

NRC INTERNATIONAL TRAVEL TRIP REPORT

Traveler, Office, Division, Phone Number

Jin-Ping (Jack) Gwo, Systems Performance Analyst, Yucca Mountain 3 Branch
Division of Spent Fuel Alternative Strategies
Office of Nuclear Material Safety and Safeguards
301-287-9149

Dates of Travel and Countries/Organizations Visited

May 24-31, 2014
Vienna, Austria; International Atomic Energy Agency (IAEA)

Subject

An IAEA Plenary Technical Meeting of GEOSAF Part II, the International Project on Demonstration of the Operational and Long-Term Safety of Geological Disposal Facilities for Radioactive Waste

Desire Outcome

Discuss and present recommendations to IAEA on the result achieved and the materials (a GEOSAF II TECDOC and a Terms of Reference for the proposed, new activity on operational safety) elaborated through a 2013 plenary meeting and a 2014 consultancy. Develop plans for future activities on a complementary product that focuses on operational safety. Incorporate U.S. perspectives in these discussions and recommendations.

Results Achieved

The plenary reviewed the draft TECDOC for GEOSAF II, which attempts to integrate the preclosure, operational aspects of a radioactive waste geological disposal safety case with postclosure safety considerations and assessment. A list of recommendations to clarify and improve the description of processes and concepts encountered during pre-operational phase (e.g., design and construction), operational phase (e.g., waste receipt, handling and emplacement) to closure phase (e.g., backfill, sealing, decommission of surface facility, and closure) were agreed on. The GEOSAF II core group was tasked to finalize the draft TECDOC before the end of 2014, when it will be distributed to participant states for reviews and comments. The participants agreed on a fourth plenary meeting during the week of May 17 to review and approve the TECDOC.

The plenary received inputs from projects sponsored by EU and NEA (e.g., SITEX, IGD-TP, and EG-OS) regarding recent activities on geological disposal and from member states (e.g., Sweden and France) regarding planning and designs for high-level waste and spent fuel repositories. These inputs were subsequently incorporated in the group's recommendation to a Terms of Reference (ToR) for the new, planned activities on operational safety.

The plenary recommended and agreed on a list of activities for the new initiative on operation safety and on a draft ToR for a working group on this subject. A report is proposed to address the recommendations and to be presented for review and discussion in the next plenary

meeting in May 2015. A workshop or technical meeting was also scheduled to identify gaps in IAEA guidance to preclosure operational safety in the spring of 2015.

Summary of Trip

The plenary meeting of GEOSAF II was held in Vienna, Austria, on May 24 – 29, 2014, to discuss (1) a draft TECDOC prepared by the core group of GEOSAF II and (2) a pre-draft ToR for a complementary report on operational safety. At the second plenary meeting of GEOSAF II in May 2013, the group reviewed a draft report for GEOSAF II, which were revised to incorporate recommendations from the group and became the draft TECDOC presented to the plenary meeting in May 2014. At the May 2013 plenary meeting, a complementary product of the TECDOC was also proposed to address only operational safety. The 2014 plenary meeting divided its attention and time between the review and working group recommendations to the draft TECDOC and discussion and recommendations to the ToR and deliverable of the new, operational safety work packages. Interspersed between working group sessions and plenary meetings were presentations of disposal programs in a few member states and related programs in other international organizations such as EU and NEA.

The meeting began with a summary of the GEOSAF II project and the results achieved in the last plenary, followed by a presentation of recent IAEA activities on radioactive waste, including DPC (Dual Purpose Cask), PRISM (Practical Illustration and Use of the Safety Case Concept in the Management of Near-Surface Disposal), HIDRA (Human Intrusion in the context of Disposal of Radioactive Waste), and ILW (Intermediate Level Waste). GEOSAF II draws much of its framework from the IAEA Specific Safety Requirements (SSR) 5, "Disposal of Radioactive Waste," and Specific Safety Guide (SSG) 23, "The Safety Case and Safety Assessment for the Disposal of Radioactive Waste." The presentations and the working group sessions referred to these two IAEA guidance documents repetitively on both requirements and definitions. The GEOSAF II core group presented to the plenary the organization and individual chapters of the draft TECDOC. The group was then divided into three working group to review the draft and provide recommendations to the entire plenary. The draft TECDOC expounded on the three main concepts: 'safety envelop', 'design target', and 'as-built state,' and introduced a 'loop' concept to iterate between the new information gained during the operational phase and the update of the safety case. The 'loop' was facilitated by a management system to ensure requirements were properly met and new information was fed back to the update of the safety case. A 'handshake' concept was used to ensure the final state of the operational phase is compatible with the initial state of the postclosure phase.

The three working groups were charged to provide inputs on the timeline of entire preclosure phase, communication of the aforementioned concepts to stake holders, and uncertainty management. The traveler was chosen to moderate the third working group. The working groups continued their reviews and discussion of the TECDOC until the morning of the second day and presented their recommendations to the plenary in the afternoon. Two presentations followed the working group summaries: NEA EG-OS (Expert Group on Operational Safety) and EU SITEX (Sustainable Network of Independent Technical Expertise for Radioactive Waste Disposal). The main themes of the NEA EG-OS are fire risk, NEA hazard database, ventilation, co-activity hazard (with a questionnaire in preparation) and waste acceptance criteria. The main SITEX functions are training and tutoring of expertise, review of safety cases, research and development implementation, and interaction with civil societies. Following the presentations, the draft ToR for the new operational safety product was presented to the plenary and the group

was again divided into the three separate working groups after the objectives of working group discussion were clearly articulated.

The working groups continued their review of the ToR through the third day of the meeting, in between presentations of Sweden national experiences, SITEX working package 2.1, ongoing IGD-TP works of the European Union, and UK national experience on geological disposal safety case. The working groups presented their recommendations when the plenary reconvened on the fourth day.

Before the presentations of the working groups on the fourth day, ANDRA presented France's national experience on high-level waste disposal, focusing particularly on the design and planning for the construction of the repository and emplacement of waste. Comments to the potential impact of co-activities during the preclosure phase was discussed and exchanged extensively by the plenary participants. The working groups' review and recommendations to the ToR on the operational safety report were assembled by the core group of GEOSAF II and a working session of the entire plenary in the afternoon of the fourth day completed a draft, updated ToR for the new activity. Plans to achieve the results in the next 12 months and the constitution of a second core group for that purpose, including a potential technical meeting (e.g., workshop) before the next plenary meeting, were discussed and finalized. The plenary adjourn on the conclusion of the fourth day, one day ahead of its original schedule.

Pending Actions/Planned Next Steps for NRC

The GEOSAF II core group was tasked to finalize the draft TECDOC and submitted to participant states of the plenary for review and comments before the end of 2014. The TECDOC will be subsequently reviewed and approved in the next plenary in 2015. NRC staff will be part of this review and final approval. The core group is also tasked to complete a draft ToR for operational safety, while the second core group will meet before the next plenary and complete a draft report for operational safety. The U.S., in particular, DOE WIPP, was listed as a potential participant to the technical meeting or workshop proposed for the purpose of assembling international experiences on gaps of IAEA guidance to operational safety. No action on the part of NRC staff on this subject is expected.

Points for Commission Consideration/Interest

The content of this report may be of interest to the Commission. There are no actions that the Commission needs to take as a result of this meeting.