# DBE TECHNOLOGY NEWS

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2015

## IMPLEMENTATION OF RETRIEVABILITY INTO THE DRIFT DISPOSAL CONCEPT FOR A HLW REPOSITORY IN SALT FORMATIONS

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## DBE TECHNOLOGY GMBH WAS ASSIGNED THE HIGHEST POSSIBLE LEVEL IN AN AUDIT ON OCCUPATIONAL HEALTH AND SAFETY

Verantwortung für Generationen
Responsibility for Generations

DBE TEC

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*Members of DAEF (German association for repository research)*

*Dear Readers!*

*In 2015, DBE TECHNOLOGY GmbH will complete its 15th year of existence. 15 is usually the age where children strive for more independence from their parents and start to look for their own challenges. Our company enjoyed economic independence from its parent company, DBE, from the very beginning. The know-how of DBE and the expertise of the staff who changed to DBE TECHNOLOGY GmbH turned out to be good assets. Without forgetting our roots, we were able to add new competences and to expand the expertise of our staff. More than half of our current staff has been hired and trained by DBE TECHNOLOGY GmbH itself, and we entered into market areas that are not covered by DBE's competences, e.g. near surface disposal of radioactive waste.*

*Accordingly, we became more independent from changes of the German HLW disposal policy resulting from the decision made last year for restarting the site selection process, taking into account all options. Thanks to the national and multinational cooperation in numerous projects regarding HLW disposal in various geologic formations, we are well-prepared to contribute to this challenging process. Established good cooperation relationships with competent partners and customers in Germany and abroad are another success factor that makes us confident that we will be able to tackle the new challenges in a changing environment in 2015 and beyond.*

*As regards the overall situation concerning radioactive waste disposal in Germany, we hope that very soon a decisive breakthrough will be achieved in the work of the commission that was established last year by the German parliament and that is entrusted by law to develop the basics of a new site selection process for a HLW repository.*

*In a more global sense, we hope very much that the conflict between the Western Countries and Russia that was raised last year in the context of the political changes in Ukraine will very soon come to a good end. Traditionally, we maintain a good and extensive cooperation with partners in both countries and are proud to have been able to contribute to the improvement of their national radioactive waste management systems. The current situation is not only unacceptable for the millions of people suffering directly from the military conflict in Eastern Ukraine but also for the international community. It destroys the basis for a fruitful mutual beneficial cooperation, which in turn is the basis for peacefully living together on this planet.*

*Having these ideas in mind, we wish you all the best for 2015 and now happy reading of this newsletter, which compiles a selection of our most recent activities.*

*Dr. Jürgen Krone*

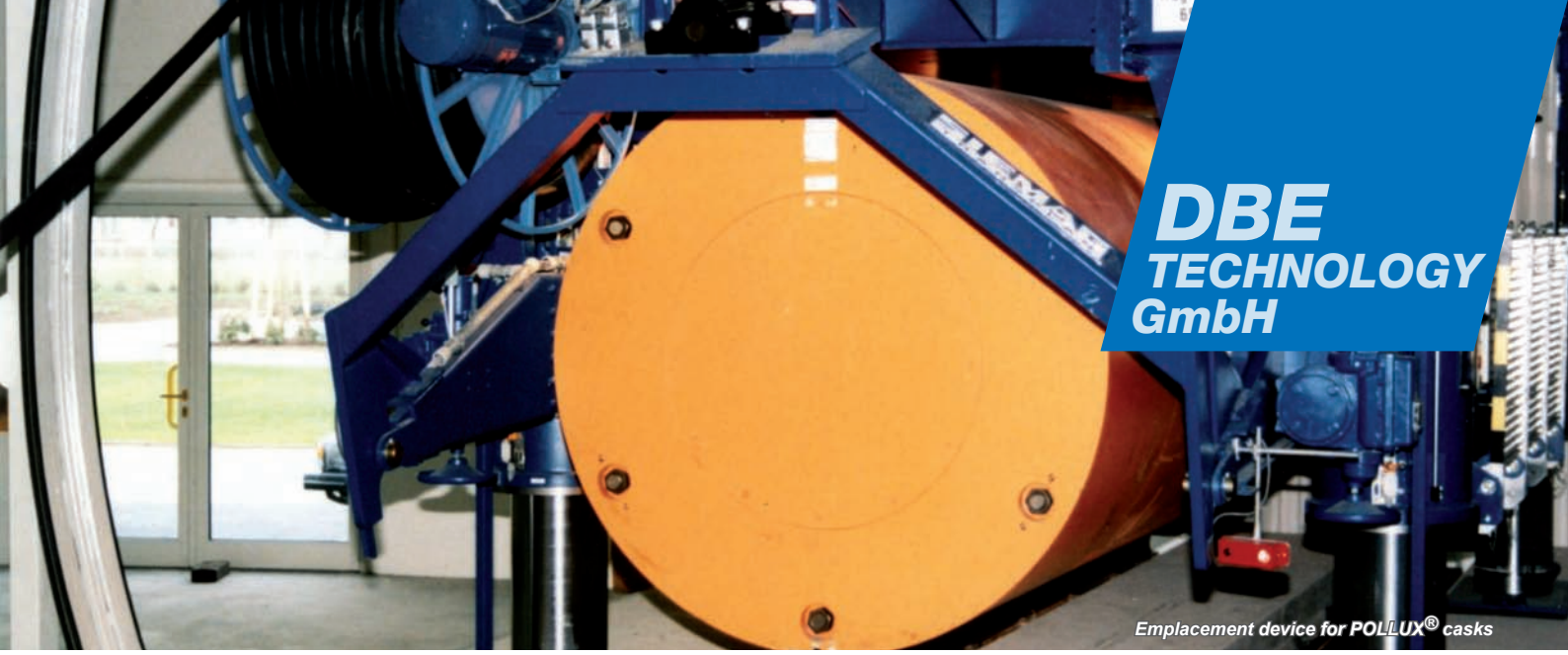
*Managing Director*
*DBE TECHNOLOGY GmbH*

DBE TECHNOLOGY GmbH

## DAEF position paper on the methodology of the siting process for HLW repositories in Germany

DBE TECHNOLOGY GmbH is a founding member of DAEF (Deutsche Arbeitsgemeinschaft Endlagerforschung), a German association for repository research founded by the leading German institutions concerned with research in the deep geological disposal of radioactive waste. In October 2014, DAEF published a position paper on "Scientific-technical and Socio-scientific Aspects of a Site Selection Procedure for a Repository for Heat-generating Radioactive Waste in Deep Geologic Formations in Germany". DBE TECHNOLOGY GmbH contributed significantly to the preparation of this paper.

According to the „Gesetz zur Suche und Auswahl eines Standortes für ein Endlager für Wärme entwickelnde radioaktive Abfälle und zur Änderung anderer Gesetze – (Standortauswahlgesetz – StandAG)" of July 23, 2013, the procedure for the search for and selection of a site for a repository for heat-generating radioactive waste is to be reorganized. In its paper, DAEF presents the scientific basis already established for the selection of a repository site and gives recommendations for a corresponding selection process based on the experience made in other countries and on the current state of research. The paper also indicates challenges regarding the planning and implementation of a selection procedure and identifies scientific-technical criteria for a safety-oriented comparison and elimination of regions and sites as well as socio-scientific and regional development concerns. Special challenges are posed by the required practical application of these criteria to the different geologic formations to be taken into account in Germany; i.e. rock salt, claystone, and crystalline rock. The paper also aims at establishing a link between these criteria and the corresponding objectives and values. DAEF is of the opinion that during the site selection process, decisions will have to be made based on considerations and value judgements because a selection process based on "objectified", scientific facts will reach its limits.



*Emplacement device for POLLUX® casks*

According to DAEF, the final disposal of radioactive waste in deep geologic formations is a disposal option that is safe even for very long periods. From a scientific perspective, it is an option that best meets the requirements of finding a permanent solution for the disposal of radioactive waste while keeping the burden for future generations to a minimum.

## Implementation of retrievability into the drift disposal concept for a HLW repository in salt formations

In 2010, the new "Safety Requirements Governing the Final Disposal of Heat-Generating Radioactive Waste" were issued in Germany stipulating retrievability of radioactive waste containers from the repository during the operational period and making it a strict requirement for licensing. To meet this requirement, DBE TECHNOLOGY GmbH analyzed which adaptations are necessary to existing repository concepts. The corresponding research and development project was funded by the German Federal Ministry for Economic Affairs and Energy. The results showed that retrievability is generally feasible. In addition to this, conceptual designs for retrieval were developed and open technical questions identified.

For a HLW repository in salt formations, the mine layout of the drift disposal concept includes the emplacement of POLLUX® casks on the drift floor at regular distances in the emplacement drifts. The voids between POLLUX® cask and drift walls will be backfilled with crushed rock salt. The transport and emplacement equipment for POLLUX® casks as well as the backfilling technique were successfully tested by DBE in the mid-nineties.

DBE TECHNOLOGY GmbH concluded that a re-mining strategy will be a suitable option to retrieve POLLUX® casks without impacting the long-term safety of the repository. This strategy relies on the emplacement and backfilling techniques mentioned above. In order to retrieve the POLLUX® casks, new retrieval drifts have to be excavated parallel to the waste containers. These new drifts will allow continuous ventilation and cooling. Then, the remaining pillar between the two drifts will be removed and the POLLUX® casks will be exposed.

For retrieval, the emplacement device has to be equipped with a new supporting frame to lift and carry the POLLUX® cask and with wheels or a crawler chassis so that it is no longer rail-bound.

Currently, a new R&D project - funded by the German Federal Ministry for Economic Affairs and Energy - has been started to broaden the knowledge about retrievability and to develop technical approaches.

## Development of a Strategy for the Management of Radioactive Waste and Spent Fuel in China

China is in the process of developing a comprehensive policy and a strategy for managing radioactive waste originating from mining activities, the treatment of ores (uranium and other metals), uranium enrichment, nuclear fuel cycle, the operation of nuclear power plants, research and experimental reactors, medical and industrial activities. In October 2012, the national safety goals were set up to 2020, meaning mainly improvement of safety of nuclear installations and radiation sources and expansion of capacity in the area of nuclear safety. The aim is to achieve levels of nuclear and radiation safety commensurate with best international practice by that time. An essential part of the policy deals with radioactive waste treatment, storage and disposal.

A consortium of European Waste Management Organisations was awarded a contract, funded by the European Commission, to cooperate with and provide assistance to the Chinese stakeholders in the further elaboration of a national policy and strategy for the management of spent nuclear fuel (SNF) and radioactive waste (RAW). In addition to the provision of information on the German situation for the compilation of international best practices, DBE TECHNOLOGY GmbH is tasked with a report on the Comparison of Spent Fuel Storage Alternatives. The main task will be to define mechanisms for the implementation of the strategy itself and mechanisms for the respective supervision of the implementation.

The consortium members are ANDRA (France), COVRA (The Netherlands), DBE TECHNOLOGY GmbH (Germany), ENRESA (Spain) and SKB International AB (Sweden). The Kick-off meeting took place in Bejing on November 26, 2014, and the project duration is three years.

*Qinshan, China's first reactor started operation in 1991 (Source: imago stock & people)*

*Recutting of a drift at the Asse mine (Germany)*

## High-ranking representatives of the Brazilian National Nuclear Energy Commission visit DBE TECHNOLOGY GmbH

In October 2014, two experts of the Brazilian Nuclear Energy Commission CNEN (Commissão National de Energia Nuclear) looked forward to exchanging information with their German colleagues. Rogerio Mourao and Julio Marumo spent about four weeks with their colleagues at DBE TECHNOLOGY GmbH. Commissioned by the Brazilian Government, CNEN is in charge of the design, licensing, and operation of all nuclear facilities in the five Brazilian regions. In addition to the management of radioactive waste, this includes in particular the construction of an extensive surface repository for LILW, which is in the design phase in Brazil.

The expertise of DBE TECHNOLOGY GmbH in the design, construction, and operation of radioactive waste repositories in general, and especially our know-how in the design of surface repositories and in planning the operation of such facilities formed the basis for

*Brasilian visitors*

the experience exchange. Due to the experience and know-how made available to Mr Mourao and Mr Marumo, they were able to identify optimisation potential for the current Brazilian concept for a surface repository and took home fresh ideas and new impressions.

## 140 guests at the Evening of Arts and Sciences 2014

On November 17, 2014, the Evening of Arts and Sciences took place in the entrance hall of DBE TECHNOLOGY GmbH's head office. 140 members of the business and research communities, of government institutions, and of the media took the opportunity to exchange ideas in a relaxed and comfortable atmosphere and to enjoy a nice evening. Manfred Müller, head of the research department on air traffic safety at LUFTHANSA and lecturer for risk management at the Bremen University, talked about "Individual safety needs versus calculated risk – are men assessable as a risk factor?" His excellent and interesting guest lecture led to lively discussions among the audience. Entertainment was provided by the musicians „Spicy Trio" and the cartoonist Iouri Didenko.

## DBE TECHNOLOGY GmbH was assigned the highest possible level in an audit on occupational health and safety

DBE TECHNOLOGY GmbH is a company that provides consulting services in all aspects of radioactive waste management while meeting highest safety and quality standards. But the company is also aware of the safety and health of its staff.

*Beatrice Maier (DNV GL) hands the certificate with the result of the audit on occupational health and safety over to Hartmut Bothe (DBE TECHNOLOGY GmbH).*

In everyday work, safety and occupational health are important business objectives that are verified periodically and comprehensively. The last corresponding audit was conducted in September 2014 by the well-respected expert organization DNV GL Business Assurance GmbH. In this audit, the occupational health and safety policy of DBE TECHNOLOGY GmbH and its parent company DBE was assigned the highest safety level DNV GL can award: "level 10". This is a unique top rating of both companies that has never been achieved by any other company in the world. This result was only possible because all employees are aware of the significance of safety and health measures. Neither within the company nor in our work with clients and external institutions will we accept any compromise when it comes to safety and health protection.

For further information visit www.dbe-technology.de or scan the QR code below.

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