

CENTER FOR NUCLEAR WASTE REGULATORY ANALYSES
San Antonio Office

TRIP REPORT
November 4, 1992

SUBJECT: Nuclear Waste Technical Review Board Meeting

DATE/PLACE: October 14-15, 1992
Las Vegas, NV

AUTHORS: Prasad Nair and John Walton

DISTRIBUTION:

CNWRA

J. Latz
W. C. Patrick
CNWRA Directors
CNWRA Element Managers
G. Cragolino
N. Sridhar
H. Manaktala
E. Tschoepe
D. Dunn

NRC-NMSS

B. Meehan
M. Knapp
W. Brown
B. Stiltenspole
J. Linehan
R. Ballard
R. Weller
C. Interrante
K. Chang
T. Ahn
R. Codell
M. Silberberg
J. Randall
M. McNeil

SwRI

S. Rowe

CENTER FOR NUCLEAR WASTE REGULATORY ANALYSES
San Antonio Office

TRIP REPORT
November 4, 1992

SUBJECT: Nuclear Waste Technical Review Board (NWTRB) Meeting

DATE/PLACE: October 14-15, 1992
Las Vegas, NV

PERSONS PRESENT:

CNWRA

NRC

P. Nair
J. Walton

T. Ahn
R. Codell
V. Colten-Bradley
P. Justice
P. Prestholt

Besides the CNWRA and NRC staff there were all the members of the NWTRB, their technical staff and consultants, DOE and their contractor staff, and the State of Nevada.

BACKGROUND AND PURPOSE OF THE TRIP:

The NWTRB held this meeting to review the work that is being performed by the DOE and others in the areas of the source term and system performance assessment. The agenda of the meeting is attached. The NRC work on Source Term Code, SOTEC, as part of the total system iterative performance assessment, was also presented at the meeting by R. Codell (NRC). The meeting provided the authors an opportunity to gain an understanding about new developments in the EBS area in the DOE program.

SUMMARY OF PERTINENT POINTS:

On the first day, the DOE and their contractors presented technical details of the various components of the source term for repository applications. David Stahl, M&O Contractor, presented a new concept for the engineered barrier system. The new concept consists of a two metal layered waste package with an engineered backfill and emplaced in a horizontal drift in the repository. This concept was evolved from several designs proposed by individuals and organizations at the NWTRB Denver workshop in June 1991. It is expected that the DOE plans to carry this concept to the advanced conceptual design stage. Officially, there are about seven other concepts on the books, including the borehole emplacement design in the Site Characterization Plan document. Depending on the concept chosen for the EBS design, the important near field processes and the modelling parameters for the source term can significantly change. DOE is evaluating the new EBS concept for both a hot and a cold repository loading conditions.

R. Van Konynenburg (LLNL) gave a presentation on ^{14}C . He discussed the inventory levels of ^{14}C source term. He has, with additional analysis reduced the inventory of ^{14}C from earlier estimates. However, the ^{14}C source term still has a potential to exceed regulatory limits.

A number of other talks were given on source term experiments and modelling efforts for spent fuel and glass. J. Bates (ANL) gave an interesting presentation on release rate from glass. Experimental results indicate that, after initially decreasing, the release rate in longer term experiments increases. A large proportion of the release was in the form of colloids.

On the second day alternative performance assessments were presented by D. Engel (PNL), R. Shaw (EPRI), and R. Codell (NRC). The presentations on the source term indicate that there is a long way to go before technically defensible source term estimates can be obtained. All the models ignore complex issues such as colloid formation. Experiments are still being performed in J-13 well water, a composition largely irrelevant to the repository conditions. Two consultants to the NWTB, M. Apted of Intera I.T., and N. Garisto of Beak Consultants (Canada) presented their views on source term evaluations. They both emphasized the need for benchmarking codes, focused data and model development, and for better presentation of performance assessment results to the technical community.

C. Gertz (YMPO) and D. Harrison (DOE) provided details of the planned work and budgets for FY93. Part of the waste package program for FY93 involves a tuff block test to be performed at LLNL. This test will simulate fractures and study the wetting fronts in variably heated repository conditions. DOE's Mission 2001, for the license application submittal, is contingent on a significant funding increase for the project for the period FY94-01. This may be very optimistic given past history. The copies of the overheads presented at the meeting are available from the authors, and a copy is also being placed in the CNWRA library.

IMPRESSIONS/CONCLUSIONS:

It was an important meeting for the authors to attend and obtain insights on the approaches taken by the various participants on the evaluation of source term models. From the presentations it was evident that there needs to be closer interactions among experimentalists and the modelling staff. The test plans for the LLNL block tests in FY93 has not been planned in any detail. The expectations from such a test is not clear and several technical difficulties in data gathering and interpretation can be anticipated.

PROBLEMS ENCOUNTERED:

None

PENDING ACTION:

None

RECOMMENDATIONS:

The CNWRA/NRC staff should continue to participate in forums that provide an opportunity to exchange information on source term work that is being carried out at several technical centers. The CNWRA/NRC program on source term, IPA, and EBSPAC should follow closely the developments on the new EBS design concept being proposed by the DOE.

REFERENCES:

None

SIGNATURES:


Prasad K. Nair
Element Manager, EBS

11/4/92
Date


John Walton
Senior Research Engineer

11/4/92
Date

CONCURRENCE SIGNATURE:


Budhi Sagar
Technical Director

11/6/92
Date



**UNITED STATES
NUCLEAR WASTE TECHNICAL REVIEW BOARD**
1100 Wilson Boulevard, Suite 910
Arlington, VA 22209

Agenda

Full Board Meeting

October 14-15, 1992

**Plaza-Suite Hotel
4255 South Paradise
Las Vegas, NV 89109
(702) 369-4400**

Wednesday, October 14, 1992

8:30 A.M.	Welcome and Opening Remarks John E. Cantlon, Chairman Nuclear Waste Technical Review Board (NWTRB)
8:35 A.M.	Morning Session Introduction Ellis D. Verink, Jr., NWTRB
8:40 A.M.	Opening Remarks Carl Gertz Department of Energy (DOE)
8:45 A.M.	Source Term Concept and Definition David Stahl Management and Operating Contractor (M&O)
9:15 A.M.	¹⁴C Releases Richard A. Van Konynenburg Lawrence Livermore National Laboratory (LLNL)
10:00 A.M.	Overview on Spent Fuel Ray B. Stout, LLNL
10:45 A.M.	BREAK (15 minutes)
11:00 A.M.	Oxidation Testing of Spent Fuel Robert Einziger Pacific Northwest Laboratory (PNL)

Wednesday, October 14, 1992 (continued)

11:30 A.M.	Dissolution Testing of Spent Fuel Walter J. Gray, PNL
12:00 P.M.	Dissolution Testing of UO₂ Steven A. Steward, LLNL
12:30 P.M.	LUNCH (1 hour, 15 minutes)
1:45 P.M.	Afternoon Session Introduction Donald Langmuir, NWTRB
1:50 P.M.	Glass Testing and Colloid Evaluations John K. Bates Argonne National Laboratory
2:20 P.M.	Glass Modeling William L. Bourcier, LLNL
2:50 P.M.	Thermodynamic Database for the Source Term Cynthia Palmer, LLNL
3:20 P.M.	BREAK (10 minutes)
3:30 P.M.	Geochemical Code EQ3/6 Thomas J. Wolery, LLNL
4:20 P.M.	Plans for Future Work Diane Harrison, DOE
4:50 P.M.	RECESS UNTIL THURSDAY, October 15



**UNITED STATES
NUCLEAR WASTE TECHNICAL REVIEW BOARD**
1100 Wilson Boulevard, Suite 910
Arlington, VA 22209

Agenda

Full Board Meeting

October 14-15, 1992

**Plaza-Suite Hotel
4255 South Paradise
Las Vegas, NV 89109
(702) 369-4400**

Thursday, October 15, 1992

- | | |
|-------------------|--|
| 8:00 A.M. | Morning Session Introduction
Patrick A. Domenico, NWTRB |
| 8:05 A.M. | Combining Processes: An Engineered Barrier System Source Term
William J. O'Connell, LLNL |
| 8:40 A.M. | Source Term in the Sandia National Laboratories (SNL)
Total System Performance Assessment
Michael L. Wilson and Ralston W. Barnard, SNL |
| 9:15 A.M. | Source Term in the PNL Total System Performance Assessment
David W. Engel, PNL |
| 9:55 A.M. | Source Term in the Electric Power Research Institute (EPRI)
Performance Assessment
Robert A. Shaw, EPRI |
| 10:35 A.M. | Model for Radionuclide Release in the Nuclear Regulatory
Commission (NRC) Iterative Performance Assessment, Phase 2
Richard B. Codell and Tae M. Ahn, NRC |
| 11:15 A.M. | BREAK (15 minutes)

Source Term Overviews by NWTRB Consultants |
| 11:30 A.M. | Michael J. Apted, Intera Information Technologies, Inc. |
| 11:45 A.M. | Nava C. Garisto, Beak Consultants, Ltd. |

Thursday, October 15, 1992 (continued)

12:00 P.M.	Open Discussion
12:45 P.M.	Concluding Remarks on Source Term Sessions D. Warner North, NWTRB
1:00 P.M.	LUNCH (1 hour, 15 minutes)
2:15 P.M.	Overview of Ghost Dance Fault Mapping Richard W. Spengler U.S. Geological Survey
2:45 P.M.	Introductory Remarks John Bartlett, DOE
2:55 P.M.	YMPO Fiscal Year 1993 Budget Carl Gertz, YMPO
3:55 P.M.	Closing Remarks and Adjournment John E. Cantlon, Chairman, NWTRB