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ENGINEERING DATA TRANSMITTAL

Page 1 of 1

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Approval Designator (F)		Reason for Transmittal (G)	
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		Disposition (H) & (I)	
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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	<i>[Signature]</i>	9/16/98				SNF Project Files			R3-11
		Design Agent									
1	1	Cog.Eng. K. E. Smith	<i>[Signature]</i>	9/15/98							
1	1	Cog. Mgr. J. D. Cloud	<i>[Signature]</i>	9-15-98							
		QA									
		Safety						DOE/KL PR			H2-53
		Env.									

18. K. E. Smith Signature of EDT Originator Date 9/15/98		19. Authorized Representative Date for Receiving Organization		20. J. D. Cloud Design Authority/Cognizant Manager Date 9-15-98		21. DOE APPROVAL (if required) Ctrl. No. N/A ☐ Approved ☐ Approved w/comments ☐ Disapproved w/comments 10/24/98	
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Multi-Canister Overpack Number of Shield Plug Ports

K. E. Smith

DE&S Hanford, Inc., Richland, WA 99352

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Abstract: Port #1 provides additional flexibility to address monitoring, sampling, and off-normal events. Deletion of the port now and then reintroduction at a later time will have negative cost and schedule impacts to the project. The port can easily be removed in the future, and the decision to eliminate the port should be made only after operating experience demonstrates conclusively that there is no practical use for the port. The comparison of the potential uses of port #1 versus the cost savings associated with removal of the port does not justify elimination of the port at this time.

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Release Approval Date

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Issue Closure Package

Issue: MCO Number of Shield Plug Ports

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MULTI-CANISTER OVERPACK
NUMBER OF SHIELD PLUG PORTS

Introduction

Incorporation of the MCO Sealing Strategy eliminated the staging of "pressure-managed" MCOs in the Canister Storage Building (CSB). The process pressure relief valve previously contained in shield plug port # 1 was designed to provide the ability to manage the pressure within the MCO in order to preclude a full 150 psig blow-down through the safety class rupture disk. With elimination of the pressure managed MCO strategy at the CSB, the relief valve is no longer needed in the MCO design. With the elimination of the pressure relief valve, the potential future utilization of port # 1 should be evaluated against the fabrication cost savings associated with deleting the port.

Port Summary

The MCO shield plug is equipped with four ports. An isometric sketch is at the end of this paper showing the layout of the ports within the shield plug. A summary of each port follows:

Port # 1

This port # 1 is described below in the Discussion section.

Port # 2

This port has a 1 inch diameter passage way which is connected to the MCO internal high efficiency particulate air (HEPA) filter manifold.

The primary use of this port is for process gas removal during the vacuum drying of the MCO at the cold vacuum drying (CVD) facility. The CVD facility vacuum pump is connected to this port and it is used for water vapor and other gas removal. This port is also used while the MCO is in the sealed cask on transfer to the CVD. It allows the gas inside the MCO to interact with the atmosphere inside the cask.

The secondary use of this port is for gas sampling of the MCO at the canister storage building (CSB) prior to the cover caps being welded onto the MCO.

Port # 3

This port has a 0.59 inch diameter passage way and is connected to a 2 mm strainer at the bottom of the MCO.

The primary use of this port is for removal of bulk water from the MCO at the CVD facility.

The secondary use for this port is for the introduction of gasses into the MCO.

Other possible uses include reflooding the MCO with water should the need arise.

Port # 4

This port has a 1 inch diameter passage way which is connected to the 2 mm strainer inside the armored chamber at the shield plug.

The primary use of this port is for the pressure relief rupture disk in the event of a flooded runaway corrosion event occurs inside the MCO. This event is possible any time the MCO is fueled and flooded with water. The MCO is assembled flooded at the basins and the bulk water is removed in the CVD facility.

The secondary use of this port is as a backup port for the vacuum drying of the MCO in the event port # 2 or the MCO internal HEPA filters become inoperational, blinded, or blocked.

This port also defines the release by a blow down, if any, from the MCO in the case of disk actuation in the port appliance due to excessive pressure.

Discussion

Port # 1 has a 1 inch diameter passageway through the shield plug which is connected to the MCO internal high efficiency particulate air (HEPA) filter manifold. The current MCO design shows a threaded port plug and seal in place to blank-off the port. Potential uses of this port include the following:

- HEPA filtered relief
- Sampling, verification and/or adjustment of MCO gas content and pressure prior to the MCOs being welded or shipped off-site. This includes the capability to access the MCO through the cover cap penetration and port # 1 without removal of the welded cover cap
- Umbilical connection for "on-line" surveillance of MCOs
- Tell-tale pressure indication device on the MCOs
- Remote broadcast/sensing devices on the MCOs
- Other monitoring schemes associated with the MCOs

The uses above would facilitate:

- monitoring of the MCOs at the CSB
- upset recovery of the MCOs
- maintaining a fall-back capability (i.e. cavity space in and threaded connection to the shield plug) for future use

While the exact use of port # 1 has not been identified at this time, this port provides considerable flexibility to address numerous monitoring applications and recovery from off-normal events. The # 1 port can be changed to suit without affecting facility (CVD or CSB) process connections or easily removed from the design in the future, should none of the potential uses mentioned above be required. However, removing the port now and then having to reinstate the port in the future would adversely impact the MCO Topical Report, MCO Design Report, dose analysis, and fabrication contract. Any increase in fabrication scope after award of the contract would be costly. Impacts due to later reintroduction of port # 1 could also cause schedule delays.

The potential cost savings of eliminating the port, threaded plug, shield plug passageways, cover plate, cover bolts, and seals is estimated at about \$500 per MCO for a total of \$200,000 for the 400 MCOs. Given the potential uses of the port, it is prudent to retain the port at this time. Future consideration for removal of the port can be made sometime after the fuel removal campaign is initiated and operating experience confirms that the potential uses for the port are not needed. Additionally, recovery plans should be developed and approved prior to making the decision to eliminate this port. The fabrication contract bid documents will require all bidders to provide a fixed price credit for deletion of port # 1. This will ensure that the full value associated with deleting the port is realized, should it be determined in the future that the port is not needed.

CONCLUSION

Port # 1 provides additional flexibility to address monitoring, sampling, and off-normal events. Deletion of the port now and then reintroduction at a later time will have negative cost and schedule impacts to the project. The port can easily be removed in the future, and the decision to eliminate the port should be made only after operating experience demonstrates conclusively that there is no practical use for the port. The comparison of the potential uses of port # 1 versus the cost savings associated with removal of the port does not justify elimination of the port at this time.

DISTRIBUTION COVERSHEET

Subject: MCO ISSUE PAPERS PER ATTACHED DISTRIBUTION INDEX

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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