Civilian Radioactive V Management System

Mahagement & Operating Contractor

# UNCONTROLLED COPY

#### **IMPLEMENTING LINE PROCEDURE**

Title:

#### CHECKLISTS FOR DESIGN PRODUCTS

19.95

Procedure Number:

**NLP-3-28** 

0

**Revision**:

Effective Date:

Author:

W. J. Leonard

August 11,

Responsible Manager:

A. M. Segrest

Approvals: **Organization** Mana

Ille

QA'Manager. Nevada

Office Manag

pproval Date

- 28-95

Approval Date

Approval Date

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FOR INFORMATION ONLY

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951025 WASTE PDR WM-11

#### Title: Checklists for Des\_Products Procedure No.: NLP-3-28/Rev. 0

#### 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.

Civilian Radioactive Waste Management System Management and Operating Contractor Title: Checklists for Des Products Procedure No.: NLP-3-28/Rev. 0

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

CRWMS/M&O

Complete only applicable items.

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Page: / Of: 5

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Сотр	liance Ch	eck By (P	rint Name	)		Signature	_,, <u></u> ,,	Date
Yes	No	N/A	1. Is	the De	sign Analysis ready fo	or Discipline Check?		
		Yes	ו		Is the Design Analys	sis copy clearly marked	"Check Copy?"	
					Does the Design An Is the Design Analy:	alysis include a Cover s	Sheet and Revision Record	? ator?
		U			Is the Design Analys and retrieval?	sis legible and in a form	suitable for reproduction,	filing,
			2. Is	the De	sign Analysis ready for	r Final Check?		
					Are Review Summar Quality Administrativ from External Review	ry sheet(s), Check Copy ve Procedure QAP-3-1 w included and properly	y, Interdiscipline Review Co Document Review Records filled out?	opy, and (DRRs)
					Does Design Analysi	is include a Cover Shee	t and Revision Record?	
					Is the Design Analys and retrieval?	sis legible and in a form	suitable for reproduction,	filing,
					Are appropriate sign Review Summary?	atures in place and with	n proper dates on the Desig	gn Analysis
			3. Is r	eferen	cing thorough and com	nplete?		
					is the Design Analysi	is correctly listed in the	Basis For Design (BFD)?	· ·
					Do all references list Design Analysis?	ed in Section 5, Referer	nces, appear in the body of	f the
				Ģ	Do the references list numbers, and/or date	ted in Section 5, Refere es?	ences, have correct titles, r	evision
					Do all references use Section 5, Reference	d in the body of the De s?	sign Analysis appear in	
					Do all documents in S of the Design Analys	Section 4.4, Codes and is?	Standards, appear in the t	pody
					Do the documents in revision numbers, and	Section 4.4, Codes and d/or dates?	d Standards, have correct t	titles,
					Do all codes and stan in Section 4.4, Codes	ndards used in the body s and Standards?	of the Design Analysis ap	pear

Design Analysis Checklist (Continuation Page)

Complete only applicable items.

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**QA: N/A** 

Page: 2 Of: 5

Docum		stier				
Yes	No	N/A	4.	For No	revise N/A	ed Design Analyses, have all revision requirements been met?
			[			For revisions/changes, are changes identified by change bars in margin?
			5.	Are	requi	red tolerances justified within the body of the Design Analysis?
			6.	ls th	e De	sign Analysis properly titled, formatted, and identified?
			۵			Does the Design Analysis title, document identifier, and Configuration Item Identifier (CII) match the Engineering Document Control (EDC) listing?
			۵	]		Is the Design Analysis CII correct and at the appropriate level based on the current Configuration Item (CI) matrix?
	·		. C	]		Is the Design Analysis Cover Sheet numbered correctly?
			C	]		Is description of revision history listed on Design Analysis Revision Record?
			Ľ	]		Is description of revision history clear and concise?
			[	]		Do the title and document numbers appear consistently through all sheets?
	•		C	כ		Is Design Analysis title appropriate for the content?
		. [	7.	Does Proce	form dure	at of the Design Analysis follow the requirements of Quality Assurance 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 I) 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"?
				SECT	ION '	PURPOSE
						Is the "Purpose" clearly defined?
				SECT		QUALITY ASSURANCE
				C		Are appropriate "QA" Classifications identified in accordance with the Determination of Importance Evaluation (DIE), Quality Assurance (QA) Classification Analysis and NLP-3-18?
	<u>.</u>		:	SECT	ION 3	METHOD
				۰Ľ	]	Is the design method used appropriate for the design?
					כ	Has the method been clearly defined?
			5	SECTI	ON 4	DESIGN INPUTS
				٢	כ	Are design inputs and their sources identified?

# $\checkmark$ Design Analysis Checklist $\checkmark$

(Continuation Page)

Complete only applicable items.

QA: N/A Page: 3 Of: 5

Document Identifier			
	S	ECTION	I À 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)?
	SE	CTION	4.1DESIGN 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?
	SE	CTION	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?
	SE	CTION	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?
	SE	CTION	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?
	SEC		5 REFERENCES
			Are sources of design inputs listed?
			Are other references listed?
	SEC		USE OF COMPUTER SOFTWARE
			Is a list of Scientific and Engineering Software included?

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# Design Analysis Checklist

(Continuation Page)

Complete only applicable items.

QA: N/A Page: 4 Of: 5

		<u> </u>	
	S	ECTION	6 USE OF COMPUTER SOFTWARE (Con't)
Yes	No	N/A	
			Are the computer types, program names, version/revision numbers, and Computer Software Configuration Item (CSCI) number(s) listed and correct?
			Are the input files and outputs documented in the Design Analysis sufficient to allow independent repetition of software use?
			Are the output(s) reasonable compared to the input(s)?
			Is a statement included indicating the software was appropriate for the application?
			Is a statement included indicating the software was used only within the range of validation as described in the verification and validation documentation?
			If computational support software is used, are the software titles and version/revisionnumber(s) provided?
			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?
			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?
	SE	CTION	7 DESIGN ANALYSIS
			Is the Design Analysis, including calculations, clearly presented so that any qualified individual could review the Design Analysis without recourse to the originator?
			Is the Design Analysis complete and technically adequate?
	SE	CTION	8 CONCLUSIONS
			Are conclusions, decisions, or recommendations presented clearly?
			Are the conclusions reasonable compared to the design inputs(s)?
	SE	CTION S	9 ATTACHMENTS
			Are supporting documentation included as attachments?
			Are attachments properly identified and paginated?

Document Identifier

# Design Analysis' Checklist

(Continuation Page)

Complete only applicable items.

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 Page:	Ś	Of:	S	

Yes	No	N/A				
			8. Ar	e To B	e 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 Sheer

Complete only applicable items.

Page: 1 Of: 10

QA:

1.

IN

NEW 2/15/95

2. DESIGN ANALYSIS TITLE					
Analysis of MPC Weight, Dim	ensional Envelope, and Configuration	n Requirements	(3	CPS N/A)	
3. DOCUMENT IDENTIFIER (Including	ng Rev. No.)	4. RE\	7. NO. 5	. TOTAL PAGES	
BB0000000-01717-0200-00003	REV 00	A00	1	0	
6. TOTAL ATTACHMENTS	7. ATTACHMENT NUMBERS - NO.	OF PAGES IN EACH	8. SYSTEM ELEM		
None	N/A	·	MGDS System 1	Element	
	Print Name	Signa	ture	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.

Cipil K. Roy 08/29/95

# Design Analysis Review Summary

Complete only applicable items.

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2. DESIGN	ANALYSIS TITLE	······································			····		
Analysis	of Degradation Due (	to Water and Gases in MPC					
3. DOCUM	AENT IDENTIFIER (Inclu	iding Rev. No.)				4. REV. NO.	
BB00000	00-01717-0200-0000	05 REV 01					
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9. Due	10 Dissipling	11. Review		Com	nents	12. Backcheck	
Date		Signature	Date	Yes	No	Signature	Date
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13. REMAP	iks	•		·			
As LD	E, I have determine	ned that no interdiscipline review	is required	bec	ause t	le revised information does	not
a llect	any other function	mal area. Nugh A.	Benton	- 9/	27/9	5	
As LD	E and departmen	t Manager, I have determined	that no ex	terna	l revie	ew is required because th	ie.
revised i	revised information does not affect any other organization Hugh A. Benton 9/27/95						
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14. APPHO	VEU:						
	Kim	Milon				9-27-95	_
Originator Signature Date							
	Waque	e E. Wallin				9/29/95	_
		Checker Signature				Date	
	_ Hugh	A. Benton				91/24/95	_
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CAP-3-9

# Design Analysis Cover Sheet

Complete only applicable items.

QA: L Page: l

1.

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2. DESIGN ANALYSIS TITLE					
3. DOCUMENT IDENTIFIER (Includi	ing Rev. No.}	4. REV	. NO.	5. TOTAL PAGES	
BB0000000-01717-0200-00005	REV 01	01		22	
6. TOTAL ATTACHMENTS	7. ATTACHMENT NUMBERS - NO. O	F PAGES IN EACH	S. SYSTEM ELEM	ENT	
None.	N/A	<u></u>	MGDS System I	Element	
	Print Name	Signa	ture	Date	
9. Originator	J. KEVIN NICCOY	9 Kisin M	c log	9-29-95	
10. Checker	Wayne E. Wallin	Waque E.	Wallin	9/29/95	
11. Lead Design Engineer	HUGH A. BENTON	Nughi A. (	Senton	9/29/95	
12.QA Manager	OJ Gilsturg	0.9. 9.	tor Das	9/29/95	
13. Department Manager	HUGH A. BENTON	Hugh A i	Senton	9/29/95	
14. REMARKS					

FOR INFORMATION ONLY

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# Design Analysis Revision Record

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Complete only applicable items.

QA: L Page: 2 Of: 22

1.

2. DESIGN ANALYSIS TITLE				
3. DOCUMENT IDENTI	FIER (Including Rev. No.)	4. REVISION NO.		
BB000000-01717-0	200-00005 REV 01	01		
5. Revision No.	6. Total Pages	7. Description of Revision		
00 01	18 22	Original issue 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.

QA: L Page: 1 Of: 1

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2. DESIGN	ANALYSIS TITLE	······································	<u>-</u>	<del>_</del>	·		
Initial Wa	ste Package Probabili	stic Criticality Analysis: Uncanit	stered Fuel (7	TBV)			
3. DOCUM	ENT IDENTIFIER (Includi	ing Rev. No.)				4. REV. NO.	
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14. APPROV	ED:	· · · · · · · · · · · · · · · · · · ·				<u> </u>	
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QAP-3-9

# Design Analysis Cover Sheet

Complete only applicable items.

QA: L Page: 1 Of: 52

(1)

2. DESIGN ANALYSIS TITLE								
Initial Waste Package Probabilistic Criticality Analysis: Uncanistered Fuel (TBV)								
3. DOCUMENT IDENTIFIER (Inclu	3. DOCUMENT IDENTIFIER (Including Rev. No.) 4. REV. NO. 5. TOTAL PAGES							
B0000000-01717-2200-0007	9 REV 01	01		52				
6. TOTAL ATTACHMENTS	7. ATTACHMENT NUMBERS - NO	. OF PAGES IN EACH	8. SYSTEM ELEN	IENT				
1	I-45 pages	· · · · · · · · · · · · · · · · · · ·	MGDS System	Element				
	Print Name	Signa	ture	Date				
9. Originator	John R. Massari	Sh-M	hans	- 10/5/95				
10. Checker	Lewie E. Booth	ZE,Bo	of	10/5/95				
11. Lead Design Engineer	Peter Gottlieb	Puter Ho	utul	10/5/95				
12.0A Manager	D. J. Gilstrap	Q. J. M	they	10/5/95				
13. Department Manager	Hugh A. Benton	For H. A. BE	10/6/95					
14 REMARKS								

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# Design Analysis Revision Record

Complete only applicable items.

L Page: 2 Of: 52

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(1)

2. DESIGN ANALYSIS	TITLE	
Initial Waste Packag	e Probabilistic Critical	ity Analysis: Uncanistered Fuel (TBV)
3. DOCUMENT IDENTI	FIER (Including Rev. No.)	4. REVISION NO.
5 Revision No.	6 Total Pages	7 Description of Bevision
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 Lotus 123. Minor changes to input parameters. No changes to calculation method, scope, or assumptions.
		FOR INFORMATION ONLY

# Design Analysis Review Summary

Complete only applicable items.

Page: 1

Of: 1

[ 1.

2. DESIGN ANALYSIS TITLE								
Initial Waste Package Probabilistic Criticality Analysis: Multi-Purpose Canister w/ Disposal Container (TBV)								
3. DOCUM	3. DOCUMENT IDENTIFIER (Including Rev. No.) 4. REV. NO.							
B000000	00-01717-2200-0008	0 REV 01				01		
5. ORIGINA	Alon	All		•		D. DATE		
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13. REMAR	iks PCG Complia	we review st chocked	documan	+ com	plete	o by WEW 10/9/95		
No interdi	cololine review is rea	wired because the revised informa	tion door no	, t chong	a tha a	onclusions and therefore issue	ance of	
REV 01 w	ill not afcet any othe	r organization 1P - 10	1/4/q =	t chang	e me c	oliciusions and dieletore issue		
	affect grad pists							
The Depar	tment Manager and	LDE have determined that no exte	rnal review	is requi	red. T	The results and conclusions ha	ve not	
changed fr	rom the previous anal	lysis, and therfore, no external orga	anizations at	e affect	ed.			
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QAP-3-9

# Design Analysis Cover Sheet

Complete only applicable items.

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QA: L Page: 1 Of: 56

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2. DESIGN ANALYSIS TITLE	ilistic Criticality, Analysics, Multi-Purpo	ca Canistar With Disas	cal Container (TR	227		
3. DOCUMENT IDENTIFIER (Incl	uding Rev. No.)	4. REV	. NO.	5. TOTAL PAGES		
B00000000-01717-2200-0008	80 REV 01	01		56		
6. TOTAL ATTACHMENTS	7. ATTACHMENT NUMBERS - NO. C	OF PAGES IN EACH	8. SYSTEM ELEM	ENT		
1	47 pages		MGDS System I	Element		
	Print Name	Signat	ture	Date		
9. Originator	John R. Massari	Shullh		10/5/95		
10. Checker	Lewie E. Booth	FBG	of	10/5/95		
11. Lead Design Engineer	Peter Gottlieb	Veter X	Tochil	10/5/95		
12.QA Manager	OJ Gilstray	0.9. Jul	they	10/5/95		
3. Department Manager	Hugh A. Benton	FOR H.Q.	ain Denoral	10/2/05		
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# Design Analysis Revision Reco.J

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2. DESIGN ANALYSIS	TITLE	
Initial Waste Packag	e Probabilistic Critical	ty Analysis: Multi-Purpose Canister With Disposal Container (TBV)
3. DOCUMENT IDENTI	FIER (Including Rev. No.)	4. REVISION NO.
B0000000-01717-2	200-00080 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.
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QAP-3-8 (Effective 03/08/95)

#### **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 YMOAD-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. BB000000-01717-0200-00003 REV 00A / Copy of Design Analysis Cover Sheet / Checker's signature and date added thereto (single sheet)
- 6. Copy of Design Analyis 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. B0000000-01717-2200-00079 REV 01 / 10/6/95
- c. B0000000-01717-2200-00080 REV 01 / 10/6/95

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	OFFICE ( RADIOACTIVE W/ U.S. DEPARTIN WASHIN	DF CIVILIAN ASTE MANAGEM MENT OF ENERGY GTON, D.C.	ENT	<ul> <li>Performance Report</li> <li>Deficiency Report</li> <li>NO.YMQAD-95-D-006</li> <li>PAGE 1 OF 3</li> <li>QA: L</li> </ul>
	PERFORMANCE/E	DEFICIENCY REPO	RT	
1 Controlling Document: QAP 3-9, Revision 5	<u></u>		2 Related Re YM-ARP-95	port No. -16
3 Responsible Organization: CRWMS M&O	4	Discussed With: Hugh Benton		
5 Requirement/Measurement Crite Para 5.2.3A: Requires a check of t Para 5.2.3B: Requires a check that	ria: he design analysis for comple design inputs were correctly	eteness and technical ad	equacy. ed, are approp	riate for use in the design.
6 Description of Condition: Contrary to the above requirements 1. Document BB0000000-01717-0 copy reviewed does not provide obje check to verify the above requirement that was noted as satisfactory could signatures in place with proper date	, the following conditions and 200-00005, revision 00 and ective evidence that the above nts. The checklist used is a not have been completed at s on the design analysis revi	e noted: BB0000000-01717-0200 e requirements were che compliance (procedure) the time of the discipling ew summary?	0-00003, revis cked. The che checklist. On check. This	ion 00 - the discipline check cklists used did not require a e of the checklist questions question is: Are appropriate
2. Margin and text notations in the (TBV-069-WPD)" Document Identical calculations were checked. However version, Revision 00, provide object	e initial copy for "Initial Was fier B00000000-01717-2200 r, none of the back check co ive evidence that these docu	ste Package Probabilistic 0-00079, Revision 00A d py, Revision 00B; the fur ments underwent the sar	Criticality And to provide object that check copy the careful scrut	nalysis: Uncanistered Fuel ctive evidence that , Revision 00D; nor the final atiny. Changes made as a
7 Initiator Stephen'R. Maslar 10 Response Due Date 20 Working Days From Issuance	Date 8/ 2/ 95	9 QA Review QAR , R. 11 QA Issuance App QAR (PR)/AOQAM (	Marte rova DRI Blow	8/2/96 Date Date Date %- 2.95
SEE RESPONSE	ON 1 <sup>9</sup> .3 C	5 <i></i>	•	
13 Remedial Action Response By	Date 8/30/25	14 Remedial Action I OCTOBEE	Due Date 5, 1995 osure	Date
OAR	Date	QAR		Date
xhibit AP-16.10.1				Bey. 07/03/95

#### 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

DEFICIENCY REPORT

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

**18 Investigative Actions:** 

17 Recommended 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 jechnical and one for compliance) PGC checks both the Check Copy and the Final Check Copy.

21 Response by	Date \$ 3.095	22 Corrective Action Completion	n Due Date:
23 Response Accepted		24 Response Accepted	·····
QAR	Date	AOQAM	Date
25 Amended Response Accepted		26 Amended Response Accepted	d
QAR	Date	AOQAM	Date
27 Corrective Actions Verified		28 Closure Approved by:	
QAR	Date	AOQAM	Date

Exhibit AP-16.10.2

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

Performance Report

8

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 (SCPB: 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 (B0000000-01717-2200-00079 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

CC



TRW Environmental Safety Systems, Inc.

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

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

WBS: 1.2.6 QA: N/A From A. M

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

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.
- 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.
- 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.
- 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
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J. L. Naaf
L. J. Olguin
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D. J. Rogers
R. S. Saunders
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W. E. Wallin
RPC

AMS:lmh

Civilian Radioactive V ste Management System

Management & Operating Contractor

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#### IMPLEMENTING LINE PROCEDURE

Title:

#### **CHECKLISTS FOR DESIGN PRODUCTS**

1995

11.

Procedure Number:

#### NLP-3-28

August

0

Revision:

Effective Date:

Responsible Manager:

Author:

.

A. M. Segrest

W. J. Leonard

Approvals: sponsible Organization Manage

Approval Date

ille

QA Manager, Nevada

Office Manag

7-28-95

#### Approval Date

Approval Date

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

FOR INFORMATION ONLY

QA: -₩-

AUG | 6 1995

Title: Checklists for Des. Products Procedure No.: NLP-3-28/Rev. 0

#### 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 OAP-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.

Civilian Radioactive Waste Management System

Management and Operating Contractor

#### 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	Analysi	is Checklist
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Complete only applicable items.

QA: N/A

Page: / Of: 5

Docur	ment Ider	ntifier				
Comp	liance Cl	eck By (Prin	nt Name)		Signature	Date
Yes	N₀	N/A	1. ls	the De	sign Analysis ready for Discipline Check?	
		Yes	No □	N/A	Is the Design Analysis copy clearly marked "Check Copy?"	
					Does the Design Analysis include a Cover Sheet and Revision Record? Is the Design Analysis identified using a alphanumeric revision designa	tor?
					Is the Design Analysis legible and in a form suitable for reproduction, I and retrieval?	iling,
			2. Is 1	the Des	sign Analysis ready for Final Check?	
					Are Review Summary sheet(s), Check Copy, Interdiscipline Review Co Quality Administrative Procedure QAP-3-1 Document Review Records from External Review included and properly filled out?	py, and (DRRs)
					Does Design Analysis include a Cover Sheet and Revision Record?	
					Is the Design Analysis legible and in a form suitable for reproduction, f and retrieval?	iling,
					Are appropriate signatures in place and with proper dates on the Desig Review Summary?	n Analysis
			3. Isr	eferen	cing thorough and complete?	
					Is the Design Analysis correctly listed in the Basis For Design (BFD)?	
					Do all references listed in Section 5, References, appear in the body of Design Analysis?	the
	•				Do the references listed in Section 5, References, have correct titles, renumbers, and/or dates?	evision
					Do all references used in the body of the Design Analysis appear in Section 5, References?	
					Do all documents in Section 4.4, Codes and Standards, appear in the b of the Design Analysis?	ody
					Do the documents in Section 4.4, Codes and Standards, have correct t revision numbers, and/or dates?	itles,
					Do all codes and standards used in the body of the Design Analysis app in Section 4.4, Codes and Standards?	Dear

# Design Analysis Checklist

(Continuation Page)

						Complete only applicable items.	Page:	? of:'5
Docun	nent iden	tifier			· <del>C···········</del>			
Yes	No	N/A	4.	For re		d Design Analyses, have all revision requirements been met?		
			, , [			For revisions/changes, are changes identified by change bars in margi	in?	
			5.	Are re	əquir	ed tolerances justified within the body of the Design Analysis?		
			6.	is the	Des	sign Analysis properly titled, formatted, and identified?		i
ļ			۵	ם כ	ב :	Does the Design Analysis title, document identifier, and Configuration Item Identifier (CII) match the Engineering Document Control (EDC) In	ı sting?	
			۵	ב ב	<u>ב</u>	Is the Design Analysis CII correct and at the appropriate level based on the current Configuration Item (CI) matrix?		
			٢	ב ב	ב	Is the Design Analysis Cover Sheet numbered correctly?		•
•			. C		ב	Is description of revision history listed on Design Analysis Revision Re	cord?	
			٢		ב	Is description of revision history clear and concise?		
			٢		ב	Do the title and document numbers appear consistently through all sh	eets?	i
			٢		ב	Is Design Analysis title appropriate for the content?		
			7.	Does f Procec	form dure	nat of the Design Analysis follow the requirements of Quality Assurance QAP-3-9, Attachment 1, Design Analysis Outline?	9	
			C	ם כ	כ	Has the Design Analysis been developed to the necessary detail in acc with the Design Analysis Outline from QAP-3-9 (Attachment I) as out	cordance lined below	:
		<b>D</b> ,	C	ם כ	ב	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	"?
				SECTI	ON	1 PURPOSE		
			C	] [	ב	Is the "Purpose" clearly defined?		
				SECTI	ION :	2 QUALITY ASSURANCE		
			C	] [	נ	Are appropriate "QA" Classifications identified in accordance with the Determination of Importance Evaluation (DIE), Quality Assurance (QA) Classification Analysis and NLP-3-18?	1 \$	
				SECTI	ON :	3 METHOD		
			E	ם כ	כ	is the design method used appropriate for the design?		
•	•		C	ם כ	כ	Has the method been clearly defined?	·	
·				SECTI	ON 4	4 DESIGN INPUTS		
			C		נ	Are design inputs and their sources identified?		

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QA: N/A Page: Ż

# Design Analysis Checklist

(Continuation Page)

بالأرشية فتواجع بدائلا ا

Complete only applicable items.

•

QA: N/A

Document Identifier			
	SI	ECTION	I 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)?
	SE	ECTION	4.1DESIGN 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?
	SE	ECTION	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?
	SE	CTION	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?
	SE	CTION	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?
	SE	CTION	5 REFERENCES
			Are sources of design inputs listed?
			Are other references listed?
	SE	CTION	6 USE OF COMPUTER SOFTWARE
			Is a list of Scientific and Engineering Software included?

CRWMS/M&O

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# Design Analysis Checklist

(Continuation Page)

Complete only applicable items.

QA: N/A Page: 4 Of: 5

Document Identifier			
	SI	ECTION	6 USE OF COMPUTER SOFTWARE (Con't)
Yes	No	N/A	
			Are the computer types, program names, version/revision numbers, and Computer Software Configuration Item (CSCI) number(s) listed and correct?
			Are the input files and outputs documented in the Design Analysis sufficient to allow independent repetition of software use?
	Ċ		Are the output(s) reasonable compared to the input(s)?
			Is a statement included indicating the software was appropriate for the application?
			Is a statement included indicating the software was used only within the range of validation as described in the verification and validation documentation?
			If computational support software is used, are the software titles and version/revisionnumber(s) provided?
			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?
			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?
	SE	CTION	7 DESIGN ANALYSIS
			Is the Design Analysis, including calculations, clearly presented so that any qualified individual could review the Design Analysis without recourse to the originator?
			Is the Design Analysis complete and technically adequate?
	SE	CTION	B CONCLUSIONS
			Are conclusions, decisions, or recommendations presented clearly?
			Are the conclusions reasonable compared to the design inputs(s)?
	SE	CTION	9 ATTACHMENTS
			Are supporting documentation included as attachments?
			Are attachments properly identified and paginated?

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Design	Analysis	Checklist
-	-	

(Continuation Page)

CRWMS/M&O

Complete only app	olicable	items.
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QA: N/A

Page: 5 Of: 5

Docum	ient Idenf	tifier				-
Yes	No	N/A	•		· · · · · · · · · · · · · · · · · · ·	
			8. Are	a 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.

DED 2/15/95 QA: 21 NA Page: 1 Of: 10

1.

2. DESIGN ANALYSIS TITLE								
Analysis of MPC Weight, Dimer	Analysis of MPC Weight, Dimensional Envelope, and Configuration Requirements (SPAS N/A)							
3. DOCUMENT IDENTIFIER (Including	Rev. No.)	4. R	V.NO.	5. TOTAL PAGES				
BB0000000-01717-0200-00003 R	EV 00	00A		10				
6. TOTAL ATTACHMENTS	7. ATTACHMENT NUMBERS - NO. OF	PAGES IN EACH	8. SYSTEM ELE	VENT				
None	N/A		MGDS System	Element				
	Print Name	Sign	ature	Date				
9. Óriginator								
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.

(ipil K. Roy 08/29195

e ' 13

### **Design Analysis Review Summary**

Complete only applicable items.

1. QA: L Page: 1

Of: 1

		la se la					
2. DESIGN	ANALYSIS TITLE						
Analysis (	of Degradation Due to	D Water and Gases in MPC				4 BEV NO	
PRODOD	00 01717 0200 0000	5 PEV 01					
5. ORIGIN	ATOR			<u> </u>		6. DATE	
0	K. M. C.					8-30-95	
7. CHECK	ER					8. DATE	
IN	Jayne Eli	allin				9/25/95	
9. Due	17	11. Review		Com	nents	12. Backcheck	
Date	10. Discipline	Signature	Date	Yes No		Signature	Date
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<u></u>		· · · · · · · · · · · · · · · · · · ·	1	1			<u> </u>
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12 061446			1				
As LD a ffect As LD revised	E, I have determine any other function E and department information does no	ned that no intendiscipline review wal area. Hugh A t manager, I have determined ot affect any other organi	in is require Bentor i that no en eation. Hu	d bec n 9/ eterna gh 1	ause 1 127/9 1 revi 7 . 1	he revised information doe 5 ew is required because Senton 9/27/95	es not the
14. APPRO	VED:						
	- Kum Wach	Mc. Cor Originator Signature e E. Wallini				9-27-95 Date 9/29/95	
	Hund	Checker Signature	<u>.</u>			Date 9/29/95	
	( ) )	LDE Signature	and a			Date a/20/05	
		CA Signature	7000			Pate	

QAP-3-9

### **Design Analysis Cover Sheet**

Complete only applicable items.

QA: L\* \* 4 Page: 1 Of: 22

(1.)

2. DESIGN ANALYSIS TITLE					•
Analysis of Degradation Due to	Water and Gases in MPC				
3. DOCUMENT IDENTIFIER (Including	ng 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 EAC	н	8. SYSTEM ELEN	VENT
None.	N/A	·		MGDS System	Element
	Print Name		Signat	ure	Date
9 Originator					
J. Onginator	J. KEVIN McCoy	9 Klim Mc Coy		9-29-95	
10 Charles		Wagne E. Wallin			
IO. Checker	Wayne E. Wallin				9/29/95
11 Lord Davies Frainces				1 -	alashe
11. Lead Design Engineer	HUGH A. BENTON	Nigh	A. C	Senton	1/24/45
12.04.14			Λ	for dy	Heger,
12.UA Manager	DJ Gilstimp	0.9.	G.	kto you	in 9/29/95
				/	alabe
TS. Department Manager	HUGH A. BENTON	Hugh	A.L	Senton	7/24/95
14. REMARKS	· · · · · · · · · · · · · · · · · · ·				<u> </u>

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QAP-3-9

# **Design Analysis Revision Record**

29

Complete only applicable items.

QA: Page: 2

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1.

Of: 22

2. DESIGN ANALYSIS	TITLE		
Analysis of Degradat	ion Due to Water and	Gases in MPC	
3. DOCUMENT IDENTI	FIER (Including Rev. No.)	1	4. REVISION NO.
BB000000-01717-0	200-00005 REV 01		
5. Revision No.	o. Iotal Pages	7. Descript	
00 01	18 22	Original issue Revised approach to treatment of nitric ac of zirconium. Increased level of detail in	id condensation and determination of amount calculations throughout.
		FOR INFORMATION ONLY	
AP-3-9 (Effective 03/06/95)			0487 (Rev. 02/03/95)

### **Design Analysis Review Summary**

Complete only applicable items.

(1.)

QA:

Page: 1

Of: 1

2. DESIGN	ANALYSIS TITLE	· · · · · · · · · · · · · · · · · · ·				· · · · · · · · · · · · · · · · · · ·	
Initial Wa	ste Package Probabil	istic Criticality Analysis: Uncanis	tered Fuel (T	BV)			
3. DOCUM	ENT IDENTIFIER (Includ	ding Rev. No.)				4. REV. NO.	
B6000000	0-01717-2200-00079	9 REV 01				01	
5. OPIGINA	TOR	an -				6. DATE	
J.R. Mass	ari tom	- 1mm	$\geq$			09/21/95	
7. CHECKE	R S	2 P-				8. DATE	
L.E. Boot	100.0	(2000)				10/2/95	
9. Due	10 Dissipling	· 11. Review		Comr	nents	12. Backcheck	
Date		Signature	Date	Yes	No	Signature	Date
•							
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10.051440			L				·
13. REMAR	iks pcg Complian	ice review of Checked do	lument co	mplet	ed	by WEW 10/2/95	
No interdi	scipline review is req	uired because the revised informa	tion does not	chang	the c	conclusions and therefore issue	nnce of
REV 01 w	ill not afect any othe	r organization. 1/2	17 mit	1	tal	2/95 10/2/95	
	affect Subjects	Feller )	Source			10 11	
	אין אין איך	· · · ·				P.A.	
The Depar	tment Manager and	LDE have determined no external	review is req	uired	becaus	e this analysis does not affect a	any other
organizati	on outside the design	organization. Hurt A B	enter 10	12 kis			
		Jugan		(* //*			
14. APPRO	VED:	······	·····				
	2	Mit				•	
	-m.	111mm	· · · · · .			10/2/95	
		Originator Signature				Date	_
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		Checker Signature	·····				
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### **Design Analysis Cover Sheet**

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2. DESIGN ANALYSIS TITLE					· · · · · · · · · · · · · · · · · · ·	
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	<u> </u>	Print Name		Signat	ture	Date
9. Originator	Jol	an R. Massari	A	M	h	- 10/5/95
10. Checker	Lewie E. Booth		J.E. Boot		of	10/5/95
11. Lead Design Engineer	Pe	er Gottlieb	Putu	Ato	utul	10/5/95
12.QA Manager	l	J. Gilstrap	Q. 4	? Jo	They	10/5/95
13. Department Manager	Manager Hugh A. Benton			. Og	a or	10/6/95
14. REMARKS						Ł

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# Design Analysis Revision Record

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2. DESIGN ANALYSIS	TITLE	
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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 Lotus 123. Minor changes to input parameters. No changes to calculation method, scope, or assumptions.
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# Design Analysis Review Summary

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changed fro	om the previous anal	ysis, and therfore, no external orga	anizations ar	e affec	ted. ·			
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#### **Design Analysis Cover Sheet**

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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.)
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 5. TOTAL PAGES B0000000-01717-2200-00080 REV 01 01 56 7. ATTACHMENT NUMBERS - NO. OF PAGES IN EACH 6. TOTAL ATTACHMENTS 8. SYSTEM ELEMENT 47 pages MGDS System Element 1 **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 12.QA Manager Gilstray 01 13. Department Manager Hugh A. Benton 10 95

14. REMARKS

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# **Design Analysis Revision Record**

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2. DESIGN ANALYSIS TITLE							
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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.					
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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 B0000000-01717-2200--0079 and B0000000-01717-2200-00080 was corrected.

This DR is considered closed.

Stephen R. Maslar, QAR

11/30/95 Date

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