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Chicago Operations Office
Salt Repository Project Office
505 King Avenue
Columbus, Ohio 43201-2693
Commercial (614) 424-5916
F.T.S. 976-5916

December 23, 1985

John J. Linehan, Section Leader
Salt Section
Repository Projects Branch
Division of Waste Management, MS 623-SS
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Linehan:

SUBJECT: AGREEMENT FOR THE PREPARATION OF THE JOINT NRC/SRP WASTE PACKAGE WORKSHOP, JANUARY 22-24, 1986

Attached are the final objectives, agenda, anticipated DOE and NRC attendees, and listings of DOE and NRC reports for the subject workshop in Columbus, which has been developed through discussions with your staff.

A package of all the reports listed on the enclosure, "Listing of DOE Reports Applicable to the Workshop" is being sent to NRC via express mail. This letter and its enclosures plus the draft SRP reports will be provided to each of the salt host states as the pre-meeting materials for the workshop. The published reports shown on the list of applicable reports have previously been transmitted to the states through regular distribution of the reports at the time of publication. Extra copies of the published reports can be requested at this time by the states if they feel that would best support their participation in the meeting.

If you have any questions concerning this matter, please contact Roger Wu of my staff at FTS 976-5916.

Sincerely,

R.W. Underlich

for J.O. Neff
Program Manager
Salt Repository Project Office

SRPO:KKW:max:0622C

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Enclosures:
1. DOE/NRC Salt Waste Package Workshop, Objectives
2. DOE/NRC Waste Package Meeting, Agenda
3. DOE/NRC Waste Package Workshop, Listing of DOE Reports Applicable to the Workshop
4. DOE Anticipated Attendees
5. DOE/NRC Salt Waste Package Workshop, Proposed NRC Staff and Contractor Attendance
6. DOE/NRC Waste Package Workshop, Listing of NRC Reports Applicable to the Workshop

cc: C. Head, DOE-HQ
M. Frei, DOE-HQ
R. Lahoti, SRPO
L. Casey, SRPO
T. Taylor, SRPO
S. Basham, ONWI
R. Helgerson, ONWI
R. Johnson, NRC
T. Verma, NRC
J. Voglewode, NRC
A. La Sala, USGS

ST# 172-86

DOE/NRC SALT WASTE PACKAGE WORKSHOP

Objectives

1. To present the NRC staff and other participants the DOE-Salt Repository Program's current status and approach to waste package design and development and its contribution to the potential licensing of a salt geologic repository. Emphasis will be placed on recent changes in waste package design and supporting information, rather than a review of previously published documents. These would include:

   a) A description of the overall SRP waste package program approach and strategy with regard to design and performance verification.

   b) A description of the current package design including components/functions, materials, and design rationale.

   c) A description of SRP's WP performance assessment approach including strategy, model development, interaction with design, treatment of uncertainties and code and model validation.

   d) A description of the SRP Quality Assurance program and the uses of peer/technical review.

   e) A description of the waste package near-field environment including uncertaintites, issues, status of data, and waste package effects (heat, radiation, etc.).

   f) A description of the SRP program studying waste package containment including failure/degradation processes, uncertainties and issues, and status of data.

   g) A description of the SRP program studying waste package release including failure/release scenarios, uncertainties/issues and status of data.

2. To answer questions and receive NRC comments on the SRP waste package program and its applicability to the requirements of 10 CFR 60 and NRC staff perceived licensing needs.

3. To describe the SRP term (FY 86) planned activities in the waste package area to assist NRC and others in following the SRP program including exchange of ideas on future meetings and data reviews.

4. To have the NRC staff feedback to the DOE-SRP program through:

   a) Expression of NRC concerns of the issues related to the SRP waste package program

   b) Presentations on several topics/issues which would influence the DOE program based on NRC interpretation of the requirement of 10 CFR Part 60. (See Agenda for Specific Topics).

DOE/NRC Waste Package Meeting
January 22-24, 1986
Columbus, Ohio
Conference Room G

Agenda

January 22, 1986

8:30 a.m. Introduction

- o Introduction of Participants (SRP/NRC/Others)
- o Announcements/Arrangements

Opening Remarks

- o DOE Opening Remarks
- o NRC Opening Remarks

A. Overview of the Waste Package Program

9:00 a.m. Package Program Approach and Strategy

- o Program Organization
- o Program Philosophy
- o Design Approach
- o Performance Verification Strategy

9:45 a.m. Waste Package Concept Description

- o Design Description
- o Component Functions/Performance Allocation
- o Design Rationale/Materials Selection
- o Favorable Features
- o Major Design Uncertainties
- o Failure Modes and Processes
- o Effects of Emplacement Mode

12:00 Lunch

1:00 p.m. Performance Assessment of Waste Packages

- o Performance Assessment Strategy
- o Interfaces with Design and Testing
- o Development of Submodels
- o WAPPA Model Description
- o Treatment of Uncertainties
- o Code and Model Validation
- o Role in Licensing

3:30 p.m. Break

January 22, 1986 (Continued)

3:45 p.m. Quality Assurance and Peer/Technical Review

- o Quality Assurance Programs
- o Technical Test Procedures
- o Technical/Peer Review

5:00 p.m. Adjourn

January 23, 1986

B. Technical Focus of the Waste Package Program

8:30 a.m. Waste Package Environment

- o Preemplacement Conditions
- o Heat Effects on Salt and Brine
- o Thermomechanical Effects
- o Radiation Effects
- o Preclosure/Operational Factors
- o Integrated Effects/Field Tests
- o Expected/Unexpected Conditions
- o Impact on Modeling
- o Status of Data

11:30 a.m. Waste Package Containment

- o Failure/Degradation Processes
  - General Corrosion/Test Design
  - Nonuniform Corrosion
  - Crushing
  - Others
- o Factors Affecting Processes
- o Status of Data
- o Major Uncertainties/Issues
- o Development of Submodels

12:30 p.m. Lunch

1:30 p.m. Waste Package Containment (Continued)

3:30 p.m. Waste Package Release

- o Package Failure/Release Scenarios
- o Expected Processes
- o Status of Data
- o Major Uncertainties/Issues
- o Development of Models

5:00 p.m. Adjourn

January 24, 1986

8:30 a.m. Waste Package Release (Continued)

C. Planned Activities of the Waste Package Program

10:00 a.m.

- o Waste Package Environment
- o Waste Package Containment
- o Package Release
- o Design and Development
- o Performance Assessment
- o Future Potential Meetings/Data Reviews

D. NRC Presentations

10:45 a.m.

- o Summary of Observations on DOE Programs
- o Substantially Complete Containment for Short Half-Life Radionuclides
- o Individual Radionuclide Release Data for Licensing
- o Waste Package/Engineered Barrier System Boundary Definitions
- o Pitting Studies

12:00 Lunch

E. Questions and Summary

1:00 p.m. General Discussions/Questions

3:00 p.m. Preparation of Minutes

4:00 p.m. Summary and Minutes Discussion

5:00 p.m. Adjourn

DOE ANTICIPATED ATTENDEES

DOE

Abraham, Naomi (OGR, DOE/Waste Package)
Wu, Roger (SRPO, Waste Package)
Lahoti, Ram (SRPO, Chief of Engineering and Technology)
Casey, Leslie (SRPO, NRC Contract)

DOE-HQ SUPPORT

Gause, E. (Weston, Waste Package)
Schweitzer, D. (BNL, DOE/Waste Package)
Sastre, C. (BNL, DOE/Waste Package)
Apted, M. (PASS, Performance Assessment)
Lee, B.S. (BNL, DOE/Waste Package)

OTHER OGR PROJECTS

LaMont, P. (RL/BWIP, Waste Package)
Harper, G. (Rockwell/BWIP, Engineered Barriers)

STATE REPS.

To be determined

SRPO SUPPORT

Carr, J. (ONWI, Waste Package)
Golis, M. (ONWI, Waste Package)
Schornhorst, J. (ONWI, Waste Package Design)
Cunnane, J. (ONWI, Environmental)
Perrin, J. (ONWI, Material)
Hume, H. (ONWI, Geotechnical)
Kircher, J. (ONWI, Performance Assessment)
Raines, G. (ONWI, Performance Assessment)
Jansen, G. (ONWI, Performance Assessment)
McCauley, V. (ONWI, Performance Assessment)
Chen, P. (ONWI, Regulatory)
Basham, S. (ONWI, Waste Package)
Ailes, S. (ONWI, Quality Assurance)
McVay, G. (PNL, Waste Form)
Pederson, L. (PNL, Environment)
Bradley, D. (PNL, Waste Package)
Westerman, P. (PNL, Material)
Harrison, W. (ANL, Peer Review)
Clark, D. (ONWI, Waste Package)

USGS

La Sala, A. (USGS, Salt Liaison)

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DOE/NRC WASTE PACKAGE WORKSHOP

Listing of DOE Reports Applicable to the Workshop

Published Reports

H	BMI/ONWI-545	Performance Assessment Plans & Methods for the Salt Repository Project
M	ONWI-488	A Proposed Approach to Uncertainty Analysis
M	SAND 81-0433	Salt Block II Brine Migration Modeling
L	ORNL/TM-7310	A Statistical Sensitivity Analysis of a Simple Nuclear Waste Repository Model
H	ONWI-085	Thermal Gradient Brine Inclusion Migration in Salt Study, Gas-Liquid Inclusions Preliminary Models
H	ORNL-5607	Review of Information on the Radiation Chemistry of Materials Around Waste Canisters in Salt and Assessment of the Need for Additional Experimental Information
M	ONWI-464	Conceptual Waste Package Interim Product Specifications and Data Requirements for Disposal of Borosilicate Glass Defense High-Level Waste Forms in Salt Geologic Repositories
H	ONWI-305	Reaction and Devitrification of a Prototype Nuclear Waste Storage Glass With Hot Magnesium-Rich Brine
M	ONWI-462	Conceptual Waste Package Interim Performance Specifications for Waste Forms for Geologic Isolation in Salt Repositories
H	ONWI-483	Engineered Waste Package Conceptual Design: Defense High-Level Waste (Form 1), Commercial High-Level Waste (Form 1), and Spent Fuel (Form 2) Disposal in Salt
M	ONWI-242	Brine Migration Test for Asse Mine, Federal Republic of Germany: Final Test Plan
M	ONWI-472	EQ3/EQ6: A Geochemical Speciation and Reaction Path Code Package Suitable for Nuclear Waste Performance Assessment
M	ONWI-419	Workshop on Uncertainty Analysis of Postclosure Nuclear Waste Isolation System Performance

Priority of General Significance
- H = High
- M = Medium
- L = Low

M	ONWI-452	WAPPA: A Waste Package Performance Assment Code
M	ONWI-399	Thermodynamic Properties of Chemical Species in Nuclear Waste
M	DOE/NWTS-34	Guidelines for the Development and Testing of NWTS Waste Package Materials
H	PNL-4474	State-of-the-Art Report on Corrosion Data Pertaining to Metallic Barriers for Nuclear Waste Repositories
M	DOE/NWTS-960 Volume 1	NWTS Waste Package Program Plan, Volume I: Program Strategy, Description, and Schedule
M	ONWI-275	Elemental Release From Glass and Spent Fuel
M	ONWI-312	Waste Package Materials Screening and Selection
M	PNL-3971	Actinide Leaching From Waste Glass: Air-Equilibrated Versus Deaerated Conditions
M	DOE/NWTS-013	Nuclear Waste Package Materials Degradation Modes and Accelerated Testing
H	PNL-3614	Solubility Effects in Waste-Glass/Demineralized-Water Systems
L	ONWI-251	An Annotated Bibliography for the Design of Waste Packages for Geologic Disposal of Spent Fuel and High-Level Waste
L	PNL-3791	Factors Affecting Criticality for Spent Fuel Materials in a Geologic Setting
M	PNL-3802	A State-of-the-Art Review of Materials Properties of Nuclear Waste Forms
M	ONWI-490	Waste Package Materials Testing for a Salt Repository: 1982 Status Report
M	BMI/ONWI-533	Assessment of the Impacts of Spent Fuel Disassembly Alternative on the Nuclear Waste Isolation System
H	BMI/ONWI-538	A Study of Thermal-Gradient-Induced Migration of Brine Inclusions in Salt: Final Report

DOE Reports in Process

H	ONWI-517/WTSD-TME-001*	Waste Package Reference Conceptual Designs for a Repository
H	PNL Draft	FY 84 Waste Package Near-Field Environment Testing Report
H	PNL Draft	FY 84 Metal Barriers Testing Report
H	PNL Draft	FY 84 Waste Form Testing Report
H	PNL Draft	FY 84 Work on Corrosion & Leaching Submodels
H	PNL Draft	FY 83 Work Status Report
H	ONWI Draft	Expected Nuclear Waste Repository Waste Package Performance in Three Salt Formations, July 1985

* This report has not been issued. It is expected that this report will be made available before or at the workshop.

PROPOSED NRC STAFF AND CONTRACTOR ATTENDANCE

Bilhorn, Susan	Waste Management/Repository Projects Quality Assurance Section/Salt Team
Birchard, George	Office of Nuclear Regulatory Research Waste Management Branch
Interrante, Charles	National Bureau of Standards (WMEG)
Jacobs, Gary	Oak Ridge National Laboratory (WMGT)
Johnson, Robert	Waste Management/Repository Projects Projects Section/Salt Team Leader
Johnson, Timothy	Waste Management/Engineering Branch Materials Section Leader
Kaufman, Michael	National Bureau of Standards (WMEG)
Kelly, Walton	Waste Management/Geotechnical Branch Geochemistry Section/Salt Team
McNeil, Michael	Office of Nuclear Regulatory Research Waste Management Branch
Parry, Jack	ACRS/Senior Fellow
Peterson, Charles	Waste Management/Engineering Branch Materials Section/Salt Team
Shewmon, Paul	ACRS/Member
Soo, Peter	Brookhaven National Laboratory (WMEG)
Stephens, Kenneth	Aerospace Corporation (WMEG)
Tokar, Michael	Waste Management/Engineering Branch Design Section Leader
Verma, Telak	Division of Waste Management On-Site Representative (SRPO)
Voglewede, John	Waste Management/Engineering Branch Materials Section/Salt Team
Cialore, Henry	Battelle Columbus Laboratory
Markworth, Alan	Battelle Columbus Laboratory

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DOE/NRC WASTE PACKAGE WORKSHOP

Listing of NRC Reports Applicable to the Workshop

Published Reports

*	ATR-85(5810-01)-1ND	K. Stephens et al., Methodologies for Assessing Long-Term Performance of High-Level Radioactive Waste Packages, Aerospace Corporation Report, May 1985.
*	BNL Letter Report	T.M. Sullivan, Estimates of the Maximum Permissible Fractional Number of High Level Waste Container Failures and Failure Rates That Allow Post Containment Radionuclide Release Criteria to be Met During the Containment Period, Brookhaven National Laboratory Informal Report, October 1985. [Transmitted by T. Sullivan (BNL) letter to E.A. Wick (NRC) dated October 16, 1985.]
* (One of these three)	NRC Staff Report [Draft]	"Draft Site Issues for Waste Package," [Draft] Issue-Oriented Site Technical Position (ISTP) for Salt Repository Project (SRP), Permian Basin Sites, September 1984. [Transmitted by H.J. Miller (NRC) letter to W.J. Purcell (DOE) dated November 2, 1984].
	NRC Staff Report [Draft]	"Draft Site Issues for Waste Package," [Draft] Issue-Oriented Site Technical Position (ISTP) for Salt Repository Project (SRP), Gulf Coast Dome Sites, September 1984. [Transmitted by H.J. Miller (NRC) letter to W.J. Purcell (DOE) dated November 2, 1984].
	NRC Staff Report [Draft]	"Draft Site Issues for Waste Package," [Draft] Issue-Oriented Site Technical Position (ISTP) for Salt Repository Project (SRP), Paradox Basin Sites, September 1984. [Transmitted by H.J. Miller (NRC) letter to W.J. Purcell (DOE) dated November 2, 1984].
*	NRC Staff Report [Meeting Presentation]	E.A. Wick, "How Reliable Does The Waste Package Have To Be?," Proceedings of the Workshop on the Source TERM for Radionuclide Migration From High-Level Waste or Spent Nuclear Fuel Under Realistic Repository Conditions, Albequerque, NM, November 13-15, 1984 (Published July 1985).
	NRC Staff Report	Draft Generic Technical Position on Waste Package Reliability. [Transmitted by J.T. Greeves (NRC) memorandum to M.R. Knapp (NRC) and H.J. Miller (NRC) dated August 27, 1985.
	NRC Staff Report	Draft Generic Technical Position on Licensing Assessment Methodology for HLW Geologic Repositories, July 1984.

*These reports are of particular importance for the Workshop

NUREG-0279 — Determination of Performance Criteria for High-Level Solidified Nuclear Waste, Lawrence Livermore Laboratory Report, July 1977.

NUREG/CP-0005 — Proceedings of Conference on High-Level Radioactive Solid Waste Forms, Denver, CO, December 19-21, 1978.

NUREG/CR-0895 — Solidification of High-Level Radioactive Wastes, National Academy of Engineering Report, National Academy of Sciences, July 1979.

NUREG/CR-2317 (BNL-NUREG-51449) — Container Assessment - Corrosion Study of HLW Container Materials, Brookhaven National Laboratory Report,
- Volume 1, Nos. 1-2, "Quarterly Progress Report, April - June 1981," December 1981.
- Volume 1, No. 3, Quarterly Progress Report, July - September 1981," January 1982.
- Volume 1, No. 4, Quarterly Progress Report, October - December 1981," April 1982.
- Volume 2, No. 1, Quarterly Progress Report, January - March 1982,".

(BNL-NUREG-31611) "Quarterly Progress Report, April - June 1982".
(BNL-NUREG-32047) "Quarterly Progress Report, July - September 1982".
(BNL-NUREG-32512) "Quarterly Progress Report, October - December 1982".
(BNL-NUREG-33012) "Quarterly Progress Report, January - March 1983".
(BNL-NUREG-33603) "Quarterly Progress Report, April - June 1983".
(BNL-NUREG-33940) "Quarterly Progress Report, July - September 1983".
(BNL-NUREG-34220) "Quarterly Progress Report, October - December 1983".
(Informal Report) "Quarterly Progress Report, January - March 1984".
(Informal Report) "Quarterly Progress Report, April - June 1984".
(Informal Report) "Quarterly Progress Report, July - September 1984".

NUREG/CR-2333 (BNL-NUREG-51458) — Nuclear Waste Management Technical Support in the Development of Nuclear Waste Form Criteria for the NRC, Brookhaven National Laboratory Report,
- Volume 1, "Waste Package Overview," February 1982.
- Volume 2, "Alternate TRU Technologies," February 1982.
- Volume 3, "Waste Inventory Review," February 1982.
- Volume 4, "Test Development Review," February 1982.
- Volume 5, "National Waste Package Program," February 1982.

+ NUREG/CR-2482 (BNL-NUREG-51494) — Review of DOE Waste Package Program, Subtask 1.1 National Waste Package Program, Brookhaven National Laboratory Report,
- Volume 1, February 1982.
- Volume 2, "Semiannual Report, September 1981 - March 1982," April 1983.

+Conclusions and recommendations part of each section of each report.

*These reports are of particular importance for the Workshop

Volume 3, "April 1982 - September 1982," March 1983.
Volume 4, "October 1982 - March 1983," September 1983.
Volume 5, "April 1983 - September 1983," August 1984.
Volume 6, "October 1983 - March 1984," March 1985.
Volume 7, "April 1984 - September 1984," March 1985.

NUREG/CR-2737 — Evaluation of Bulk Properties of Radwaste Glass and Ceramic Container Materials to Determine Long-Term Stability, Catholic University of America Report, June 1982.

NUREG/CR-2755 (BNL-NUREG-51544) — Packing Material Testing Required to Demonstrate Compliance with 1000-Year Radionuclide Containment: Semiannual Report on Waste Package Verification Tests, Brookhave National Laboratory Report, January 1983.

+ NUREG/CR-3091 (BNL-NUREG-51630) — Review of Waste Package Verification Tests, Brookhaven National Laboratory Report,
Volume 1, Semiannual Report Covering the Period April 1982 - September 1982, April 1983.
Volume 2, Semiannual Report Covering the Period October 1982 - March 1983, August 1983.
Volume 3, Semiannual Report Covering the Period April 1983 - September 1983, February 1984.
Volume 4, Semiannual Report Covering the Period October 1983 - March 1984, June 1985.
Volume 5, Semiannual Report Covering the Period April 1984 - September 1984, June 1985.
Volume 6, Semiannual Report Covering the Period October 1984 - March 1985, July 1985.

+Conclusions and recommendations of each section of each report.

NUREG/CR-3187 (BNL-NUREG-51653) — Crevice Corrosion of Titanium Alloy TiCode-12 in Simulated Rock Salt Brine at 150°C, Brookhaven National Laboratory Report, March 1983.

* NUREG/CR-3219 (BNL-NUREG-51658) Volume 1 — Draft Technical Position Subtask 1.1: Waste Package Performance After Repository Closure, Brookhaven National Laboratory Report, August 1983.

NUREG/CR-3219 (BNL-NUREG-51658) Volume 2 — Draft Technical Position Subtask 1.2: Post-Emplacement Monitoring, Brookhaven National Laboratory Report, May 1983.

NUREG/CR-3282 (BNL-NUREG-51671) — Internal Hydrogen Embrittlement of Titanium Alloy TiCode-12 at Room Temperature, Brookhaven National Laboratory Report, May 1983.

*These reports are of particular importance for the workshop

NUREG/CR-3405 (BMI-2105)	Long-Term Performance of Materials Used for High-Level Waste Packaging, Battelle Columbus Laboratories Report, * Volume 1, "Annual Report, March 1982 - April 1983," July 1983.
NUREG/CR-3427 (BMI-2113)	Long-Term Performance of Materials Used for High-Level Waste Packaging, Battelle Columbus Laboratories Report, Volume 1, "First Quarterly Report, Year Two, April 1983 - June 1983," August 1983. Volume 2, "Second Quarterly Report, Year Two, July 1983 - September 1983," December 1983. Volume 3, "Third Quarterly Report, Year Two, October 1983 - December 1983," March 1984. * Volume 4, "Annual Report, Year Two," April 1983 - April 1984," June 1984.
NUREG/CR-3472	Surface Properties and Performance Predictions of Alternative Waste Forms, University of Florida Report, Volume 1, "Annual Report - October 1, 1981 through September 30, 1982," September 1983. Volume 2, "Final Report," [To be published].
NUREG/CR-3699	A Summary of Computer Codes for Waste Package Performance Assessment, CoSTAR Research Report, March 1984.
NUREG/CR-3900 (BMI-2127)	Long-Term Performance of Materials Used for High-Level Waste Packaging, Battelle Columbus Laboratories Report, Volume 1, "First Quarterly Report, Year Three, April 1984 - June 1984," September 1984. Volume 2, "Second Quarterly Report, Year Three, July 1984 - September 1984," January 1985. Volume 3, "Third Quarterly Report, Year Three, October 1984 - December 1984," March 1984. * Volume 4, "Annual Report, Year Three," April 1984 - April 1985," June 1985.
NUREG/CR-4134 (ORNL/TM-9522)	H.C. Claiborne et al., Repository Parameters Relevant to Assessing the Performance of High-Level Waste Packages, Oak Ridge National Laboratory Report, May 1985.
NUREG/CR-4198	Fracture in Glass/High-Level Waste Cannister, Iowa State University Report, May 1985.

*These reports are of particular importance for the workshop

NUREG/CR-4379 — Long-Term Performance of Materials Used for High-Level Waste Packaging, Battelle Columbus Laboratories Report,
Volume 1, "First Quarterly Report, Year Four, April - June 1985," September 1985.

NRC Reports in Preparation

** NRC Staff Report (Reliability GTP) — Final Generic Technical Position on Waste Package Reliability, December 1984.

** NUREG/CR-4134 (ORNL/TM-9522/R1) — H.C. Claiborne et al., Repository Parameters Relevant to Assessing the Performance of High-Level Waste Packages in Basalt, Tuff, and Salt, [This revision to ORNL/TM-9522 adds appendices on tuff and salt].

**These reports have not yet been issued. It is expected that they will be made available for the workshop. Previous versions of both reports are listed on pages 1 and 4, respectively.