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MEMORANDUM FOR: Michael J. Bell, Chief
High-Level Waste Licensing
Management Branch
Division of Waste Management

FROM: F. Robert Cook
High-Level Waste Licensing
Management Branch
Division of Waste Management

SUBJECT: MINUTES OF MEETING AMONG BNL AND NRC REPRESENTATIVES ON
APRIL 26, 1982

Attached are the subject minutes for your information.

ORIGINAL SIGNED BY

F. Robert Cook
High-Level Waste Licensing
Management Branch
Division of Waste Management

Enclosure:
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Minutes of a Meeting Among BNL and NRC
Representatives

Place: Brookhaven National Laboratory, Upton, NY

Date: April 26, 1982

Attendees: BNL - D. G. Schweitzer NRC - R. E. Browning
 H. J. C. Kouts F. R. Cook
 M. S. Davis J. B. Martin
 P. Soo

Purpose: The purpose of the meeting was review and agree upon an outline for the staff technical position for waste package performance which BNL had prepared. The outline was to reflect an analytical approach to evaluation of waste package designs. The outline would also allow prioritization of research and testing activities associated with qualifying aspects of analyses necessary to determine expected waste package performance. NRC was to prepare an approach analogous to that described above to compare with the BNL outline.

Meeting Summary:

1. The participants discussed major repository parameters which affect the degradation of borosilicate glass. BNL stated that they consider temperature is the parameter which most effects glass degradation.

2. Considering failure modes which should be evaluated for the glass waste form, BNL stated that they did not consider leaching as controlled by diffusion mechanisms should be the focus of further testing, but that testing to determine matrix dissolution rates should be pursued for glass compositions and repository conditions expected to occur following the containment period.
3. BNL stated they did not consider phase separation a serious failure mode for the waste glass.
4. BNL stated the effects of Eh, pH and flow rates adjacent to the waste glass were of secondary concern.
5. The effects of radiation on glass degradation was also discussed, BNL concluded it was also of secondary concern. This contrasted with BNL's appraisal of the effects of radiation on candidate container materials, i.e., Ti Code 12. In this case they consider the effects are of major concern.
6. NRC requested that BNL attempt to prioritize the parameters - both design and environmental - which are most important and to assign quantitative bounds to the parameters to define the extent of the technical concern.
7. BNL identified low temperature, shielding (low radiation field), restricted flow (static conditions resulting from backfills) and containment (i.e., exclusion of water from waste forms during the thermal period for the waste) as the most desirable set of conditions/design parameters which could practically be employed to

... simplify testing necessary to verify barrier system performance. The only quantitative position BNL took as to what constituted a moderate condition was for temperature. In this case BNL stated that keeping container surface temperatures below 100°C following emplacement would simplify testing necessary to verify performance of containers as well as the glass waste forms. (BNL reasoned that if temperatures of the container never exceeded 100°C, then following the containment period, glass temperatures also would necessarily be low, apparently below 100°C, when the interaction with water would occur. These low temperature would reduce testing necessary to determine glass matrix dissolution rates.

WFOC

Changes in the parameters were hypothesized and barrier systems incorporating varied parameters were identified. These systems were ranked by BNL in order of the amount of testing required to verify performance of the respective systems. These results are contained in Attachment A.

8. BNL stated that they would take a much stronger stand on what design concepts being considered by DOE will work best and this will be reflected in identification of testing needed to verify performance of the "good" design vs "poor" design concepts. This position was consistent with NRC's objective to identify/focus the most useful testing and desirable design concepts in the Draft Staff Technical Position BNL is preparing for NRC concerning Waste Package Performance after repository closure.
9. No outline of the draft staff technical position was agreed upon. However, it was agreed that BNL will meet with NRC at NRC on Friday,

April 30, 1982 to discuss a written generalized description of major issues associated with candidate barrier system designs and associated testing being considered by DOE. The discussion will reflect the generalization of parameters forming the basis for the subject meeting's discussion, described above.

ATTACHMENT A

1. Low Temp
Shielding
Restricted Flow
Containment by CS
2. Low Temp
Shielding
Restricted Flow
Containment by Glass and BF
3. Low Temp
No Shielding
Restricted Flow
Containment by CS
4. Low Temp
No Shielding
Restricted Flow
Containment by Glass and BF
5. High Temp
Shielding
Restricted Flow
Containment by CS
6. High Temp
Shielding
Restricted Flow
Containment by Glass and BF
7. *Low Temp
Shielding
Unrestricted Water Flow
Containment by CS
8. Low Temp
No Shielding
Unrestricted Water Flow
Containment by CS
9. High Temp
Shielding
Unrestricted Water Flow
Containment by CS
10. High Temp
Unshielded
Restricted Flow
No Containment

*Equivalent to no backfill

CS = Canister System