NOV 04 1998

ENGINEERING DATA TRANSMITTAL

Page 1 of 1

1. EDT 625078

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DISTRIBUTION	SNF Storage Projects	N/A
5. Proj./Prog./Dept./Div.:	6. Design Authority/ Design Agent/Cog. Engr.:	7. Purchase Order No.:
Spent Nuclear Fuel Project	K. E. Smith	N/A
8. Originator Remarks:		9. Equip./Component No.:
For Release		N/A
		10. System/Bldg./Facility:
		N/A
11. Receiver Remarks: 11A. Design Baseline Document? [ ] Yes [X] No		12. Major Assm. Dwg. No.:
		MCO
		13. Permit/Permit Application No.:
		N/A
		14. Required Response Date:
		N/A

15. DATA TRANSMITTED

(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	(F) Approval Desig-nator	(G) Reason for Trans-mittal	(H) Origi-nator Dispo-sition	(I) Receiv-er Dispo-sition
1	HNF-3266		0	Multi-Canister Overpack Design Pressure Rating	N/A	1	1	1

16. KEY

Approval Designator (F)	Reason for Transmittal (G)	Disposition (H) & (I)
E, S, Q, D or N/A (see WHC-CM-3-5, Sec.12.7)	1. Approval 4. Review 2. Release 5. Post-Review 3. Information 6. Dist. (Receipt Acknow. Required)	1. Approved 4. Reviewed no/comment 2. Approved w/comment 5. Reviewed w/comment 3. Disapproved w/comment 6. Receipt acknowledged

17. SIGNATURE/DISTRIBUTION
(See Approval Designator for required signatures)

(G) Reason	(H) Disp.	(J) Name (K) Signature (L) Date (M) MSIN	(G) Reason	(H) Disp.	(J) Name (K) Signature (L) Date (M) MSIN
1	1	Design Authority L. H. Goldmann 9/15/98			SNF Project Files R3-11
		Design Agent	1	1	Process Eng. Manager, J. R. Frederickson 9/16/98
1	1	Cog.Eng. K. E. Smith 9/15/98			
1	1	Cog. Mgr. J. D. Cloud 9-15-98			
		QA			
		Safety			
		Env.			

18.	19.	20.	21. DOE APPROVAL (if required)
K. E. Smith 9/15/98 Signature of EDT Originator Date	Authorized Representative for Receiving Organization Date	J. D. Cloud 9-15-98 Design Authority/ Cognizant Manager Date	Ctrl. No. N/A KES 10/21/98 [ ] Approved [ ] Approved w/comments [ ] Disapproved w/comments

BD-7400-172-2 (05/96) GEF097

Multi-Canister Overpack Design Pressure Rating

K. E. Smith
DE&S Hanford, Inc., Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-96RL13200

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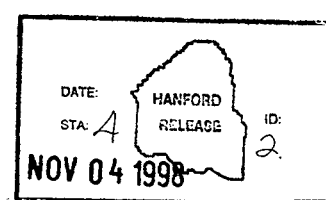
Abstract: The SNF project was directed to increase the MCO pressure rating by the U.S. Department of Energy, Richland Operations Office (RL) unless the action was shown to be cost prohibitive. This guidance was driven by RL's assessment that there was a need to improve margin and reduce risks associated with assumptions supporting the bounding pressure calculation for the MCO Sealing Strategy. Although more recent pressure analyses show a bounding MCO pressure of 50 psig, RL still considers it prudent to retain the pressure margin the 450 psig rating provides. This rating creates a real, clearly definable margin and significantly reduces the risk that the safety basis will be challenged.

11/3/98
Release Approval Date



Release Stamp

Approved for Public Release

Issue Closure Package

Issue: **MCO Design Pressure Rating**

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MULTI-CANISTER OVERPACK

DESIGN PRESSURE RATING

Introduction

The MCO Sealing Strategy increased the MCO design pressure from 150 psig to 450 psig. The basis for selection of the 450 psig pressure rating is documented in Reference 1.

Discussion

The SNF project was directed to increase the MCO pressure rating by the U. S. Department of Energy, Richland Operations Office (RL) unless this action was shown to be cost prohibitive. This guidance was driven by RL's assessment that there was a need to improve margin and reduce risks associated with assumptions supporting the bounding pressure calculation for the MCO Sealing Strategy. Review of the MCO design indicated that through minimal modifications the MCO pressure rating could be increased from 150 to 450 psig, which is within the strength of the MCO main body (0.5" wall). Subsequent refined calculations and fuel characterization have provided greater margin and confidence in the bounding pressure analysis. However, RL still considers it prudent to retain the pressure margin the 450 psig provides.

The initial bounding (10^{-6} probability) pressure analysis for the MCO Sealing Strategy was provided in HNF-1523, Rev. 0 in November, 1997. This was a formally released and peer reviewed document. It calculated a bounding pressure of 133 psig based on limited characterization data and assumptions of fuel cleaning efficiencies, including 70% of aluminum hydroxide coatings. The proximity of this bounding pressure to the MCO pressure rating of 150 psig, and challenges to the analysis due to limited characterization data and bases for supporting assumptions prompted RL to request an increase in MCO pressure margin. Subsequent pressure calculations performed in HNF-SD-SNF-TI-040, Rev. 2 provide a refined model which better accounts for bound water behavior and does not require aluminum hydroxide coating cleaning. It calculates a bounding pressure of 50 psig. Characterization data supporting this analysis includes whole element drying tests, particulate and coating measurements, and uranium hydrate TGAs. This analysis demonstrates significant pressure margin for processing and storage of MCOs.

The original cost estimate to increase the MCO pressure rating was about $3M in MCO fabrication costs, mostly due to the addition of higher strength collar material. Subsequent refinements in the MCO pressure rating strategy resulted in a change back to the 150 psig rating for the mechanical closure only, while retaining the 450 psig rating once the cover cap is welded in place. This change permitted the return to a lower cost material for the collar (304L/304

stainless steel). Refer to HNF-3267 for a discussion of the dual pressure rating approach.

Conclusion

The SNF Project endorses the higher MCO pressure rating and continues to retain the 450 psig pressure rating requirement on the final welded MCO with concurrence from RL. This rating creates a real, clearly definable margin and significantly reduces the risk that the safety basis will be challenged. It also reduces the necessity for pressure monitoring of the MCOs during interim storage.

Reference

1. Interoffice Correspondence, J.R. Frederickson to J.D. Cloud, MCO 450 PSIG Pressure Rating Basis, JFR-98-016, dated July 28, 1998

DISTRIBUTION COVERSHEET

Subject: MCO ISSUE PAPERS PER ATTACHED DISTRIBUTION INDEX

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J. B. Sullivan	S7-41	X

DISTRIBUTION INDEX

The Multi-Canister Overpack Issue papers listed below are being distributed as a package to facilitate future reference and use by SNF Project personnel. The following issue papers are attached:

1. HNF-2876, Oxygen Gettering Issue Closure Package
2. HNF-3265, MCO Number of Shield Plug Ports
3. HNF-3399, MCO Necessity of the Rupture Disk
4. HNF-3267, MCO Dual Pressure Rating
5. HNF-3293, MCO Ultrasonic Examination of Closure Weld
6. HNF-3354, MCO Monitoring Issue Closure Package and HNF-3312, MCO Monitoring Activity Description
7. HNF-3292, MCO Sealing Configuration
8. HNF-3266, MCO Design Pressure Rating
9. HNF-3255, ASME Code Requirements for MCO Design and Fabrication
10. HNF-3398, MCO Inservice Inspection and Maintenance
11. HNF-3420, MCO Internal HEPA Filters
12. HNF-3036, Low Reactive Surface Area Issue Closure Package
13. HNF-3270, MCO Pressure Testing