DBE TECHNOLOGY NEWS

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2017

8TH US-GERMAN WORKSHOP ON SALT REPOSITORY RESEARCH, DESIGN, AND OPERATION

DEVELOPMENT OF REPOSITORY CONCEPTS IN CRYSTALLINE ROCK

THE GERMAN MINISTRY OF THE ENVIRONMENT VISITS PEINE

Verantwortung für Generationen
Responsibility for Generations

DBE TECHNOLOGY GmbH

Participants of the 8th US-German Workshop

Tunnel drilling in crystalline rock, Gotthard Base Tunnel (Source: Alp Transit Gotthard Ltd.)

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Dear readers,

The re-organisation of the German radioactive waste management sector is progressing successfully. Following the Site Selection Act of 2013 and its amendments of 2016 and 2017, the responsibilities have been clearly defined and assigned to newly established organisations. Important to mention is the new regulator for radioactive waste management, BfE, which is now completely independent from the new Federal Company for Radioactive Waste Disposal, BGE. Both organisations took over their respective responsibilities in April this year and are increasing their number of staff accordingly.

The merger of Asse GmbH and DBE and the related operational parts of the Federal Office for Radiation Protection (BfS) into BGE will be completed by the end of this year. All preconditions for this are already met, and working groups made up of all parties involved are currently preparing the necessary structure and processes for the new organisation, which will be solely responsible for the implementation of the German disposal projects, i.e., the operation of the existing disposal projects Asse, Konrad, and Morsleben, as well as the site selection for a geologic repository for HLW.

Consequently, BGE's philosophy is to be the centre of competence in all questions of radioactive waste management in Germany. But competence is not something that comes for free. In fact, even "just" maintaining competence requires a high commitment and effort, which is most effectively assured if all available resources are exploited. Apart from the national R&D institutions, this obviously includes an intense exchange with our international partners and sister organisations. Hence, I am happy that I am in the lucky situation that DBE and DBE TECHNOLOGY GmbH bring a strong network into our new organisation. Examples of the activities can be seen again in the current Newsletter, which you are holding in your hand.

I am looking forward to seeing the national and international network growing and actively contributing to accomplishing our huge task of safely managing radioactive waste.

Yours sincerely,

Ursula Heinen-Esser
CEO of BGE
and Managing Director of DBE

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8th US-German Workshop on Salt Repository Research, Design, and Operation

Whereas repositories for low- and intermediate-level radioactive waste and non-heat generating defence waste have been implemented decades ago in Germany and the United States (e.g. ERMA, Asse, WIPP), the disposal of high level radioactive waste and spent fuel in rock salt is still an issue of research and development. Not only the United States and Germany but also other countries like the Netherlands and Poland are considering rock salt formations as suitable host rock for the disposal of radioactive waste.

The cooperation of German and American researchers in this field since the 1970s was continued by the 8th US-German-Workshop on Salt Repository Research, Design, and Operation this autumn. More than 50 scientists and engineers attended the Workshop – organized by SANDIA National Laboratories, Karlsruhe Institute of Technology, and DBE TECHNOLOGY GmbH – in Vlissingen at COVRA premises in The Netherlands, on September 5 to 7.

This Workshop was opened by welcome addresses from Tim Gunther, DOE (US), Mr Wirth on behalf of BMWi (Germany), and Ewoud Verhoef from COVRA (The Netherlands). The scientific and engineering program was introduced with updates on the development of the National Waste Management Programs of the three countries. Whereas the program of the Netherlands is continuing to focus on long-term interim storage, the US-Program for HLW and SF still is in debate at the Congress considering a restart of the Yucca-Mountain-Project (a repository in Tuff) and continuing the operation of the WIPP (repository in salt). The reorganisation of responsibilities in Germany (foundation of BfE as the new regulator and BGE as new implementer) as well as the change of the financing schemes of the German Waste Management Program were briefly presented as well.

The scientific and engineering topics of the workshop dealt with Safety Case, Geomechanics, Repository Design and Operational Safety. With regard to the importance of crushed salt as part of the technical barrier system in a repository in salt formations a breakout session on reconsolidation of crushed salt was inserted into the program. Special topics like actinide and brine chemistry, groundwater models as well as investigations of the pros and cons of the option of disposing of waste packages into very deep boreholes accomplished the Workshop program. As in previous years the group will continue to document and report workshop results that have substantial scientific basis in proceedings as a means to preserve this knowledge (web-site www.energy.sandia.gov).

The organisers and the participants very much appreciated the hosting of COVRA, and in particular enjoyed the guided tour to the interim storage facilities for LILW and HLW and recognized the beauty of combining art with high-tech storage technology at the site. The next US-German-Workshop will be held at BGR-premises in Hanover on September 10 and 11, 2018 prior to the 9th Conference on the Mechanical Behavior of Salt (SaltMech IX) on September 12 to 14 at the same location.

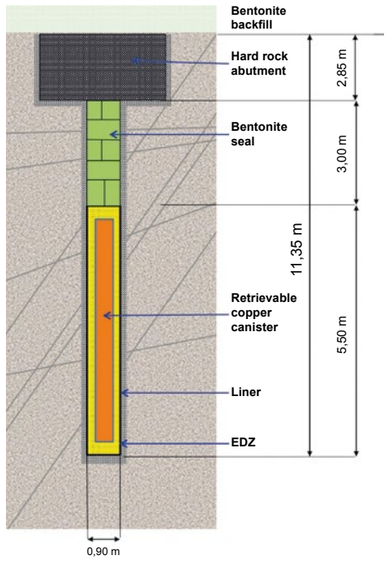
Development of repository concepts in crystalline rock

In the course of the R&D project KONEKD, three different repository concepts for heat-generating radioactive waste and spent fuel in crystalline rock were developed. Each of these concepts is based on a different mechanism on how to ensure the containment of the waste, which are: the KBS-3 concept of SKB and Posiva Oy (containment provided by waste canister and buffer primarily), the identification of multiple containment providing rock zones within the host rock formation, and the idea of ensuring containment by an overlaying bed of impermeable sedimentary rock.

The aim of the project was to develop a sound technical basis that can support further R&D with regard to the development of safety and safety demonstration concepts for a repository in crystalline rock. The main challenges that emerged during the project were caused by the lack of knowledge about the geology of the crystalline formations in Germany. Therefore, a modular approach was favored: Instead of developing three detailed repository concepts in fixed geologic models; emphasis was put on designing repository components. In the future, these can then be assembled into a repository concept and adjusted to a more realistic specific geological model. In KONEKD, this was done in an exemplary way only.

The project work comprised mining engineering aspects of building a repository in crystalline rock, a compilation of the design basis for the repository concepts (waste quantities and types, geological data, and requirements), and the development of the individual modules; e.g., underground openings, seals, and transportation and emplacement technologies. Finally, each of the three repository layouts was assembled into an exemplary geology. Preliminary estimates of the time and effort for all the processes during the lifecycle of a repository, including planning, licensing, building, operating, and closure, completed the project work and showed the main cost drivers for a repository in crystalline rock. The results of the project will be published in a final report this autumn.

KONEKD was sponsored by the Project Management Agency Karlsruhe on behalf of the Federal Ministry for Economic Affairs and Energy.



Borehole concept for spent fuel and HLW disposal in crystalline rock

Mining work in the iron ore formation at the Konrad repository (Germany) (courtesy of DBE)

The German Ministry of the Environment visits Peine

The German Federal Minister for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB), Ms. Barbara Henricks, recently visited the DBE offices here in Peine to inform herself first hand on the progress being made in the merger of DBE into the new BGE (Federal Company for Radioactive Waste Disposal). BGE is the new federal company that will merge the competencies and capabilities of DBE with those of ASSE GmbH as well as with the relevant portions of the Federal Office for Radiation Protection (BfS) into a single, better positioned organization responsible for the disposal of all radioactive waste in Germany. BGE was organized and established in accompaniment of Germany's new Site Selection Act.

Ms. Hendricks was accompanied by members of the German Parliament, as well as state and local dignitaries. In attendance were also the managing directors, senior management and worker representatives from ASSE GmbH. The Chief Executive Officer of BGE and DBE's new Commercial Managing Director, Ms. Ursula Heinen-Esser, greeted the arriving guests at the DBE Headquarters in Peine.

from left to right: Ingrid Pahlmann (member of parliament), Hubertus Heil (member of parliament), Dr. Barbara Hendricks (Minister for Environment), Dr. Ewald Seeba (CEO BGE), Ursula Heinen-Esser (CEO BGE) and Prof. Dr. Hans-Albert Lennartz (CEO BGE).

Ms. Hendricks emphasized the significant level of progress that has been achieved over the last four years since Germany passed the new Site Selection Act, a major cornerstone in identifying a suitable site for locating a repository for heat-generating radioactive waste. Once the merger is completed, the various organizations currently involved in repository development will become a single organization with the main headquarters in Peine and two additional offices in Salzgitter and Remlingen. She further underscored the significant experience in repository science and engineering and in decommissioning of nuclear facilities that has been gained in Germany over the last several decades and the importance of sharing this experience with the international sphere. The new company will employ roughly 1600 individuals.

As the event progressed, Ms. Heinen-Esser directly affirmed the importance of DBE TECHNOLOGY GmbH's continuing role in both R&D and international cooperation, particularly with respect to the new site selection process.

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