

EUROPE ACKNOWLEDGES THE NEED FOR REGIONAL REPOSITORIES

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ABSTRACT

Some countries with small nuclear power programmes in the expanded European Union may not have the resources or the full range of expertise to build their own repositories for long-lived radioactive wastes. For these countries it is sensible to consider an option of shared deep disposal facilities. The prospect of regional solutions is raised in the draft of the EC radioactive waste Directive to be adopted by May 2004. The directive assumes that Each Member State shall establish a clearly defined programme for radioactive waste management that includes all radioactive waste under its jurisdiction and covers all stages of management including disposal. Even some milestones to be incorporated into national waste management programmes are given in the Directive together with very demanding deadlines. The national programmes may also include export of radioactive waste or spent fuel under certain conditions. The presented paper contains an analysis of the Directive provisions, which could lead to the need for regional repositories in Europe.

Recognizing the need to pave the way to regional European repositories, ARIUS (Association for Regional and International Underground Storage) together with DECOM Slovakia submitted a proposal for a project within 6th Framework Programme named SAPIERR (Support Action: Pilot Initiative for European Regional Repositories). Acknowledging the importance of the proposed project in the framework of the above Directive, the evaluators of the European Commission judged SAPIERR positively and invited the proponents to contractual negotiations. The presented paper describes the history of the proposal together with planned scope of work, potential impact of the project, and expected future follow-up works.

Deep Geological Repository Development in Slovakia

Slovakia is one of those countries who are unable to deal with the enormous financial burden of the nuclear fuel cycle back end on its own. The former Czechoslovakia entrained into the nuclear energy exploitation program in 1950's without even thinking of other alternatives than return of the spent nuclear fuel back to the USSR. The first realisation that we are stuck with the spent fuel came with the disintegration of the Eastern block and a deep geological repository development program was launched for whole Czechoslovakia in early 1990's. When the country was split in 1993, the need for the national repository doubled because there was one nuclear site on each side of the country at the time of splitting.

The Slovak deep geological repository development program was initiated in 1996, and continued until 2001, when it was suspended. In November 2003, the decision was taken to reopen the program in 2004. One of the important factors contributing to the program reopening is the draft of new European Directive on the management of spent nuclear fuel and radioactive waste. The original intentions to put the repository into operation in 2037 will have to be re-evaluated.

Only in 1995 a special fund was established for the purpose of covering the spent nuclear fuel and radioactive waste management as well as nuclear power plants decommissioning. The fund charges a levy on production of the electricity from nuclear power plants and can be used solely for decommissioning and disposal. The latest analyses of the prognosis on fund expenditures and incomes reveal that current levy system is unable to cover both decommissioning and high-level radioactive waste/spent nuclear fuel disposal. The ways of coping with this potential problem have to be sought. One of them is to increase the

income of the fund by extending the levy to a small charge on any type of electricity not just the one generated in nuclear power plants. Another one is to decrease the costs of the deep geological repository by opting for a shared multinational facility.

The current size of the Slovak nuclear power program is 6 VVER-440 reactors with further two being conserved unfinished. It is certainly a small program despite the fact that Slovakia produces 51% of electricity in the nuclear reactors. The point of more favourable economy of the deep geological disposal with larger scale can be thus materialised only through joining other countries with the same problem and sharing the financial and technological resources needed for the repository development.

Going International

Since the time when the Slovak national deep geological repository development program was launched, close contacts have been maintained between the organisations involved in these programs in Czech Republic and in Slovakia. So called Czecho-Slovak seminars on the deep geological repository development were organised annually by DECOM Slovakia – coordinator of the Slovak program and RAWRA – coordinator of the Czech program. The topic of going back to the idea of the common Czecho-Slovak deep geological repository was discussed on these seminars regularly. Based on former contacts, representative of ARIUS was invited to make a presentation on the 5th Czecho-Slovak seminar and afterwards it became clear that both Czech Republic and Slovakia are just members of the still growing family of the countries calling for the shared solutions of the deep geological disposal.

In 2003, DECOM Slovakia took a more proactive approach to the development of a regional deep geological repository for the European countries. The contacts with ARIUS intensified, and DECOM Slovakia has been trying to facilitate membership of the Slovak utility in ARIUS, and most importantly, both organisations elaborated a proposal of a specific research project under the 6th Framework Program called SAPIERR aimed at the European regional repository. In addition the 6th Czecho-Slovak seminar on deep geological disposal hosted by DECOM Slovakia in Piestany in August 2003 became a fully international event held in English, and the main topic of the seminar was multinational disposal facilities. The main conclusions [1] and proposals from panel discussion on the regional repositories included a recommendation to keep the dual track approach in the deep geological repository development activities, i.e. follow both optional solutions of geological disposal: national and international/regional, and keep the possibility of final decision open. At present, one option could not be a reason for disqualifying the other one. Regional solutions could be today considered as complementary to the national ones. The international seminar was a success and the 7th sequel of this event will move in 2004 for the first time beyond the boundary of former Czechoslovakia to Hungary.

New European Radioactive Waste Directive

The prospect that countries could work together to explore the possibility of regional solutions is indicated in the draft of the European Commission Radioactive Waste Directive [2]. The Directive is under discussion and it still evolves, but the staple idea of the Directive remains the same. Each Member State shall establish a clearly defined national programme for radioactive waste management that includes all radioactive waste under its jurisdiction and covers all stages of its management. In the context of this programme, radioactive waste shall also include all spent nuclear fuel that is not subject to reprocessing contracts or, in the case of research reactor fuel, take-back agreements. The programme shall cover, in particular, all aspects of the long-term management and, in the case of solid or solidified radioactive waste, disposal with a definite timetable for each step of the process.

Originally the draft proposed a fixed timetable for siting and construction of the deep geological repositories in the Member states, but this clause raised many opposing opinions and all amendments proposed by the review committees call for more flexibility. There is no justification or logic in having

one date for all Member States, given the huge variation in the size and history of their nuclear programmes and the current status of Member States research and development programmes into radioactive waste management.

The most explicit support to the idea of regional disposal facilities is in the Explanatory memorandum that was at the start of the original draft: "A regional approach, involving two or more countries, could also offer advantages especially to countries that have no or limited nuclear programmes, insofar as it would provide a safe and less costly solution for all parties involved."

The foreword to the current version of the draft includes the statements that each Member State remains fully responsible for the management of all spent nuclear fuel and radioactive waste under its jurisdiction; and the safe management of spent nuclear fuel and radioactive waste would be enhanced by greater co-operation and co-ordination between Member States. This wording on responsibility, of course, does not prohibit regional repositories inside the European Union. Those Member States which decide to pursue the regional disposal option will have to cover the issue of responsibility transfer to the host country by firm and well prepared agreements. Acknowledgement of the positive effect of the international co-operation and co-ordination between Member States could be easily interpreted that even the ultimate form of such a co-operation, namely the shared facility can enhance the safe management of spent nuclear fuel and radioactive waste in a maximum degree.

Current version of the draft Directive core text reflects this possibility only in the clause dealing with shipments: "The programme may include shipments of radioactive waste to another Member State or third country if such shipments are fully in compliance with existing EU legislation, principally Directive 92/3/Euratom, and International commitments, are covered by firm contracts and only take place to States with appropriate facilities that meet accepted norms and standards of the Member State of origin and, in the case of material within the meaning of Article 197 of the Treaty, are under adequate safeguards. No shipment shall take place without the prior informed consent of the States concerned." The shipment to another Member State or third country for disposal in a multinational repository is not excluded by this general statement.

Consequently it is fair to say that by its new Directive on the management of spent nuclear fuel and radioactive waste, Europe acknowledges the need for regional repositories.

SAPIERR

The proposal of the SAPIERR project [3] – Support Action: Pilot Initiative for European Regional Repositories was prepared by a consortium of DECOM Slovakia and ARIUS and submitted to the European Commission in the first batch of the Calls for proposals under the 6th Framework Programme in May 2003. SAPIERR is a pilot initiative to help the European Commission to begin to establish the boundaries of the European Regional Repositories issue, collating and integrating information in sufficient depth to allow concepts for potential regional options to be identified and the new research and technical development (RTD) needs to be scoped. Possible future programme components and structures will be suggested during the project implementation. SAPIERR will bring together Member States and Candidate Countries of the European Union wishing to explore the feasibility of regional European solutions for the deep geological disposal. Specific proposals for regional facilities, including potential siting are not part of this initial pilot study. The work is aimed at establishing the boundary conditions for such collaboration and the implications in an enlarged European Community. The development of a geological repository is a very long-term project with an overall duration of decades. Given the rapid geopolitical development in Europe, the socio-political reservations concerning multinational repositories that have been expressed by some countries may well have been overcome by the time of actual construction, and the environmental and economic advantages of these solutions may prevail over the

political problems.

The proposal received very positive evaluation in the evaluation process by the European Commission. After the comments and recommendations of the Commission were incorporated into the proposal, SAPIERR was finally approved by the Commission. The contractual negotiation between European Commission and DECOM Slovakia – the SAPIERR coordinator were very simple due to well understood structure of the proposal and due to simple two-member consortium arrangements; and consequently the SAPIERR contract was closed in the first batch of the 6th Framework Program contracts. The start date of SAPIERR is December 1st, 2003 and the project duration is 2 years.

The work will involve a working group of interested countries representatives, data gathering and analysis. The working group is deemed to be the best vehicle to bring together representatives of the organisations interested in regional solutions to share their views, to provide input for the work of the consortium, to monitor results of the project, and to assure the best dissemination of information on the national level. A commitment to participate in the working group and to supply relevant national data has been obtained by organisations from some European Union Member States and from numerous Candidate Countries during the project preparation phase. The working group will meet on a two-day workshop in Piestany in Slovakia on 19th to 20th February 2003, only few days before the Tucson conference. Following the workshop, the working group will continue interacting on the basis of e-mail and internet communication. It will supply information needed in the analytical work and review the outputs. In this data gathering & analysis, the consortium will put together the data and views from European countries interested in regional solutions together with review of the existing information from other European Commission programmes, and the IAEA database. The issues looked at will comprise:

- Amounts, types and times of arising of wastes from the countries that might be relevant to a regional disposal facility
- The nature of legal issues of waste transfer, liability and waste transport, export/import
- National political and organisational views and policy, european radioactive waste policy
- National social perspectives
- Economic aspects of shared facilities (nationally and in the European Union).

Scenarios and possible concepts for European regional disposal will then be identified as well as related RTD needs to propose mechanisms for developing strategy options and future research programmes within the European Union. Taking into account the latest draft of the IAEA TECDOC “Developing and implementing multinational repositories: Infrastructural framework and scenarios of co-operation” so called co-operation scenario will be given the highest priority, as this is the scenario available to the European countries with small nuclear power program or with just institutional radioactive wastes which are now members of the SAPIERR working group. This scenario is characterised by the participation of partner countries in developing a repository programme jointly together with the potential hosting country or countries. In this case one or more other countries interested to dispose their waste in the potential hosting country or countries will be involved directly in an early stage of repository development and implementation. It is conceivable, and for Europe much more likely, that countries can initially come together to discuss the advantages and drawbacks of a shared repository – without defining the potential host or hosts at the outset. The identification of the potential host country was deliberately set beyond the scope of SAPIERR project. Instead, trans-national RTD requirements to be carried out in future will be identified by definition of the Support Action instrument. SAPIERR will want to clarify the RTD

requirements to address unresolved safety, governance, and economics aspects of the potential European regional repository. More specifically, it should also propose mechanisms for developing strategy options & RTD needs in future European Union programmes.

Project findings will be reported to the European Commission, published on the dedicated web site, and most importantly, DECOM Slovakia and ARIUS will host a two-day international seminar at the end of the project at which the results will be presented for open discussion to any interested participants. This event will take place in Brussels. The meeting will also include invited presentations from interested EU and non-EU countries on the topic of regional solutions. The meeting will be widely advertised and open to all interested parties even beyond the SAPIERR working group members. Regional repositories are also of interest outside Europe but have been little studied. SAPIERR and especially the international closing seminar will be an excellent opportunity to put the European Union in a leading position to provide advice and, possibly, services to other countries.

Way Ahead

To me, as an educated person, who is familiar with the principles of the protection of human health and environment against radioactivity, it seems very natural and almost inevitable that construction of a single European regional repository is much more environmentally friendly than putting the radioactive waste to so many “holes” scattered all over Europe. Yet I acknowledge the fear of the radioactive waste import among common people and consequently among politicians. But I truly believe there is a way forward. I hope that SAPIERR is on that way. Hopefully the countries participating in the SAPIERR will take an active part in further research on issues of safety, security, governance, socio-politics and economics identified by SAPIERR. Maybe, I will be able to review these hopes at the Tuscon conference in two years time.

REFERENCES

- 1 Proceedings of 10th Anniversary of DECOM Slovakia Conference – CD
- 2 Proposal for a COUNCIL DIRECTIVE (Euratom) on the management of spent nuclear fuel and radioactive waste; Brussels, 14 October 2003.
- 3 Annex I - “Description of Work” to Contract No. FI6W-CT-2003-509071 under SIXTH FRAMEWORK PROGRAMME, EURATOM, Brussels, 17 October 2003.