



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

April 2, 1997

MEMORANDUM TO: Michael J. Bell, Chief
ENGB/DWM/NMSS

John H. Austin, Chief
PAHL/DWM/NMSS

FROM: Kien C. Chang *KCC*
ENGB/DWM/NMSS

Dennis Vinson *DV*
PAHL/DWM/NMSS

SUBJECT: TRIP REPORT, OBSERVATION OF YUCCA MOUNTAIN - TSPA-VA
ABSTRACTION/TESTING WORKSHOP - WASTE PACKAGE DEGRADATION,
LAS VEGAS, NEVADA, JANUARY 8-10, 1997

The Yucca Mountain Project Performance Assessment Management Team held a 3-day Waste Package Degradation/Testing Workshop in Las Vegas, Nevada, on January 8-10, 1997. NRC was invited to observe the workshop to foster understanding of DOE's approach.

1. Attachment 1 is the Agenda for the subject workshop. The topics covered on January 8 and 9 included Overview and Objectives of TSPA-VA, Current Waste Package Design, and Prioritization/Screening of Issues with discussions of processes related to these issues. On January 10, 1997, the last day of the workshop, attendees were split into small planning groups to work out detailed plans on testing/analyses of the waste package portion of TSPA-VA (due September 1998). NRC observers attended all technical sessions but did not stay for the January 10 (detailed planning development) session. At the end of the working session on January 9, the workshop was running behind on test plan development. M. Scott, the workshop moderator, announced that it may be necessary for the attendees to continue filling in details of the plan development after January 10. Joon Lee of DOE's Waste Package Performance Working Group indicated to NRC observers that he would continue to inform NRC on the workshop's planning development.
2. Attachment 2 is the List of Attendees, which included representatives from INTERA(DE & S), LLNL, SNL, Framatome Cogema, and TRW. Organizations invited to observe the workshop included NRC and NWTRB.
3. The following items are workshop highlights and NRC observation:
 - (i) The workshop started with a reasonably clear and focused objective, i.e., to generate a reasonable TSPA-VA plan to focus on approaches to evaluate waste package performance within the resource constraints imposed by TSPA-VA.

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(ii) The discussions of issues started with reviews of the status of work and waste package analyses in TSPA-93 and TSPA-95. In attempting to consider all uncertainties and processes affecting waste package performance, areas of consideration were expanded into analyses involving many inputs requiring global solutions. The workshop moderator soon found it necessary to contain the scope of consideration in defining acceptable approaches to address the issues.

(iii) Attendees were divided into four groups to examine the following five broad issues:

- Issue 1 - Outer Barrier (with 21 subissues),
- Issue 2 - Inner Barrier (with 27 subissues),
- Issue 3 - Galvanic Effects (with 16 subissues),
- Issue 4 - Microbe-induced Corrosion (with 15 subissues), and
- Issue 5 - Rockfall, Juvenile Failure (with 14 subissues).

The groups prioritized the subissues based upon the significance of each subissue's effect on: 1) the time of waste package failure, 2) the rate at which waste packages fail, and 3) the rate at which additional perforations develop in failed waste packages. Subissues with the highest total scores were retained, and those with low scores were deleted from further consideration.

We consider that our observation of this workshop was beneficial because it updated NRC staff on the Yucca Mountain Project plan for TSPA-VA. The information we brought back will help better focus staff efforts related to sensitivity studies and evaluation of DOE's TSPA-VA.

Attachments: As stated

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OFC	ENGB*	PAHL*	ENGB*	PAHL
NAME	KChang/eb/prf read	DVinson	RWeller	MMcConnell
DATE	4/1/97	4/1/97	4/1/97	4/12/97

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We consider that our observation of this workshop was beneficial because it updated NRC staff on the Yucca Mountain Project plan for TSPA-VA. The information we brought back will help better focus staff efforts related to sensitivity studies and evaluation of DOE's TSPA-VA assessment.

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OFC	ENGB	PAHL	ENGB	PAHL
NAME	KChang <i>Feb/prf read</i>	DVinson	RWeller <i>Raw</i>	KMcConnell
DATE	4/11/97	4/11/97	4/11/97	1/197

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 IG : YES NO Delete file after distribution: Yes No
 LSS : YES NO

Attachment 1

TSPA-VA Waste Package Degradation Abstraction/Testing Workshop

**Agenda for
TSPA-VA Waste Package Degradation Abstraction/Testing Workshop**

**January 8-10, 1997
Room 450, Bank of America Building
Las Vegas, NV**

Following is a final version of the workshop agenda which has evolved to reflect the comments received from the workshop participants and the PA management. The current version of the workshop agenda benefited from the lessons learned from the TSPA-VA Unsaturated Zone Flow Abstraction/Testing Workshop which was the first of the workshop series led by the Performance Assessment (PA) in support of TSPA-VA and was held in mid-December in Albuquerque, NM.

Note that Session 5 (uncertainty and variability; confidence in simulation results) in the 01/02/97 letter for the pre-workshop responses was removed as a separate session in the final agenda. The session for the issues on premature failure, rockfall effect, and structural failure is now Session 5. The reasoning behind this rearrangement is that the uncertainty, variability and confidence in waste package degradation modeling and abstraction are applicable to all other issues, and should be considered in all sessions. Because of their significant impacts on waste package degradation modeling and abstraction, presentations from the TSPA and process-level perspectives on the uncertainty and variability issues will be given before the beginning of Session 1.

The workshop agenda may change slightly during the workshop, depending on the workshop progress and other issues that may come out at the workshop. Also note that all the workshop attendees are invited on Wednesday evening to Holy Cow for dinner/drinks/chats. Holy Cow is at the intersection of Las Vegas Blvd. and Sahara Ave. (next to Sahara Hotel).

TSPA-VA Waste Package Degradation Abstraction/Testing Workshop

**Agenda for
TSPA-VA Waste Package Degradation Abstraction/Testing Workshop**

January 8-10, 1997
Room 450, Bank of America Building
Las Vegas, NV

Wednesday, January 8

- | | | |
|------------------|---|--|
| 9:00 | Welcome and Introduction
Ground rules | J. Lee/M. Scott |
| 9:20 | Overview and Objectives of TSPA-VA | B. Andrews (1) |
| 9:35 | Workshop Introduction
Objectives of workshop
Guidelines and format of workshop | J. Lee (2) |
| 9:50 | TSPA Introduction
TSPA overview
Scenarios | J. McNeish (3) |
| 10:20 | Status of Waste Package Degradation Abstraction and Major Abstraction Issues | J. Lee (4) |
| 10:40 | Break | |
| 10:55 | Current Waste Package Design | K. McCoy (5) |
| 11:10 | Status and Schedule of Corrosion Testing and Modeling Program | D. McCright (6) |
| 11:40 | Uncertainty and Variability in Waste Package Degradation Modeling and Abstraction
TSPA perspective (10 min.)
Process-level perspective (10 min.)
Process-level perspective (10 min.) | J. McNeish (7)
J. Atkins (8)
A. Lamont (9) |
| 12:10 | Lunch | |
| 1:00 | Guidelines for Prioritization/Screening of Issues
Process and criteria for prioritization/screening | J. Lee (10) |

TSPA-VA Waste Package Degradation Abstraction/Testing Workshop

- 1:15 Panel/Small & Full Group Discussions of Session I
[Carbon Steel Outer Barrier Corrosion; Salt-Scale Deposit Effect]
TSPA presentation - 10 min.; other presentations - 5 min. each
Clarification questions to presenters - 5 min.
Small group brainstorming of issues important to waste package performance - 30 min.
Full group discussion on the issues identified - 15 min.
Small group prioritization of the issues identified - 15 min.
Full group consensus of the issue prioritization - 15 min.

Lee (11)

G. Gdowski → (12)
Denny Jones (13)
McCoy (14)

3:00 Break

- 3:15 Panel/Small & Full Group Discussions of Session II
[Nickel-Based Material Inner Barrier Corrosion]
TSPA presentation - 10 min.; other presentations - 5 min. each
Clarification questions to presenters - 5 min.
Small group brainstorming of issues important to waste package performance - 30 min.
Full group discussion on the issues identified - 15 min.
Small group prioritization of the issues identified - 15 min.
Full group consensus of the issue prioritization - 15 min.

Lee (15)
Ajit Roy (16) → missing
(17) Farmer & Halsey

- 5:00 Summary of the Day and Plans for Next Day
5:15 Adjourn for the day

M. Scott

6:00 Social Gathering at Holy Cow

Thursday, January 9

- 8:00 Summary of Previous Day and Plan for the Day

M. Scott

- 8:05 Panel/Full Group Discussions of Session III
[Galvanic Coupling Effect]

(18) Lee
(19) → Roy (Ajit)
McCrigh → (20)

- TSPA presentation - 10 min.; other presentations - 5 min. each
Clarification questions to presenters - 5 min.
Small group brainstorming of issues important to waste package performance - 20 min.
Full group discussion on the issues identified - 10 min.
Small group prioritization of the issues identified - 10 min.
Full group consensus of the issue prioritization - 10 min.

TSPA-VA Waste Package Degradation Abstraction/Testing Workshop

Friday, January 10

- 8:00 Summary and Discussion of Previous Day and Plans for the Day M. Scott
- 8:05 Small Group Brainstorming on Development of *Detailed* Plans on Abstraction/Testing Plans and Schedules for the Issues Identified
Produce abstraction/testing plans and schedules
- 10:45 Break
- 11:00 Full Group Summary on the Status of the Detailed Plan Development
- 11:30 Closing Comments M. Scott/B. Andrews
Comments by DOE, NRC, NWTRB representatives and others
- 12:00 Wrap Up/Lunch
- 2:00 Core Team Group Wrap Up
- 5:00 Adjourn

TSPA-VA Waste Package Degradation Abstraction/Testing Workshop

Panel Member Format for Important Issues to Waste Package Degradation Simulation

Session No.	Issue No.	Issue Abbreviation	Panel Member	
			w/ Presentation	w/o Presentation
I	1 5	Carbon steel outer barrier corrosion Salt-scale deposit effects	TSPA modeler: J.Lee Data collector: G.Gdowski, D.Jones Process-level modeler: K.McCoy	J.Farmer, D.McCright, D.Stahl
II	2	Nickel-based material inner barrier corrosion	TSPA modeler: J.Lee Data collector: A.Roy Process-level modeler: J.Farmer, B.Halsey	G.Gdowski, D.Jones, D.McCright, D.Stahl
III	3	Galvanic coupling effects	TSPA Modeler: J.Lee Data Collector: A.Roy Process-level modeler: D.McCright	J.Farmer, G.Gdowski, B.Halsey, D.Stahl
IV	4	MIC	TSPA modeler: J.McNeish Data collector: J.Horn, D.Jones Process-level modeler: B.Clarke	J.Farmer, D.McCright
V	10 11 12	Premature Failure Rockfall Effect Structural Failure	TSPA modeler: J.McNeish Data collector: J.Cogar, R.Nolting Process-level modeler: K.McCoy	D.McCright, D.Stahl

Attachment 2

TSPA-VA Waste Package Degradation Abstraction/Testing Workshop
January 8-10, 1997
Las Vegas, NV

List of Attendees

Participants:

Name	Organization	Phone	Fax	e-mail
Bob Andrews	INTERA (DE&S)	702-295-5549	702-295-4730	robert andrews@notes.ymp.gov
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Denny Jones	UNR/LLNL	510-423-2469	510-423-1997	jones59@llnl.gov

Attch. 2

TSPA-VA Waste Package Degradation Abstraction/Testing Workshop

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TSPA-VA Waste Package Degradation Abstraction/Testing Workshop

Observers:

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