WM Record File A 3164 / A 3167 — WM Project 16, 11, 10 — Docket No. — PDR — LPDR 1 (B.R.)

Distribution:

MEETING REPORT (Return to WM, 623-SS) C2

U. S. Nuclear Regulatory Commission meeting with Brookhaven National Laboratory under NRC FIN No. A-3164 and A-3167.

DATE: January 31, 1984

LOCATION: Brookhaven National Laboratory, Upton, NY

PURPOSE: A general review of progress on FIN's A-3164 (Review of DOE Waste Package Program) and A-3167 (Review of Waste Package Verification Tests).

PARTICIPANTS:

NRC	BNL
T. L. Jungling	D. Schweitzer
M. Tokar	M. Davis
E. A. Wick	P. Soo
	H. Jain
	C. Sastre
	C. Pescatore
	T. Sullivan
	E. Gause

SUMMARY OF COMMITMENTS, CONCLUSIONS, AND AGREEMENTS:

1. Himatsu Jain reviewed the BNL proposal (A-3167, Task 3 - The Basalt (Magnetite-Hematite) Water Reaction.

2. Evelyn Gause presented the status of the test entitled, "Determination of Corrosion Conditions for Low Carbon Steel Containers in a Basalt Repository." Although the tests are not complete, the significant results are that some dissolved oxygen remained in the water after the tests (0.6 ppm), there was no significant difference in ph across the temperature gradient and some colloids were found. Uniform corrosion film was observed but no pitting (as expected due to the short duration of the test) was found . The bentonite in the packing material was altered so that its swellability was reduced.

3. Claudio Pescatore presented the current status of BNL's HLW/TA analytical effort and presented proposals for projects to be pursued for the balance of FY84 (these are enclosed). BNL has WAPPA running, but does not think that WAPPA, in its present form, can be used to assess the performance of the waste package. There is a problem with the DOE (ONWI) WAPPA custodian being kept up to date on

the updates of WAPPA by the various users. An updating procedure should be formalized and adopted by DOE.

4. BNL's product schedules may be affected by the support effort required for the NRC review of the EA's. BNL will estimate the effort required to support the waste package EA review and advise the impact on products.

5. BNL advised that NRC-RES plans to reduce FY85 funding of A-3237 (Container Assessment). BNL feels it is vital to do stress corrosion cracking tests of 304L stainless steel in steam in the presence of radiation to see if the Tuff Container will crack. BNL requested that NMSS consider funding this work at a level of 1 man year. NRC agreed to take this under advisement.

6. The following documents were transmitted to BNL:

   a. Updated 10 CFR Part 60
   b. LBL Comments on Post Emplacement Monitoring
   c. LLW Report on Reliability by William Sutcliffe

7. These commitments, conclusions, and agreements were read and agreed to by Everett A. Wick and Peter Soo prior to adjournment.

E. A. Wick

WORK IN FY 1984 HAS INVOLVED

1. TECHNICAL ASSISTANCE TO THE NRC
   (QA FOR TEKNEKRON; AEROSPACE; DOE-NRC WORKSHOP)

2. RESUBMITTING THE DTP ON WASTE PACKAGE RELIABILITY AND PRESENTATION OF A PAPER ON THE SUBJECT AT THE BOSTON MEETING

3. WORK ON EXTRAPOLATING ISOTHERMAL CORRELATIONS TO NON-ISOTHERMAL SYSTEMS

4. IN-HOUSE IMPLEMENTATION AND REVIEW OF WAPPA.

WORK ON WAPPA

1. WAPPA IS PRESENTLY RUNNING AT BNL

2. BASED ON THE CODE MANUAL WE HAVE REVIEWED:
   (A) THE LEACH-AND-TRANSPORT MODEL
   (B) THE CORROSION MODEL
   (C) THE COMPLEX SAMPLE PROBLEM

3. WE ARE NOW ADDING OUR OWN IMPROVEMENTS TO THE CODE FOR POTENTIAL BNL USAGE

4. PLAN TO COMPLETE THE REVIEW OF WAPPA BY LOOKING AT THE STRUCTURAL, THERMAL, AND RADIATION MODELS. WE WILL WRITE A REPORT ON WAPPA BY THE END OF APRIL

WAPPA's STRUCTURAL LIMITATIONS

1. NO COUPLING BETWEEN THERMAL FLUX FROM THE WP AND THE TEMPERATURE AT THE WP - HOST ROCK INTERFACE

2. VERTICAL AND RADIAL PRESSURES FIXED ONCE AND FOR ALL

3. STRUCTURAL MODEL IS BASED ON CONTINUUM MECHANICS WITH NO ACCOUNT OF CONSOLIDATION THEORY FOR PACKING MATERIALS

4. CORROSIONS PARAMETERS ARE TEMPERATURE DEPENDENT. HOWEVER, THE CODE DOES NOT HAVE A WATER CHEMISTRY EVOLUTION MODEL.

5. THE CODE CAN ONLY TREAT A WATER SATURATED REPOSITORY (NOT GOOD FOR TUFF)

6. THE CODE DOES NOT HAVE A CONTROL OF THE NUMERICAL ERRORS ASSOCIATED WITH THE ADOPTED NUMERICAL STRATEGY.

PROPOSED WORK:

1. HEAT TRANSFER B.C.'S FOR WAPPA'S THERMAL MODEL
   (6 MONTHS)

2. EVAPORATION OF SALT DEPOSITION
   (1-1/2 YEARS)

3. VOLUMETRIC FEEDBACK EFFECTS ON CANISTER CORROSION
   (2 MONTHS FOR FEASIBILITY STUDY)

4. LEACH AND TRANSPORT
   (1 TO 1-1/2 YEARS)

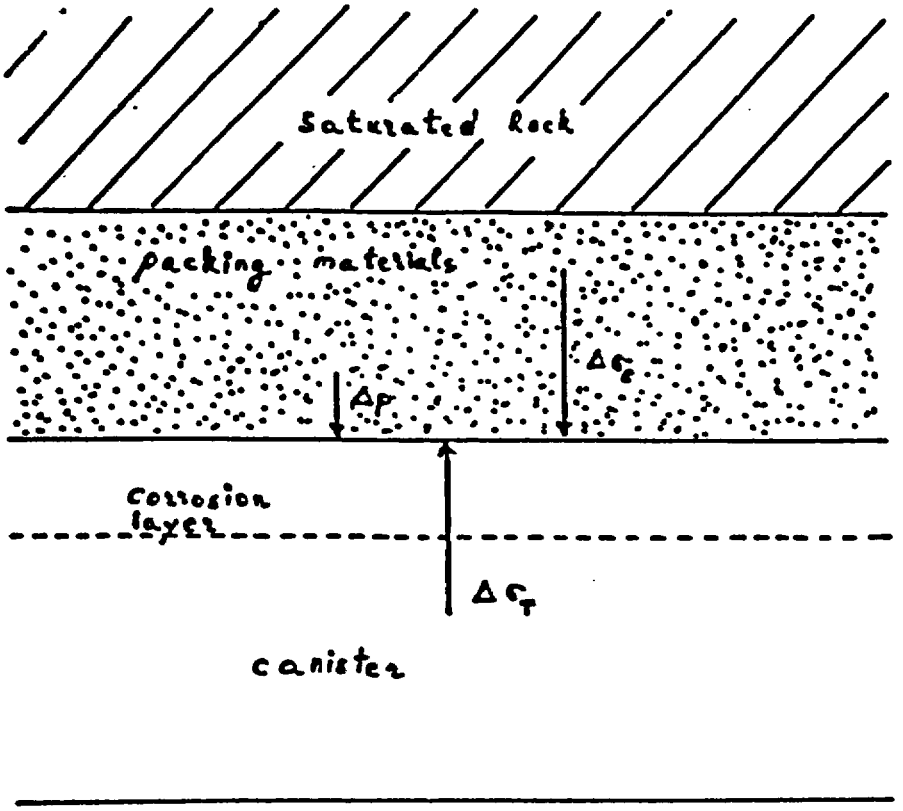
Saturated Rock
packing materials
$\Delta\sigma_c$
Δp
Corrosion layer
$\Delta\sigma_T$
canister

Figure 1

Distribution:
WM file: 109.1
WMEG r/f
EAWick r/f
WMEG Branch
REBrowning
MJBell
HJMiller
JOBunting
PSJustus
MRKnapp
LBHigginbotham
MTokar
TLJungling