporal nonsense !

Figure 1: Only national repositories, spatial nonsense

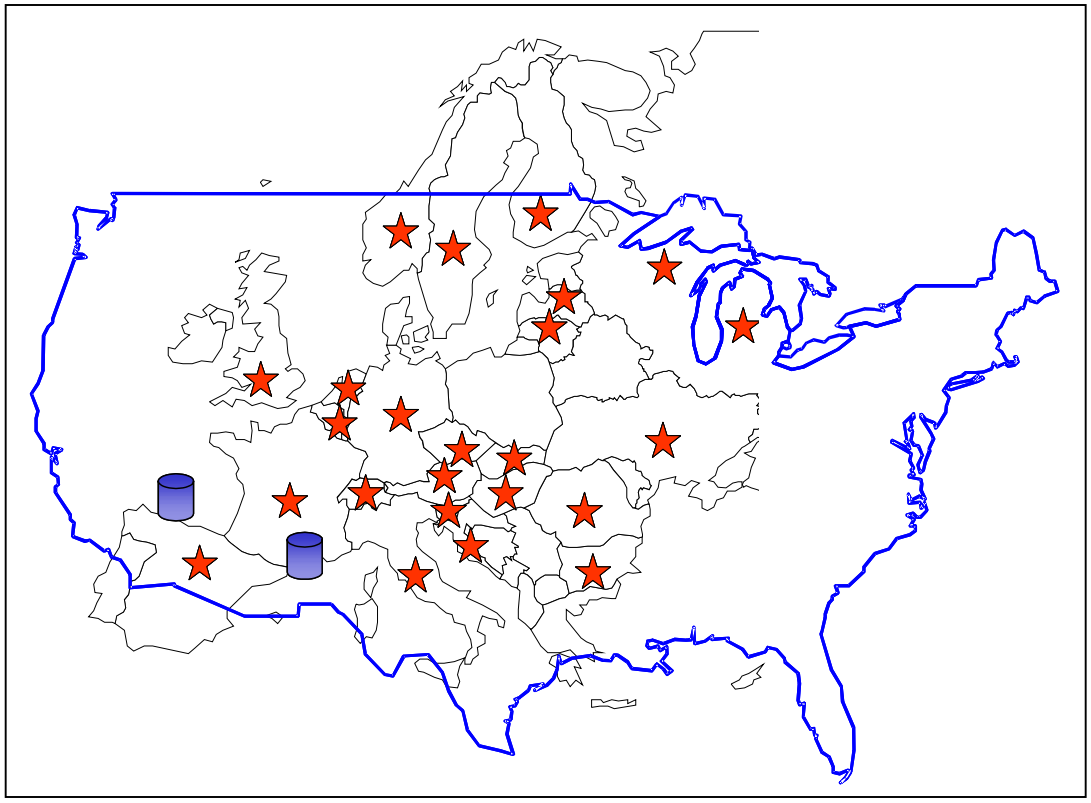

Figure 2: Europe 500 years ago. Fixed national boundaries – temporal nonsense

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11 SAPIERR, support action, pilot initiative on European regional repositories (www.SAPIERR.net)

12 SAPIERR Work Package 1 Deliverable 2 pages 89, 90 (available on the web-site www.sapierr.net)