



Department of Energy
Office of Civilian Radioactive Waste Management
Yucca Mountain Site Characterization Office
P.O. Box 98608
Las Vegas, NV 89193-8608
APR 25 1996

Wesley E. Barnes, Project Manager, YMSCO, NV
ATTN: James R. Compton, YMSCO, NV

EVALUATION OF AMENDED RESPONSE TO AND VERIFICATION OF
CORRECTIVE ACTION AND CLOSURE OF CORRECTIVE ACTION REQUEST
(CAR) YMQAD-96-C003 RESULTING FROM YUCCA MOUNTAIN QUALITY
ASSURANCE DIVISION'S (YMQAD) REVIEW (SCPb: N/A)

The YMQAD staff has evaluated the amended response to and
verified the corrective action to CAR YMQAD-96-C003 and
determined the results to be satisfactory. As a result, the CAR
is considered closed.

If you have any questions, please contact either Robert B.
Constable at (702) 794-7945 or Stephen R. Dana at (702) 794-7176.

Robert B. Constable

YMQAD:RBC-1605

Richard E. Spence, Director
Yucca Mountain Quality Assurance Division

Enclosure:
CAR YMQAD-96-C003

cc w/encl:
R. L. Strickler, M&O, Vienna, VA
R. P. Ruth, M&O, Las Vegas, NV
Patricia Pytel, M&O, Las Vegas, NV
D. S. White, M&O, Las Vegas, NV
E. R. Cooper, YMSCO, NV
Records Processing Center

cc w/o encl:
W. L. Belke, NRC, Las Vegas, NV
S. R. Dana, YMQAD/QATSS, Las Vegas, NV
D. G. Sult, YMQAD/QATSS, Las Vegas, NV

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WM-11

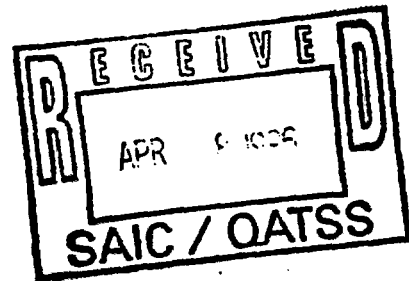
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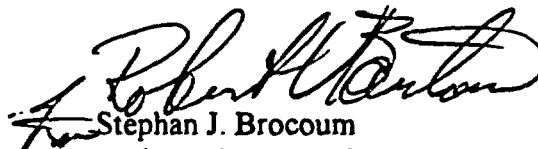
APR 08 1996



Richard E. Spence, Director, Yucca Mountain Quality Assurance Division, NV

**AMENDED RESPONSE TO CORRECTIVE ACTION REQUEST (CAR) YMQAD-96-C003
(SCP.B. N/A)**

Enclosed is the amended response to CAR YMQAD-96-C003 for evaluation by the Yucca Mountain Quality Assurance Division. If you have any questions regarding this amended response, please contact James R. Compton at 794-7076.


Stephan J. Brocoum
Assistant Manager for
Suitability and Licensing

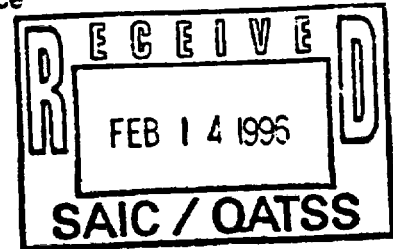
AMSL:JRC-1546

Enclosure:
CAR YMQAD-96-C003
Amended Response

cc w/encl:
W. L. Belke, NRC, Las Vegas, NV
D. G. Sult, QATSS, Las Vegas, NV
S. B. Jones, YMSCO, Las Vegas, NV
R. L. Craun, YMSCO, Las Vegas, NV
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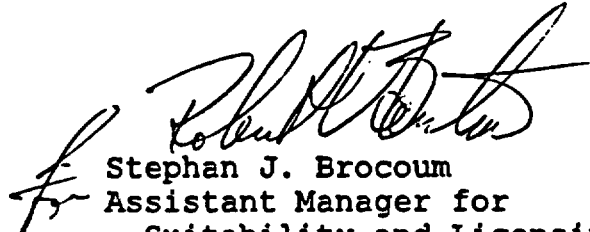
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P.O. Box 98608
Las Vegas, NV 89193-8608
FEB 14 1996



Richard E. Spence, Director, Yucca Mountain Quality Assurance
Division, NV

CORRECTIVE ACTION REQUEST (CAR) YMQAD-96-C003 RESPONSE
(SCPB: N/A)

Enclosed is the response to YMQAD-96-C003. If you have any
questions, please contact James R. Compton at
(702) 794-7076.


Stephan J. Brocoun
Assistant Manager for
Suitability and Licensing

AMSL:DCR-1175

Enclosure:
CAR YMQAD-96-C003

cc w/encl:

D. G. Sult, YMQAD/QATSS, Las Vegas, NV (Original)
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J. R. Dyer, YMSCO, NV

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RADIOACTIVE WASTE MANAGEMENT
U.S. DEPARTMENT OF ENERGY
WASHINGTON, D.C.8
CAR NO. YMQAD-96-C003
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CORRECTIVE ACTION REQUEST

1 Controlling Document:

OCRWM QARD, DOE/RW-0333P, Revision 1

2 Related Report No.:

CAR YM-94-100

3 Responsible Organization:

YMSCO

4 Discussed With:

R. Schreiner/W. Simecka

5 Requirement:

Note: This CAR is issued to supersede CAR YM-94-100 in order to implement the revised OCRWM Corrective Action Program QARD, Sections 5.2.2.B, 5.2.2.D, and 5.2.2.E. "Implementing documents shall include the following information as appropriate to the work to be performed:

B. Technical and regulatory requirements.

D. Quantitative or qualitative acceptance criteria sufficient for determining that activities were satisfactorily accomplished.

E. Prerequisites, limits, precautions, process parameters, and environmental conditions."

6 Description of Condition:

There is a lack of adequate flowdown and traceability of 10CFR60 requirements to the ESFDR.

Discussion - Examples are:

- Quantitative criteria not provided through ESFDR to Specifications for 10CFR60 requirements. Examples of this are: maximum allowable convergence for opening; maximum rate of convergence for openings; maximum allowable tonnage of rock falls. Quantitative design criteria are necessary: 1) for the designers to provide a credible design, 2) for DOE to adequately determine if they have received a design that will meet the objectives or goals of the designs intended application, and 3) for the designers to satisfactorily perform the design validation process which is part of the performance confirmation process. Furthermore, what constitutes deleterious rock movement resulting from ramp convergence or rock falls needs to be defined.
- 10CFR60.141 has not been adequately addressed in the ESFDR. This especially applies to 10CFR60.141 (d). The requirement in 10CFR60.141 (d) states: "These measurements and observations shall be compared with the original design bases and assumptions, the need for modifications to the design or in construction methods shall be determined (contd.)"

7 Initiator:


Kenneth O. Gilkerson

Date 1-25-96

9. Does a stop work condition exist?


Yes ___ No ☒ ; If Yes, Attach copy of SWOIf Yes, Check One: ☐ A ☐ B ☐ C ☐ D

10. Recommended Actions:

Quantify the design criteria (performance criteria) in the ESFDR or any subsequent lower-tiered documents such that the requirements in 10CFR60 are adequately addressed with specific criteria for design activities. A more specific quantified design criteria will also be required to satisfactorily determine if the engineered item is performing as intended. This should be part of the design validation process which in turn is part of the performance confirmation process.

With regard to establishing a quantitative design criteria for its immediate use in the North Ramp Package 2C design, it is recommended that the design group be required to either use the quantitative design criteria developed by Hardy and Bauer in their Sandia Report 89-0837, "Drift Design Methodology and Preliminary Application for the Yucca Mountain Site Characterization Project," dated December 1991, or develop an alternative justifiable quantitative design criteria. (contd.)

11 QA Review:


C.C. Wam
K.O. GILKERSON

Date 1-26-96

12 Response Due Date:

10 working days from issuance

13 Affected Organization QA Manager Issuance Approval:

Printed Name ROBERT B CONSTABLE

Signature



Date 1-30-96

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WASHINGTON, D.C.**

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CORRECTIVE ACTION REQUEST

14 Remedial Actions:

See Action to Preclude Recurrence for additional remedial actions. A Regulatory Compliance Review Report was prepared and delivered to the NRC (Ltr, Brocoum to Holonich, dtd 10/25/1995; Ltr, Dreyfus to Bernero, dtd 3/14/95; Ltr, Dreyfus to Paperiello, dtd 8/3/95; Regulatory Compliance Review Report, dtd March 1995 and July 1995). This Regulatory Compliance Review Report demonstrated the adequacy of the flowdown and implementation of appropriate 10 CFR 60 requirements to the ESFDR and from the ESFDR into the design solutions.

The NRC has reviewed the Regulatory Compliance Review Report and concluded that, "... the DOE, in general, has identified 10CFR60 requirements applicable to the ESF Design Package 2C. The assessment of 10CFR60 design requirements included in the report is acceptable." (Ltr, Bell to Brocoum, dtd December 1995). (contd.)

15 Investigative Actions:

YMQAD-96-C003 identified a concern with demonstrating the adequacy of the flowdown and traceability of 10 CFR 60 requirements into the ESFDR and quantitative criteria not provided through ESFDR to specifications for 10CFR60 requirements. The NRC has also expressed a concern regarding DOE's difficulty in demonstrating this flowdown.

The adequacy of flowdown and traceability issue is concerned with ensuring that 10 CFR 60 requirements are adequately addressed in the ESFDR and ultimately in the actual design. In response to this potential problem, the M&O has completed two Regulatory Compliance Review Reports which investigated and documented the flowdown and traceability of 10 CFR 60 requirements that were identified by NUREG-1439 (Ltr, Brocoum to Holonich, dtd 10/25/1995; Ltr, Dreyfus to Bernero, dtd 3/14/95). (contd.)

16 Root Cause Determination:

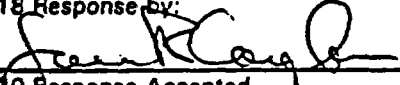
The design documentation existing at the time of the audit did not facilitate ease of demonstrating compliance with 10CFR60 requirements.

17 Action to Preclude Recurrence:

Regulatory Compliance Review Reports, dtd March 1995 and July 1995, demonstrated adequate traceability and flowdown for the ESFDR Revision 1. (Completed)

The change to the Design Analysis Quality Assurance Procedure, QAP-3-9, effective 5 February 1995, requires the designer to identify specific requirements from the applicable requirements document and then to identify the design criteria developed in the analysis to satisfy these requirements. These design criteria are then used to develop design specifications and drawings. This improvement provides a mechanism to assure that 10CFR60 requirements, as traced through the document hierarchy, are implemented into the design. (Completed)

(contd.)

<p>18 Response by:  Date <u>4/1/96</u></p>	<p>19 Corrective Action Due Date: <u>2/14/96</u></p>
<p>20 Response Accepted OAR <u>N/A</u> Date _____</p>	<p>21 Response Accepted AOQAM <u>N/A</u> Date _____</p>
<p>22 Amended Response Accepted OAR <u>S. Dreyfus</u> Date <u>4/16/96</u></p>	<p>23 Amended Response Accepted AOQAM <u>R. Bernero</u> Date <u>4-17-96</u></p>
<p>24 Corrective Actions Verified OAR <u>S. Dreyfus</u> Date <u>4/17/96</u></p>	<p>25 Closure Approved by: AOQAM <u>R. Bernero</u> Date <u>4-17-96</u></p>

4/5/96 HMISL: JRC-1546

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

8 ☒ Corrective Action Request
☐ Stop Work Order

NO. YMQAD-96-C003

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CAR/SWO CONTINUATION PAGE

6 - Adverse Condition (continued)

and these differences and the recommended changes reported to the Commission." This requirement defines the design validation process that must be performed by the design group. To determine what constitutes "measurements and observations" as stated in this requirement, see 10CFR60.141 (a), (b), and (c).

NOTE: This adverse condition was originally part of CAR YM-94-074 that was issued to the M&O as a result of audit YMP-94-01. This CAR escalates the issues involved to the YMSCO for resolution.

10 - Recommended Actions (continued)

Whatever criteria is selected should be further developed and/or verified by determining what constitutes deleterious rock movement as described in 10CFR60.133 (e) (2). More specifically, how much convergence or rock falls can be allowed before there is an adverse impact on waste isolation or radiological safety. This is really the key to the whole quantitative design criteria question. Presently, there is enough data and numerical techniques for the Yucca Mountain Site Characterization Project (YMP) to address what constitutes deleterious rock movement with regard to convergence and rock fall magnitudes. An effort to determine what constitutes deleterious rock movement should be put on a very high priority so that the YMP will have a credible basis for development of the design.

Once this criteria is developed, it could be placed in the ESFDR or lower-tier specifications and labeled as (TBV). Then the design group could use the methodology currently being developed as part of the resolution to CAR YM-94-073 to compare data collected during ESF construction with these developed baseline criteria and make appropriate design changes as necessary.

Evaluate the impact of this CAR on the start-up of the TBM.

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CAR/SWO CONTINUATION PAGE

14- Remedial Actions:

Finally, the M&O has conducted surveillance 96-NSS-13 to verify traceability of specific 10CFR60 requirements to individual analysis. The report's Executive Summary states, "The requirements for documenting the criteria and showing a trace to the applicable ESFDR requirement was satisfactorily implemented in the analyses reviewed. With respect to verifying flowdown of 10CFR60 requirements into analysis, the surveillance determined that the existing process works, but is still cumbersome."

15- Investigative Actions:

Ltr, Dreyfus to Paperiello, dtd 8/3/95; Regulatory Compliance Review Report, dtd March 1995 and July 1995). The cumbersome nature in demonstrating compliance with 10CFR60 requirements has lead the M&O to revise the ESFDR to simplify the flowdown and traceability of 10CFR60 requirements (ESFDR Rev 2).

The concern in regard to quantitative criteria not provided through ESFDR to specification for 10CFR60 requirements has been investigated and found to be in compliance with the QARD, paragraph 5.2.2.D. Requirements documents may contain quantitative or qualitative acceptance criteria sufficient for determining that activities were satisfactorily accomplished. Sufficiency has been demonstrated by the QAP 6.2 review process. The Technical Document Preparation Plan for Design Confirmation Analyses, revision 00, dtd February 20, 1996, in response to CAR 73 will support the specification of essential site specific data and information to be acquired under approved site characterization study plans and the subsequent completion of the design confirmation analysis for the purpose of evaluating and assessing the ESF ground support and opening design.

17- Action to Preclude Recurrence:

The Technical Document Preparation Plan for Design Confirmation Analyses, revision 00, dtd February 20, 1996, in response to CAR 73 provides guidance for the development, review and revision of Design Confirmation Analyses. (Completed)

Completion of the ESFDR Revision 2 has simplified the traceability and flowdown of 10CFR60 requirements. Requirements have been allocated to the configuration item and organized. All 10CFR60 requirements defined in NUREG 1439 have been analyzed for applicability to the ESF. All requirements in response to 10CFR60 are identified in the parent trace for clarity. (Completed by 30 April 1996)

CAR NO. YMQAD-96-C003
VERIFICATION OF CORRECTIVE ACTION
DATED APRIL 16, 1996

REMEDIAL ACTIONS

1. Reviewed Regulatory Compliance Review Reports, dated March 1996 and July 1995, to determine adequacy of flowdown and implementation of 10 CFR 60 requirements to the ESFDR and from the ESFDR to the design output.

Resolution: Acceptable

2. Reviewed M&O Surveillance 96-NSS-13. The surveillance executive summary does state that, "The requirements for documenting the criteria and showing a trace to the applicable ESFDR requirement was satisfactorily implemented in the analyses reviewed. With respect to verifying flowdown of 10 CFR 60 requirements into analysis, the surveillance determined that the existing process works, but is still cumbersome."

Resolution: Acceptable

ACTION TO PRECLUDE RECURRENCE

1. The TDPP for Design Confirmation Analysis, dated 2/20/96, page 3 states, "Design Confirmation analyses are intended to be part of the Performance Confirmation Program's baseline phase and will be specifically used for the assessment and evaluation of: Design changes to accommodate actual field conditions encountered as required by 10 CFR 60.141 and 141(d)." Also, the TDPP, page 3 states, "Design confirmation analyses will be used to satisfy 10 CFR 60.133 requirements which concern the development of additional design criteria for the underground facility. . ." and "Design confirmation analyses are intended to be part of the Performance Confirmation Program's baseline phase and will be specifically used for the assessment and evaluation of : Deleterious rock movement (10 CFR 60.133(e)(2))."

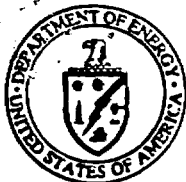
Resolution: Acceptable

2. ESFDR, Revision 2 simplified the traceability and flowdown of 10 CFR 60 requirements through use of configuration item identifiers. The ESFDR, Revision 2 is currently under Document Control. Note: YMQAD was a QAP-6.2 reviewer for the ESFDR, Revision 2.

Resolution: Acceptable

S. Dana: 

Date: 4/17/96



CAR-96003

Department of Energy
Office of Civilian Radioactive Waste Management
Yucca Mountain Site Characterization Office
P.O. Box 98608
Las Vegas, NV 89193-8608

JAN 31 1996

*Jack FYI
Bill
Berké
6/4/96*

Wesley E. Barnes, Project Manager, YMSCO, NV
ATTN: James R. Compton, YMSCO, NV

ISSUANCE OF CORRECTIVE ACTION REQUEST (CAR) YMQAD-96-C003
RESULTING FROM YUCCA MOUNTAIN QUALITY ASSURANCE DIVISION
(YMQAD) REVIEW (SCPB: N/A)

Enclosed is CAR YMQAD-96-C003. In accordance with the implementation of Administrative Procedure 16.20, CAR YM-94-100 has been converted into CAR YMQAD-96-C003. Under direction of the Office of Quality Assurance, this conversion was necessary for this significant condition CAR as its resolution date extends beyond the end of the calendar year.

An acceptable response has never been obtained relative to this issue. The corrective actions to fix the deficiencies have hinged on the issuance of Exploratory Studies Facility Design Requirements, Revision 4, which to this date has not occurred. Please provide an amended corrective action response (with implementation dates) for YMQAD review within ten days of the date of this letter. A CAR Continuation Page has been provided. CAR YM-94-100 is now closed. Send the original of your response to Deborah G. Sult, YMQAD/QATSS, 101 Convention Center Drive, Suite 640, Las Vegas, Nevada 89109.

If you have any questions, please contact either Robert B. Constable at 794-7945 or Kenneth O. Gilkerson at 794-7738.

Robert B. Constable

YMQAD:RBC-1047 Richard E. Spence, Director
Yucca Mountain Quality Assurance Division

Enclosures:

1. CAR YMQAD-96-C003
2. CAR/SWO Continuation Page