

Management & Operating Contractor

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IMPLEMENTING LINE PROCEDURE

Title: CHECKLISTS FOR DESIGN PRODUCTS

FOR INFORMATION ONLY

Procedure Number: NLP-3-28

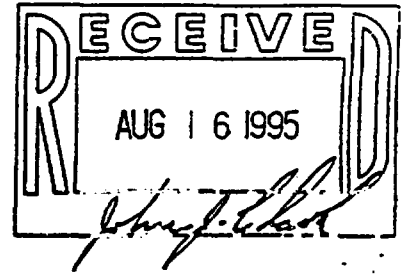
CONTROLLED COPY

Revision: 0

CRWMS M & O / LAS VEGAS, NV.
COPY NO. 101983

Effective Date: AUGUST 11, 1995

Author: W. J. Leonard



Responsible Manager: A. M. Segrest

Approvals:

[Signature]
Manager, Responsible Organization

7/27/95
Approval Date

Joe W Wells
QA Manager, Nevada

7-28-95
Approval Date

[Signature]
Office Manager

7/28/95
Approval Date

1. PURPOSE

This procedure supplements the checking requirements identified in Management and Operating (M&O) Quality Administrative Procedures, QAP-3-8, Specifications; QAP-3-9, Design Analyses; and QAP-3-10, Engineering Drawings.

2. SCOPE

This procedure applies to the Mined Geologic Disposal System (MGDS) Development organization of the Civilian Radioactive Waste Management System M&O Contractor at the Nevada Site.

3. APPLICABLE DEFINITIONS

Applicable definitions are found in the Design Control series of Quality Administrative Procedures (QAPs).

4. RESPONSIBILITIES

- 4.1 The MGDS Development Manager is responsible for the preparation and maintenance of this procedure.
- 4.2 The following persons have responsibilities in this procedure:
 - A. Checkers.

5. PROCEDURE

If an individual is performing work that is subject to this procedure and cannot accomplish that work in full compliance with this procedure, the individual shall suspend work and shall resume work only after this procedure has been revised to correct the affected work practices.

5.0 PROCESS OUTLINE

Not applicable.

5.1 The Checker shall:

- A. initiate a checklist for the document being checked (analysis, engineering drawing, or specification) which contains the following information as a minimum:
 - 1. the document identifier and revision number;
 - 2. the name of the checker and date checked;
 - 3. the review topics identified in QAP-3-8 and QAP-3-10 for specifications and engineering drawings, respectively;
- B. perform the required checks in accordance with the processes identified in the respective procedure, QAP-3-8, QAP-3-9, or QAP-3-10; and
- C. return the completed checklist and the engineering product to the originator of the product for resolution of comments, in accordance with the respective procedure.

6. RECORDS

There are no lifetime quality assurance (QA) records associated with this procedure.

The checklists are considered non-permanent QA records and are submitted to the Records Processing Center (RPC) in the records package of the checked document, by Engineering Document Control (EDC), in accordance with QAP-17-1, Record Source Responsibilities for Inclusionary Records.

7. ATTACHMENTS

None.

Design Analysis Checklist

Complete only applicable items.

Document Identifier		
Compliance Check By (Print Name)	Signature	Date

Yes	No	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1. Is the Design Analysis ready for Discipline Check?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is the Design Analysis copy clearly marked "Check Copy?"
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Does the Design Analysis include a Cover Sheet and Revision Record?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is the Design Analysis identified using a alphanumeric revision designator?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is the Design Analysis legible and in a form suitable for reproduction, filing, and retrieval?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. Is the Design Analysis ready for Final Check?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are Review Summary sheet(s), Check Copy, Interdiscipline Review Copy, and Quality Administrative Procedure QAP-3-1 Document Review Records (DRRs) from External Review included and properly filled out?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Does Design Analysis include a Cover Sheet and Revision Record?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is the Design Analysis legible and in a form suitable for reproduction, filing, and retrieval?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are appropriate signatures in place and with proper dates on the Design Analysis Review Summary?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3. Is referencing thorough and complete?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is the Design Analysis correctly listed in the Basis For Design (BFD)?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Do all references listed in Section 5, References, appear in the body of the Design Analysis?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Do the references listed in Section 5, References, have correct titles, revision numbers, and/or dates?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Do all references used in the body of the Design Analysis appear in Section 5, References?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Do all documents in Section 4.4, Codes and Standards, appear in the body of the Design Analysis?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Do the documents in Section 4.4, Codes and Standards, have correct titles, revision numbers, and/or dates?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Do all codes and standards used in the body of the Design Analysis appear in Section 4.4, Codes and Standards?

Design Analysis Checklist

(Continuation Page)

Complete only applicable items.

Document Identifier

Yes No N/A

4. For revised Design Analyses, have all revision requirements been met?

Yes No N/A

For revisions/changes, are changes identified by change bars in margin?

5. Are required tolerances justified within the body of the Design Analysis?

6. Is the Design Analysis properly titled, formatted, and identified?

Does the Design Analysis title, document identifier, and Configuration Item Identifier (CII) match the Engineering Document Control (EDC) listing?

Is the Design Analysis CII correct and at the appropriate level based on the current Configuration Item (CI) matrix?

Is the Design Analysis Cover Sheet numbered correctly?

Is description of revision history listed on Design Analysis Revision Record?

Is description of revision history clear and concise?

Do the title and document numbers appear consistently through all sheets?

Is Design Analysis title appropriate for the content?

7. Does format of the Design Analysis follow the requirements of Quality Assurance Procedure QAP-3-9, Attachment 1, Design Analysis Outline?

Has the Design Analysis been developed to the necessary detail in accordance with the Design Analysis Outline from QAP-3-9 (Attachment 1) as outlined below:

If any of the following sections cannot be used or do not warrant discussion, is one of the following used: "Not Applicable," "N/A," or "Not Used"?

SECTION 1 PURPOSE

Is the "Purpose" clearly defined?

SECTION 2 QUALITY ASSURANCE

Are appropriate "QA" Classifications identified in accordance with the Determination of Importance Evaluation (DIE), Quality Assurance (QA) Classification Analysis and NLP-3-18?

SECTION 3 METHOD

Is the design method used appropriate for the design?

Has the method been clearly defined?

SECTION 4 DESIGN INPUTS

Are design inputs and their sources identified?

Design Analysis Checklist

(Continuation Page)

Complete only applicable items.

QA: N/A

Page: 3 Of: 5

Document Identifier

SECTION 4 DESIGN INPUTS (Con't)

- | Yes | No | N/A | |
|--------------------------|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are the design inputs correctly selected? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are the design inputs correctly incorporated? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are the design inputs appropriate for use in the design (e.g., any assumptions, constraints, bounds, or limits of the input reflected in the design)? |

SECTION 4.1 DESIGN PARAMETERS

- | | | | |
|--------------------------|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are the design parameters used in the design and their sources properly identified? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are the design parameters listed correct? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Is the selection of the design parameters correct for the intended application? |

SECTION 4.2 CRITERIA

- | | | | |
|--------------------------|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Have criteria from requirements documents been listed? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Do the requirements documents listed have the correct titles, sections, and revision dates? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are the requirements listed directly applicable to the design subject? |

SECTION 4.3 ASSUMPTIONS

- | | | | |
|--------------------------|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are assumptions clearly stated? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Do assumptions have a documented basis? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are assumptions requiring verifications clearly identified? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Is justification provided for assumptions that do not require verification? |

SECTION 4.4 CODES AND STANDARDS

- | | | | |
|--------------------------|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Is a list of the applicable codes and standards included? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Do all applicable codes and standards include names, numbers, dates, and applicable revision data or addenda? |

SECTION 5 REFERENCES

- | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are sources of design inputs listed? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are other references listed? |

SECTION 6 USE OF COMPUTER SOFTWARE

- | | | | |
|--------------------------|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Is a list of Scientific and Engineering Software included? |
|--------------------------|--------------------------|--------------------------|--|

Design Analysis Checklist

(Continuation Page)

Complete only applicable items.

QA: N/A

Page: 4 of 5

Document Identifier

SECTION 6 USE OF COMPUTER SOFTWARE (Con't)

- | Yes | No | N/A | |
|--------------------------|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are the computer types, program names, version/revision numbers, and Computer Software Configuration Item (CSCI) number(s) listed and correct? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are the input files and outputs documented in the Design Analysis sufficient to allow independent repetition of software use? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are the output(s) reasonable compared to the input(s)? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Is a statement included indicating the software was appropriate for the application? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Is a statement included indicating the software was used only within the range of validation as described in the verification and validation documentation? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | If computational support software is used, are the software titles and version/revision number(s) provided? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | If computation support software is used, does the Design Analysis provide a documented description of the use, including user-defined formulas and/or algorithms, inputs, and results (outputs) sufficient to allow an independent repetition of the computation? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | If computational support software is used, are user defined formulas and/or algorithms correct, are inputs correctly selected, and are results (outputs) reasonable compared to the inputs? |

SECTION 7 DESIGN ANALYSIS

- | | | | |
|--------------------------|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Is the Design Analysis, including calculations, clearly presented so that any qualified individual could review the Design Analysis without recourse to the originator? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Is the Design Analysis complete and technically adequate? |

SECTION 8 CONCLUSIONS

- | | | | |
|--------------------------|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are conclusions, decisions, or recommendations presented clearly? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are the conclusions reasonable compared to the design inputs(s)? |

SECTION 9 ATTACHMENTS

- | | | | |
|--------------------------|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are supporting documentation included as attachments? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are attachments properly identified and paginated? |

Design Analysis Checklist

(Continuation Page)

Complete only applicable items.

Document Identifier

Yes No N/A

8. Are To Be Verified (TBVs) and To Be Determined (TBDs) properly identified?

Yes No N/A

Do TBDs and/or TBVs match logs?

Is unqualified data, assumptions based on preliminary data, or data requiring reverification noted "TBV" or for "REFERENCE ONLY"?

Is there justification why TBVs/TBDs for design parameters in SECTION 4.1 which are based upon unqualified data are not carried down to the design outputs (drawings and specifications)? Is it consistent with TBV/TBD description form

Is there justification why TBVs/TBDs/To Be Resolved (TBRs) in SECTION 4.2 for requirements cited from requirements documents are not carried down to the design outputs (drawings and specifications)?

Are assumptions in SECTION 4.3 that need to be verified identified as TBV?

Is the document listed in the TBX log?

Design Analysis Cover Sheet

Complete only applicable items.

1.

WED 2/15/95

QA: *TN*

Page: 1 Of: 10

2. DESIGN ANALYSIS TITLE Analysis of MPC Weight, Dimensional Envelope, and Configuration Requirements (SCAB N/A)			
3. DOCUMENT IDENTIFIER (Including Rev. No.) BB0000000-01717-0200-00003 REV 00		4. REV. NO. 00A	5. TOTAL PAGES 10
6. TOTAL ATTACHMENTS None	7. ATTACHMENT NUMBERS - NO. OF PAGES IN EACH N/A		8. SYSTEM ELEMENT MGDS System Element
	Print Name	Signature	Date
9. Originator			
10. Checker			
11. Lead Design Engineer			
12. QA Manager			
13. Department Manager			

14. REMARKS

FOR INFORMATION ONLY

CHECK COPY

Check performed 2/15/95.
The signature below attests that the check was performed on the above date.

Gigin K. Roy
02/29/95

Design Analysis Review Summary

Complete only applicable items.

1.

QA: L

Page: 1 Of: 1

2. DESIGN ANALYSIS TITLE Analysis of Degradation Due to Water and Gases in MPC	
3. DOCUMENT IDENTIFIER (Including Rev. No.) BB0000000-01717-0200-00005 REV 01	4. REV. NO. 01
5. ORIGINATOR <i>J. Kevin McCoy</i>	6. DATE 8-30-95
7. CHECKER <i>Wayne E. Wallin</i>	8. DATE 9/25/95

9. Due Date	10. Discipline	11. Review		Comments		12. Backcheck	
		Signature	Date	Yes	No	Signature	Date

13. REMARKS
As LDE, I have determined that no interdiscipline review is required because the revised information does not affect any other functional area. *Hugh A. Benton 9/27/95*

As LDE and department manager, I have determined that no external review is required because the revised information does not affect any other organization. *Hugh A. Benton 9/27/95*

14. APPROVED:

<i>J. Kevin McCoy</i> Originator Signature	9-27-95 Date
<i>Wayne E. Wallin</i> Checker Signature	9/29/95 Date
<i>Hugh A. Benton</i> LDE Signature	9/29/95 Date
<i>J. J. G. [Signature] for JWW</i> QA Signature	9/29/95 Date

Design Analysis Cover Sheet

Complete only applicable items.

1.

QA: L

Page: 1 Of: 22

2. DESIGN ANALYSIS TITLE			
Analysis of Degradation Due to Water and Gases in MPC			
3. DOCUMENT IDENTIFIER (Including Rev. No.)		4. REV. NO.	5. TOTAL PAGES
BB0000000-01717-0200-00005 REV 01		01	22
6. TOTAL ATTACHMENTS	7. ATTACHMENT NUMBERS - NO. OF PAGES IN EACH		8. SYSTEM ELEMENT
None.	N/A		MGDS System Element
	Print Name	Signature	Date
9. Originator	J. Kevin McCoy	J. Kevin McCoy	9-29-95
10. Checker	Wayne E. Wallin	Wayne E. Wallin	9/29/95
11. Lead Design Engineer	HUGH A. BENTON	Hugh A. Benton	9/29/95
12. QA Manager	D. J. Gilstrap	D. J. Gilstrap <i>for DQA TB 9/29/95</i>	9/29/95
13. Department Manager	HUGH A. BENTON	Hugh A. Benton	9/29/95

14. REMARKS

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Design Analysis Revision Record

CRWMS/M&O

Complete only applicable items.

1.

QA:

L

Page: 2

Of: 22

2. DESIGN ANALYSIS TITLE		
Analysis of Degradation Due to Water and Gases in MPC		
3. DOCUMENT IDENTIFIER (Including Rev. No.)		4. REVISION NO.
BB0000000-01717-0200-00005 REV 01		01
5. Revision No.	6. Total Pages	7. Description of Revision
00	18	Original issue
01	22	Revised approach to treatment of nitric acid condensation and determination of amount of zirconium. Increased level of detail in calculations throughout.
FOR INFORMATION ONLY		

Design Analysis Review Summary

Complete only applicable items.

1.

2. DESIGN ANALYSIS TITLE Initial Waste Package Probabilistic Criticality Analysis: Uncanistered Fuel (TBV)	
3. DOCUMENT IDENTIFIER (Including Rev. No.) BG0000000-01717-2200-00079 REV 01	4. REV. NO. 01
5. ORIGINATOR J.R. Massari	6. DATE 09/21/95
7. CHECKER L.E. Booth	8. DATE 10/2/95

9. Due Date	10. Discipline	11. Review		Comments		12. Backcheck	
		Signature	Date	Yes	No	Signature	Date

13. REMARKS DCG Compliance review of checked document completed by W&W 10/2/95

No interdiscipline review is required because the revised information does not change the conclusions and therefore issuance of REV 01 will not affect any other organization. *Per Bethel 10/2/95 P.A.*

The Department Manager and LDE have determined no external review is required because this analysis does not affect any other organization outside the design organization. *Hugh A. Benton 10/2/95*

14. APPROVED:

<hr style="border: 0; border-top: 1px solid black;"/>	<u>10/2/95</u> Date
<hr style="border: 0; border-top: 1px solid black;"/>	<u>10/5/95</u> Date
<hr style="border: 0; border-top: 1px solid black;"/>	<u>10/5/95</u> Date
<hr style="border: 0; border-top: 1px solid black;"/>	<u>10/5/95</u> Date

Design Analysis Cover Sheet

Complete only applicable items.

①

QA: *E*

Page: 1

Of: 52

2. DESIGN ANALYSIS TITLE Initial Waste Package Probabilistic Criticality Analysis: Uncanistered Fuel (TBV)			
3. DOCUMENT IDENTIFIER (Including Rev. No.) B00000000-01717-2200-00079 REV 01		4. REV. NO. 01	5. TOTAL PAGES 52
6. TOTAL ATTACHMENTS 1	7. ATTACHMENT NUMBERS - NO. OF PAGES IN EACH I-45 pages		8. SYSTEM ELEMENT MGDS System Element
	Print Name	Signature	Date
9. Originator	John R. Massari	<i>John Massari</i>	10/5/95
10. Checker	Lewie E. Booth	<i>L. E. Booth</i>	10/5/95
11. Lead Design Engineer	Peter Gottlieb	<i>Peter Gottlieb</i>	10/5/95
12. QA Manager	D. J. Gilstrap	<i>D. J. Gilstrap</i>	10/5/95
13. Department Manager	Hugh A. Benton	<i>H. A. Benton</i> FOR H. A. BENTON	10/6/95

14. REMARKS

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Design Analysis Revision Record

Complete only applicable items.

1.

QA: L

Page: 2 Of: 52

2. DESIGN ANALYSIS TITLE		
Initial Waste Package Probabilistic Criticality Analysis: Uncanistered Fuel (TBV)		
3. DOCUMENT IDENTIFIER (Including Rev. No.)		4. REVISION NO.
B00000000-01717-2200-00079 REV 01		01
5. Revision No.	6. Total Pages	7. Description of Revision
00	61 + 3 Attachments 67 Total Pages	Original Issue
01	52 + 1 Attachment 97 Total Pages	Revised to provide increased detail of calculations performed . Mathcad+ v5 used in place of Lotus123. Minor changes to input parameters. No changes to calculation method, scope, or assumptions.
FOR INFORMATION ONLY		

Design Analysis Review Summary

Complete only applicable items.

1.

QA: . . . L
Page: 1 Of: 1

2. DESIGN ANALYSIS TITLE
Initial Waste Package Probabilistic Criticality Analysis: Multi-Purpose Canister w/ Disposal Container (TBV)

3. DOCUMENT IDENTIFIER (Including Rev. No.)
B00000000-01717-2200-00080 REV 01

4. REV. NO.
01

5. ORIGINATOR
J.R. Massari

6. DATE
09/21/95


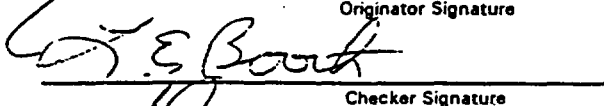
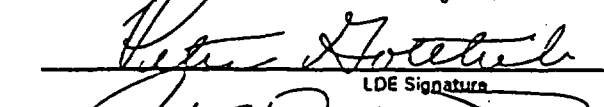
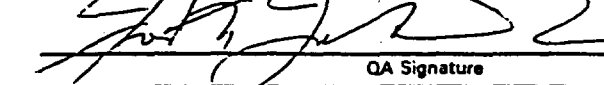
7. CHECKER
L.E. Booth

8. DATE
10/04/95

9. Due Date	10. Discipline	11. Review		Comments		12. Backcheck	
		Signature	Date	Yes	No	Signature	Date

13. REMARKS PCG Compliance review of checked document completed by W&D 10/9/95
No interdiscipline review is required because the revised information does not change the conclusions and therefore issuance of REV 01 will not ~~affect~~ affect any other organization. *10/4/95*
affect QA
The Department Manager and LDE have determined that no external review is required. The results and conclusions have not changed from the previous analysis, and therefore, no external organizations are affected.
Nugh A. Benton 10/4/95

14. APPROVED:

 Originator Signature	<u>10/4/95</u> Date
 Checker Signature	<u>10/5/95</u> Date
 LDE Signature	<u>10/5/95</u> Date
 QA Signature	<u>10/5/95</u> Date


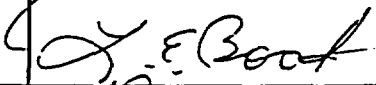
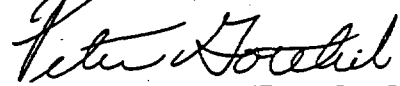

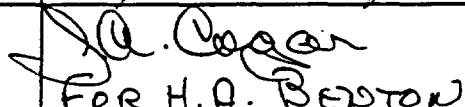
Design Analysis Cover Sheet

Complete only applicable items.

①

QA: L

Page: 1 Of: 56

2. DESIGN ANALYSIS TITLE			
Initial Waste Package Probabilistic Criticality Analysis: Multi-Purpose Canister With Disposal Container (TBV)			
3. DOCUMENT IDENTIFIER (Including Rev. No.)		4. REV. NO.	5. TOTAL PAGES
B00000000-01717-2200-00080 REV 01		01	56
6. TOTAL ATTACHMENTS	7. ATTACHMENT NUMBERS - NO. OF PAGES IN EACH		8. SYSTEM ELEMENT
1	47 pages		MGDS System Element
	Print Name	Signature	Date
9. Originator	John R. Massari		10/5/95
10. Checker	Lewie E. Booth		10/5/95
11. Lead Design Engineer	Peter Gottlieb		10/5/95
12. QA Manager	O J Gilstrap		10/5/95
13. Department Manager	Hugh A. Benton	 FOR H.A. BENTON	10/6/95

14. REMARKS

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Design Analysis Revision Reco. J

Complete only applicable items.

1.

QA: N

Page: 2 Of: 56

2. DESIGN ANALYSIS TITLE		
Initial Waste Package Probabilistic Criticality Analysis: Multi-Purpose Canister With Disposal Container (TBV)		
3. DOCUMENT IDENTIFIER (Including Rev. No.)		4. REVISION NO.
B00000000-01717-2200-00080 REV 0		01
5. Revision No.	6. Total Pages	7. Description of Revision
00	63 + 3 Attachments 66 Total Pages	Original Issue
01	56 + 1 Attachment 103 Total Pages	Revised to provide increased detail of calculations performed. Mathcad+ v5 used in place of Lotus 123. Minor changes to input parameters. No changes to calculation method, scope, or assumptions.
FOR INFORMATION ONLY		

OBJECTIVE EVIDENCE

DEFICIENCY REPORT

YMQAD-95-D-006

**Checking of QAP-3-9
Design Analyses**

**W. E. Wallin
Waste Package Development
702/794-1975**

wew
10/6/95
audit703.

Table of Contents

DR YMQAD-95-D-006

1. Deficiency Report YMQAD-95-D-006 / pages 1 of 3 through 3 of 3 / dated 8/2/95 by S. R. Maslar
2. IOC LV.MG.AMS.8/95-129 "Checking/Review by Product Checking Group (SCPB: N/A)" from A. M. Segrest dated 8/21/95 (2 pages)
3. NLP-3-28 "Checklists for Design Products" dated 8/11/95 (3 pages)
4. "Design Analysis Checklist" from the MGDS Design Guidelines Manual, REV 01, 5/29/95 (5 pages)
5. BB0000000-01717-0200-00003 REV 00A / Copy of Design Analysis Cover Sheet / Checker's signature and date added thereto (single sheet)
6. Copy of Design Analysis Review Summary, Cover Sheet, and Review Record sheets for each of the following updated Design Analyses (three sheets each):
 - a. BB0000000-01717-0200-00005 REV 01 / 9/29/95
 - b. B00000000-01717-2200-00079 REV 01 / 10/6/95
 - c. B00000000-01717-2200-00080 REV 01 / 10/6/95

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

8 Performance Report
 Deficiency Report
NO. YMQAD-95-D-006
PAGE 1 OF 3
QA: L

PERFORMANCE/DEFICIENCY REPORT

1 Controlling Document:
QAP 3-9, Revision 5

2 Related Report No.
YM-ARP-95-16

3 Responsible Organization:
CRWMS M&O

4 Discussed With:
Hugh Benton

5 Requirement/Measurement Criteria:
Para 5.2.3A: Requires a check of the design analysis for completeness and technical adequacy.

Para 5.2.3B: Requires a check that design inputs were correctly selected and incorporated, are appropriate for use in the design.

6 Description of Condition:
Contrary to the above requirements, the following conditions are noted:

- Document BB0000000-01717-0200-00005, revision 00 and BB0000000-01717-0200-00003, revision 00 - the discipline check copy reviewed does not provide objective evidence that the above requirements were checked. The checklists used did not require a check to verify the above requirements. The checklist used is a compliance (procedure) checklist. One of the checklist questions that was noted as satisfactory could not have been completed at the time of the discipline check. This question is: Are appropriate signatures in place with proper dates on the design analysis review summary?
- Margin and text notations in the initial copy for "Initial Waste Package Probabilistic Criticality Analysis: Unclustered Fuel (TBV-069-WPD)" Document Identifier B00000000-01717-2200-00079, Revision 00A do provide objective evidence that calculations were checked. However, none of the back check copy, Revision 00B; the final check copy, Revision 00D; nor the final version, Revision 00, provide objective evidence that these documents underwent the same careful scrutiny. Changes made as a

7 Initiator: *S. R. Maslar*
Stephen R. Maslar Date *8/2/95*

9 QA Review: *S. R. Maslar*
QAR Date *8/2/95*

10 Response Due Date
20 Working Days From Issuance

11 QA Issuance Approval: *[Signature]*
QAR (PR)/AOQAM (DR) Date *8-2-95*

12 Remedial Actions:
SEE RESPONSE ON P. 3 OF 3

13 Remedial Action Response By: *[Signature]*
Date *8/30/95*

14 Remedial Action Due Date
OCTOBER 6, 1995 Date

15 Remedial Action Response Acceptance
QAR Date

16 PR Verification/Closure
QAR Date

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

8
DR NO. YMQAD-95-D-006
PAGE 2 OF 3
QA: L

DEFICIENCY REPORT

17 Recommended Actions:

Evaluate extent of the problem and ensure recently implemented corrective actions will be effective.

18 Investigative Actions:

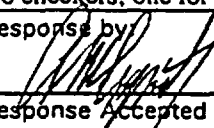
Technical and compliance checking of all quality affecting engineering documents, including Design Analyses, is the responsibility of the Product Checking Group (PCG). The MGDS Design Guidelines Manual DI# B00000000-01717-3500-00001 Rev 01, issued 5/29/95, requires that "the PCG manager, in conjunction with the LDE, will select qualified personnel to check the engineering document." Conversations with the Product Checking Group Manager and group members (those checking engineering documents on a full time basis) have indicated that the deficiencies cited in (6) would without question be discovered during the checking process now in effect. The new Design Analysis Checklist is much more comprehensive than the checklists employed while checking the four documents cited in (6). Furthermore, PCG checks each document twice (Check Copy and Final Check Copy).

19 Root Cause Determination:

No root cause identification of condition is required, based on investigative action.

20 Action to Preclude Recurrence:

The MGDS Design Guidelines Manual Rev 01, 5/29/95, which was issued by PCG subsequent to preparation of each of the four Design Analysis documents cited in (6), presents an extensive Design Analysis Checklist which now addresses both technical check (question 7, with many subparts) and compliance check. Mandatory use of the Design Analysis Checklist is invoked by NLP-3-28 Checklists for Design Products Rev 00, 8/11/95. The Design Analysis Checklist is much more comprehensive than the checklists employed while checking the four documents cited in (6). Furthermore, the PCG MGDS Design Guidelines Manual requires that "the PCG manager, in conjunction with the LDE, will select qualified personnel to check the engineering document." If not a permanent PCG member, the selected person will perform only a technical check, unless authorized by the PCG manager to also perform the compliance check; otherwise a PCG member will be assigned to perform a separate compliance check (thus there may be two checkers; one for technical and one for compliance). PCG checks both the Check Copy and the Final Check Copy.

21 Response by:  Date 8/30/95	22 Corrective Action Completion Due Date: 10/06/95
23 Response Accepted QAR Date	24 Response Accepted AOQAM Date
25 Amended Response Accepted QAR Date	26 Amended Response Accepted AOQAM Date
27 Corrective Actions Verified QAR Date	28 Closure Approved by: AOQAM Date

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

8 Performance Report
 Deficiency Report
NO. YMQAD-95-D-006
PAGE 3 OF 3
QA: L

PR/DR CONTINUATION PAGE

Block 6 (Continued)

consequence of a notation in revision 00A added new text and data, of which one datum was wrong. This error appears in the final document, Revision 00.

3. The same error also appears in the corresponding place in "Initial Waste Package Probabilistic Criticality Analysis: Multi-Purpose Canister with Disposal Container (TBV-060-WPD)," Document Identifier B00000000-01717-2200-00080, Revision 00, again with no objective evidence that calculations were rechecked. The initial review for this document was begun after the final check for the previous document.

4. It is also note that for BB0000000-01717-0200-00003, Revision 00, there is no objective evidence that the checker reviewed the check copy. No initials exist on any page of the check copy. Further, the design analysis checklist is signed by a different individual than the one that signed as the checker on the design analysis review summary sheet.

Block 12 Remedial Actions:

IOC LV.MG.AMS.8/95-129, Checking/Review by Product Checking Group (SCP: N/A), 8/21/95 states that Product Checking Group (PCG) check is mandatory for Design Analyses, Specifications, and Drawings that are quality affecting.

Regarding Block 6 Item 1: NLP-3-28; Checklists for Design Products, Rev 0, 8/11/95, requires use of expanded technical and compliance checklists. A signed and dated notation by the technical checker (A. Roy) has been added to document BB0000000-01717-0200-00003 Cover Sheet attesting that Dr. Roy performed the technical check on 2/15/95, the day before he signed the Review Summary sheet box #7. Document BB0000000-01717-0200-00005 will be corrected and reissued as Revision 01; the revisions will be checked by the individual(s) designated by PCG.

Regarding Block 6 Items 2 and 3: Each document (B00000000-01717-2200-00079 and B00000000-01717-2200-00080) will be corrected and reissued as Revision 01; the revisions to each will be checked by the individual(s) designated by PCG.

Regarding Block 6 Item 4: A signed and dated notation by the technical checker (A. Roy) has been added to document BB0000000-01717-0200-00003 Cover Sheet attesting that Dr. Roy performed the technical check on 2/15/95, the day before he signed the Review Summary sheet box #7. Two checker signatures will occur whenever PCG assigns different individuals to perform the technical check and the compliance check.

Interoffice Correspondence
Civilian Radioactive Waste Management System
Management & Operating Contractor



TRW Environmental
Safety Systems, Inc.

Subject
Checking/Review by
Product Checking Group
(SCPB: N/A)

Date
August 21, 1995
LV.MG.AMS.8/95-129

WBS: 1.2.6

QA: N/A

From
A. M. Segrest

Location/Phone
TES3/500
(702) 794-1924

To
Distribution

cc

The purpose of this memo is to clearly identify the MGDS Development products that are to be submitted for checking or review by the Product Checking Group (PCG).

- o Design Analyses, Specifications, and Drawings that are quality affecting: PCG check is mandatory.
- o Design Analyses, Specifications, and Drawings that are non-quality affecting: Submit them to PCG for check. The design disciplines may be requested to perform the checking function for minor design products when the PCG, because of workload, cannot check them in a timely manner.
- o Technical Documents, designated quality affecting, developed in accordance with QAP-3-5 shall be reviewed by the PCG as part of the review per QAP-3-5 or QAP-3-1. PCG's review may be for procedural compliance only if the subject is outside of technical expertise of the PCG.
- o The PCG will not be a reviewer for Technical Documents that are designated non-quality affecting.

Please contact Jim Salchak if you have any questions.

Distribution:

H. A. Benton
K. K. Bhattacharyya
C. W. Chagnon
Manny DeLeon
T. W. Doering
D. S. Einarson
M. J. Gomez
Peter Gottlieb

LV.MG.AMS.8/95-129

August 21, 1995

Page 2

Distribution cont'd:

R. E. Howell
W. R. Kennedy
G. N. Kimura
J. K. McCoy
J. L. Naaf
L. J. Olguin
J. W. Peters
D. J. Rogers
R. S. Saunders
J. J. Salchak
David Stahl
D. H. Tang
W. E. Wallin
RPC

AMS:lmh

Management & Operating
Contractor

UNCONTROLLED COPY

IMPLEMENTING LINE PROCEDURE

Title: CHECKLISTS FOR DESIGN PRODUCTS

FOR INFORMATION ONLY

Procedure Number: NLP-3-28

CONTROLLED COPY

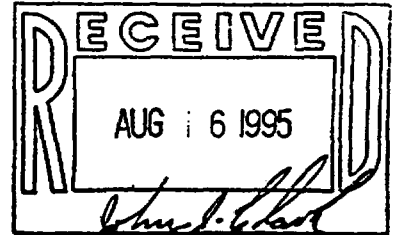
Revision: 0

CRWMS M & O / LAS VEGAS, NV.

COPY NO. 101983

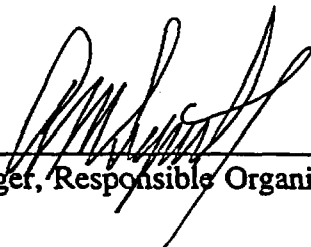
Effective Date: AUGUST 11, 1995

Author: W. J. Leonard



Responsible Manager: A. M. Segrest

Approvals:



Manager, Responsible Organization

7/27/95


Approval Date



QA Manager, Nevada

7-28-95

Approval Date



Office Manager

7/28/95

Approval Date

1. PURPOSE

This procedure supplements the checking requirements identified in Management and Operating (M&O) Quality Administrative Procedures, QAP-3-8, Specifications; QAP-3-9, Design Analyses; and QAP-3-10, Engineering Drawings.

2. SCOPE

This procedure applies to the Mined Geologic Disposal System (MGDS) Development organization of the Civilian Radioactive Waste Management System M&O Contractor at the Nevada Site.

3. APPLICABLE DEFINITIONS

Applicable definitions are found in the Design Control series of Quality Administrative Procedures (QAPs).

4. RESPONSIBILITIES

- 4.1 The MGDS Development Manager is responsible for the preparation and maintenance of this procedure.
- 4.2 The following persons have responsibilities in this procedure:
 - A. Checkers.

5. PROCEDURE

If an individual is performing work that is subject to this procedure and cannot accomplish that work in full compliance with this procedure, the individual shall suspend work and shall resume work only after this procedure has been revised to correct the affected work practices.

5.0 PROCESS OUTLINE

Not applicable.

5.1 The Checker shall:

- A. initiate a checklist for the document being checked (analysis, engineering drawing, or specification) which contains the following information as a minimum:
 - 1. the document identifier and revision number;
 - 2. the name of the checker and date checked;
 - 3. the review topics identified in QAP-3-8 and QAP-3-10 for specifications and engineering drawings, respectively;
- B. perform the required checks in accordance with the processes identified in the respective procedure, QAP-3-8, QAP-3-9, or QAP-3-10; and
- C. return the completed checklist and the engineering product to the originator of the product for resolution of comments, in accordance with the respective procedure.

6. RECORDS

There are no lifetime quality assurance (QA) records associated with this procedure.

The checklists are considered non-permanent QA records and are submitted to the Records Processing Center (RPC) in the records package of the checked document, by Engineering Document Control (EDC), in accordance with QAP-17-1, Record Source Responsibilities for Inclusionary Records.

7. ATTACHMENTS

None.

Design Analysis Checklist

Complete only applicable items.

Document Identifier		
Compliance Check By (Print Name)	Signature	Date

- | Yes | No | N/A | |
|--------------------------|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1. Is the Design Analysis ready for Discipline Check? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Yes No N/A |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Is the Design Analysis copy clearly marked "Check Copy?" |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Does the Design Analysis include a Cover Sheet and Revision Record? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Is the Design Analysis identified using a alphanumeric revision designator? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Is the Design Analysis legible and in a form suitable for reproduction, filing, and retrieval? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 2. Is the Design Analysis ready for Final Check? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Are Review Summary sheet(s), Check Copy, Interdiscipline Review Copy, and Quality Administrative Procedure QAP-3-1 Document Review Records (DRRs) from External Review included and properly filled out? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Does Design Analysis include a Cover Sheet and Revision Record? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Is the Design Analysis legible and in a form suitable for reproduction, filing, and retrieval? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Are appropriate signatures in place and with proper dates on the Design Analysis Review Summary? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 3. Is referencing thorough and complete? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Is the Design Analysis correctly listed in the Basis For Design (BFD)? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Do all references listed in Section 5, References, appear in the body of the Design Analysis? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Do the references listed in Section 5, References, have correct titles, revision numbers, and/or dates? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Do all references used in the body of the Design Analysis appear in Section 5, References? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Do all documents in Section 4.4, Codes and Standards, appear in the body of the Design Analysis? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Do the documents in Section 4.4, Codes and Standards, have correct titles, revision numbers, and/or dates? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Do all codes and standards used in the body of the Design Analysis appear in Section 4.4, Codes and Standards? |

Design Analysis Checklist

(Continuation Page)

Complete only applicable items.

QA: N/A

Page: 2 Of: 5

Document Identifier

Yes	No	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4. For revised Design Analyses, have all revision requirements been met?
			Yes No N/A
		<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> For revisions/changes, are changes identified by change bars in margin?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5. Are required tolerances justified within the body of the Design Analysis?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6. Is the Design Analysis properly titled, formatted, and identified?
		<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Does the Design Analysis title, document identifier, and Configuration Item Identifier (CII) match the Engineering Document Control (EDC) listing?
		<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Is the Design Analysis CII correct and at the appropriate level based on the current Configuration Item (CI) matrix?
		<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Is the Design Analysis Cover Sheet numbered correctly?
		<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Is description of revision history listed on Design Analysis Revision Record?
		<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Is description of revision history clear and concise?
		<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Do the title and document numbers appear consistently through all sheets?
		<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Is Design Analysis title appropriate for the content?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7. Does format of the Design Analysis follow the requirements of Quality Assurance Procedure QAP-3-9, Attachment 1, Design Analysis Outline?
		<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Has the Design Analysis been developed to the necessary detail in accordance with the Design Analysis Outline from QAP-3-9 (Attachment I) as outlined below:
		<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> If any of the following sections cannot be used or do not warrant discussion, is one of the following used: "Not Applicable," "N/A," or "Not Used"?
			SECTION 1 PURPOSE
		<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Is the "Purpose" clearly defined?
			SECTION 2 QUALITY ASSURANCE
		<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Are appropriate "QA" Classifications identified in accordance with the Determination of Importance Evaluation (DIE), Quality Assurance (QA) Classification Analysis and NLP-3-18?
			SECTION 3 METHOD
		<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Is the design method used appropriate for the design?
		<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Has the method been clearly defined?
			SECTION 4 DESIGN INPUTS
		<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Are design inputs and their sources identified?

Design Analysis Checklist

(Continuation Page)

Complete only applicable items.

Document Identifier

SECTION 4 DESIGN INPUTS (Con't)

Yes No N/A

- Are the design inputs correctly selected?
- Are the design inputs correctly incorporated?
- Are the design inputs appropriate for use in the design (e.g., any assumptions, constraints, bounds, or limits of the input reflected in the design)?

SECTION 4.1 DESIGN PARAMETERS

- Are the design parameters used in the design and their sources properly identified?
- Are the design parameters listed correct?
- Is the selection of the design parameters correct for the intended application?

SECTION 4.2 CRITERIA

- Have criteria from requirements documents been listed?
- Do the requirements documents listed have the correct titles, sections, and revision dates?
- Are the requirements listed directly applicable to the design subject?

SECTION 4.3 ASSUMPTIONS

- Are assumptions clearly stated?
- Do assumptions have a documented basis?
- Are assumptions requiring verifications clearly identified?
- Is justification provided for assumptions that do not require verification?

SECTION 4.4 CODES AND STANDARDS

- Is a list of the applicable codes and standards included?
- Do all applicable codes and standards include names, numbers, dates, and applicable revision data or addenda?

SECTION 5 REFERENCES

- Are sources of design inputs listed?
- Are other references listed?

SECTION 6 USE OF COMPUTER SOFTWARE

- Is a list of Scientific and Engineering Software included?

Design Analysis Checklist*(Continuation Page)**Complete only applicable items.*

QA: N/A

Page: 4 Of: 5

Document Identifier

SECTION 6 USE OF COMPUTER SOFTWARE (Con't)

- | Yes | No | N/A | |
|--------------------------|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are the computer types, program names, version/revision numbers, and Computer Software Configuration Item (CSCI) number(s) listed and correct? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are the input files and outputs documented in the Design Analysis sufficient to allow independent repetition of software use? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are the output(s) reasonable compared to the input(s)? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Is a statement included indicating the software was appropriate for the application? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Is a statement included indicating the software was used only within the range of validation as described in the verification and validation documentation? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | If computational support software is used, are the software titles and version/revision number(s) provided? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | If computation support software is used, does the Design Analysis provide a documented description of the use, including user-defined formulas and/or algorithms, inputs, and results (outputs) sufficient to allow an independent repetition of the computation? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | If computational support software is used, are user defined formulas and/or algorithms correct, are inputs correctly selected, and are results (outputs) reasonable compared to the inputs? |

SECTION 7 DESIGN ANALYSIS

- | | | | |
|--------------------------|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Is the Design Analysis, including calculations, clearly presented so that any qualified individual could review the Design Analysis without recourse to the originator? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Is the Design Analysis complete and technically adequate? |

SECTION 8 CONCLUSIONS

- | | | | |
|--------------------------|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are conclusions, decisions, or recommendations presented clearly? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are the conclusions reasonable compared to the design inputs(s)? |

SECTION 9 ATTACHMENTS

- | | | | |
|--------------------------|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are supporting documentation included as attachments? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Are attachments properly identified and paginated? |

Design Analysis Checklist

(Continuation Page)

Complete only applicable items.

Document Identifier

Yes No N/A

8. Are To Be Verified (TBVs) and To Be Determined (TBDs) properly identified?

Yes No N/A

Do TBDs and/or TBVs match logs?

Is unqualified data, assumptions based on preliminary data, or data requiring reverification noted "TBV" or for "REFERENCE ONLY"?

Is there justification why TBVs/TBDs for design parameters in SECTION 4.1 which are based upon unqualified data are not carried down to the design outputs (drawings and specifications)? Is it consistent with TBV/TBD description form

Is there justification why TBVs/TBDs/To Be Resolved (TBRs) in SECTION 4.2 for requirements cited from requirements documents are not carried down to the design outputs (drawings and specifications)?

Are assumptions in SECTION 4.3 that need to be verified identified as TBV?

Is the document listed in the TBX log?

Design Analysis Cover Sheet

Complete only applicable items.

1.

QA: *SKN*

Page: 1 Of: 10

NEW 2/15/95

2. DESIGN ANALYSIS TITLE

Analysis of MPC Weight, Dimensional Envelope, and Configuration Requirements

(SCAB N/A)

3. DOCUMENT IDENTIFIER (Including Rev. No.)

BB0000000-01717-0200-00003 REV 00

4. REV. NO.

00A

5. TOTAL PAGES

10

6. TOTAL ATTACHMENTS

None

7. ATTACHMENT NUMBERS - NO. OF PAGES IN EACH

N/A

8. SYSTEM ELEMENT

MGDS System Element

	Print Name	Signature	Date
9. Originator			
10. Checker			
11. Lead Design Engineer			
12. QA Manager			
13. Department Manager			

14. REMARKS

FOR INFORMATION ONLY

**CHECK
COPY**

*Check performed 2/15/95.
The signature below attests
that the check was performed
on the above date.*

*Gijin K. Roy
02/29/95*

Design Analysis Review Summary

Complete only applicable items.

①

QA: L

Page: 1

Of: 1

2. DESIGN ANALYSIS TITLE							
Analysis of Degradation Due to Water and Gases in MPC							
3. DOCUMENT IDENTIFIER (Including Rev. No.)						4. REV. NO.	
BB0000000-01717-0200-00005 REV 01						01	
5. ORIGINATOR						6. DATE	
<i>J Kevin Mc Coy</i>						8-30-95	
7. CHECKER						8. DATE	
<i>Wayne E Wallin</i>						9/25/95	
9. Due Date	10. Discipline	11. Review		Comments		12. Backcheck	
		Signature	Date	Yes	No	Signature	Date
13. REMARKS							
As LDE, I have determined that no interdiscipline review is required because the revised information does not affect any other functional area. <i>Hugh A. Benton 9/27/95</i>							
As LDE and department manager, I have determined that no external review is required because the revised information does not affect any other organization. <i>Hugh A. Benton 9/27/95</i>							
14. APPROVED:							
<i>J Kevin Mc Coy</i>				<u>9-27-95</u>			
Originator Signature				Date			
<i>Wayne E. Wallin</i>				<u>9/29/95</u>			
Checker Signature				Date			
<i>Hugh A. Benton</i>				<u>9/29/95</u>			
LDE Signature				Date			
<i>J J G. Lopez for JWW</i>				<u>9/29/95</u>			
QA Signature				Date			

Design Analysis Cover Sheet

Complete only applicable items.

1.

2. DESIGN ANALYSIS TITLE			
Analysis of Degradation Due to Water and Gases in MPC			
3. DOCUMENT IDENTIFIER (Including Rev. No.)		4. REV. NO.	5. TOTAL PAGES
BB0000000-01717-0200-00005 REV 01		01	22
6. TOTAL ATTACHMENTS	7. ATTACHMENT NUMBERS - NO. OF PAGES IN EACH		8. SYSTEM ELEMENT
None.	N/A		MGDS System Element
	Print Name	Signature	Date
9. Originator	J. KEVIN MCCOY	J. Kevin McCoy	9-29-95
10. Checker	Wayne E. Wallin	Wayne E. Wallin	9/29/95
11. Lead Design Engineer	HUGH A. BENTON	Hugh A. Benton	9/29/95
12. QA Manager	D. J. Gilstrap	D. J. Gilstrap <i>for DQA 9/29/95</i>	9/29/95
13. Department Manager	HUGH A. BENTON	Hugh A. Benton	9/29/95

14. REMARKS

FOR INFORMATION ONLY

**UNCONTROLLED
COPY**

Design Analysis Revision Record

Complete only applicable items.

1.

QA: L

Page: 2 Of: 22

2. DESIGN ANALYSIS TITLE		
Analysis of Degradation Due to Water and Gases in MPC		
3. DOCUMENT IDENTIFIER (Including Rev. No.)		4. REVISION NO.
BB0000000-01717-0200-00005 REV 01		01
5. Revision No.	6. Total Pages	7. Description of Revision
00	18	Original issue
01	22	Revised approach to treatment of nitric acid condensation and determination of amount of zirconium. Increased level of detail in calculations throughout.
FOR INFORMATION ONLY		

Design Analysis Review Summary

Complete only applicable items.

1.

2. DESIGN ANALYSIS TITLE Initial Waste Package Probabilistic Criticality Analysis: Uncanistered Fuel (TBV)							
3. DOCUMENT IDENTIFIER (Including Rev. No.) BG0000000-01717-2200-00079 REV 01						4. REV. NO. 01	
5. ORIGINATOR J.R. Massari						6. DATE 09/21/95	
7. CHECKER L.E. Booth						8. DATE 10/2/95	
9. Due Date	10. Discipline	11. Review		Comments		12. Backcheck	
		Signature	Date	Yes	No	Signature	Date
13. REMARKS PCG Compliance review of checked document completed by W&W 10/2/95 No interdiscipline review is required because the revised information does not change the conclusions and therefore issuance of REV 01 will not affect any other organization. <i>Peter Hottel 10/2/95 P.H.</i> <i>9/21/95</i> The Department Manager and LDE have determined no external review is required because this analysis does not affect any other organization outside the design organization. <i>High A. Benton 10/2/95</i>							
14. APPROVED:							
				10/2/95			
Originator Signature				Date			
				10/5/95			
Checker Signature				Date			
				10/5/95			
LDE Signature				Date			
				10/5/95			
QA Signature				Date			

Design Analysis Cover Sheet






Complete only applicable items.

①

QA: L

Page: 1

Of: 52

2. DESIGN ANALYSIS TITLE			
Initial Waste Package Probabilistic Criticality Analysis: Uncanistered Fuel (TBV)			
3. DOCUMENT IDENTIFIER (Including Rev. No.)		4. REV. NO.	5. TOTAL PAGES
B00000000-01717-2200-00079 REV 01		01	52
6. TOTAL ATTACHMENTS	7. ATTACHMENT NUMBERS - NO. OF PAGES IN EACH		8. SYSTEM ELEMENT
1	I-45 pages		MGDS System Element
	Print Name	Signature	Date
9. Originator	John R. Massari		10/5/95
10. Checker	Lewie E. Booth		10/5/95
11. Lead Design Engineer	Peter Gottlieb		10/5/95
12. QA Manager	D. J. Gilstrap		10/5/95
13. Department Manager	Hugh A. Benton	 FOR H. A. BENTON	10/6/95

14. REMARKS

FOR INFORMATION ONLY

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COPY**

Design Analysis Revision Record

Complete only applicable items.

1.

QA: E. S.

Page: 2

Of: 52

2. DESIGN ANALYSIS TITLE		
Initial Waste Package Probabilistic Criticality Analysis: Uncanistered Fuel (TBV)		
3. DOCUMENT IDENTIFIER (Including Rev. No.)		4. REVISION NO.
B00000000-01717-2200-00079 REV 01		01
5. Revision No.	6. Total Pages	7. Description of Revision
00	61 + 3 Attachments 67 Total Pages	Original Issue
01	52 + 1 Attachment 97 Total Pages	Revised to provide increased detail of calculations performed. Mathcad+ v5 used in place of Lotus123. Minor changes to input parameters. No changes to calculation method, scope, or assumptions.

FOR INFORMATION ONLY

Design Analysis Review Summary

Complete only applicable items.

1.

2. DESIGN ANALYSIS TITLE Initial Waste Package Probabilistic Criticality Analysis: Multi-Purpose Canister w/ Disposal Container (TBV)	
3. DOCUMENT IDENTIFIER (Including Rev. No.) B00000000-01717-2200-00080 REV 01	4. REV. NO. 01
5. ORIGINATOR J.R. Massari	6. DATE 09/21/95
7. CHECKER L.E. Booth	8. DATE 10/04/95

9. Due Date	10. Discipline	11. Review		Comments		12. Backcheck	
		Signature	Date	Yes	No	Signature	Date

13. REMARKS PCG Compliance review of checked document completed by GJW 10/9/95

No interdiscipline review is required because the revised information does not change the conclusions and therefore issuance of REV 01 will not affect any other organization. *W.J. 10/4/95*
affect QM risks

The Department Manager and LDE have determined that no external review is required. The results and conclusions have not changed from the previous analysis, and therefore, no external organizations are affected.

Hugh A. Benton 10/4/95

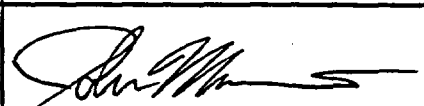
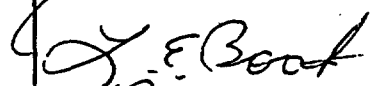


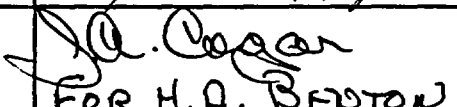
14. APPROVED:

Originator Signature	10/4/95 Date
Checker Signature	10/5/95 Date
LDE Signature	10/5/95 Date
QA Signature	10/5/95 Date

Design Analysis Cover Sheet

Complete only applicable items.

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2. DESIGN ANALYSIS TITLE			
Initial Waste Package Probabilistic Criticality Analysis: Multi-Purpose Canister With Disposal Container (TBV)			
3. DOCUMENT IDENTIFIER (Including Rev. No.)		4. REV. NO.	5. TOTAL PAGES
B00000000-01717-2200-00080 REV 01		01	56
6. TOTAL ATTACHMENTS	7. ATTACHMENT NUMBERS - NO. OF PAGES IN EACH		8. SYSTEM ELEMENT
1	47 pages		MGDS System Element
	Print Name	Signature	Date
9. Originator	John R. Massari		10/5/95
10. Checker	Lewie E. Booth		10/5/95
11. Lead Design Engineer	Peter Gottlieb		10/5/95
12. QA Manager	O J Gilstrap		10/5/95
13. Department Manager	Hugh A. Benton	 FOR H.A. BENTON	10/6/95
14. REMARKS			
<p>FOR INFORMATION ONLY</p> <p>UNCONTROLLED COPY</p>			

Design Analysis Revision Record

Complete only applicable items.

1.

QA: N

Page: 2 Of: 56

2. DESIGN ANALYSIS TITLE		
Initial Waste Package Probabilistic Criticality Analysis: Multi-Purpose Canister With Disposal Container (TBV)		
3. DOCUMENT IDENTIFIER (Including Rev. No.)		4. REVISION NO.
B00000000-01717-2200-00080 REV 0		01
5. Revision No.	6. Total Pages	7. Description of Revision
00	63 + 3 Attachments 66 Total Pages	Original Issue
01	56 + 1 Attachment 103 Total Pages	Revised to provide increased detail of calculations performed . Mathcad+ v5 used in place of Lotus123. Minor changes to input parameters. No changes to calculation method, scope, or assumptions.
FOR INFORMATION ONLY		

VERIFICATION OF CORRECTIVE ACTION FOR DR YMOAD-95-D006

Verified implementation of corrective actions per Surveillance #YMP-SR-96-01. Objective evidence is included in the QA file for the Deficiency Report. Verification included review to ensure error in B00000000-01717-2200--0079 and B00000000-01717-2200-00080 was corrected.

This DR is considered closed.

S. R. Maslar
Stephen R. Maslar, QAR

10/30/95
Date