

CENTER FOR NUCLEAR WASTE REGULATORY ANALYSES

TRIP REPORT

SUBJECT: Spring 2002 Nuclear Waste Technical Review Board Meeting
Project Number 20.01402.571; AI 01402.571.026

DATE/PLACE: May 7–8, 2002
Washington, DC

AUTHOR: Gustavo A. Cragnolino

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PERSONS PRESENT: The NWTRB meeting was attended by approximately 100 people. T. McCartin, J. Greeves, W. Reamer, T. Ahn, and T. Bloomer [U.S. Nuclear Regulatory Commission (NRC)] were also present.

BACKGROUND AND PURPOSE OF TRIP:

The purpose of the trip was to attend presentations and discussion on the Yucca Mountain safety case, staged repository concepts, and corrosion testing. An additional purpose of the trip was to visit with the NRC Container Life and Source Term (CLST) staff to discuss current and future work.

SUMMARY OF PERTINENT POINTS:

After introductory remarks by Jared Cohon, chairman of the Nuclear Waste Technical Review Board (NWTRB), R. Loux (Agency for Nuclear Projects, Nevada) made a presentation outlining the position of the State of Nevada with respect to the process associated with the Site Recommendation (SR) and listing the court suits that are being filed against the U.S. Department of Energy (DOE), U.S. Environmental Protection Agency (EPA) and NRC. It was apparent from Loux's presentation that the State will use as one of its more important arguments that the current DOE design shifts the role of primary barriers for disposal from the geological characteristics of the site, to the engineered barriers contrary to what is dictated according to him by the Nuclear Waste Policy Act (NWPA). He disputed the validity of the Secretary of Energy main arguments for supporting the SR based on the existence of "sound science" and national security considerations and questioned many DOE technical assertions regarding performance of materials and degree of uncertainty in the assessments.

M. Chu, the new Director of the Office of Civilian Radioactive Waste Management (OCRWM), was introduced by L. Barret, the previous director who is now retiring but remains as advisor. In addition to providing her technical and managerial background, which includes a Deputy Manager position in WIPP, Chu described next steps in the DOE program as prepare license application (LA) to be submitted in December 2004, accelerate transportation program, address waste receipt/contract issues, and a renewed effort in the science and engineering areas. Chu emphasized the expectation that breakthroughs (new ideas) will be an important component of the science and technology program, even though she noted that continuous improvement in scientific understanding is necessary to reduce uncertainties and resolve pending technical issues. In responding to questions she used several examples to illustrate her point regarding

scientific advances with particular attention given to near field environment modifications and treatment of saturated flow. An extensive period of questions and comments by NWTRB members followed Chu's presentation. Cohon commented, paraphrasing the NWTRB report, that the technical basis supporting DOE's repository performance estimates is weak to moderate at this time. He also considered the SR presentation of the Secretary of Energy very weak in those aspects related to the uncertainty associated with performance predictions. For him, the main challenge for the DOE at the time of the LA is to have, in addition to showing compliance, an increased understanding of the relevant processes. Cohon emphasized the independent role of the NWTRB indicating that it cannot be conceived as a partner of the DOE following some remarks of Chu, who mentioned that for the September NWTRB meeting she will have a more precise description of the DOE activities and will request input from the NWTRB.

R. Dyer [DOE/Yucca Mountain Project (YMP)] presented an overview of the status of the YMP, and discussed the work plan through LA. He noted that the detailed plan describes testing, analysis and design to support the submittal of a LA in December 2004. Although he emphasized that the continuation of scientific investigations was important for the YMP, he had difficulties in answering what proportion of the budget in support of the LA will go to research. Finally, he estimated that about 3 to 5 percent will go to fundamental research to support performance predictions.

R. Card (Under Secretary of Energy) improvised his presentation. It was noted by Cohon when Card was introduced that his main credential was the conduct of a very successful clean-up and closure operation, in terms of budget and schedule, in Rocky Flats (save 59 years and \$30 billion!!!). Card provided his assessment of the capability of DOE to do the job of completing the LA indicating that the focus on compliance implies a scientific understanding and that he wants to go beyond a narrow thinking in the process of LA and construction of the repository. He even mentioned that if transmutation becomes feasible it will be considered and that he sees the repository program as a way to demonstrate U.S. leadership in nuclear waste management. He noted that the DOE will go ahead with the license application as is being developed or it will be determined, at the appropriate time and depending on many different variables, the incorporation of new features and modification of the design. Card indicated that he expects that new discoveries would improve the understanding of the repository processes.

In the afternoon session the status of corrosion studies was covered. J. Payer (Case Western Reserve University), chairman of the DOE Waste Package (WP) Performance Peer Review Panel, presented the findings of the panel, already available in a final report in www.ymp.gov. He answered several questions from the NWTRB indicating among other answers that no analogs studies were evaluated due to the lack of appropriate analogs for the alloys of interest and that the characterization by the DOE of the environment in contact with the WP was still work in progress.

M. Morgenstein (Geosciences Management Institute) presented the studies conducted on behalf of the State of Nevada on corrosion of engineered barriers. He focused on prediction of the possible range of environments and determination of corrosion behavior within that range. In addition to discussing the analyses of many metal cations in snow (the snow samples were mostly dilute calcium bicarbonate type of waters) and soil leachate samples, Morgenstein showed that a condensate collected from boiling pore water reached very high chloride to sulfate plus nitrate molar ratios and a pH close to 1.0. However, no model calculations were

conducted to simulate the pH variation. On the basis of these findings, tests using Alloy 22 discs were conducted in 1,000 times concentrated, simulated J-13 well water with 5,000 ppm fluoride at 160 °C which showed extremely high general corrosion rates at pH 1.0 that decreased 50 times when the pH is increased to 2.0. However, the applicability of these data to the repository conditions is not clear. This presentation was extremely limited in terms of new information.

The meeting continued with the session on the safety case and related strategy with a presentation by C. Pescatore (OECD/ NEA) on the international perspective on the subject. This was followed by a good presentation by T. McCartin (NRC), in which the 10 CFR Part 63 requirements for the safety cases were discussed in great detail. The presentation by J. Ziegler (DOE/YMP) was well presented but received significant criticism from Cohon (NWTRB) who summarized his observations by saying that the DOE has not been able to communicate well the safety case because DOE is not conveying properly its reasons for confidence in the repository performance. The last presentation by S. Frishman (State of Nevada), was extremely critical of the DOE safety case. In response to a question by Cohon, he stated that it was too late for the DOE to do something regarding the safety case because the site itself does not provide what is needed. A final discussion with many interventions followed. Confidence build-up through the science program was questioned by stating that research results could be negative instead of positive. Basis for retrievability were mentioned but the trust on DOE decision to go ahead, if needed, was debated.

The following day the meeting continued with presentations on staged repository concepts with several presentation. C. McCombie (Consultant) made an interesting presentation summarizing the work conducted by a team for the National Research Council in which the concept of adaptive staging was developed, their attributes were defined and many national programs were analyzed in terms of linear or adaptive staging. This presentation was followed by J. Williams (DOE) who tried to demonstrate that DOE is using, in some way, a staged approach but his presentation lead to many questions related to inconsistencies in the presentation and deficiencies in the answers. The session was completed with a presentation by S. Frishman (Nevada) who again criticized many aspects of the DOE approach.

The meeting was completed with two sessions, one on repository design and the second on performance confirmation and long term R&D. J. Kessler (EPRI) made a good presentation summarizing the report prepared by EPRI on performance confirmation which followed a workshop on the subject.

The meeting was closed with a session on the DOE YMP plans for fiscal years 2002-2003 by N. Williams, P. Swift and L. Trautner for the areas of performance assessment and repository design. The presentations revealed the connections with the LA and improvements needed in the performance assessment (PA) evaluations and the steps in the details of the repository design. Organization charts and schedules were presented. The last presentation by S. Brocoum, as new advisor for the scientific part of the YMP, dealt with a science and technology program which will be coordinated with universities and international programs to supplement long-term testing and analysis and to develop new technologies to improve performance and reduce costs. This presentation was clearly in tune with the presentations of M. Chu and R. Card.

IMPRESSION/CONCLUSIONS:

The attendance to the NWTRB meeting was highly beneficial because the meeting provided an opportunity to obtain different views about the safety case and related strategies, staged repository development, concepts and plans, flexible repository design and updated plans from DOE for the YMP. The discussion on performance confirmation was useful but the presentation on corrosion testing by the representatives of the State of Nevada was a disappointment due to the lack of relevant information. The report of the DOE WP Peer Review Panel was available for review prior to the meeting.

PROBLEMS ENCOUNTERED:

None.

PENDING ACTIONS:

None.

RECOMMENDATIONS:

Future attendance to these meetings is useful to keep track of the DOE program but also to have a general perspective of relevant issues and ideas in the area of high-level nuclear waste management, science, and technology .

REFERENCES:

The handouts of the various presentations are available upon request from the author. An agenda of the meeting is attached.

SIGNATURES:



Gustavo Cragolino
Staff Scientist

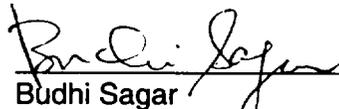
7/30/2002
Date

CONCURRENCE:



Vijay Jain, Manager
Corrosion Science & Process Engineering, Element

Date



Budhi Sagar
Technical Director

7/31/2022
Date

Attachment

GC:jg



UNITED STATES
NUCLEAR WASTE TECHNICAL REVIEW BOARD
2300 Clarendon Boulevard, Suite 1300
Arlington, VA 22201-3367

Spring 2002 Board Meeting
May 7-8, 2002

Washington Marriott Hotel
1221 22nd Street N.W.
Washington, DC
Tel: 202-872-1500
Fax: 202-872-1424

Tuesday, May 7, 2002

- 8:00 a.m. Call to order and introductory statements**
Jared Cohon, Chairman, Technical Review Board (NWTRB)
- 8:15 a.m. State of Nevada, Agency for Nuclear Projects**
Robert Loux, Executive Director
8:35 a.m. Questions, discussion
- 8:45 a.m. Overview of the Program**
Margaret Chu, Director
Office of Radioactive Waste Management (OCRWM)
9:15 a.m. Questions, discussion
- 9:45 a.m. Overview of the Project**
Russ Dyer (DOE/YMP)
10:15 a.m. Questions, discussion
- 10:45 a.m. BREAK**
- 11:00 a.m. Robert Card**
Under Secretary of Energy
11:20 a.m. Questions, discussion
- 11:30 p.m. Public Comment**
- 12:00 p.m. LUNCH**
- 1:10 p.m. Status on Corrosion Studies**
Session Chair: Dan Bullen (NWTRB)
- 1:15 p.m. DOE Waste Package Performance Peer Review**
Joe Payer (Case Western Reserve University)

- 1:35 p.m. Questions, discussion*
- 1:45 p.m. Near-Field Corrosion Processes Evaluation for the State of Nevada.**
Maury Morgenstein (Geosciences Management Institute)
- 2:05 p.m. Questions, discussion*
- 2:15 p.m. Safety Case/Strategy, Confidence Building, and Uncertainty**
Session Chair: Richard Parizek (NWTRB)
- 2:20 p.m. International Perspective on a Safety Case/Strategy**
Claudio Pescatore (OEAD/NEA)
- 2:45 p.m. Questions, discussion*
- 3:00 p.m. Nuclear Regulatory Commission View of Safety Case/Strategy**
Tim McCartin (NRC)
- 3:25 p.m. Questions, discussion*
- 3:40 p.m. DOE Safety Case/Strategy**
Joe Ziegler (DOE/YMP)
- 4:05 p.m. Questions, discussion*
- 4:20 p.m. State of Nevada - Views on a Safety Case/Strategy**
Steve Frishman
- 4.45 p.m. Questions, discussion*
- 5:00 p.m. Public Comment**
- 5:30 p.m. Adjourn**



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Arlington, VA 22201

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May 7-8, 2002

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Washington, DC
Tel: 202-872-1500
Fax: 202-872-1424

Wednesday, May 8, 2002

- 8:00 a.m. Introductory statements**
Jared Cohon, Chairman, Technical Review Board (NWTRB)
- 8:15 a.m. Staged Repository Development, Concepts, and Plans**
Session Chair: Debra Knopman (NWTRB)
- 8:20 a.m. International View on Staged Repository Development**
Charles McCombie (Independent Consultant)
8:45 a.m. Questions, discussion
- 9:00 a.m. DOE Views on Staged Repository**
Jeff Williams (DOE)
9:25 a.m. Questions, discussion
- 9:40 a.m. State of Nevada Views on Staged Repository Development**
Steve Frishman
9:55 a.m. Questions, discussion
- 10:10 a.m. BREAK**
- 10:05 a.m. Repository Design**
Session Chair: Dan Bullen (NWTRB)
- 10:10 a.m. Flexible Repository Design and Thermal Operating Conditions**
Elwood Stroupe (BSC)
10:35 a.m. Questions, discussion
- 10:50 a.m. Nye County Ventilated Repository Concept**
Parviz Montazer

- 11:30 a.m. Status on Repository Design - Geotechnical Considerations**
Mark Board (BSC)
11:55 p.m. Questions, discussion
- 12:10 p.m. LUNCH**
- 1:15 p.m. Performance Confirmation and R&D Testing**
Session Chair: Priscilla Nelson (NWTRB)
- 1:20 p.m. Enhancing Confidence, Technology, and Efficiency for Radioactive Waste Management**
Steven Brocoum, Senior Policy Advisor (DOE/YMP)
1:45 p.m. Questions, discussion
- 2:00 p.m. The Role of Long Term R&D and Performance Confirmation**
John Kessler (EPRI)
2:25 p.m. Questions, discussion
- 2:40 p.m. BREAK**
- 3:05 p.m. Project Plans FY 02-03 Performance Assessment and Testing Priorities**
Nancy Williams, Manager of Projects (BSC), Peter Swift (BSC/SNL) and Larry Trautner (BSC)
4:15 p.m. Questions, discussion
- 4:30 p.m. Public Comments**
- 5:00 p.m. Adjournment**