

News briefs

International peer review of a radioactive waste repository

The NEA conducts peer reviews as part of its mandate to help improve and harmonise the technical basis for dealing with nuclear waste issues in its Member countries. Over the years it has performed such reviews for national programmes in Japan, the Netherlands, Sweden, the United Kingdom and the United States. The most recent review was of the Total System Performance Assessment supporting the site recommendation process (TSPA-SR) of the Yucca Mountain Project in the United States.

The US Department of Energy (USDOE) has been studying the Yucca Mountain site in Nevada for more than 15 years to determine whether it is a suitable place to construct an underground repository for US spent nuclear fuel and high-level radioactive waste of commercial and military origins. In addition to site characterisation work and development of the system concept, the USDOE also carried out a number of performance assessments over the past decade.

The peer review of the TSPA-SR was requested by the USDOE and carried out over the period from June to December 2001. An independent team of ten international specialists, including two members of the Joint Secretariat formed by the Nuclear Energy Agency (NEA) and the International Atomic Energy Agency (IAEA), conducted the review. The team members represented several scientific and technical disciplines relevant to assessing the performance of underground radioactive waste repositories.

The primary objective given to the International Review Team (IRT) was to review and critically analyse the performance assessment methodology and rationale used by the USDOE in the site-recommendation decision process in order to:

- identify consistencies and inconsistencies between methods that were implemented by the USDOE and those being considered or

developed in international recommendations, standards and practices;

- provide a statement regarding the adequacy of the overall performance assessment approach for supporting the site recommendation decision;
- provide detailed recommendations for specific technical and other improvements that would help performance assessment better support the next programmatic decision point, if the site is recommended and subsequently approved, which entails the preparation and submission of a license application.

The IRT has generally concluded that:

While presenting room for improvement, the TSPA-SR methodology is soundly based and has been implemented in a competent manner. Moreover, the modelling incorporates many conservatisms, including the extent to which water is able to contact the waste packages, the performance of engineered barriers and retardation provided by the geosphere.

Overall, the IRT considers that the implemented performance assessment approach provides an adequate basis for supporting a statement on likely compliance within the regulatory period of 10 000 years and, accordingly, for the site recommendation decision.

On the basis of a growing international consensus, the IRT stresses that understanding of the repository system and its performance and how it provides for safety should be emphasised more in future iterations, both during and beyond the regulatory period. Also, further work is required to increase confidence in the robustness of the TSPA.

The Peer Review is available for free download from the NEA website at www.nea.fr. Paper copies may be ordered at the address provided on page 32. ■