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Group Participants

April 30, 1985

Mr. S. P. Cowan
Deputy Project Manager
DWPF Project Office
Savannah River Operations Office
U. S. Department of Energy
Aiken, South Carolina 29801

Dear Mr. Cowan:

**MINUTES OF FOURTH MEETING OF DWPF/REPOSITORIES
INTERSITE COORDINATION GROUP - MARCH 26, 1985
SONORA/BROADHURST ROOM - HOLIDAY INN, TUCSON, ARIZONA**


The group meeting was held in conjunction with the Waste Management '85 Conference, as has been the case for the previous two meetings. The primary purpose was to discuss two important issues that need resolution which bear heavily on the acceptance of DWPF canisters in candidate federal repositories: approved interim waste acceptance specifications and overall quality assurance. The minutes, which are attached, provide a report on and a record of the group's deliberations. I have also included additional information in the minutes to assist those who were not present to better assess the goals of the group and the current status of these important issues.

The Coordination Group has proved to be an excellent vehicle for the involved parties to discuss important issues relating to safe disposal of DWPF canisters in a federal repository.

8505160077 850430
PDR WASTE
WM-1 PDR

The group meetings in the future are going to be scheduled in conjunction with Waste Management conferences, the next being in Pasco, Washington the week of September 22, 1985.

Sincerely,



E. J. Hennelly
Planning Coordinator
Waste Technology Coordination
Division

EJH:ce

Attachments

MINUTES
DWP/REPOSITORIES INTERSITE COORDINATION
GROUP MEETING
MARCH 26, 1985
SONORA/BROADHURST ROOM - HOLIDAY INN
TUCSON, ARIZONA

Prepared By E. J. Hennelly, Chairman

April 26, 1985

ATTACHMENTS

Meeting Agenda
List of Attendees

Minutes of DWPF Repositories Meeting

Introduction

To assist those who were not present and to introduce the report of the discussions at the meeting, I have summarized the current situation for the DWPF and repository programs as they relate to each other.

DWPF

- o Borosilicate glass from the DWPF has been determined to be acceptable for disposal in a deep geologic repository (1982 EA).
- o DWPF focus now is to assure that the Plant will make an acceptable product.
- o Three documents exist that provide the interim product specifications for each repository type. All specifications are achievable.
- o DOE needs internal concurrence on the acceptance specifications well in advance (1985) of DWPF startup (1989).
- o Quality assurance on waste forms R & D and DWPF process control of production are the major focuses of current efforts.

Repositories

- o Site characterization plans are a high priority - QA is important issue here with NRC.
- o Repositories soon to enter pre-licensing phase - license application would be made (approximately 1991) well after scheduled DWPF startup (1989).
- o Support for DWPF-related work at repositories continues to be unreliable.
- o Repositories recognize short-term (next five years) needs of DWPF.

- o Long-term (next 20 years) needs of commercial programs provide different and sometimes competing schedules, priorities, plans, and objectives.
- o Acceptable auditing of QA activities has the appearance of an unresolved problem.

Discussion - Summary

With this brief introduction, the summary of the discussion is as follows:

Documentation

The schedule for securing a review and approval process for DWPF waste form acceptance requirements and specification documentation was the first item of discussion. DOE-SR wants the site-specific documents as complete as possible as soon as possible and passed on by the repository projects to the DOE Headquarters for review and approval. The documents could be used as bases for creating the generic document now being requested by OCRWM. The objective of the plan was to have the final "interim" documents through the system by December '86. DOE-SR wanted this expedited to December '85.

The schedule, as discussed, but not final, was something like:

- o Begin with existing documents.
 1. UCID-20165 - "The Nevada Nuclear Waste Storage Investigation Project - Interim Acceptance Specifications for DWPF and WVDP Waste Forms and Canisterized Waste." V. M. Oversby, August 1984.

This document was reviewed at the Third DWPF/Repositories Meeting in Tucson. March 1984.
 2. ONWI - 464 - "Conceptual Waste Package Interim Product Specification and Data Requirement for Disposal of Borosilicate Glass Defense High-Level Waste Forms in Salt Geologic Repositories." June 1983.

The abstract of this report identifies DWPF specifically as the defense HLW producer. The document was presented in draft form to the first DWPF/Repositories Meeting in Atlanta in October 1982 and was issued in final form in June 1983. The document was the outcome of several discussions between ONWI and DWPF beginning in 1980-81.

3. SD-BWI-CR-018 - "Draft Waste Acceptance Requirements for the BWIP. June 1983.

The report covers both commercial and defense HLW. The abstract of this report identifies specifically Savannah River defense high-level waste. Although available earlier, the document was first published in draft form in June 1983. Savannah River reviewed the document, and BWIP responded in August 1983 to the first review. Comments on SD-BWI-CR-018 were received from DOE-RL, Roy F. Weston, Incorporated, PNL, RHO, and Savannah River Laboratory (second review) in early 1984. BWIP responded in an undated document received by DOE-SR in May 1984. The schedule for issuing the revised draft was given on Tuesday, March 26, 1985 in Session XI, Paper 8, of Waste Management '85 "Compliance Testing for Acceptance of a Nuclear HLW Form by a Geologic Repository" - by E. H. Randklev RHO-BWIP: the expected date for completion is September 1985.

- o Through prior consultation and discussions with repository groups, DWPF would review and comment on existing documents. 7/1/85
- o DOE field offices would use normal channels to obtain mutual agreement on final interim drafts. 10/1/85
(To be considered interim for longer term usage for disposal but acceptable for nearer term DWPF startup).
- o OCRWM to receive drafts from repository projects beginning 10/15/85
- o Forward drafts to DP. 12/1/85
- o DP to implement for DWPF. 1/1/86

Final dates and schedule would be set by DOE field offices. Other glass producers would follow in sequence as final waste form characterization became possible (scheduled for November 1985 for WVDP - approximately 1988 for HWVP).

Quality Assurance

The discussion focused on the following:

- o QA plans for R & D on waste forms to supply data for repository licensing.
- o QA for process control of plant operations to make acceptable products.
- o Methods for auditing of QA/QC.

It appeared from the discussions that the following conditions exist within DOE.

- o Both the SRP (Salt Repository Project) and BWIP (Basalt) are making a rigorous application of NQA-1 so that they may have to take full responsibility for all waste form R & D data for licensing. This would put data from other sources such as DWPF in an important but supporting role.
- o NWWSI (TUFF - LLNL) believes that proper QA relationships can be achieved by mutual agreements (MOU approach) and successful audits. Their experience in applying QA in other fields bears this out. They plan a workshop later this year with NRC on these points.

The major points of difference seem to be the "Level" of QA applied to each program and the requirement for a separate QA organization. NRC requires conformance to 10 CFR 50, Appendix B, and has spelled this out in detail in the NRC Review Plan for Quality Assurance for Site Characterization - June 1984. In Appendix A of this document (Section 18.1), DOE is identified as performing "the audits of prime contractor, representation subcontractors, consultants, vendors, and laboratories to assess the effectiveness of the prime contractors audit program." NRC's role has been depicted to normally be to "review audits of others - i.e., NRC witnesses, consults, and advises" DOE auditors. NRC Review, Appendix A, (Section 18.5) indicates that the DOE auditors are to be "trained personnel having no direct responsibilities in the areas being audited." It appears that the DOE Field Office audits would be acceptable to the NRC.

It appears from this post-meeting review that the following situations may exist:

- o DOE Field Office audits would be acceptable to NRC after approval has been given following a thorough review of the auditing process.
- o Line organization responsibility of QA was emphasized by NRC Commissioner Asselstine in his luncheon address (3/26), and the role of a "separate" QA organization may be defined in several acceptable ways.
- o Consultation with NRC Staff is needed to resolve these issues promptly so that the important waste form R & D now going on can be properly fitted into the acceptance plan for DWPF canisters needed before startup, and the licensing plan for the repositories which will follow for many years.

This topic will be a recurring one and will be the subject of further discussions at the next meeting in September.

General Discussion

General Comments

- o Repositories don't have resources to deal with more than one waste form supplier at this time. They are in the prelicensing mode and are developing techniques and test methods rather than final approval testing.
 - o West Valley will have reference glass in November 1985. Reference documentation evolving.
 - o MCC is sponsoring a review of existing documentation on engineering tests and standards to prepare a single document on possible test methods that would show compliance of waste forms with repository requirements. It was expected to be useful to new producers who have not yet selected a waste form. Current DWPF/Repositories coordination has been well into test development since 1982, and results may be helpful to other potential producers.
 - o R. G. Baxter - Savannah River Plant* - presented a talk on the plans for analyzing and testing DWPF operations. A summary is given in the attached slides. He emphasized the importance DWPF places on assuring that the Plant will produce acceptable borosilicate glass. The talk also
- * SRP now stands for Savannah River Plant, Standard Review Plan and Salt Repository Project. Hence, Savannah River is usually indicated DWPF in these minutes.

stressed the advanced technology that is being used to control plant operations, record data, and to provide means to make key information available for use by a repository in meeting its regulatory requirements with regard to DWPF waste canisters.

- o Repositories need heat load data as a function of expected operations. Forecasts are now being made for specific waste that will be processed in the first few years (always subject to some revisions). Actual heat data will be supplied with each canister as made including decay before shipment to a repository - currently, about a decade or more. The DWPF program will be to concentrate waste and reduce the number of canisters so that heat load of specific canisters cannot be predicted too far into the future. Total heat of all canisters can be predicted accurately from reactor data and decay before shipment.
- o Marty Molecke reported on the WIPP-DHLW Test program (slides attached). This program focuses primarily on DWPF-type canisters, and details of the program are to be discussed in a series of workshops at WIPP. A DOE-sponsored Waste Management Symposium is planned at WIPP on October 22-26, 1985.

Next meeting of the Group is planned during the Waste Management Conference in Pasco, Washington the week beginning September 22, 1985.

ESDAY - MARCH 26, 1985
HOLIDAY INN - BROADWAY
TUCSON AZ

Attendees
DWPf/Repositories Intersite Coordination Group Meeting

<u>Name</u>	<u>Organization</u>	<u>Phone</u>
Ed Hennelly - Chm.	Savannah River Lab	803-725-5323
Virginia Oversby	LLNL	FTS 543-2228
Larry Ramspott	LLNL	FTS 532-4176
M. John Plodinec	SRL	FTS 239-2170 or 6346
Marty A. Molecke	SNL	FTS 844-0781
Ned E. Bibler	SRL	FTS 239-2313
John K. Bates	ANL	FTS 972-4385
Joseph J. Krupar	DOE-RL	FTS 444-7327
Richard N. Gurley	HWVP/Rockwell	FTS 444-5029
Don Wodrich	Rockwell Hanford	FTS 440-2038
Jim Cunnane	Battelle	614-424-4710
Steve Stein	Battelle Northwest	FTS 509-375-6812
Ed Occhipinti	Savannah River Plant	803-725-1183
Michael Tokar	NRC	301-427-4748
Pauline Brooks	NRC	FTS 427-4780
James E. Minor	Battelle Northwest	FTS 444-8543
Sy Vogler	ANL	FTS 972-6497
Roger Aines	LLNL	FTS 523-7184
Joel Haugen	DOE/CH	FTS 972-2093
Chris Chapman	WVNSC	716-942-3235
John L. Knabenschuh	WVNSC	716-942-3235,Ext.295
Jim Pope	WVNSC	716-942-3235,Ext.275
Marcella Madsen	SNL	505-844-1740
Richard G. Baxter	Savannah River Plant	FTS 239-1187
William J. Brumley	DOE-SR, DWPf-PO	FTS 239-3296
Steve Cowan	DOE-SR, DWPf-PO	FTS 239-3915
Pedro Macedo	Cath. Univ.	202-635-5327
Elizabeth A. Bracken	DOE-RL	FTS 444-7962
Steven C. Slate	PNL	FTS 444-5957
Bruce G. Kitchen	Savannah River Lab	FTS 239-5331
Mark Frei	DOE-RW	FTS 252-6824

AGENDA
DWPF/REPOSITORIES INTERSITE COORDINATION GROUP
MARCH 26, 1985
HOLIDAY INN, SONORA/BROADHURST ROOM - BROADWAY
TUCSON, ARIZONA

- 8:30 AM Opening Remarks - E. J. Hennelly, Chairman
- 8:40 Discussion and Acceptance of Plan for DWPF
Canister Acceptance Documentation at Repositories
- o Details
 - o Schedule
 - o Special WIPP Documentation?
- 9:30 Quality Assurance
- o Reports From Repository Sites on Current Status
 - o Discussion of Plan of Action
 - o Need for Workshop or Informal Discussions
 - o Is There an End in Sight?
- 10:45 Regulatory Interactions
- o Current Status
 - o Future Plans and Activities
 - o Commercial vs. Defense Requirements
 - Funding
 - Priorities
- 11:20 Future Reporting of Group
- 11:30 General Discussion Items
- 11:50 Date for Next Group Meeting
- 12:00 Adjourn

TABLE I

SAMPLING ACCURACY IN THE DWPE

ANALYSIS OF COMPONENTS IN THE WASTE GLASS

- (A) CHEMICAL COMPONENTS >0.5 WT%
- (B) RADIOACTIVE ISOTOPES WITH A HALF-LIFE OVER 10 YEARS,
AND
- (C) A CONCENTRATION >0.1% OF TOTAL CURIES AFTER GLASS HAS
AGED 1000 YEARS.

ANALYSIS ACCURACY

- (A) PRECISION OF ANALYSIS: $\pm 10\%$ AT THE 95% CONFIDENCE LEVEL
- (B) ACCURACY OF SAMPLING: IN PROCESS OF DETERMINATION

TABLE IICHEMICAL COMPOUNDS IN WASTE GLASS
OVER 0.5 WEIGHT PERCENT

<u>COMPOUND</u>	<u>WT % IN GLASS</u>
AL ₂ O ₃	3.96
B ₂ O ₃	10.29
CAO	0.85
FE ₂ O ₃	7.04
FEO	3.12
K ₂ O	3.58
LI ₂ O	3.16
MGO	1.36
MNO	2.00
NA ₂ O	11.00
NA ₂ SIO ₃	--
NA ₃ PO ₄	--
NIO	0.93
SIO ₂	45.57
TIO ₂	0.99
U ₃ O ₈	2.20
ZEOLITE	1.67
TOTAL WEIGHT PERCENT	97.72

TABLE III
 RADIONUCLIDE ANALYSES NEEDED FOR DWPf PROCESS STREAMS

Isotopes	REASON FOR ANALYSIS	
	Repository Criteria	DWPf Process
Co-60		X
Ni-59	X	
Ni-63	X	
Se-79	X	
Sr-90/Y-90		X
Zr-93	X	
Tc-99	X	
Ru-106/Rh-106		X
Sn-126	X	
Sb-125		X
Sb-126		X
Sb-126m	X	X
Cs-134		X
Cs-137/Ba-137		X
Ce-144/Pr-144/Pr-144m		X
Pr-144M		X
Sm-151	X	
Eu-152		X
Eu-154		X
Eu-155		X
U-235	X	X
U-236	X	
U-238	X	X
Pu-238	X	X
Pu-239	X	X
Pu-240	X	X
Pu-241	X	X
Pu-242	X	X
Am-241	X	X

TABLE IV

DWPF PROCESS STREAM SAMPLING

SLUDGE RECEIPT ADJUSTMENT TANK

TOTAL SOLIDS	CALCIUM
PH	NICKEL
MERCURY	YIELD STRESS
MANGANESE	

SLURRY MIX EVAPORATOR

TOTAL SOLIDS
LI/FE RATIO
FE+2/FE+3 RATIO
YIELD STRESS

MELTER FEED TANK (ACCOUNTABILITY)

FISSION PRODUCTS
ACTINIDES
URANIUM
ELEMENTAL

TABLE V

MELTER FEED TANK ANALYSIS

FISSION PRODUCTS

CS/BA-137	PM-147
RU/RH-106	EU-154
CE/PR-144	SB-125
SR/Y-90	CO-60
CS-134	

ACTINIDES

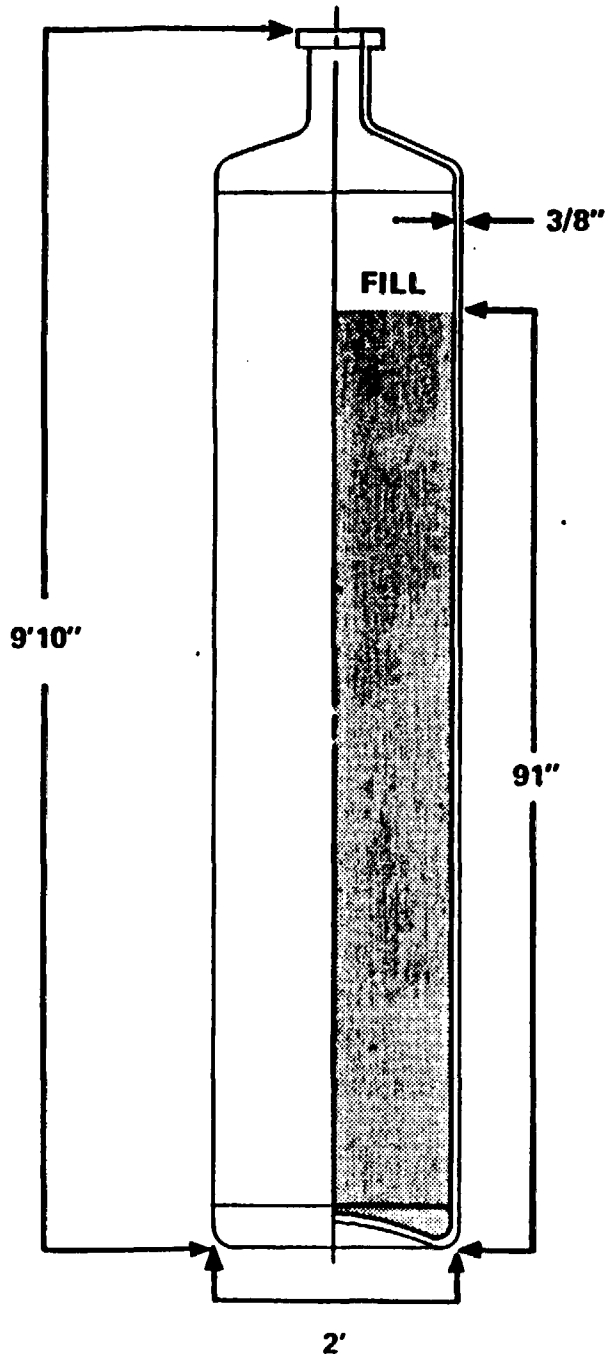
PU-238	PU-241
PU-239	TOTAL PU
PU-240	

URANIUM

U-235
U-238

ELEMENTAL

AL	FE	SO ₄ =
NI	K	CL
MN	RU	F
HG	B	NA
CA		



FILLED CANISTER

MATERIAL:	304L STAINLESS STEEL
EMPTY WEIGHT:	1100 LB
NET WEIGHT:	3710 LB
WEIGHT OF RADIONUCLIDES:	94 LB
ACTIVITY:	234,000 Ci
DECAY HEAT:	692 W
RADIATION FIELD (AT SURFACE):	5,500 rad/hr
SURFACE CONTAMINATION:	LESS THAN 10^{-4} $\mu\text{Ci}/\text{cm}^2$

WIPP ACTUAL DHLW TEST PACKAGE REQUIREMENTS

I. OPERATIONAL PERIOD TESTS:

A. EARLY PRODUCTION DWPf (70-100 W/CAN)

- . 12 CANISTERS*

TICODE-12 &/OR SS-304L W/ONWI OVERPACK

B. "REFERENCE" DWPf DHLW (470-692 W/CAN)

- . 24 CANISTERS*

TICODE-12 &/OR SS-304L W/ONWI OVERPACK

II. CONTAINMENT PERIOD/ACCELERATED AGING TESTS:

- . 12 CANISTERS

TICODE-12 OR SS-304L W/ONWI OVERPACK

- . 815-1000 W/CAN

- . SR-90 DOPING ACCEPTABLE

- . < 30,000 RAD/HR SDR

- . 6 CANS INTENTIONALLY DEGRADED AT WIPP HOT CELL

III. LONG-TERM PERIOD ("1000-YR-OLD" WASTE) TESTS:

- . 1 CANISTER, TICODE-12

- . 1 CANISTER, SS-304L

- . EACH CAN PARTIALLY SEGMENTED AT WIPP

- . ≤ 5 TEST EMBLACEMENTS PER CAN TYPE

IV. SUMMARY:

- . 50-74 TOTAL CANISTERS OF DHLW

*NO. OF CANISTERS DEPENDENT ON MATERIALS CHOICE

- . 49 TICODE-12 (MAX), 25 SS-304L (MAX)

WIPP ACTUAL DHLW TEST SCHEDULES

I. DELIVERY TO WIPP SCHEDULES;

- . DELIVERY (AND EMPLACEMENT) RATE, 2 CANS/MONTH
- . OPERATIONAL/EARLY PRODUCTION, 9/89-9/90
- . OPERATIONAL/REFERENCE, 9/90-3/92, OR EARLIER
- . CONTAINMENT/ACCELERATED AGING, 3/92-6/93
- . LONG-TERM/1000-YR-OLD, 6/93

II. RETRIEVAL DEMONSTRATIONS (TENTATIVE):

- . TWO EARLY PRODUCTION 3/90
- . TWO REFERENCE 6/91

III. RETRIEVALS FOR TEST ANALYSES (TENTATIVE):

- . EARLY PRODUCTION, 2 CANS AFTER 2, 5, 8, 12...YEARS
- . REFERENCE, 2 CANS AFTER 2, 5, 8, 12...YEARS
- . ACCELERATED AGING, 1 CAN AFTER 2, 5, 8, 12...YEARS
- . 1000-YR-OLD, TO BE DETERMINED
- . WIPP REEMPLACEMENT OR OFF-SITE TRANSPORT, TBD



Sandia National Laboratories

INTERIM BOUNDING CRITERIA
FOR DHLW TESTS AT WIPP (12/84)

- . WASTE FORM (DHLW) DWPB BOROSILICATE GLASS
 - A) GLASS WITH SLUDGE ONLY, OR
 - B) GLASS WITH SLUDGE AND SUPERNATE

- . WASTE CANISTER
 - DIMENSIONS: 24" O.D. BY 118" (0.61 X 3.0 M)
 - MATERIALS: STAINLESS STEEL 304L OR TICODE-12
 - GROSS WEIGHT: \leq 7000 LB (3200 KG).

- . THERMAL POWER OUTPUT
 - \leq 1000 WATTS/CANISTER

- . NUCLEAR CRITICALITY
 - FISSILE OR FISSIONABLE CONTENT 1100 G/CANISTER
 - UNIFORMLY DISTRIBUTED

- . CURIE CONTENT
 - \leq 430,000 CI/CANISTER

- . SURFACE DOSE RATE
 - < 30,000 R/HR.



Letter, E. J. Hennelly to S. P. Cowan, Minutes of Fourth Meeting of DWPF/Repositories Intersite Coordination Group - March 26, 1985, Tucson, Arizona, dated April 30, 1985.

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