



Department of Energy

Washington, DC 20585

APR 03 2002

QA: QA

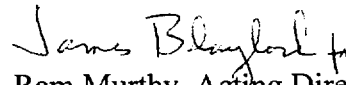
J. D. Cloud
Bechtel SAIC Company, LLC
1180 Town Center Drive, M/S 423
Las Vegas, NV 89144

VERIFICATION OF CORRECTIVE ACTIONS AND CLOSURE OF DEFICIENCY REPORT (DR) BSC-02-D-064

The Office of Quality Assurance staff has evaluated the corrective actions of DR BSC-02-D-064 and determined the results to be satisfactory. As a result, the DR is considered closed.

If you have any questions, please contact either James Blaylock at (702) 794-1420 or James V. Voigt at (702) 794-1487.

OQA:JB-0901


Ram Murthy, Acting Director
Office of Quality Assurance

Enclosure:
DR BSC-02-D-064



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APR 03 2002

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OFFICE OF CIVILIAN
RADIOACTIVE WASTE MANAGEMENT
U.S. DEPARTMENT OF ENERGY
WASHINGTON, D.C.

8. ☒ DEFICIENCY
☐ CORRECTIVE ACTION
REPORT
NO. BSC-02-D-064
PAGE 1 OF
QA: *XQA*

DEFICIENCY/CORRECTIVE ACTION REPORT

D60 1/23/02

1. Controlling Document: QAP-3-9, Rev. 7, Design Analysis		2. Related Report No.: N/A	
3. Responsible Organization: BSC		4. Discussed With: L. Abernathy, J. Cloud, T. Higgins, M. Haas, S. Su	
5. Requirement: I. QAP-3-9, Section 5.3.1 states: "The LDE in coordination with the Department Manager, shall determine if the design analysis or revised information for design analysis revisions affects a discipline or a functional area other than the originating discipline or organization . . . B. If so, a design review is required, identify on the Design Analysis Review Summary the required disciplines, organizations, or other affected groups that will participate in the design review and include a due date, then return the modified design analysis and the Design Analysis Review Summary to the Originator." Continued on page 2.			

6. Description of Condition: Technical comments identified during the review of Design Analysis BCB000000-01717-0200-00011, Rev. 00, "Waste Handling Building Shield Wall Analysis" were not resolved. The records package for this document is incomplete and includes incorrect information. Details are as follows: 1. Draft 00B of this analysis was issued for design review on July 16, 1997. The Subsurface Design group was identified as a required reviewer on the Design Analysis Review Summary (MOL.19980216.0229). 2. The Subsurface Design group reviewers' comments (Attached) were transcribed onto Draft 00B (Master Review Copy) on July 23, 1997. 3. Subsurface Design group comments were not resolved and their Backcheck concurrence was not obtained on the Design Analysis Review Summary (MOL.19980216.0229). 4. A review of Draft 00D of the design analyses was completed on August 21, 1998 as documented on a Design Analyses Review Summary (MOL.19990526.0013). The Subsurface Design group was not included as a reviewer of this draft. Continued on page 3.	
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7. Initiator: Dan Tunney <i>Dan Tunney</i> Date 1-23-2002	9. Does a stop work condition exist? (Not required for a DR) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Check One: <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D
-----------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

10. Recommended Actions: 1) Resubmit Design Analysis to Subsurface Design Group and resolve comments, if any. 2) Submit corrected records package. 3) Analyze cause of Draft 00D not being reviewed by Subsurface Design. 4) Examine other documents by Analysis author and checker for adequate reviews. 5) Analyze reasons for two different Rev. 00B records packages and not Master Review Copy. <i>T60 1/24/02</i>	
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11. QA Review: <i>James V. Voigt</i> QAR James V. Voigt Date 1-24-2002	12. Response Due Date: 10 working days from issuance
---------------------------------------------------------------------------	---------------------------------------------------------

13. DOQA Issuance Approval: Printed Name Ram Murthy Signature <i>James Blaylock</i> Date 1/30/02	
-----------------------------------------------------------------------------------------------------	--

22. Corrective Actions Verified <i>James V. Voigt</i> QAR James V. Voigt Date 27 March 2002	23. Closure Approved by: <i>James Blaylock</i> Date 4/2/02
---------------------------------------------------------------------------------------------------	---------------------------------------------------------------

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U.S. DEPARTMENT OF ENERGY
WASHINGTON, D.C.

8. ☒ DR/CAR
☐ Stop Work Order

NO. BSC-02-D-064

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QA: *XQA*

DEFICIENCY/CORRECTIVE ACTION REPORT/STOP WORK ORDER CONTINUATION PAGE

5. REQUIREMENT (Continued from page 1)

D60 1/23/02

II. QAP-3-9, Section 5.3.4 states: "The Originator shall: ...

C. Resolve all comments with reviewers;

D. Elevate comment resolution issues to the LDE;

E. Modify the design analysis as required to incorporate comment resolutions;

F. Forward a copy of the following to all reviewers for backcheck:

1. the modified design analysis;

2. the Design Review; and

3. the Design Analysis Review Summary."

Section 5.3.5 states: "The Reviewer shall:

A. backcheck the modified design analysis against the Design Review copy ;

B. indicate concurrence and indicate that review comments made are either incorporated or satisfactorily resolved on the modified design analysis by signing and dating the backcheck section of the Design Analysis Review Summary ..."

III QAP-3-9, Section 6.1 states: "Records to be assembled into a Quality Assurance (QA) records package include:

QA: N Check copy, Design Review copy(s), and Final Check copy.

QA: L Design analysis (includes Design Analysis Cover Sheet and Design Analysis Revision Record) and Design Analysis Review Summary."

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8. ☒ DR/CAR
☐ Stop Work Order

NO. BSC-02-D-064

PAGE 3 OF

QA: *XQA*

DEFICIENCY/CORRECTIVE ACTION REPORT/STOP WORK ORDER CONTINUATION PAGE

6. DESCRIPTION OF CONDITION (Continued from page 1)

D60 1/23/02

5 Deficiency Report LVMO-00-D-024 (MOL.20000427.0187) was initiated on December 2, 1999, because the approved revision 00 of the analysis could not be located. Rev. 00 of the analysis (MOL.19990111.0156) was recreated and approved on January 13, 2000. Comments identified by the Subsurface Design group review of 00B remain unresolved.

6 The quality assurance records supporting this analysis were submitted in two separate records packages (MOY-980109-01-01 and MOY-990519-09-01) rather than one.

7 The review copy for Rev 00B (MOL.19980216.0236) in the records package is not the same as the original Rev. 00B (MOL.19980216.0234 and MOL.19980216.0235). The master review copy (including the original comment of all reviewers) is not in the records package.

Work has not been stopped as a result of this deficiency.

**DESIGN REVIEW COMMENTS ON
RADIOLOGICAL SAFETY DESIGN ANALYSES**
DI: BCBD00000-01717-0200-00011 REV B

Reviewers: S. Su/M. N. Haas

[Signature] 7/23/97 *A. An* 7/23/97

This document was reviewed in accordance with the QAP-3-9 design review requirements. This design review assumed that all data, assumptions, methods, models, calculations and results including computer input and output files had been checked by a qualified technical checker during discipline checking. The following design review comments are offered to assist the Repository Surface Design group in refining the analysis in a suitable manner.

1. Title and Purpose

The title is too general, and not descriptive. It also implies that this design analysis is all inclusive, covering all MGDS shielding designs. Suggest changing to "MGDS Surface Shielding Analyses for WHB Shield Walls". Delete "door" in PURPOSE, since no door shielding is addressed.

2. Section 3, p. 7

Indicate which code is used to obtain the reference results for the shielding thicknesses. Also include the statement that the neutron source is not considered in this design analysis, since the concrete walls used for the waste handling building provide more than adequate neutron shielding. Need to note that photons generated as a result of (n, γ) reactions have not been included and state why.

3. Section 4.1, Table 4.1-1, p. 8

- a. The following items are not in, or inconsistent with, Ref. 5.23: 8, 10, 11, 14, 16, and 18.
- b. All calculated values should be presented in Section 7 (Items 3, 4, 8, etc.).
- c. Use the terminology "Characteristics Data Base (CDB)" for the data source from Ref. 5.16.
- d. Items 5 and 16: Need to include the Co-60 activation sources in the entire end fittings (upper and lower end fittings) in the analysis. Inconsistent burnup values are used between top (30GWd/MTU) and bottom (60 Gwd/MTU). Suggest using the data in the MGDS Subsurface Radiation Shielding Analysis.
- e. Item 9: Active fuel width is too small for typical PWR fuel assemblies and inconsistent with the value given in Attachment IX (p. IX-3). Should be about 8.5".

f. Item 5: The value of 6.548×10^8 MeV/cm³-sec is not in Ref. 5.16.

g. Item 13: The values are for the waste package transporter, not for the transfer cask. This comment applies to the entire document. Reference to "Underground Transfer Cask" needs to be corrected to "Subsurface Waste Package Transporter".

h. The unit for the dose conversion factor is incorrect. Should be (mrem/hr)/(pho/cm²-sec).

i. Case 7: The ID is incorrect. Fill height (not the overall height) should be used for the canister volume containing the glass waste. Per ACD, the design source terms should be at the time of canister fill which is zero decay in the CDB, instead of 10 years used in the analysis for the DHLW.

j. Change "Standard Reference Fuel" in Item 6 to "Design Basis Fuel" (global).

4. Section 4.3, p. 12

Indicate where the assumptions are used in the analysis (global).

5. Section 4.3.1.2, p. 13

A management decision has been made to continue using the ANSI/ANS 6.1.1-1977 standard, which was incorporated in the Radiation Shielding Design Guide. Assumption 4.3.1.2 presents a conflict of this decision.

6. Sections 4.3.1.3, 4.3.1.5 and 4.3.1.6, p. 13

Delete unnecessary assumptions. A careful check should be performed on all assumptions to be sure if and where they are used.

7. Section 4.3.1.7, p. 13

This assumption applies to the contribution from the active fuel region only. Inclusion of the end fitting contributions may invalidate this assumption.

8. Section 4.3.1.9, p. 13

~~Delete "not"~~. This assumption does not appear used in the analysis.
10/23/97

9. Section 4.3.4.3, p. 15

The PWR SFA width is too small (see comment #3e).

10. Section 4.3.4.5, p. 15

Per Ref. 5.23, scaling should be made from the high burnup data, not linear interpretation between the standard and high burnup data.

11. Section 4.4.2, p. 18

Do not believe that ICRP9 is used in the analysis.

12. Refs. 5.24 through 5.28, p. 20

Need the batch number for the computer data.

13. Ref. 5.29, p. 20

Use the released version, not the check or review version.

14. Section 6, p. 21

Identify the qualified hardware used.

15. Section 7, General comments

This section and the accompanying attachments are difficult for the reviewer to follow. Suggest organizing by subsections to describe source, model, calculation, and results individually for each case. The description should focus on how the codes are applied in the analysis, e.g., modeling of the source and geometry, use of buildup factors, etc. There is no need to repeat the capabilities of the codes which are available in the references.

The waste package or disposal container model should be consistent with that used in the Waste Package Development and Repository - Subsurface Design Departments. Also make the source model consistent, including the active fuel and non-fuel regions.

16. Attachment I

- a. Organize per suggestion in Comment #15 (global for all attachments).
- b. Include all input or sample files for reviewers to check technical correctness (global for all attachments).
- c. Modify Fig. I-1 to make it understandable and technically acceptable (global for similar pictures in other attachments).

- d. Shielding is determined after the waste package is loaded and secured in the transporter. The transfer of the waste package from the Load Cell to the transporter is unshielded. It appears more appropriate to base the required shielding wall thickness on the unshielded WP.
- e. Results in Table I-3.1 are questionable. For example, the dose rate at (-899.16, 182.2, 0) is unreasonably high, as compared to other points.
- f. No plot data are given for Fig. I-2. The design dose rate limit is shown as 0.18 mrem/hr instead of 0.25 mrem/hr (global).
- g. The concrete attenuation shown in Fig. I-2 appears over-stated. It shows that one foot of concrete reduces the dose rate by a factor of 200. The reasonable value is about 60 for the PWR fuel gamma source.

17. Attachment II

- a. Focus on the code applications. Delete description of the code capabilities (global for all attachments).
- b. Table II-2.1 (p. II-2): Compare on an apple-to-apple basis (i.e., including all contributions for all cases). The contribution from the TTP is apparently relatively small. The agreement in the active fuel contribution between the codes is actually poor, indicating a suspicious modeling problem.
- c. Add QAP-SI-0 in the last paragraph of Summary
- d. Other comments on this attachment (See comment #18).

18. Attachment III

- a. Table III.2-1 (p. III-2): Two data points are inadequate for the plot.
- b. Table III-3-1 (p. III-4): Change "Source Position" to "Half Matrix", and "1 Matrix" to "Full Matrix" (global). Results are questionable, as the two dose points should have similar dose rates.
- c. Section 3.2 (p. III-4): PATH can take cm or ft (in.) input. Delete the code capability description. Show the volumetric source strength used for active fuel. Include the gas plenum Co-60 source (global for all analyses).
- d. Table III-3.2 (p. III-5): Indicate that the results are for "half matrix" and "full matrix".

e. Table III-3.3.1 (p. III-6): The MicroShield results for the active fuel region appear grossly over-estimated, as shielding by the intervening assemblies is ignored. These results should not be used for comparison to the QAD and PATH results, because of the differences in modeling.

f. Table III-3.4 (p. III-6): Questionable results (see comment #18b).

g. Fig. III-3 (p. III-9): The attenuation curve may be linear on the semi-log scale, but not on the linear scale.

19. Attachment IV

a. Fig. IV-1 (p. IV-2): The inner and outer barriers should be shown as circles.

b. Table IV-3.1 (p. IV-4): Show how the results are combined.

c. Section 3.1, last paragraph (p. IV-4): Define "side shields" or use the common terminology.

d. Table IV-3.2 (p. IV-5): Results in this table are inconsistent with those in Table IV-3.1. Check and resolve the discrepancies.

e. Table IV-3.3 (p. IV-7): The MicroShield results are in poor agreement with QAD, indicating that a modeling problem may exist in the analysis.

f. Fig. IV-3 (p. IV-8): Plot data are inconsistent with the tabulated results. Indicate which curve is used to determine the shielding thickness.

20. Attachment V

a. Table V-3.2 (p. V-5): Relative contributions from different source regions are questionable. Also, the combined total result may not be properly obtained with the way QAD was run. This comment applies to all similar analyses.

b. Fig. V-2 (p. V-6) : Correct the design dose rate limit.

21. Attachment VI

Table VI-3.1 (p. VI-4): If the model includes the inner and outer barriers, this analysis is then incorrect, as the WP surface dose rate is about 40 rem/hr. With one foot of concrete for DP1, the dose rate should be less than 1 rem/hr, not 138 rem/hr as given. The analyses in other attachments should be checked to see if the same type of error was made.

22. Attachment VII

- a. The source basis for the DHLW is inconsistent with the ACD design basis (see comment #3i).
- b. Table VII-3.1: Clarify "ms" for dose point 1. Large discrepancies are noted between QAD and MicroShield. Check and resolve differences.

23. Attachment VIII

Results of this analysis are inconsistent with those in Attachment IV for the disposal container case without the "side shields". For instance, with 5 ft of concrete, Fig. VIII-3 (p. VIII-6) shows about $6\text{E-}04$ mrem/hr for 1 MPC versus about $1\text{E-}04$ mrem/hr for 1 DC in Fig. IV-3. The dose rate from the MPC is expected to be lower than, or comparable to, that from the DC, since the MPC provides additional shielding with 1" steel shell.

24. Attachment IX

- a. Sections 3.1.3 and 3.1.4 (p. IX-33 & IX-34): The end fitting source terms should correspond to the DBF characteristics (4.2%, 48086 MWd/MTU & 10 yr).
- b. Section 3.3 (p. IX-41): Check the heights used for the end fitting regions. Active fuel + top plate + bottom plate = $365.76 + 16 + 51.56$ cm = 433.32 cm = 170.6 in. which exceeds the fuel assembly length of 165.625 in. given on p. IX-3. The length of 165.625 " includes the gas plenum region, while 170.6 " does not.

TYPE RESPONSE:

- ☒ Initial
☐ Complete
☐ Amended

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WASHINGTON, D.C.

DR/CAR NO. BSC-02-D-064

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OF

QA:

DEFICIENCY/CORRECTIVE ACTION REPORT (RESPONSE)

14a. Immediate Actions:

Design personnel were reminded to resolve mandatory comments and to obtain concurrence prior to issue of the document. They were also reminded that unresolved issues should be escalated to management for resolution and the resolution documented as required by the controlling procedure. (See L. Trautner e-mail dated February 7, 2002)

Compliance Date: February 7, 2002

14. Remedial Actions:

The basis for the shield wall thickness may be incorrect. However, it is not expected that this will have an adverse impact since this is a detail that will be worked out in final design. The Waste Handling Building Shield Wall Analysis will be reviewed against the unresolved comments to determine if there is an adverse impact. This review will be conducted by Analysis and Component design group since there is no longer a Subsurface design organization. The unresolved comments and a response to these comments will be documented and appended to the records package.

15. Extent of Condition:

A list of other controlled documents initiated by the author or the checker of the Waste Handling Building Shield Wall Analysis has been developed. The records packages for these include evidence that the comments identified were resolved. However, three of these documents will be evaluated to determine if there is any technical impact since the topic of these is related to shielding or dose calculations, and these were not originally required to be reviewed by the Subsurface Design Organization or the Waste Package Design Organization.

16. Cause: (Attach results of root cause determination prepared in accordance with AP-16.4Q for a significant deficiency.)

Because the author and checker of this document are no longer on the project, it is unknown why the Subsurface design organization comments were not resolved, why the subsurface group was omitted as a reviewer of the subsequent draft, and why there were anomalies in the original master review copy records package. These deficiencies occurred several years ago under a different organization. As stated above, design personnel have been reminded of the importance of resolving the mandatory comments as required by the procedures.

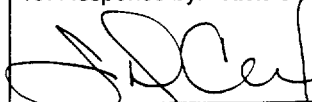
17. Action to Preclude Recurrence:

After the completion of the extent of condition if it is determined that additional actions to preclude recurrence are necessary, these will be provided in the final response.

18. Due Date: March 11, 2002

- ☒ For submittal of complete response
☐ For completion of corrective action

19. Response by: Jack Cloud Responsible Individual: Martin Haas



Date 2-12-02 Phone 295-4383

20. Evaluation: ☒ Accept ☐ Partially Accept ☐ Reject

William J. Blaser for
 QAR JAMES Voigt

Date 02-14-02

21. Concurrence:

DOQA James Blaylock

Date 2/15/02

TYPE RESPONSE:

- ☐ Initial
☒ Complete
☐ Amended

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DR/CAR NO. BSC-02-D-064

PAGE

OF

QA: LQA

DEFICIENCY/CORRECTIVE ACTION REPORT (RESPONSE)

14a. Immediate Actions:

Design personnel were reminded to resolve mandatory comments and to obtain concurrence prior to issue of the document. They were also reminded that unresolved issues should be escalated to management for resolution and the resolution documented as required by the controlling procedure. (See L. Trautner e-mail dated February 7, 2002)

Compliance Date: February 7, 2002

14. Remedial Actions:

The basis for the shield wall thickness may be incorrect. However, this will not have an adverse impact since this is a detail that will be worked out in final design. The Waste Handling Building Shield Wall Analysis has been reviewed against the unresolved comments to determine if there is an adverse impact. This review was conducted by the Analysis and Component design group since there is no longer a Subsurface design organization. The unresolved comments and a response to these comments was documented and appended to the records package. There were no adverse impacts.

15. Extent of Condition:

A list of other controlled documents initiated by the author or the checker of the Waste Handling Building Shield Wall Analysis has been developed. The records packages for these include evidence that the comments identified were resolved. Four were evaluated to determine if there was any technical impact since the topic is related to shielding or dose calculations and were not originally required to be reviewed by the Subsurface Design Organization or the Waste Package Design Organization. This evaluation is attached. There were no adverse impacts.

16. Cause: (Attach results of root cause determination prepared in accordance with AP-16.4Q for a significant deficiency.)

Because the author and checker of this document are no longer on the project, it is unknown why the Subsurface design organization comments were not resolved, why the subsurface group was omitted as a reviewer of the subsequent draft, and why there were anomalies in the original master review copy records package. These deficiencies occurred several years ago under a different organization. As stated above, design personnel have been reminded of the importance of resolving the mandatory comments as required by the procedures.

17. Action to Preclude Recurrence:

Based on the extent of condition it has been determined that no additional actions to preclude recurrence are necessary.

18. Due Date: March 11, 2002

- ☐ For submittal of complete response
☒ For completion of corrective action

19. Response by: Jack Cloud Responsible Individual: Martin Haas

Date

3-7-02

Phone 295-4383

20. Evaluation:

☒ Accept☐ Partially Accept☐ Reject

QAR James V. VOIGT

Date 3-11-2002

21. Concurrence:

DOQA James Blaylock

Date 3/13/02

A. Extent of Condition and Technical Impacts of Related Documents

Four related documents were identified for evaluation of the extent of condition as well as technical impacts. These documents were originated by the same author as the *Waste Handling Building Shield Wall Analysis* document (DI: BCBD00000-01717-0200-00011 REV 00, MOL.19990111.0156), and related to radiation shielding and dose calculations by the Surface Design group. The results of the evaluation are presented below for each document identified.

1. Calculation Document: *Shielding and Dose Assessment for the Surface Handling Facilities in Support of the LA Features and Alternative Design* (DI: BCBD00000-01717-0200-00023 REV 00, MOL.19981202.0546)

Extent of Condition: This document is an engineering calculation document, which was exempt from design review by affected organizations. The checking and approval of the document complied with NLP-3-27, Rev. 0 in effect at that time. This document is free of the condition associated with *Waste Handling Building Shield Wall Analysis* (DI: BCBD00000-01717-0200-00011 REV 00, MOL.19990111.0156).

Technical Impacts: The calculation supported the evaluation of the LA features and alternative design in the areas of shielding and dose assessment for the surface facility operations. The features considered in the evaluation included: ceramic coatings of waste packages, magnetite self-shielded waste package, DUCRETE self-shielded waste package, fuel rod consolidation, etc. Since the features evaluated in this document were not selected for the subsequent design for Site Recommendation, there is no technical impact resulting from any possible deficiency of this document.

2. Design Analysis Document: *Waste Handling Operations - Dose Assessment* (DI: BCBD00000-01717-0200-00010 REV 00, MOL.19980204.0909)

Extent of Condition: This document was checked (MOL.19980112.0497) by Dr. Martin N. Haas, and reviewed (MOL.19980112.0504) by Dan McKenzie of the former Subsurface Design Department, in accordance with QAP-3-9 Rev. 7 in effect at that time. The checking and review process was in compliance with the QA procedures. Comments from checking and design review were satisfactorily resolved and incorporated into REV 00. This document was a deliverable to the DOE, and received DOE acceptance (MOL.19980204.0907). This document is free of the condition associated with *Waste Handling Building Shield Wall Analysis* (DI: BCBD00000-01717-0200-00011 REV 00, MOL.19990111.0156).

Technical Impacts: This document has become obsolete, as it was later revised and superseded to reflect the design changes (see REV 01 below). Therefore, there is no technical impact associated with this design analysis document.

3. Design Analysis Document: *Waste Handling Operations - Dose Assessment* (DI: BCB00000-01717-0200-00010 REV 01, MOL.19990104.0467)

Extent of Condition: This document supercedes REV 00 (MOL.19980204.0909) with complete revision to reflect updates to the operational sequences, incorporation of additional transportation cask dose rate information, and potential ALARA design modifications. The document was neither checked nor reviewed by the former Subsurface Design Department. However, the checking, review and approval process satisfied QAP-3-9, Rev. 7 in effect at that time. This document is free of the condition associated with *Waste Handling Building Shield Wall Analysis* (DI: BCB00000-01717-0200-00011 REV 00, MOL.19990111.0156).

Technical Impacts: The basis used in this document is the waste package (WP) design for Viability Assessment (see Table 4-1b, Item 6, p. 16), which provides thicker barrier walls than the design for Site Recommendation (SR). Accordingly, the results in this document should not be used for License Application (LA) design. The document needs to be revised to be consistent with the WP design, surface facility layout, operational sequences, and radiation source terms for LA.

4. Technical Report: *Radiation Access Zone and Ventilation Confinement Zone Criteria for the MGR Surface Facilities* (DI: TDR-WHS-NU-000001 REV 00, MOL.20000920.0227)

Extent of Condition: This document was developed in accordance with AP-3.11Q, Rev. 1, ICN 1 in effect then. The former Subsurface Design Department was excluded from the design review, as there were no interfaces with the subsurface facilities identified. Therefore, This document is free of the condition associated with *Waste Handling Building Shield Wall Analysis* (DI: BCB00000-01717-0200-00011 REV 00, MOL.19990111.0156).

Technical Impacts: This document provides the criteria for radiation access and ventilation confinement access zones for the surface facilities only. No shielding or dose calculations were involved in this document. Hence, there is no technical impact resulting from this document.

B. Impacts on SR Documents

In addition to the evaluation in Section A, the extent of condition also covers the impacts of BSC-02-D-064 on the documents supporting SR as described below:

1. *Final Environmental Impact Report for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada* (DOE/EIS-0250, MOL.20020207.0244 through 20020207.0249)

Table F-8 (p. F-25) of this document provides estimates of annual exposures (person-rem per year) for surface facility workers during handling and packaging of waste material for emplacement. The source of the information is from Table 6-2 of the cited reference: [CRWMS M&O 2000. *Repository Surface Engineering Files Report Supplement*. TDR-WHS-EV-000001 REV 00 ICN 01. Las Vegas, Nevada: CRWMS M&O. ACC:

MOL.20000626.0025]. The reference points to an input transmittal: [CRWMS M&O 2000. *Worker Dose to Support the Surface Engineering File*. Input Transmittal 00129.T. Las Vegas, Nevada: CRWMS M&O. ACC: MOL.20000322.0261]. The documents affected by or related to Deficiency Report (DR) BSC-02-D-064 were not used in this reference to support the Final Environmental Impact Statement (FEIS) Report. Therefore, the documents associated with BSC-02-D-064 pose no impact on the FEIS.

2. ***Yucca Mountain Site Suitability Evaluation*** (DOE/RW-0549)

Table 2-8 (p. 2-30) provides a summary of preclosure Category 1 event sequence radiation doses for the public and repository workers, based on the FEIS report. Since the FEIS report does not use the documents associated with DR BSC-02-D-064 directly or indirectly for references, this DR has no impact on the *Yucca Mountain Site Suitability Evaluation* report.

3. ***Yucca Mountain Science and Engineering Report***, Revision 1 (DOE/RW-0539-1)

This document contains the following references related to the surface facilities:

- (a) CRWMS M&O 2000p. *Engineering Files for Site Recommendation*. TDR-WHS-MD-000001 REV 00. Las Vegas, Nevada: CRWMS M&O. ACC: MOL.20000607.0232.
- (b) CRWMS M&O 2000q. *WHB/WTB Space Program Analysis for Site Recommendation*. ANL-WHS-AR-000001 REV 00. Las Vegas, Nevada: CRWMS M&O. ACC: MOL.20000808.0408.

These references refer to the *Waste Handling Building Shield Wall Analysis* document (DI: BCBD00000-01717-0200-00011 REV 00, MOL.19990111.0156) for shield wall thickness, space requirements and facility layout. The basis used in this document is inappropriate for SR, as the waste package design remained the same as the VA design. Use of the SR WP design would increase shielding for the waste handling building, because of additional shielding required to compensate for the reduced WP barrier wall thickness in the SR design. The increased shielding may impact the space requirements and layout of the surface facilities. The shielding deficiency represents a design issue rather than an SR issue, as the surface facility design is still evolving and subject to change. Since the *Waste Handling Building Shield Wall Analysis* document will be revised, there will be no impact on the design for LA.

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CONDITION ADVERSE TO QUALITY CONTINUATION PAGE

VERIFICATION OF CORRECTIVE ACTIONS FOR DR BSC-02-D-064

BLOCK 14a - IMMEDIATE ACTIONS

VERIFICATION OF CORRECTIVE ACTIONS FOR DEFICIENCY REPORT (DR) BSC-02-D-064

BLOCK 14a - IMMEDIATE ACTIONS

Commitment: (1) Design personnel to be instructed on the importance of resolving issues identified during the review of documents. An e-mail to be provided summarizing the situation and discussing the correct actions to be followed.

Confirmation: (1) Examined e-mail Carmella Gonzalez to Design Staff dated 2/8/02 on "DR-64: Concerning Unresolved Mandatory Review Comments" that adequately meets the above commitment.

BLOCK 14 - REMEDIAL ACTIONS

Commitment: (1) Unresolved comments and a response to these comments will be documented and appended to the records package.

Verification: (1) Examined records package dated 3/6/2002 submitted to the Records Processing Center for Radiological Safety Design Analyses - BCBD00000-01717-0200-00011, REV.00B. This records package appropriately cross references existing affected records and documents status and impact of unresolved comments. Documentation prepared by S. Su and M. Haas appeared comprehensive, complete and adequately concludes the remedial actions. The Records Processing Center return receipt acknowledgement was also examined, it is dated 3/25/2002 and was assigned a number of MOY-020325-11.

BLOCK 15 - EXTENT OF CONDITION

Commitment: (1) Establish a list of other controlled documents initiated by the author/checker of the Radiological Safety Design Analyses - BCBD00000-01717-0200-00011, REV.00B. Reviewers are to examine the records packages for evidence that the comments identified were resolved. Three documents related to shielding or dose calculations will be evaluated for technical impact because their original review did not include the Subsurface Design Organization or the Waste Package Design Organization.

Confirmation: (1) List of controlled documents was established by D. Tunney and was verified. Discussed with reviewers S. Su and M. Haas their examination of documents from this list related to radiation shielding and dose calculations. Their review determined that comments were adequately resolved and that there were no adverse impacts, summaries of their results are attached to the complete DR response. Activities discussed adequately addressed the extent of condition commitments.

The Impact Evaluation was also assessed by the reviewers and addressed in the attachment to the complete DR response and is reasonable based upon their knowledge of the subject and their past experience reviewing these record types.

BLOCK 16 - CAUSE

The cause of the deficient condition is indeterminate, possibly human error. The individuals responsible are not available to determine reasons for their review actions, as they are no longer with the project.

BLOCK 17 - ACTION TO PRECLUDE RECURRENCE

Commitment: (1) No commitments were identified for 'Actions to Preclude Recurrence'.

Confirmation: (1) Extent of condition did not reveal any similar problems and the DR deficient condition is considered an isolated case. Also the identified condition occurred (July 1997) prior to the Process Validation and Re-engineering (PVAR) process

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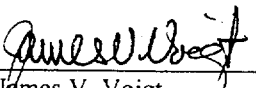
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CONDITION ADVERSE TO QUALITY CONTINUATION PAGE

revisions of 6/30/99. Implementation of PVAR procedures and the current post-PVAR procedures have initiated additional controls that will aid in precluding similar deficiencies.

Based upon the satisfactory verification of corrective action commitments described above, it is recommended that this DR be closed.


James V. Voigt

27 March 2002
Date