



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

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MEMORANDUM FOR: Robert E. Browning, Director
Division of Waste Management

MAY 12 1986

FROM: Tilak R. Verma, Senior On-Site
Licensing Representative
Salt Repository Project (SRP)

SUBJECT: SRP SITE REPORT FOR THE MONTH
OF APRIL, 1986

- 1. **WASTE PACKAGE:** On April 3 and 4, 1986, R. Cook and I attended a "Review of BWIP and SRP Corrosion Program" held in Richland, Washington. The meeting agenda consisted of BWIP Waste Package Program Review in the morning and a tour of BWIP and SRP Waste Package Laboratory work in the afternoon of April 3, 1986. On April 4, 1986, after a brief overview of SRP Waste Package Program by Roger Wu of SRPO, John Carr of ONWI presented SRP Waste Package Program Strategy and Approaches. Dick Westerman presented the details of SRP Corrosion Program at PNL. Viewgraphs from these presentations are available in the OR (SRP) Office.

Waste Package degradation modes were discussed in detail. CER has done literature review for DOE (SRPO) on "Degradation Modes in Low Carbon Steel in Brine Environments" and "Corrosion Enhancement of Mild Steel by Micro and Macro-Organisms and Failure by Hydrogen Embrittlement". Both of these reports are available in draft form. Other degradation modes, that are being evaluated by SRP, according to Wu of SRPO, are Uniform Corrosion, Localized Corrosion (including Pitting Corrosion and Crevice Corrosion), Stress Corrosion Cracking, and Hydrogen Embrittlement.

John Carr of ONWI discussed major waste package requirements as primary requirements:

- o Containment of radionuclides within packages is to be substantially complete for 300 to 1,000 years following repository closure.
- o Following loss of containment, release from waste package for each radionuclide which is greater than 0.1 percent of total curie content existing of 1,000 years postclosure, shall be less than one part in 100,000 of its 1,000 year inventory.

And as secondary performance requirements:

- o To positively assist other waste management systems in the transport, receipt, handling, packaging and emplacement of wastes to maintain worker and public exposure under normal and design base accidents within regulatory limits established by the NRC or within design goals established by DOE.

WM Record File 106 WM Project 16
 Docket No. _____
 PDR
 LPDR

B606160258 B60512
 PDR WASTE
 WM-16 PDR

Distribution: *S. Bilhorn *Coptan *Kennedy
 *REB *JOB *DPM *Linahan
 *MSB *JTG *MRK *R. JOHNSON
 (Return to WM. 623-SS) TUSTUS CFR et

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- o To enable the waste emplaced in the repository to be retrieved if judged necessary by the NRC starting at any time up to 50 years following the start of repository emplacement operations.

Carr also gave details of near-field environment for the Deaf Smith County site:

- o Lithostatic Pressure: 2,500 psi
- o Repository horizon: LSU No. 4. Approximately 160 feet of bedded salt containing anhydrite, siltstone and claystone occurring in small pockets and thin stringers.
- o In bulk LSU No. 4 is estimated to be by volume
 - 87 percent halite
 - 9 percent anydrite
 - 4 percent clay
 - Trace amounts of dolomite and polyhalite
- o Water/brine content
 - Pure samples halite = 0.4 percent (wt)
 - Halite-cemented mudstone = 5.0 percent (wt)
 - Bulk average basis = 4.0 percent (wt)
- o Brine Composition (Magnesium)
 - Fluid inclusion in halite 20,000 to 100,000 mg/L
 - Mudstones/clays not known but WIPP data indicates concentrations similar to inclusions.

Carr concluded his presentation by listing major information and data needs, and contractor tasks. Contractors assisting SRP on waste package related work are:

HEDL
SAIC
BNL
LBL
CER
GE
PNL-MCC
PNL-DEFENSE
PNL-SRP

Dick Westerman of PNL provided the details of waste package work being done by PNL. He also summarized some of the data obtained since January, 1986 (Attachment No. 1).

I had attended both waste package program overviews by BWIP and SRP. It was my impression that SRP presentations provided more details on rationale and test methodology.

Attachment N. 1.

A216 STEEL CORROSION DATA OBTAINED SINCE JANUARY, 1986
Metal Barrier Testing Task, WPP

- Test GC-2, unirradiated
PBB3 (brine only), 150°C

Corrosion Rate, mil/yr

	<u>1 month</u>	<u>3 month</u>
As-cast	45	41
Normalized	59	53
Weldment	34	29

- Test GC-3, unirradiated
PBB3 (brine only), 90°C

Corrosion Rate, mil/yr

	<u>1 month</u>	<u>3 month</u>
As-cast	2.2	1.9
Normalized	2.4	1.4
Weldment	1.8	1.2

- Test GC-4, unirradiated
PBB3/surrogate site specific salt, 150°C

Corrosion Rate, mil/yr

	<u>1 month</u>
As-cast	27
Normalized	33
Weldment	14

- Irradiation-Corrosion Test, 1.6×10^3 rad/hr
PBB3/surrogate site-specific salt, 150°C

Corrosion Rate, mil/yr

	<u>1 month</u>
As-cast	27
Weldment	19

- Irradiation-Corrosion Test, 1.3×10^3 rad/hr
PBB1/surrogate site-specific salt, 150°C

Corrosion Rate, mil/yr

	<u>1 month</u>
As-cast	1.6
Weldment	1.6

2. QUALITY ASSURANCE: During the week of April 21 through April 25, 1986, I attended (as a NRC observer) a SRPO QA audit of Parsons Brinckerhoff in Houston, Texas. Parsons Brinckerhoff is a primary DOE contractor (A/E for Salt Exploratory Shaft Facility Design). It was an important audit because Parsons Brinckerhoff has completed Title I design for the salt ESF and is in a process of getting ready for the Title II ESF design. The scope of the SRPO audit was to verify the internal implementation of PB/PB-KBB's Quality Assurance Plan and implementing procedures on activities pertaining to the design of the ESF, specifically indoctrination and training, document control, computer code verification and documentation, technical procedures, preparation and review, Title I documents, independent technical reviews, and verification of corrective actions from previous audit.

An audit checklist was prepared with a good technical input from SRPO and ONWI technical staff who had an up-to-date knowledge of the project activities. The audit resulted in SRPO issuing four findings and two observations (Attachment No. 2). My observations and impressions from the audit are:

1. There was only one experienced QA auditor on the team, however, he still divided the team into three sub-groups and assigned a number of audit attributes from the audit checklist. The sub-group, I stayed with, did not have enough QA auditing experience to ask the right type of questions to establish to effectiveness of the QA program.
 2. The lead auditor seemed under somewhat of a self-imposed pressure to finish the audit as soon as he could. The checklist was quite comprehensive and could have resulted in a more effective audit if there were no time and/or experienced auditor type constraints.
 3. Monthly QA status reports from December, 1985, indicated a very low QA effort in the A/E activities, however, SRPO took no action.
 4. Management at Parsons Brinckerhoff exhibited a strong commitment to QA program for the A/E design activities for ESF.
3. REPOSITORY ENGINEERING: SRPO, with input from ONWI, SWEC, Parsons Brinckerhoff, Fluor and Texas Bureau of Economic Geology, has prepared a synthetic geotechnical data base. The data base consists of stratigraphic column, geophysical logs, seismic ground acceleration, hydrogeologic matrix, core logs, soil mechanics data, and rock mechanics data. The synthetic data base is to be used for ESF and repository design activities. I have obtained a set of documents containing the data base.

T. Lamb of SWEC has presented a paper - "Stress Measurements in the Palo Duro Basin, Texas Panhandle", at the Solution Mining Research Institute's Spring Meeting in mid-April.



AUDIT ACTION REPORT
(See reverse side for instructions.)

Issue Date: 25 April 1986
Audit No: PB-86-3-E
AAR No:

1. To R. Jarowski
2. Organization/Department
3. Company or BPMD Project PB/PB-KBB

4. From HPA James
5. FINDING OBSERVATION
6. Trend Deficiency 7. Cause
Code No. Code No.

8. DESCRIPTION OF CONDITION REQUIRING CORRECTIVE ACTION

IN-WORK REVIEW MEETINGS ARE NOT CONDUCTED AS DEFINED

9. DISCUSSION OF CONDITION REQUIRING CORRECTIVE ACTION

IN-WORK REVIEW MEETING MINUTES (#M146 & #M152) ARE ON FILE FOR DESIGN DRAWING ~~FOR~~ INTERFACE MEETINGS. THERE IS NO RECORD OF FOLLOW-UP CORRECTIVE ACTION NOR QA VERIFICATION OF THE STIPULATED CORRECTIVE ACTION.

DRAFT

10. REQUIREMENT/REFERENCE CRITERIA

EP-4.01 (10/83), Para 3.3 & 3.4

11. REPORTED BY HPA James 4/25/86
Name Date

12. DISCUSSED WITH _____
Name Date

THIS SECTION TO BE COMPLETED BY RESPONSIBLE ORGANIZATION AND RETURNED TO BPMD QA BY _____

13. PROPOSED CORRECTIVE ACTION (including action to prevent recurrence):

14. Scheduled Completion Date _____ 15. Signed _____
(Authorized Representative) (Date)



AUDIT ACTION REPORT
(See reverse side for instructions.)

Issue Date: 25 April 1986
Audit No: PB-86-3-E
AAR No:

1. To R Janowski
2. Organization/Department
3. Company or BPMD Project PB/PB-KBB.

4. From HPULINES
5. FINDING OBSERVATION
6. Trend Deficiency 7. Cause
Code No. Code No.

8. DESCRIPTION OF CONDITION REQUIRING CORRECTIVE ACTION

Items requiring corrective action are not corrected in a ~~an expediate~~ timely fashion.

9. DISCUSSION OF CONDITION REQUIRING CORRECTIVE ACTION

Two items requiring PB/PB-KBB corrective action have not been completed in a timely fashion:

- 1. No Procurement Procedure - identified on NCR-ES-14-02 3/25/85 with the corrective action being issued on 4/22/86*
- 2. A Management Assessment was conducted on July 30/31, 1985 identified the need to revise EP 4.01, In Work Reviews.*

NOTE: PB/PB-KBB Monthly QA STATUS REPORTS TO SRPD for November 1985 through April 1986 show no QA activities conducted on the ESF project.

10. REQUIREMENT/REFERENCE CRITERIA

*QAPP Section XVII Part A & C
QADP 8.00 (7/82) Para 1, Scope, Para 2 Purpose*

11. REPORTED BY [Signature] 4/25/86 12. DISCUSSED WITH _____
Name Date Name Date

THIS SECTION TO BE COMPLETED BY RESPONSIBLE ORGANIZATION AND RETURNED TO BPMD QA BY _____

13. PROPOSED CORRECTIVE ACTION (including action to prevent recurrence):

14. Scheduled Completion Date _____ 15. Signed _____
(Authorized Representative) (Date)

DRAFT



AUDIT ACTION REPORT
(See reverse side for instructions.)

Issue Date: 25 April 1986
Audit No: PB-86-3-E
AAR No:

1. To PB/PB-KBB R JANOWSKI
2. Organization/Department
3. Company or BPMD Project

4. From HP James
5. FINDING OBSERVATION
6. Trend Deficiency Code No.
7. Cause Code No.

8. DESCRIPTION OF CONDITION REQUIRING CORRECTIVE ACTION

Audits have ^{not been} conducted to assess the effectiveness of the PB/PB-KBB QA Program Plan and Procedures.

9. DISCUSSION OF CONDITION REQUIRING CORRECTIVE ACTION

Audits as conducted do not adequately assess the effectiveness of the QA Program Plan and Procedures:

- 1. There is no audit schedule for 1986
- 2. No audit plans have ^{been} prepared
- 3. No audit/surveillance were conducted on the design/specification review processes
- 4. Audit deficiency corrective action responses do not address corrective action to prevent recurrence.
- 5. No evidence of technical input into the audit process.

10. REQUIREMENT/REFERENCE CRITERIA

QAOP 104 (10/83) Para 3.2c and 4.2b

11. REPORTED BY HP James 4/25/86

12. DISCUSSED WITH _____
Name Date

THIS SECTION TO BE COMPLETED BY RESPONSIBLE ORGANIZATION AND RETURNED TO BPMD QA BY _____

13. PROPOSED CORRECTIVE ACTION (including action to prevent recurrence):

14. Scheduled Completion Date _____ 15. Signed _____
(Authorized Representative) (Date)

DRAFT



AUDIT ACTION REPORT
(See reverse side for instructions.)

Issue Date: 25 April 1986
Audit No: PB-86-3-E
AAR No:

1. To R. Janowski
2. Organization/Department —
3. Company or BPMD Project PB/PB-KAB

4. From HDNUNES
5. FINDING OBSERVATION
6. Trend Deficiency Code No.
7. Cause Code No.

8. DESCRIPTION OF CONDITION REQUIRING CORRECTIVE ACTION

Not all drawing changes (Issue Nos.) and ~~not~~ specification changes (Issue Nos.) have documented evidence to support their evaluation by personnel responsible for their initial issue.

9. DISCUSSION OF CONDITION REQUIRING CORRECTIVE ACTION

Not all drawing issues has been circulated for change review concurrence (no signoff) by the cognizant party. Revisions shown for specification issues had no cognizant individual or reviewer identified. There was a lack of consistent (over) approval of the documents.

10. REQUIREMENT/REFERENCE CRITERIA

EP 401, Part 2, Part 3, Para 3.1, 3.3 & 3.4

11. REPORTED BY DP James 4/25/86
Name Date

12. DISCUSSED WITH _____
Name Date

THIS SECTION TO BE COMPLETED BY RESPONSIBLE ORGANIZATION AND RETURNED TO BPMD QA BY _____

13. PROPOSED CORRECTIVE ACTION (including action to prevent recurrence):

14. Scheduled Completion Date _____ 15. Signed _____
(Authorized Representative) (Date)

DRAFT

- 1. To RIANOWSKI
- 2. Organization/Department
- 3. Company or BPMD Project PB/PB-KBB
- 4. From HANLINES
- 5. FINDING
- 6. Trend Deficiency Code No.
- 7. OBSERVATION
- 7. Cause Code No.

8. DESCRIPTION OF CONDITION REQUIRING CORRECTIVE ACTION

QA Training records have not been transferred to the Document Control Center since 12/84 as required.

9. DISCUSSION OF CONDITION REQUIRING CORRECTIVE ACTION

Training records, course outlines and class attendance sheets, have not been transferred to the document control center.

10. REQUIREMENT/REFERENCE CRITERIA

*QAOP 1.02 (12/82) Section 1 Scope
ES-08-01 (Rev. 3) (Jan 84)*

11. REPORTED BY (D. Jones) 4/25/86 12. DISCUSSED WITH _____
Name Date Name Date

THIS SECTION TO BE COMPLETED BY RESPONSIBLE ORGANIZATION AND RETURNED TO BPMD QA BY _____

13. PROPOSED CORRECTIVE ACTION (including action to prevent recurrence):

14. Scheduled Completion Date _____ 15. Signed _____
(Authorized Representative) (Date)

DRAFT



AUDIT ACTION REPORT
(See reverse side for instructions.)

Issue Date: 25 April 1986
Audit No: PB-86-3-E
AAR No: 01

1. To PB/PB-KBB, R Janowski
2. Organization/Department —
3. Company or BPMD Project
DOE/SRPO

4. From HP/LINES
5. FINDING OBSERVATION
6. Trend Deficiency Code No.
7. Cause Code No.

DRAFT

8. DESCRIPTION OF CONDITION REQUIRING CORRECTIVE ACTION
Not all personnel have been trained in each procedure as required. ^{Personnel} Procedures are trained on a subject basis not on an individual procedure basis as required by the QAPP

9. DISCUSSION OF CONDITION REQUIRING CORRECTIVE ACTION
Personnel not trained in all procedures are:
1. R Janowski
2. J. Morley
3. K. Stayer
4. D. Windsor

Procedures not covered encompassed QAOP 2.01, QAOP 2.02, QAOP 2.03, QAOP 4.00 & QAOP 8.00. Records reflect training by subject and not the individual procedure. Subjects taught are EPC (in total), Document Control, QA Program and audits and corrective action.

10. REQUIREMENT/REFERENCE CRITERIA
QAPP Section 2, Subpart F

11. REPORTED BY [Signature] 4.24.86 12. DISCUSSED WITH _____
Name Date Name Date

THIS SECTION TO BE COMPLETED BY RESPONSIBLE ORGANIZATION AND RETURNED TO BPMD QA BY _____

13. PROPOSED CORRECTIVE ACTION (including action to prevent recurrence):

14. Scheduled Completion Date _____ 15. Signed _____
(Authorized Representative) (Date)

4. IN-SITU TESTING: ONWI has prepared a position paper on "How Much At-Depth Testing is Required to Support Licensing and Construction Authorization for the Deaf Smith County Site". The paper discusses the regulatory basis for testing, lists the types and number of tests to be conducted and presents test schedules. The paper calls for submitting the License Application before all tests are complete. A draft copy of the position paper is available in OR (SRP) office.
5. MISCELLANEOUS:
 1. During the week of April 14, 1986, I was at HQ and attended meetings and held discussions with the technical and management staff in the DWM. Also, provided a briefing to Mr. Davis and Mr. Mausshardt. All the discussions were quite useful.
 2. Steve Frishman (Texas) visited SRPO on April 9, 1986 and held discussions with the SRPO staff and management.

Tilak R. Verma
Tilak R. Verma
Senior On-Site Licensing
Representative, SRP

cc: M. Bell
J. Bunting
J. Greeves
P. Justus
J. Linehan
R. Johnson
S. Bilhorn
R. Cook
P. Prestholdt
J. Neff, SRPO
G. Appel, SRPO
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