



PEBS Newsletter No. 1

Background

Since 1984, the European Commission has supported research related to the management of radioactive waste. R&D projects are funded by Euratom through multiannual framework programmes. The Commission launched the Sixth and Seventh Framework Programmes in 2002 and 2006 respectively. Both programmes represented a major step forward from previous Community-supported programmes, since the scope and the ambition of the research as well as the average level of funding for individual projects were substantially increased. The PEBS project is one of the "Small and Medium Projects" forming part of the FP7 Euratom programme. PEBS is a multinational European research project that investigates processes affecting the engineered barrier performance of geological repositories for high-level waste disposal. The PEBS consortium consists of 17 leading nuclear research organisations, radioactive waste management agencies/implementing organisations, universities and companies.

Project kick-off

On April 13th and 14th, 2010, the first Project Meeting of the PEBS project took place at BGR in Hannover, Germany. The management framework and the basic ideas and instruments were presented and discussed.

All partners presented their organisations and gave a short overview of their tasks and objectives. The scientific officer of the European Commission, DG RTD, Unit J 2 (EURATOM), and the nominated members of the High Level Expert Committee, HLEC, also attended.

PEBS objectives

The main aim of the PEBS (Long-term **Performance of the Engineered Barrier System**) project is to evaluate the sealing and barrier performance of the EBS over time, through development of a comprehensive approach involving experiments, model development and consideration of the potential impacts on long-term safety functions. The experiments and models cover the full range of conditions from initial emplacement of wastes (high heat generation and EBS resaturation) through to later-stage establishment of near steady-state conditions, i.e. full resaturation and thermal equilibrium with the host rock. These aspects will be integrated in a manner that establishes a more convincing link between the initial transient state of the EBS and its long-term state, which provides the required isolation of the wastes.

The work proposed within the project builds on existing knowledge and experience generated during recent years and supported by ongoing national and EC research programmes. The project aims to provide a more complete description of the THM and THM-C (thermo-hydronechanical-chemical) evolution of the EBS system, a more quantitative basis for relating the evolutionary behaviour to the safety functions of the system, and a further clarification of the significance of



Kick-Off at BGR in Hannover, Germany

residual uncertainties for long-term performance assessment. The importance of uncertainties arising from potential discrepancy between the process models and the laboratory and in situ experiments to be performed within PEBS, and their implications for extrapolation of results will be reviewed, with particular emphasis on possible impacts on safety functions.

In addition to the aims of the five scientific-technical work packages and the Project Management work package, the consortium will disseminate the main results to the broad scientific community within the EU, China and Japan, use its expertise for public information purposes and promote knowledge and technology transfer through training. WP 5 brings together all activities concerning dissemination and training.

The Steering Committee is responsible for solving any problems raised and the ExCom has to answer overarching questions. The HLEC has the role of an external and independent advisory committee.

Composition of the PEBS consortium

The type and complexity of the research subject covered by PEBS call for multidisciplinary expertise.

To achieve the scientific-technical objectives of PEBS and to guarantee the relevance of the research and the use of its results, the project required a strong multidisciplinary team involving both the major European radioactive waste management organisations and the main nuclear research institutes, as well as the support of other research institutions, universities, industrial partners and consultancy companies. The PEBS consortium comprises 17 participating organisations that are endowed with a wide variety of highly specialised skills, competences and responsibilities and have access to the research infrastructures needed to perform the multidisciplinary R&D work proposed within PEBS.

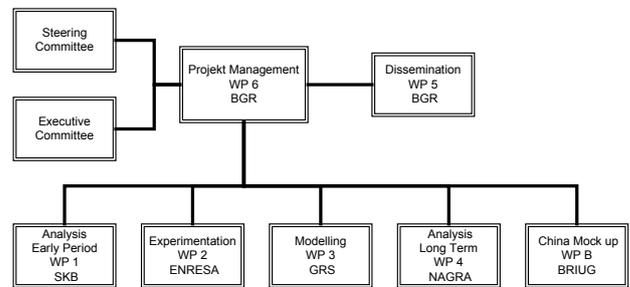
The German Federal Institute for Geosciences and Natural Resources, BGR, acts as the Coordinator. The following radioactive waste agencies, universities, industrial companies and research centres are participating in PEBS:

AITEMIN (Spain), ANDRA (France), BGR (Germany), BRIUG (China), CIEMAT (Spain), CIMNE (Spain), Clay Technology (Sweden), ENRESA (Spain), Golder (Spain), GRS (Germany), JAEA (Japan), NAGRA (Switzerland), Solexperts (Switzerland), SKB (Sweden), TK-Consult (Switzerland), UAM (Spain), UDC (Spain).

Key activities:

- Bring together multidisciplinary and complementary expertise in laboratory experiments, including the capacity to work with actinides, long-lived fission products and real high-level waste, *in situ* testing in URLs, modelling, and safety assessments for the different research domains
- The participating organisations perform parts of the proposed R&D within their competence
- Ensure for the end users that the outcome of the project is of direct use for waste disposal implementation programmes (including performance assessment) and interaction with different stakeholders
- Set priorities concerning types of waste, engineered barriers, repository designs and host rocks that are to be considered in the project
- Manage research performed in underground research laboratories
- Ensure the dissemination of knowledge and technology within the scientific community
- High-tech "state-of-the-art" analytical techniques and (*in situ*) monitoring techniques;
- High-tech "state-of-the-art" experimental set-ups
- Modelling
- Engineering
- The proposed training includes the use of high tech lab facilities for bentonit research and related field work

This wide range of participant organisations is a decisive factor for the success of the project given the large number of complementary scientific disciplines that are required in investigations related



Work Breakdown Structure

to near-field processes, i.e. nuclear chemistry and physics, geochemistry, hydrogeology, mineralogy, geomechanics of clay, hard rock and rock salt, thermomechanics, mining engineering, *in situ* instrumentation, and modelling for all these disciplines.



Mock-up at BRIUG Labs

EURATOM has contributed to cooperation between the EU and China. As a result, building on ongoing geoscientific cooperation between Germany and China, BRIUG was asked to join the PEBS consortium. In the PEBS project BRIUG performs various experiments using an own mock-up. The results of these experiments together with all other data gathered by the PEBS partners in Mont Terri and technical labs will be shared and interpreted.

Notice from the coordinator

In March PEBS was invited to present the project and to attend joint European-Chinese consultations. In addition, PEBS was asked to provide information about the management and preparation of EURATOM projects and proposals. Between the EU and China, several teams for joint projects have been formed. In addition to co-funding, these joint projects will be financed with separate EU and Chinese contributions.

Content of the next newsletter

The second Project Meeting has been scheduled proposed for May 2011. The following newsletter will report on its outcome, the interim results and the further steps.

For more detailed information see PEBS web site:

<http://www.pebs-eu.de>