

Site Selection Process in Germany for Radioactive Waste Disposal

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1. Introduction

This paper summarizes the key issues evolved over the past several years in Germany in the field of radioactive waste management and disposal. As Korea will face problems and challenges in managing high-level radioactive wastes and especially in selecting a site for a final repository, the intention of this paper is to provide those Korean implementers and the regulatory authorities in this field with the know-hows and lessons learned in Germany.

2. The Fukushima Disaster and Reaction of Germany: Immediate Policy Reversal

On March 11, 2011, the Daiichi-Fukushima nuclear disaster broke out, after which 50k households had to be displaced after radiation contaminated air, soil and sea. After Fukushima disaster, a nationwide opinion poll in Germany showed that 80% of Germans opposed the government policies to extend nuclear power. In the end, on May 30, 2011, the Chancellor Angela Merkel completed the full reversal of her nuclear policy, announcing that all of Germany 17 NPPs (Nuclear Power Plants) are to be shut down by 2022.

3. The Repository Site Selection Act and Procedure for Site Selection

With the decision of shutting down all NPPs by 2022, an initiative was raised to discuss when and how to start looking for a site for a radioactive waste repository. For the search for an appropriate repository site in Germany, the Repository Site Selection Act (Standortauswahlgesetz – StandAG, in German) became effective on 27 July 2013. The Act provides a national, science-based and comparative site selection procedure for the best possible repository.

According to the Act, host rocks suitable for the disposal of high-level radioactive waste (HLRW) in deep geological formations may basically be granite, salt and clay.

The site selection process took the following steps. First, a 32-member Commission was formed (the Commission of Storage of High-Level Radioactive Waste Materials) by the Parliament in May 2014. The task of the Commission was to develop, for two years, the criteria, processes and decision bases to evaluate the Act to make proposals for public participation and transparency. The Commission published a report on July 2016. Among five major proposals by the Commission, the one for organizational requirements draws an attention. This is described in Section 4. Second, the Act is evaluated based on the report of the Commission, which is followed by (1) identification of eligible site regions, (2) development of site-related exploration programmes and examination criteria, (3) in-depth geological exploration, (4) concluding site comparison and site proposal, (5) site decision and conclusion of the site selection procedure by 2031, and (6) licensing for the construction, operation and decommissioning of the repository.

4. Key Players and Tasks

With the Act on the Organisational Restructuring in the Field of Radioactive Waste Management, the federal government has reorganized responsibilities in the field of radioactive waste disposal to ensure a clear allocation of responsibilities and tasks in the field of radiation protection and radioactive waste disposal. These organizations are *BfS*, *BfE* and *BGE mbH*.

The *BfS* (*The Federal Office for Radiation Protection*) is an organizationally independent, scientific-technical, higher federal authority responsible for radiation protection, nuclear safety, transport and storage of nuclear fuels, and radioactive

waste disposal. With the Act became effective in July 2016, the federal tasks of supervision and licensing in the field of nuclear energy, interim storage, repository site selection and repository surveillance are transferred to a new federal authority called *BfE*.

4.1 The Federal Office for the Safety of Nuclear Waste Management (*BfE*)

On the basis of the Act, *BfE* takes over the task of the central supervisory, licensing and regulatory authority in the field of radioactive waste management. It is responsible for the repository site selection procedure. This is a licensing and regulating authority under nuclear and mining law and responsible for public participation and also supervisory authority under nuclear law for radioactive waste repositories. The execution of the associated tasks that had so far been distributed to different federal and state authorities was difficult for the citizens to follow. At times, for example, the false impression was given that the *BfS* was acting at the same time as operator and regulator in the same area.

4.2 The Federal Company for Radioactive Waste Disposal (*BGE mbH*)

This newly formed *BGE mbH* performs the planning, construction, operation and decommissioning of repositories. As the so-called project developer pursuant to the Repository Site Selection Act, the federally owned company is also tasked with the search for a repository for high-level waste materials in Germany. It is currently in its formulation stages. After it has been ensured that the company is able to act, the corresponding tasks will be transferred from the *BfS* to the *BGE mbH*.

5. Public participation

The Act demands active public relations work by both the *BfS* and *BfE*, for example, in all stages of the site selection procedure. In the Act, it has been regulated which milestones the public shall participate in and the minimum forms of participation to be applied. It is planned to perform public participation in a dialogue-oriented process including dialogue between citizens, public meetings and information provided via the Internet, citizens' offices and by other suitable media. The followings

are the cases where the public shall be given the opportunity to make comments:

- (1) on proposals by the Commission for the bases for decision-making and on all other tasks,
- (2) on proposals for eligible site regions and the selection of sites to be explored from the surface,
- (3) on proposals for the site-specific exploration programmes and examination criteria,
- (4) on the report of the results from the exploration from the surface and their evaluation,
- (5) on the proposal for the sites to be explored underground,
- (6) on the proposals for the in-depth geological exploration programmes and examination criteria,
- (7) on the findings and evaluations of the underground exploration, and
- (8) on the proposal of the site for the future repository.

6. Closing

In review of the German system of site selection procedure for a final repository for radioactive wastes, we found three major issues that drew our attention. Firstly, the 32 members of the Commission formed by the Parliament represent diverse groups in the society which are State Governments, Parliamentary Groups of Federal Parliament, Sciences, Environmental Groups, Churches, Industry and Trade Unions. Such diverse fields of background of the Commission members could provide unbiased view of the site selection criteria. It is also worth noting that detailed protocols of all the meetings of the Commission have been archived in the website (www.bundestag.de/endlager/) and were made accessible easily to the public. Secondly, through the Act and by the proposal of the Commission, the responsibilities of the relevant organizations (*BfE*, *BfS*, *BGE mbH*) were clearly defined and a clear cut was made between the operators and the regulatory authorities. Thirdly, we have found that public participations are planned in all stages of the site selection procedure. Such measure may in some cases significantly delay the programmes. However, at the same time such measures mentioned above significantly improve transparency and help gain people's trust.