

## WM2017 Conference Panel Report

### PANEL SESSION 97: Progress on Deep Repository Programmes Around the World

**Co-Chairs:** Eric Knox, *Aecom*  
Andrew Orrell, *IAEA (Austria)*

**Panel Reporter:** Thilo v. Berlepsch, *DBE TECHNOLOGY GmbH*, (Germany)

#### Panelists:

1. **Bruce McKirdy**, *Managing Director of Radioactive Waste Management Limited – RWM (UK)*
2. **Andrew Griffith**, *Deputy Assistant Secretary for Spent Fuel and Waste Disposition, US DOE*
3. **Sami Hautakangas**, *Head of Spent Fuel and Disposal Services, Fortum Power and Heat Oy (Finland)*
4. **Carl Reinhold Brakenhielm**, *Senior Professor at Uppsala University and chairman of the Swedish National Council for Nuclear Waste (Sweden)*
5. **Judith Horrichs**, *Public and Government Relations, Federal Company for Radioactive Waste Disposal – BGE (Germany)*
6. **Patrick Landais**, *Chief Technology Officer, Andra (France)*

The panel was designed to identify issues which are of current general interest in the area of geologic repository programmes. Panellists have been invited representing advanced projects in the licensing or even construction phase (Finland and Sweden), programmes right before the licensing phase or just having started the site selection phase (France and the UK), and programmes which recently have had a preferred site but now are set back and are in the process of redefining the site selection or licensing process (USA and Germany). The discussion was fostered by brief overview presentations on the status of the various programmes for HLW disposal.

**Bruce McKirdy** gave a brief overview over the planned siting process to be launched in the UK. A previous siting process initiated in 2008 failed in 2013 due to an unfortunate combination of too many decisions to be made at various local and regional levels. As a consequence, the Governments of England and Northern Ireland, Scotland, and Wales reviewed their policies with England and Northern Ireland and Wales adopting geological disposal. However, Scotland has opted for a different policy based upon near surface disposal. RWM develops a technically safe disposal system based on specific waste forms for an appropriate site being determined in a consent based process. **Bruce McKirdy** finished by giving an outlook on the main next steps of the site selection process. After finishing the current National Geologic Screening RWM will make available all relevant and available information needed by the public. The Government is preparing further policy on the approach to working with communities and on planning in the form of a National Policy Statement. All this information will be put in place so that the siting process can be launched and work with communities can be initiated.

**Andrew Griffith** presented important driving factors for the national HLW management program beginning with clarifying the challenge by summarising the shear amounts of commercial and defense HLW waste which has to be handled.

## WM2017 Conference Panel Report

He stressed the fact that everything is driven by the repository system, since geologic isolation is the only reliable and feasible final solution, which in turn defines final requirements and criteria for the waste. Other considerations than disposal, as for example the much-discussed long term storage option, can only be – by definition – an interim solution. He also stressed the importance of international cooperation in the field of radioactive waste management.

**Sami Hautakangas** summarised the Finish programme which started in 1983 and ever since kept well aligned with the original time schedule leading to the construction license grant for the HLW repository in 2015. After describing the current activities on site **Sami Hautakangas** explained the main factors for success in Finland, which are besides the uncomplicated and well described Finish inventory the generally high trust of the Finish population in the national public bodies and authorities as well as the Finish culture enabling early, clearly defined and durable definition of roles and responsibilities. Additionally, open-minded learning from and with international partners also supported the country's success.

**Carl Reinhold Brakenhielm** described the organisation of the Swedish waste management programme and its main challenges. The implementer SKB developed a repository design based on the KBS 3-concept with HLW embedded in iron casks with a copper coating deposited at a depth of 500 meters in a geological repository and finally sealed with bentonite. The main process of licensing is governed by two laws, the Environmental Code (EC) and the Nuclear Activities Act (NAA). The Land and Environmental Court is assessing applications under the EC, and Swedish Radiation and Safety Authority (SSM) is assessing applications under the NAA. The affected municipalities are preparing statements and have veto rights. The Swedish Government will take the ultimate decision. A positive statement of SSM from 2016 recommends that the Land and Environmental Court in its forthcoming judicial review deems the repository system to be a permissible activity. Nevertheless, SSM also comments on further issues, the most important of which are addressing management of uncertainty for certain technological issues, requesting a complete picture of risks and potential consequences related to interim storage, and stating disproportionality of continuation of interim storage with the aim of potentially developing alternative disposal options, especially Deep Boreholes. A final decision from the Swedish Government is expected for 2018 or 2019, being the last of five remaining hurdles for SKB to overcome. The others are: decision from the Land and Environmental Court later in 2017, decision by SSM in 2018, and decisions of the two affected communities, Forsmark for the repository and Oskarshamn for the encapsulation plant. A separate challenge for the Swedish programme is the shrinking nuclear fleet. Until 2020 the number of reactors will decrease to 6 falling from initially 12, meaning that funding of the programme will become more difficult.

**Judith Horrichs** explained the current situation of the German site selection programme for a HLW repository. Following strong and violent conflicts the main political parties agreed on initiating an unbiased new site selection process and passed a new site selection act in 2013. In 2014 the new site selection act was evaluated by a disposal commission, which published its findings including proposals for processes for public involvement and site selection criteria in summer 2015. The process shall consider the three main potential host rock formations in Germany, hard rock, clay, and salt, shall be assessed without preference, and the entire area of Germany shall be considered equally. Finally, **Judith Horrichs** described the new organisational setup in Germany with the newly established implementer BGE, the new regulatory body BfE, and the responsible Federal ministry BMUB. A very important part of the site selection process is a comprehensive public involvement approach trying to really

## WM2017 Conference Panel Report

take into account the opinion and knowledge of all affected Stakeholders. The principle idea is that the public is not only constantly informed about the activities, but also is enabled and asked to assess reports by BGE. These assessments will be taking into account in the decision making process of the Federal Government.

**Patrick Landais** highlighted the recent developments of the French Cigéo programme for a HLW repository in clay. A reversibility law, enacted in 2016, defined new requirements for the French geological disposal programme. Besides reversibility as a mandatory built-in feature of the repository design, specific requirements on safety, equipment performance, and monitoring have been introduced. In 2016, Andra submitted the safety option files for evaluation by the French Nuclear Safety Authority as well as by an international review team. The current main activities of the project are developing a detailed design for Cigéo (including various design optimisations) supported by RD&D studies especially in the Bure URL, managing the assessment of the design by the responsible authorities and the development of the organisational structure of Cigéo for the industrial phase. In terms of local public perception Andra successfully did overcome initial difficulties by a comprehensive information and consultation programme, as well as initiatives to support local economic development, to build human capacity and to raise the attractiveness of the living environment in the area. Currently, the local stakeholders are involved in the major aspects of the project affecting the region such as the impact assessment. Nevertheless, recently a strong and violent opposition arose locally mainly imposed by people not originating from the area. A small but very well organised group with high communication and legal skills form the core of the opponents. The group principally shows opposition only without any willingness to constructively discuss concerns. This very new experience for Andra has to be analysed carefully and means to manage these challenges have to be developed.

Following the presentations, a lively and constructive discussion arose. Specific interest was expressed for details of the new German site selection process and the US borehole programme.

**Judith Horrichs** explained that the requirement to select the site with the best possible safety still has to be translated into the detailed site selection process. Principally, a site will be chosen which that shows best safety on the basis of a comparative analysis of different option in the different potential host rocks, i.e., the German site selection process is safety driven. On another issue, **Judith Horrichs** explained that the National Advisory Board is a mean which has not been used before in the context of nuclear projects, but in other fields of politics.

**Andrew Griffith** was questioned on reasons and activities concerning the obvious negative public perception hurdle of the deep borehole field test. **Andrew Griffith** admitted that he was took by surprise when communities strongly opposed a scientific, non-radioactive borehole test project even though there are no plans for the site to transition into a nuclear waste disposal project. This reflected the high degree of mistrust the public has against the Federal Government in general, and DOE specifically, he concluded. The new approach is designed such that communities are an active part of the project from the start of the project to better understand the scientific benefits and limited risks. He further explained that there is no such thing as a standard “one size fits all” blueprint for involving the different affected communities, rather specific solutions have to be developed based on the priorities of the community.

## WM2017 Conference Panel Report

Some generic questions have been put forward to the panel as well, addressing questions on the general process for site selection as for example whether the site selection process somehow favours communities which already have experience with nuclear facilities and, thus, might have a positive attitude towards a radioactive waste disposal facility. Except for Finland and Sweden, which have a relatively homogeneous geology throughout the countries, the panellists said that safety is driving the process. **Carl Reinhold Brakenhielm** noted that despite several attempts it is difficult to transfer experiences from one country to another due to different cultural backgrounds. And **Andrew Griffith** reported about the US experience that the local public perception might substantially change over time depending on the circumstances.

Being asked on experiences about involvement of the public of neighbouring countries the panellists commonly reported relatively comprehensive challenges, which generally are solvable. For example, during the last decade Finland has been in the position to run several licensing processes for nuclear installations. These processes have included the statements from the neighbouring countries, where Finland has been challenged by the Swedish public about construction of nuclear installations.

A final question addressed the requirement of waste retrievability. While retrievability is a mandatory design feature prescribed in the national legislation in the US, France, and in Germany, it is not required in Sweden, Finland, and the UK