

101

PDR-1
LPDR- Wm-10 (2)

JUL 27 1987

MEMO RB/JB/87/07/21

- 1 -

87215640/15

H

WM Project: WM-10

WM Record File: 101

PDR yes

LPDR yes

TRIP REPORT

WM Record File

WM Project 10

101

Docket No.

MEMORANDUM TO: Mysore S. Nataraja, Section Leader
Geotechnical Eng/Design Section
Technical Review Branch
Division of High-Level Waste Management

PDR ✓

LPDR ✓ (B)

Distribution:

FROM: John T. Buckley
Geotechnical Eng/Design Section
Technical Review Branch
Division of High-Level Waste Management

(Return to WM, 623-SS)

SUBJECT: TRIP TO RICHLAND, WASHINGTON ON JULY 13-16, 1987

PURPOSE OF TRIP

On July 14-15, 1987 DOE/Westinghouse held a workshop to discuss the creep behavior of the basalt rock mass with regard to the design and construction of a geologic repository at the Hanford site. DOE convened a group of experts in an effort to develop an approach the BWIP should take to characterize basalt creep in the conceptual design. The purpose of my trip was to attend this workshop as an observer. A workshop agenda and list of participants is attached as appendix A.

ACCOMPLISHMENTS

On Tuesday, July 14th the Westinghouse staff briefed the consulting group on various technical aspects of BWIP. Briefing packages for rock characteristics, repository conceptual design and waste package conceptual design are attached as appendix B. Following the Westinghouse staff briefing each consultant presented a 25 minute summary of their current research projects related to creep in rock. The discussion on Wednesday, July 15th was devoted to obtaining a consensus opinion of the consultants on the following questions:

1. Predominant mode of deformation
 - ° Of the two postulated modes of creep in the basalt rock mass (creep within intact material and creep along joints), which is most likely to predominate?
2. Applicability of deformation mechanism and fracture mapping or other applicable techniques:
 - ° Can the deformation mapping and fracture map technique (or other techniques) be applied to predict long-term (up to 10,000 years) deformation and fracture in basalt?
 - ° Can uncertainties in creep rate predictions be quantified when the deformation mechanism and fracture map technique is applied?

8709040103 870727
PDR WASTE
WM-10 PDR

2560

JUL 27 1987

MEMO RB/JB/87/07/21

- 2 -

- Aside from the deformation and fracture mapping technique, are there other analytical methods available that would be applicable and productive for evaluating creep in basalt?

3. Laboratory testing support

- What specific laboratory testing strategies are recommended to support deformation mechanism and fracture map development (or other analytical techniques)? Would the data obtained be applicable to development of empirical constitutive models of time dependent rock deformation as well?
- Can accelerated laboratory testing be conducted to support deformation mechanism and fracture map development for the basalt rock mass? Would it be feasible to complete the necessary testing within one year? If not, would it be feasible to complete the necessary testing within four years?

While listening to the consultants discuss the questions listed above it became apparent that there were varied opinions. It was decided that a very general consensus opinion would be produced for each question. Each consultant would then have an opportunity to add paragraphs to qualify or explain their positions. Write-ups by the consultants will be included in the proceedings for the workshop. The proceedings will be distributed to all workshop attendees after finalization by the consultant group.

During the open discussion it was generally agreed by the consultants that a credible creep law could probably not be developed for the basalt rock mass within a time period of four years. The discussion then addressed how to design the waste package to mitigate any possible effects of the basalt rock mass creep. It was generally agreed that creep effects could be mitigated by surrounding the waste package by a sufficiently large quantity of a low modulus backfill. The consultants agreed that it should be possible to adequately characterize the creep behavior of a consistent backfill material within four years. The Westinghouse staff appears to be leaning toward a waste package design which incorporates a larger annulus between the canister and the borehole wall or in-room emplacement with backfill.

One topic of importance which was not adequately addressed is "what impact will creep have on the extent of the disturbed zone?" The consulting group just briefly discussed how movement of the rock mass would affect the flow paths at the Hanford site. The topic may require further attention by the Westinghouse staff.

151

John T. Buckley
Geotechnical Eng/Design Section
Technical Review Branch
Division of High-Level Waste Management

JUL 27 1987

MEMO RB/JB/87/07/21

- 3 -

OFFICIAL CONCURRENCE AND DISTRIBUTION RECORD

MEMORANDUM TO: Mysore S. Nataraja, Section Leader
 Geotechnical Eng/Design Section
 Technical Review Branch
 Division of High-Level Waste Management

FROM: John T. Buckley
 Geotechnical Eng/Design Section
 Technical Review Branch
 Division of High-Level Waste Management

SUBJECT: TRIP TO RICHLAND, WASHINGTON ON JULY 13-16, 1987

DATE: JUL 27 1987

DISTRIBUTION

HLWM/SF	NMSS RF	RBrowning, HLWM	MBell, HLWM
JBunting, HLSE	RBallard, HLTR	JLinehan, HLOB	JTBuckley, HLTR RF
MNataraja, HLTR	HLTR RF	PDR	

CONCURRENCES

ORGANIZATION/CONCUREE	INITIALS	DATE CONCURRED
HLTR/JTBuckley/JM	<u>JB</u>	87/07/23
HLTR/MNataraja	<u>Raj</u>	87/07/23

~~Not released~~

- Original delivered

(original not received in the WMDCC)

7/28/87 3:20pm.
 Date Time