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Document #: SD-WM-DRR-050

Title/Desc:

DESIGN REVIEW REPORT FOR THE HYDROGEN INTERLOCK
PRELIMINARY DESIGN

Pages: 51

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JAN 25 1996

ENGINEERING DATA TRANSMITTAL

Page 1 of 1
1. EDT No 613805

2. To: (Receiving Organization) Characterization Project Operations (75100)	3. From: (Originating Organization) Characterization Equipment Design (75230)	4. Related EDT No.: N/A
5. Proj./Prog./Dept./Div.: Core Sampling / FGWL Tanks	6. Cog. Engr.: E. J. Waldo	7. Purchase Order No.: N/A
8. Originator Remarks: ETN-96-003 This report documents the completion of a preliminary design review for the hydrogen interlock. The hydrogen interlock, a proposed addition to the Rotary Mode Core Sampling (RMCS) system portable exhaustor, is intended to support core sampling operations in waste tanks requiring flammable gas controls.		9. Equip./Component No.: N/A
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1	WHC-SD-WM-DRR-050	ALL	0	DESIGN REVIEW REPORT for the HYDROGEN INTERLOCK PRELIMINARY DESIGN	SQ	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	5. Post-Review	1. Approved
		2. Release	5. Post-Review		2. Approved w/comment
		3. Information	6. Dist. (Receipt Acknow. Required)		3. Disapproved w/comment
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					6. Receipt acknowledged

17. SIGNATURE/DISTRIBUTION (See Approval Designator for required signatures)										(G)	(H)
Reason	Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(J) Name	(K) Signature	(L) Date	(M) MSIN	Reason	Disp.
1	1	Cog. Eng: EJ WALDO	<i>EJ Waldo</i>	1/25/96	S7-12	EK STRAALSUND	<i>EK Straalsund</i>	1/24/96	L6-37	1	1
1	1	Cog. Mgr: DW HAMILTON	<i>DW Hamilton</i>	1/23/96	S7-12	GF VARGO JR	<i>G.F. Vargo Jr</i>	1/23/96	H5-09	1	1
1	1	QA: ML MCELROY	<i>M.L. McElroy</i>	1/23/96	S7-07	GA BARNES	<i>G.A. Barnes</i>	1/23/96	H5-09	1	1
1	1	Safety: LS KROGSRUD	<i>L.S. Krogsrud</i>	1/24/96	R3-08	JA HARVEY	<i>JA Harvey</i>	1/24/96	S7-07	1	1
1	1	Env: PJ MARTELL	<i>PJ Martell</i>	1/25/96	S3-95	JS LEE	<i>JS Lee</i>	1-24-96	S7-03	1	1
1	1	Design Auth: JD ROBINSON	<i>JD Robinson</i>	1/23/96	S7-12	RE MERRIMAN	<i>R.E. Merriman</i>	1/24/96	E6-27	1	1
1	1	Chair: RJ BLANCHARD	<i>RJ Blanchard</i>	1/25/96	S7-12	NJ MILLIKEN	<i>NJ Milliken</i>	1/24/96	A3-37	1	1

18. JE CORBETT Signature of EDT Originator Date 1/25/96	19. JG BURTON Authorized Representative for Receiving Organization Date 1-25-96	20. DW HAMILTON Cognizant Manager Date 1/23/96	21. DOE APPROVAL (if required) Ctrl. No. ☐ Approved ☐ Approved w/comments ☐ Disapproved w/comments
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DESIGN REVIEW REPORT for the HYDROGEN INTERLOCK PRELIMINARY DESIGN

J. E. Corbett

Westinghouse Hanford Company, Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-87RL10930

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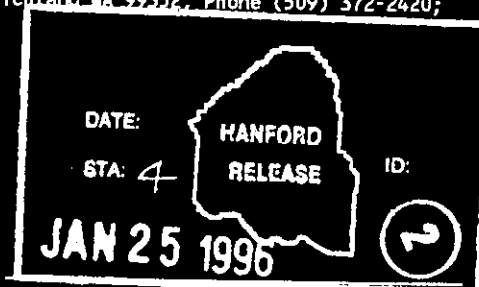
Key Words: Exhauster, Hydrogen Interlock, Core Sampling, Flammable Gas Watch List, Rotary Mode Core Sampling, RMCS, Core Sample Truck, Preliminary Design Review, 50% Design Review, Design Review Report

Abstract: This report documents the completion of a preliminary design review for the hydrogen interlock. The hydrogen interlock, a proposed addition to the Rotary Mode Core Sampling (RMCS) system portable exhauster, is intended to support core sampling operations in waste tanks requiring flammable gas controls. The objective of this review was to validate basic design assumptions and concepts to support a path forward leading to a final design. The conclusion reached by the review committee was that the design was acceptable and efforts should continue toward a final design review.

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Release Approval _____
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Date 1/25/96



Approved for Public Release

DESIGN REVIEW REPORT
for the
HYDROGEN INTERLOCK PRELIMINARY DESIGN

Issued by:

**Tank Waste Remediation System
Characterization Project**

January 1996

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Hydrogen Interlock Preliminary Design

1.0 SCOPE

This report documents the completion of a preliminary design review for the hydrogen interlock. The hydrogen interlock, a proposed addition to the Rotary Mode Core Sampling (RMCS) system portable exhaust, is intended to support core sampling operations in waste tanks requiring flammable gas controls. This review included the Software Design Description (SDD) and design drawings (listed in section 3.0) considered to be at the 50% design completion state. The Functional Design Criteria (FDC) and a DOE 6430.1a Compliance Checklist were provided to support the review.

This document and the formal design review are in support of design modifications to the core sampling systems used by Characterization Project Operations (CPO). The modifications are required to expand the scope of core sampling to include Flammable Gas Watchlist (FGWL) tanks, as well as any other tanks with flammable gas controls. The objective of this review was to validate basic design assumptions and concepts to support a path forward leading to a final design.

2.0 SUMMARY

The design review committee was selected in accordance with EP 4.1 and is documented in Section 3.0 of this report. The initial 50% design review briefing was held on October 4, 1995. Due to the nature and extent of the comments generated by this briefing, design changes warranted a second 50% design review briefing, which was held on October 24, 1995. Meeting minutes for these briefings are attachments to Section 3.0 of this report. The major decision made during this review was to move the Whittaker cells from the carts to the spool assembly, and to make the carts identical for interchangeability. The 50% design review close-out meeting was held on November 16, 1995. The majority of the review comment records (RCR) were closed out at that time, and the remaining RCR's were closed out by January 4, 1996. At this stage of the design review there are no outstanding action items. The conclusion reached by the review committee was that the design was acceptable and efforts should continue toward a final design review.

3.0 DOCUMENTATION

The following items are provided as attachments to this report:

1. Listing of design review committee members
2. Copies of RCR's
3. Meeting Minutes
4. Letters and minutes provided as hand-outs

The following items were provided for review or support of the design and are available in the design review file:

1. WHC-SD-WM-TI-720, "DOE 6430.1a Compliance Checklist for the RMCS Exhauster Flammable Gas Interlock".
2. WHC-SD-WM-FDC-045, "Function Design Criteria, Flammable Gas Detection and Shutdown System".
3. WHC-SD-WM-SDR-010, "Flammable Gas Tank Exhauster Interlock...PLC Software Design Description".
4. Design Drawings H-14-100519 through H-14-100530.

ATTACHMENT 1

Listing of design review committee members

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Westinghouse
Hanford CompanyInternal
Memo

From: Characterization Equipment Design 75230-95-030
 Phone: 373-1248 S7-12
 Date: October 2, 1995
 Subject: CHARACTERIZATION PROGRAM-- FORMAL DESIGN REVIEW BRIEFING FOR THE
 HYDROGEN INTERLOCK, ROTARY MODE CORE SAMPLING SYSTEM PORTABLE
 EXHAUSTER

To: Distribution

cc:	G. A. Barnes	H5-09	M. L. McElroy	S7-07
	R. J. Blanchard	S7-12	R. E. Merriman	E6-27
	L. E. Borneman	R1-52	N. J. Milliken	H4-65
	J. E. Corbett	S7-12	R. E. Raymond	S7-12
	D. W. Hamilton	S7-12	J. D. Robinson	S7-12
	J. A. Harvey	S7-07	J. S. Schofield	S7-12
	M. E. Huda	S7-07	E. K. Straalsund	L6-37
	L. S. Krogsrud	R3-08	G. F. Vargo Jr	H5-09
	J. S. Lee	S7-08	E. J. Waldo	S7-12
			RJB: File LB	

A design review briefing meeting for the Hydrogen Interlock - Rotary Mode Core Sampling System Portable Exhauster will be held on October 4, 1995 (Wednesday), starting at 1:00 p.m. at the 2750E building, room A229. This meeting will initiate the formal design review for the Hydrogen Interlock 50% design review state. The Design Review Committee will receive a design review package, Review Comment Record forms (RCR), and the review checklist to record their comments prior to the subsequent design review meeting. The RCR forms either hard copy or electronic mail forms are to be returned, with comment, to John Corbett or Jim Robinson by October 12, 1995, for compilation and resolution prior to the design review meeting.

The design review meeting is to be held October 17, 1995, at 2750E, room A229. At this meeting each reviewers comments will be discussed to determine if they have been resolved to the reviewer's satisfaction and/or if additional action is required.

The purpose of this review is to determine the technical adequacy of the design based on the Functional Design Requirements document, WHC-SD-WM-FDC-045, Revision 0.

The Design Review Committee members and their primary areas of responsibility are listed below. The chairman was selected by the Characterization Equipment Design Manager, D. W. Hamilton. The committee members were selected by the manager Characterization Equipment Design and approved by the chairman.

Distribution
Page 2
October 2, 1995

75230-95-030

DESIGN REVIEW COMMITTEE

R. J. (Roy) Blanchard	Design Review Chairman
J. E. (John) Corbett	Design Review Secretary
G. A. (Geoff) Barnes	Mechanical Engineering
L. E. (Lucinda) Bornemann	Environmental Engineering
J. A. (Jerry) Harvey	Industrial Safety
M. E. (Huda) Huda (ALTERNATE)	Industrial Safety
L. S. (Steve) Krogsrud	Nuclear Engineering
J. S. (Jim) Lee	Characterization Operations/Facilities
M. L. (Mike) McElroy	Quality Assurance
R. E. (Ray) Merriman	Electrical Engineering
N. J. (Nancy) Milliken	Safety Analysis
J. D. (Jim) Robinson	Cognizant Design Engineer
E. K. (Eric) Straalsund	Electrical Instrumentation
G. F. (George) Vargo Jr.	Cognizant Electrical Design Engineer
E. J. (Eric) Waldo	Interfacing System/Customer Rep. Design


J. Blanchard, Senior Principal Engineer
Design Review Chairman
Characterization Equipment Design

Concurrence: 
D. W. Hamilton, Manager
Characterization Equipment Design

tla

ATTACHMENT 2
Copies of RCR's

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REVIEW COMMENT RECORD (RCR)

1. Date October 5, 1995		2. Review No.	
3. Project No.		4. Page 1 of 1 3 of 22-12	

5. Document Number(s)/Title(s) HYDROGEN INTERLOCK - RMCSS PORTABLE EXHAUSTER	6. Program/Project/ Building Number CHARACTERIZATION PROJECT	7. Reviewer Roy Blanchard	8. Organization/Group Characterization Equipment Design	9. Location/Phone 2704HV, 373-1248
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17. Comment Submittal Approval:		11. CLOSED	
Organization Manager (Optional) <u>10/23/95</u> Date <u>Roy Blanchard</u> Reviewer/Point of Contact <u>James D. R.</u> Author/Originator		<u>10/23/95</u> Date <u>Roy Blanchard</u> Reviewer/Point of Contact <u>James D. R.</u> Author/Originator	

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	Do the requirements in the FDC call for such an elaborate design, i.e., must be on a trailer or can the system be mounted on a skid like the exhauster and transported on a flat bed trailer? The rotary mode core sampling system has I believe two spare flat bed trailers (see Al Kostelnik).		The intent of the wheels in the revised design is to provide some mobility when positioned near the exhauster. I will verify with operations if the preference is for wheels or skids.	
2	I strongly suggest that you start a Failure Mode And Effects Analysis (FMECA), early in the design, and work with the analyst to get the best, most reliable components in the design up front.		There will be a reliability analysis of some sort performed, although now (October 17, 1995) it is not clear if it will be done within WHC or external (SAIC for example).	
3	Need to get a specific letter on file that has the signature of the DOE person in charge that they agree with WHC's position on the safety classification of this equipment and that DOE agrees with not having to live to the requirements of DOE 6430.1a		DOE-RL has a design review package. I have talked with Paul Hernandez and he has agreed that John Gray will review the documents. Included in those documents are the FDC which clearly states that 6430.1a does not apply to this design.	
4	Need to release the Engineering Task Plan that describes this activity to be in compliance with 10 CFR 830.120. I.E., need to have a plan, technical standards, design bases, etc. Should have the plan released ASAP, must include a schedule.		WHC-SD-WM-ETP-165 will be released the week of October 16, 1995.	

REVIEW COMMENT RECORD (RCR)

1. Date 10/6/95		2. Review No. 1	
3. Project No. 1		4. Page 1 of 3	

5. Document Number(s)/Title(s) RMCS Flammable Gas Interlock Design Review	6. Program/Project/ Building Number Characterization	7. Reviewer EJ Waldo	8. Organization/Group Characterization Eng.	9. Location/Phone 2704HV/3-4065
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17. Comment Submittal Approval:		11. CLOSED	
Organization Manager (Optional) <u>James D. Mc</u> Reviewer/Point of Contact <u>11/17/95</u> Date <u>Chris Waldo</u> Author/Originator		Reviewer/Point of Contact <u>James D. Mc</u> Reviewer/Point of Contact <u>11/17/95</u> Date <u>Chris Waldo</u> Author/Originator	

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1.	Current design calls for a 60A power supply. Generators and distribution trailers provide a 40A power supply to the exhausters. These items would have to be modified to account for additional load.		The design has been changed so that no modifications will be required to the existing truck power distribution system.	
2.	The current design calls for all power to the exhauster skid to be cut when an alarm occurs within the hydrogen interlock. This will lead to problems in cold weather conditions, because water in seal-pot is likely to freeze if exhauster is unattended. Recovery time from a shutdown will also be increased due to lack of climate control within exhauster instrument cabinet when power is lost. An alternative would be to interlock to the existing exhauster automatic shutdown circuit. This would stop the fan and shut off the heater instantly, while allowing the exhauster to remain under power. This would also solve the power distribution problem commented on above, because then the exhauster and interlock would be powered independently, and a 40A spare disconnect is present on all of our power sources which could power the interlock.		Connecting to the existing shutdown circuit would not provide redundant capability. Even if a separate circuit were provided shutdown of the fan motor occurs through the variable frequency drive (VFD). To do as you suggest would require a second VFD. It is postulated that shutdown due to hydrogen releases during unattended operation (no drilling) would be unlikely. The waste is not being disturbed by drilling so there would be no mechanism for the release of any gas pockets.	

REVIEW COMMENT RECORD (RCR)		1. Date 10/6/95		2. Review No. 1	
		3. Project No. 1		4. Page 2 of 13	
12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status	
3.	Controlling the hydrogen sample loops at a steady flow rate by an electric valve controlled by the PLC, should be considered. This will improve the accuracy of the hydrogen readings and reduce operator interface.		The Whittaker cells have been moved to the spool piece. There is no sample loop in the revised design.		
4.	If the decision is made to place the Whittaker cells within the spool piece, I would recommend doing away with the sample carts entirely. There is plenty of room within the Air Monitor cabinet for additional components. The existing data logger or a pair of Yokogawa controllers identical to the one already being used to control fan speed, could be used to perform all the remaining logic functions, which would eliminate the PLCs.		It is intended for the interlock to be a stand alone item. The revised design allows the interlock to be used with any piece of equipment in a variety of applications. Placing the majority of interlock equipment within the exhauster would defeat this purpose.		
5.	Photohelic are not "intrinsically safe". As such the first potential ignition source on the RMCS exhausters is the tank pressure photohelic located on the top of the riser about 40 ft. upstream of the hydrogen interlock. This could be solved by moving the tank pressure photohelic to the spool piece or heater assembly, since the vacuum there should be the same as in the duct where it is currently being measured. An alternative would be to replace the photohelic with a pressure transducer. This would allow shutting down the fan (see comment #2) rather than cutting power to the skid, in the event of a hydrogen alarm.		The Photohelic will be replaced with pressure transducers. This will give the added capability (if desired) to record pressure levels.		
6.	I do not see any purpose for the K1 relay. The system would work exactly the same without it, as near as I can tell.		You are correct. The K1 relay serves as a redundant loss of power relay.		

REVIEW COMMENT RECORD (RCR)

		1. Date	2. Review No.	3. Project No.	4. Page	16. Status
		10/6/95	1	1	3 of 13	
12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)			
7.	The air conditioning system will not operate as described in SDD based on drawing H-14-100520. According to the drawing all power to the AC passes through the K8 relay contacts which is controlled by the PLC. This means that the blower will not operate continuously, but only when the PLC closes the relay to cool off the cabinet. The AC also does not immediately receive power upon power initialization since the PLC must close the K8 relay contact first. Under cold weather conditions the AC will not operate (blower or compressor) until the PLC begins to function. There should be two sets of power supplies to the AC, one directly to the blower (independent of the PLC), and one passing through the K8 relay which will power the compressor on demand from the PLC. Will we be overriding the heater and AC internal thermostat controls since the PLC is to be running the show?		Again, you are correct. The revised drawings show the method of operation as you described.			
8.	I would recommend not placing wheels on these carts. At 1000 lbs. each they will be nearly impossible to push around the tank farms by hand, and dragging them behind a vehicle (which operations will think of) would be a very rough ride, and hard on the instrumentation.		The revised design will weigh considerably less than 1000 lbs. In addition the carts will be equipped with lifting lugs. The intent is to position them with the same crane that is used on the exhausters. The wheels are intended to ease movement during storage.			
9.	Some drawing comments: H-14-100520 sh. 1, zn D8: Fused Disc. SW 30A is called out, but fuses say 15A. H-14-100520 sh. 2: Emer Stop button is referred to as S2 in zone D7 and as S1 in Zone E3. Indicator lights shown in zone C6 are not included on block diagram drawings.		Accept. The callouts have been corrected.			

HYDROGEN INTERLOCK 50% DESIGN REVIEW - Rotary Mode Core Sampling System Portable Exhauster, October 4, 1995

REVIEW COMMENT RECORD (RCR)

1. Date 10/09/95		2. Review No. 50%	
3. Project No. RMCS		4. Page 1 of 2	

5. Document Number(s)/Title(s) HYDROGEN MONITOR DESIGN REVIEW	6. Program/Project/ Building Number RMCS	7. Reviewer N.J. Milliken	8. Organization/Group TWRS SAR Engineering (8M100)	9. Location/Phone 450 Hills/ 376-7846
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17. Comment Submittal Approval:		11. CLOSED	
Organization Manager (Optional) <u>10/23/95</u> <u>[Signature]</u> Reviewer/Point of Contact <u>[Signature]</u> Author/Originator		<u>10/23/95</u> <u>[Signature]</u> Reviewer/Point of Contact <u>[Signature]</u> Author/Originator	

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1.	Topic: Hydrogen Accumulation on the System. Allow for both restart and initial start-up by providing provisions in the operating procedure to bleed the system prior to start-up and restart (restart really).	NJM	The present intent is to open the isolation valves on the exhauster and let the tank vent through the exhauster. This would allow any accumulated hydrogen to disperse.	<i>Used</i>
2.	Topic: Sample Port. Provide for taking a sample in the instance of a shutdown scenario. The three-way valve can be used for this purpose.	NJM	I will assume that the request is for a manual sample port. In the revised design, the Whittaker cells are mounted in the spool piece. The vacuum pump and associated flow equipment are no longer needed. It is intended to use the cells to measure hydrogen concentration upon startup and after a shutdown event. A manual sample port will also be provided.	<i>closed</i>
3.	Topic: Isolation of the Ignition Source. There is no isolation between the heater and the tank. Does the designer feel that this may be an issue, since the ignition source can not be isolated from the tank's vapor space?	NJM	I do not believe it to be an issue. The intent of the interlock is to deenergize potential ignition sources, not isolate them. Once deenergized, they are no longer potential ignition sources. The exhauster would then serve as an additional breather filter to further dissipate hydrogen.	<i>closed</i>

REVIEW COMMENT RECORD (RCR)

		1. Date	2. Review No.
		10/09/95	50%
		3. Project No.	4. Page
		RMCS	2 of 2
12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)
4.	Topic: Reasons for the Exhauster NOT being Intrinsically Safe. It should be clearly stated in the documentation the reasons for the exhauster not being intrinsically safe. "The exhauster is not intrinsically safe because of (1) the heater, (2) the fan, and (3) the CAMs. For the following reasons: (1) of the potential for burn-through of the heating elements that would result in a flash, (2) ..."	NJM	Internal Memo 75230-95-033, attached to this RCR provides the information you requested. Please attach to Design Recond AS well. <i>Closed</i>
5.	Topic: NFPA Classification. WHC should prepare a NFPA classification review/checklist per the appropriate supporting document for fire protection.	NJM	R. J. Huckfeldt is preparing WHC-SD-WM-HC-014, Rev. 1. When complete, the design of the exhauster and interlock will be compared against the qualifications contained within the hazards classification document. <i>Closed</i>
6.	Topic: Shutdown Conditions. Clearly document that during shutdown conditions the vacuum pump remains on. Also, clearly take the conditions of shutdown, basically what remains on.	NJM	In the revised design the vacuum pumps are gone (the Whittakers are located in the spool piece). If the exhauster is shutdown due to hydrogen levels all monitoring equipment within the interlock remains on. <i>Closed</i>
7.	Topic: Shutdown Conditions. Clearly state the 5 conditions that would lead to shutdown. (1) Loss of Power, (2) Rate of Rise, (3) Loss of Flow, (4) Predetermined Trip Point, (5) PLC Watchdog	NJM	In the revised design the shutdown conditions would be high hydrogen level, exceeding hydrogen rate, PLC watchdog, and loss of power. <i>Closed</i>
			hydrogen
			nothing within the
			Vapor space is
			energized at this
			time. DM 10/23/95

**Westinghouse
Hanford Company****Internal
Memo**

From: CHARACTERIZATION EQUIPMENT DESIGN
Phone: 376-4777 S7-12
Date: October 16, 1995
Subject: NON CLASSIFIED ITEMS ON RMCS EXHAUSTER

75230-95-033

To: N. J. Milliken H4-65
cc: Design File S7-12

This Memo is written to address a design review comment submitted by N. J. Milliken. The comment was received as part of the 50% design review for the rotary mode core sampling exhauster hydrogen interlock. The comment requested a detailed discussion of those exhauster components that may not be suitable for service with potentially flammable atmospheres.

As of the date of preparation of this memo (October 16, 1995), the vapor spaces of flammable gas watchlist tanks have not been classified per the National Electric Code (NEC). Without this classification, there is no definite method of determining suitability of components that will be in contact with the potentially flammable airstream. Consequently, the most conservative interpretation has been used, i.e., Class I Division 1, Group B. When this is done three components are found not to be suitable for this application; the heater, the fan, and the continuous air monitors (CAMs).

The heater manufacturer will not certify the heater for use in a Class I, Division 1, Group B atmosphere. In reviewing the correspondence between the vendor and myself it appears there are two reasons for this. Element burn through (and subsequent flash) and the sealing of the element penetration into the housing (element wiring termination would then be exposed to a flammable mixture). The vendor does however state that the heater assembly is suitable for Class I, Division 2, Group B applications.

The fan is manufactured by Cincinnati Fan and is a "Type B" pressure blower. The wheel and housing are cast aluminum, the input shaft is steel. Cincinnati Fan does not recommend this combination in potentially flammable airstreams as there is some evidence that aluminum, when striking rusty steel, can produce a spark.

Correspondence with the CAM manufacturer indicates that the CAMs were not designed to operate in potentially flammable airstreams as there are relays in the remote heads that may

produce a spark when operated. In addition, there is a large voltage potential behind the mica detector screen. If the screen were to rupture, this potential would be directly exposed to the flammable airstream. Screen rupture is a common mode of failure on these detectors.

It has been pointed out to the author that the new exhausters on 101-SY uses the same CAMs as the RMCS exhauster. Apparently an automatic shutdown, tied to CAM failure, has been installed. This has been sufficient to obtain a safety waiver.

There is an effort underway to demonstrate that CAMs are not required on RMCS exhausters. The basis being that the potential off site dose consequence is so low that continuous monitoring is not required.

James D. Robinson

James D. Robinson
Advanced Engineer

REVIEW COMMENT RECORD (RCR)				1. Date	2. Review No.
				Oct. 10, 95	1 <i>1A</i>
				3. Project No.	4. Page
				NA	1 of 23
5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone	
H-14-100519/BLOCK DIA & PID	HYDROGEN INTERLOCK	RE MERRIMAN	ICF KH/ELECT. ENG	1200 JADWIN/372-0514	
17. Comment Submittal Approval:			11. CLOSED		
Organization Manager (Optional) <u><i>H.F. Vargh</i></u> Date <u><i>11/22/95</i></u>			Reviewer/Point of Contact <u><i>R.E. Meremair</i></u> Date <u><i>11/22/95</i></u>		
Author/Originator <u><i>R.E. Meremair</i></u>			Reviewer/Point of Contact <u><i>R.E. Meremair</i></u> Author/Originator		
12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)		16. Status
1	On Process Flow line show Tank and riser, and Exhauster heater and fan.		ACCEPT		
2	Dwg. Title "Block Diag. & P&ID" add "P&ID" to sketch title. Sheet #1 & #2.		"		
3	Why two lines between Rosemount AP Cell and Digital readout? (4PL this sheet and sheet #2)		"		
4	Vacuum pump rectangle; add "Motor" in block and arrow to block. (2 PL)		"		
5	Change 440 to 460 V all sheets and documents.		"		
	Drawing Sheet #2				
6	PORTABLE EXHAUSTER should be replaced with SPOOL PIECE and SPOOL PIECE should be replace with FILTER CABINET.		"		
7	Process Flow Stream #1 Return and #2 should be swapped and worded the same way.		"		

REVIEW COMMENT RECORD (RCR)

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
8	Process drains should show on this sheet.		ACCEPT	
	H-14-100520, Sht. #1			
9	Plug and Jack jumper labeling does not match Dwg.100522 arrangement #1.		"	
10	Several conductor taps, contactors, fuses are NOT shown in enclosures as the Disc. SWs and Tranf. are.		"	
11	Power goes to Exhauster Unit not just motor. Does not show motor starter , heater, control etc on Exhauster.		"	
12	At Fused Disc. Sw and control transformer(Cart 1 & 2) shows two fuses or fuse and Circuit breaker in series. Do not need both.		"	
13	What are loads of AC & heater.		" , will CALCULATE	
14	Consider using B phase at Cart #2 Fused Disc. SW; this will help detect a blown B phase fuse at the main 60 Amp Fused Disc. SW.		Accept	
15	Where is interlock with redundancy to "Core Sample Truck"? Ref. WHC-SD-WM-II-720, Rev. 0, P4 Paragraph 2 and Redundant requirements P. 5, paragraph 4.		REDUNDANCY is REQUIRED TO TRUCK.	
	H-14-100520, Sht. 2			
16	Three "SI" switches shown?		will Re-number	
17	Where is TK1 OMORON device located?		will SHOW	
18	At NEMPORT; I don't see equipment to make the connection to the datalogger in exhauster.		" "	
19	At OMEGA; you really need "two" 120 V hots to same device.		YES	

REVIEW COMMENT RECORD (RCR)				1. Date Oct. 10, 95	2. Review No. 1
				3. Project No. NA	4. Page 3 of 23
12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status	
20	Does Whittaker need power?		ACCEPT		
21	At ROSEMOUNT; where is 4-20 ma output?		"		
22	Shown two ways "Heater Bypass" and "Bypass (Heater)"		"		
23	At Modicon "Heater" is this the cabinet? H-14-100520, Sht. 3		"		
24	PLC output label "Loss of Flow" as "Loss of Sample Flow"		"		
25	Relabel PLC "Heater OFF" to "Cabinet Heater On/Off"		"		
26	Relabel "Heater" to "Cabinet Heater"		"		
27					

REVIEW COMMENT RECORD (RCR)

1. Date Oct. 12, 95	2. Review No. 1A
3. Project No. NA	4. Page 1 of 2

5. Document Number(s)/Title(s) H-14-100521/CART ASSEMBLY	6. Program/Project/ Building Number HYDROGEN INTERLOCK	7. Reviewer RE MERRIMAN	8. Organization/Group ICF KH/ELECT. ENG	9. Location/Phone 1200 JADWIN/372- 0514
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17. Comment Submittal Approval:

10. Agreement with indicated comment disposition(s)
11/27/95 A.F. Vargof. 11/27/95 G.F. Vargof.
 Date Reviewer/Point of Contact Reviewer/Point of Contact
R.E. Meriman R.E. Meriman
 Author/Originator Author/Originator

11. CLOSED

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
27	Sheet #1; Why is note 13 flagged.		will change	
28	Sheet #3; What is in item #3, need detail dwg?		ACCEPT	
29	What is in box between item #3 & #12?		will DEFINE	
30	Item #5, instrument cabinet, is it NEMA 4X enclosure, is it Manufacture (NEMA) approved for mounting in horizontal position?		DESIGN CHANGE - NOT REQUIRED	
31	Are all penetrations to Item #5 (Instrument Cabinet) weatherproof?		YES	
32	Where are the following located; Rosemount PSL, cabinet heater, cabinet A/C, Rosemount Digital Readout, Inside receptacle, Outside receptacle, Data logger interface?		will Define	
	H-14-100522, Sht #1			
33	Arrangement #1; where is connection Rotary Mode Drill, shutdown circuits?		EXIST OR EXHAUSTER	
34	General notes; should everything be Metric?		NOT REQUIRED	
	H-14-100525, Sht #1			
35	Where does Item #18 (Heater) get it's power?		will Define	
36	Label all items, like Item #16 (Filter).		ACCEPT	

REVIEW COMMENT RECORD (RCR)

REVIEW COMMENT RECORD (RCR)					1. Date Oct. 12, 95	2. Review No. 1A
					3. Project No. NA	4. Page 2 of 2
12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status		
37	Parts/material List, Item #'s don't always match dwg i.e. #27.		Accept			
38	Gen Note #2, Heat Trace location, part callout and power source?		"			
39	Gen Note #3, Metric requirements?		NOT REQUIRED			
40	View A-A, Where does drain line tie into spool piece?		Accept			
41	Does this design satisfy the "Separation" requirements, couldn't the sample lines exit from opposite sides on the spool piece, and the filters be in separate boxes?		Accept			
42	H-14-100529; Is there a title for this layout?		Accept			
43	It would help to understand the flow path it the Exhauster- heater, filter, fan, motor, and stack were identified.		NOT REQUIRED			
44	Grounding of equipment in Tank Farms; Ref. WHC-SD-WM-568, Rev. 1, P. 5, Sect 5.1 "Electrical Grounding And Bonding" you need a ground to the tank!		Accept			
45	WHC-SD-WM-SDR-010, Modicon 984-120 Compact PLC Software Design Description, Use NEMA voltage designation 480 V not 440 V.		"			
46	H-14-100519, Sht #1; Change block "NEMA 3φ Motor STARTER" TO "NEMA 3φ Motor CONTACTOR"		"			
	END					

REVIEW COMMENT RECORD (RCR)

REVIEW COMMENT RECORD (RCR)		1. Date 10/16/95	2. Review No. 1
		3. Project No.	4. Page 1 of 2

5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Exhauster Interlock	TWRS Characterization	G.A. Barnes	Characterization Equipment Development	ETC-1/12/376- 2241

17. Comment Submittal Approval:

10. Agreement with indicated comment disposition(s)

11. CLOSED

Organization Manager (Optional)

Reviewer's Point of Contact

Date 10/20/95

Reviewer Point of Contact

Author/Originator

Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
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Since the interlock design is being redone and the design documents given out at the briefing are no longer valid, the following comments are general and may assist CED in the redesign effort.

The use of SST junction boxes and hardware should be evaluated due to the cost and weight of SST. If aluminum junction boxes could be used on the carts a significant weight reduction could be realized. Also, if CS boxes could be used (where weight doesn't matter) instead of SST, costs could be reduced.

We will evaluate the weight savings between aluminum and stainless, but based on the abuses similar equipment has taken in the past, my inclination is to go with stainless.

CED should evaluate using a VMS for the flammable gas tank exhauster. The way the VMS operates makes it intrinsically safe, making an interlock unnecessary. Characterization Equipment Development would gladly sit down with CED to discuss using this technology.

The present course is to continue to develop the interlock design while investigating qualifying existing components on the RMCS exhausters. Management has indicated to me that development of a new exhauster is a long term project, primarily because of the time needed to prepare new State operating permits.

REVIEW COMMENT RECORD (RCR)

1. Date 10/16/95		2. Review No. 1	
3. Project No.		4. Page 2 of 2	

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
3	If carts are going to be used for instrumentation, CED should use a four wheeled cart with the largest tires practical. A two wheeled handtruck is very difficult to maneuver in the farms and the large tires will work better in soft gravel. Also, the carts should have lifting lugs so they can be moved using a crane.		We have incorporated this comment in the revised design. The carts are four wheeled, with 21 inch tires. Lifting lugs are included on the carts.	
4	CED should evaluate how long it will take the exhauster heater to cool down if there is a "burn through". Will it cool down enough in one minute if hydrogen is present? This seems very far fetched, but someone may ask later.		The heater is automatically deenergized if an element burns through (fails). If hydrogen is not present, cool down time is not critical. If hydrogen is present above allowable levels, the interlock would shut down the heater. What you are suggesting would take the simultaneous occurrence of three separate acts. An interlock failure coupled with heater failure and subsequent failure to deenergize the heater, all of this happening when there are high hydrogen levels.... Thank you for the comment.	
5	The welded joints on the spool piece should be welded from both sides, where practical. This will make the spool piece easier to decon and will also make it easier for the HPTs to release it.		Accept. The revised design will incorporate welds on both sides of the joint.	

REVIEW	COMMENT	RECORD	(RCR)	1. Date	2. Review No.
				November 10, 1995	2
				3. Project No.	4. Page
				NA	1 of 2

5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
H-14-100530 WHC-SD-WM-SDR-010	HYDROGEN INTERLOCK	RE MERRIMAN	ICF KH/ELECT. ENG.	1200 JADWIN/372/0514

17. Comment Submittal Approval:	10. Agreement with indicated comment disposition(s)	11. CLOSED
Organization Manager (Optional)	<u>11/27/95</u> Date <u>G.F. Vargor</u> Reviewer/Point of Contact <u>R.E. Merriman</u> Author/Originator	<u>11/27/95</u> Date <u>G.F. Vargor</u> Reviewer/Point of Contact <u>R.E. Merriman</u> Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	WHC-SD-WM-SDR-010 - P. 3; Change 440 to 480 all places. Meet current voltage standards, ANSI C84.1-1982.		ACCEPT	
2	Project is identified in DSI and other documentation as "Hydrogen Interlock." On Drawings it is called "Exhausted Interlock." Which is correct?		Exhauster Interlock	
	Drawing H-14-100530 Sht 1;			
3	K7-1 & 2 Motor "starter", why not a "Contactor." No O.L.s shown and smaller enclosure.		AGREE	
4	Exhauster Power, what is Load. Will DS2 15A fuse carry load?		CHANGE TO 30A 240V fuse	
5	CBI must be in listed enclosure NEC 380-3. Do you want a fuse instead? This CBI may be confused with CBIs on Carts via SDD 3.2.1.		15A fuse	
6	Exhauster cart electrical load?		220 Amp	
7	Need transformer secondary overcurrent protection on T1 and T2, NEC 450-3(b)(1) is for 2-wire secondaries only, see NEC 240-3(i).		AGREE	

REVIEW COMMENT RECORD (RCR)				1. Date November 10, 1995	2. Review No. 2
				3. Project No. NA	4. Page 2 of 2
12. Item	13. Comment(s)/discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status	
8	Why do you have both DS 3 & DS 4; same for T1 and T2? Combine into one source with both J1A and J2A supplied from new transformer secondary O.C. device. May not need DS3 if T1 is doubled in size and DS1 fuse size is lowered.		DIS-AGREE NOT REQUIRED		
9	Transformers T1 and T2 secondaries do not appear to be grounded properly. NEC 250-5(d) and 250-26.		OK AS IS		
10	Note 12, 1 1/2" conduit size is not same as other places.		ACCEPT		
11	Nameplate schedule; ALPHAs are not used, Plate size is not used, Text for J3, J1, J2 need "A" added, complete schedule.		"		
	H-14-100520, Sht. 1 and 3				
12	Connector "PI" needs ref. dwg. to interconnection.		"		
13	What is voltage level at DS5?		"		
14	Label wires L1, L2, Neut., gnd.		"		
15	CB & Fuse sizes?		"		

REVIEW COMMENT RECORD (RCR)				1. Date 11/15/95	2. Review No. 1
				3. Project No.	4. Page 1 of 1
5. Document Number(s)/Title(s) Exhauster Interlock	6. Program/Project/ Building Number TWRS Characterization	7. Reviewer G.A. Barnes	8. Organization/Group Characterization Equipment Development	9. Location/Phone ETC-1/12/376- 2241	
17. Comment Submittal Approval:			11. CLOSED		
Organization Manager (Optional)			Date		
10. Agreement with indicated comment disposition(s) 11/16/95 11/16/95 11/16/95			12. Item 1 13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.) H-14-100523. Is the spool piece going to be heat traced to prevent condensation from forming inside the spool piece? Will condensation (or ice if the exhauster is shut down) effect the Whittaker cells?		
14. Hold Point 15. Disposition (Provide justification if NOT accepted.) Condensate will not effect the Whittaker cells. It is not yet clear (the tests haven't been conducted) what the effect of temperatures below 40°F will have on the response time of the cells. Heat trace will not be used to prevent condensate, but it may be used to warm the spool piece to reduce response time.			16. Status		
2 H-14-100521. Unless there are special criteria that warrants designing and building SST carts for the interlocks, CED should look into procuring them. This would save a lot of time and money. A similar cart (in size) that might be used for this application can be found in the McMaster catalog (part # 2538T32).			Commercially available carts were considered. However, the modifications required to meet our requirements (storage space, corrosion resistance, and weather proofing) it would not have saved much, if any, money.		

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ATTACHMENT 3
Meeting Minutes

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MEETING MINUTES**SUBJECT:** Hydrogen Interlock Design Review Briefing

TO: Distribution		BUILDING N/A		
FROM: J. E. Corbett		CHAIRMAN R. J. Blanchard		
DEPARTMENT-OPERATION-COMPONENT Characterization	AREA 200E	SHIFT Day	DATE OF MEETING 10/4/95	NUMBER ATTENDING 17

The meeting was chaired by Roy Blanchard. A list of attendees is contained on the attached meeting roster. The meeting opened with introductions and presentation of objectives and agenda (attached). Lucinda Borneman noted that she is part of the Environmental Compliance organization, which would not be reviewing the design but would provide the proper point of contact for the environmental review. Jim Robinson presented the mechanical portion of the design presentation and system description. George Vargo presented the electrical portion of the design presentation and described the Programmable Logic Control (PLC) functions. Items discussed during the briefing included:

- The design concept is based on having no single point failure modes
- Exhauster shutdown is automatic and designed to fail safe
- Potential ignition sources (including exhauster heater)
- The need to have Fire Protection review the design
- The possibility of using an alternative to NFPA classification
- Moving Whittaker cells to the exhauster intake would simplify the design
- The PLC has a watchdog function
- Making the carts identical would simplify operation/maintenance and spares
- Reliability and sensitivity must be considered in the design
- The schedule goal is for deployment December 31, 1995 (PBI in negotiation)

At the end of the meeting, reviewers were asked to submit RCR's to John Corbett, within 10 working days.

HYDROGEN INTERLOCK FORMAL DESIGN REVIEW
Rotary Mode Core Sampling System Portable Exhauster

MEETING ROSTER

SUBJECT: Design Review Briefing

DATE: 10/4/95

CHAIRMAN: R. J. Blanchard

LOCATION: ~~2750E/A229~~ 2407HV/G230

PROGRAM: Characterization

NAME	COMPANY	MSIN	PHONE
J. E. CORBETT	WHC	57-12	372-2001
Nancy Milliken	WHC	H4-65	376-7846
CARL HANSON	WHC	H5-09	376-4810
Eric Strazlsund	WHC	L6-37	376-3808
Lucinda Borenman	WHC	R1-51	373-2521
Dennis Hamilton	WHC	57-12	372-1130
James Robinson	WHC	57-12	6-4777
GEORGE F. VARGO JR	WHC	H5-09	376-5387
ROY J. BLANCHARD	WHC	57-12	373-1246
R E Bouer	WHC	L6-57	6-5908
G.A. BARNES	WHC	H5-09	376-2241
R E MERRIMAN	ICF-KH	E6-27	372-0514
SC. Smith	PLCst	L6-37	373-6977
Rw. Truitt	WHC	L6-37	376-2590
M.L. McElroy	WHC	57-07	373-5588
EJ Waldo	WHC	57-12	3-4065
RE Raymond	WHC	57-07	3-3647

MEETING AGENDA

OCTOBER 4, 1995

50% DESIGN REVIEW BRIEFING - HYDROGEN INTERLOCK, RMCSS PORTABLE EXHAUSTER

- Scope/Objectives Roy Blanchard
- Introduction of Committee Roy Blanchard
- Presentation of Requirements
 - Mechanical Jim Robinson
 - Electrical George Vargo
- Functional Design Requirements and Checklist Jim Robinson
- Design Review Package/Mechanics John Corbett

OBJECTIVES OF THE BRIEFING

- Provide information to the design review committee on the overall scope of the design, the functions and requirements the design is intended to satisfy, and the background information relative to the review.
- To provide guidance and ground rules to the design review committee pertaining to the scope and conduct of the design review and the mechanics for resolving comments.
- To provide the design review committee with copies of drawings to be reviewed, the functional design criteria which the drawings are intended to satisfy, and other documents relevant to the design review.
- To set the date, time, and location of the design review meeting.

MEETING MINUTES

SUBJECT: Hydrogen Interlock Design Review Briefing II

TO: Distribution		BUILDING N/A		
FROM: J. E. Corbett		CHAIRMAN R. J. Blanchard		
DEPARTMENT-OPERATION-COMPONENT Characterization	AREA 200E	SHIFT Day	DATE OF MEETING 10/24/95	NUMBER ATTENDING 14

The meeting was chaired by Roy Blanchard. A list of attendees is contained on the attached Roster. The meeting opened with introduction of new participants* and an overview. The purpose of the second briefing was explained, as the design concept had changed significantly due to the previous meeting's comments. The major changes were discussed, including the following:

- Power distribution was changed to make the carts identical
- Fail safe shutdown would be assured due to the power distribution arrangement and Programmable Logic Controller (PLC) logic/operation

Concerns brought up which were not dispositioned in the meeting included whether any other gases would need to be monitored (besides hydrogen) and if static build up in the exhaust flex duct would be possible or acceptable. These issues will be resolved in the Safety Assessment.

At the end of the meeting, reviewers were asked to submit RCR's to John Corbett, within 10 working days.

* NOTE: John Martell assumed responsibility for the environmental review per Lucinda Borneman's comment at the previous meeting.

HYDROGEN INTERLOCK FORMAL DESIGN REVIEW

Rotary Mode Core Sampling System Portable Exhauster

MEETING ROSTER

SUBJECT: Design Review Briefing II

DATE: 10/24/95

CHAIRMAN: R. J. Blanchard

LOCATION: 2750E/A229

PROGRAM: Characterization

[illegible]

MEETING MINUTES

SUBJECT: Hydrogen Interlock 50% Design Review Close-out

TO: Distribution		BUILDING N/A		
FROM: J. E. Corbett		CHAIRMAN R. J. Blanchard		
DEPARTMENT-OPERATION-COMPONENT Characterization	AREA 200E	SHIFT Day	DATE OF MEETING 11/16/95	NUMBER ATTENDING 10

This meeting was held to present the close-out of all RCR's written as part of the 50% design review.

The meeting was chaired by Roy Blanchard and was attended by those listed on the attached meeting roster.

Jim Robinson presented changes to the design based on RCR dispositions. George Vargo was unable to attend due to urgent matters on another project. His RCR's will be closed prior to release of the design review report. The only concern brought up during the meeting was by Nancy Milliken, which was in regards to a rate of rise trip on initial start-up of the system. Milliken agreed to submit a RCR for Robinson to close prior to design review report. With no other actions, the meeting was closed. Copies of all RCR's will be included in the design review report.

HYDROGEN INTERLOCK FORMAL DESIGN REVIEW

Rotary Mode Core Sampling System Portable Exhauster

MEETING ROSTER

SUBJECT: 50% Design Review Closeout

DATE: 11/16/95

CHAIRMAN: R. J. Blanchard

LOCATION: 2704HV/G229

PROGRAM: Characterization

[illegible]

ATTACHMENT 4

Letters and minutes provided as hand-outs

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CORRESPONDENCE DISTRIBUTION COVERSHEET

Author

Addressee

Correspondence No.

KT Lang/RL

President/WHC

Incoming: 9309100

Subject: U.S. DEPARTMENT OF ENERGY ORDER 6430.1A APPLICABILITY FOR ROTARY MODE
CORE SAMPLING PORTABLE EXHAUSTER

INTERNAL DISTRIBUTION

Approval	Date	Name	Location	v/att
		Correspondence Control	A3-01	
		President's Office		
		WT Alumkal (Level I)		
		GL Crawford	S0-09	
		C DeFigh-Price		
		CW Dunbar	R1-30	
		JC Fulton		
		HD Harmon		
		JL Homan	H5-09	
		JL Lee		
		WC Miller	S4-55	
		GJ Miskho	R2-50	
		TL Moore	S5-08	
		SR Moreno		
		SR Morgan	R2-50	
		DJ Newland		
		MA Payne (Assignee)		
		RS Popielarczyk	R1-30	
		JG Propson	R2-18	
		JL Rathbun	R3-09	
		RE Raymond	R2-54	
		JD Thomson	R1-30	
		EP Vodney		
		JC Wiborg	H4-60	
		RD Wojtasek		
		TFIC	R1-20	

*REISSUE on 12/22/93 to correct letter number.
(9309072 is not correct)



Distribution corrections: Marian Cram, 376-4123, Debbie Romine, 376-4804 or
Doris Hartley, 376-8111
54-6000-117 (9/88) (EF) WEF008 - Distribution Coversheet

Department of Energy

Richland Field Office

P.O. Box 150

Richland, Washington 99352

DEC 16 1993



93-CST-066

President
Westinghouse Hanford Company
Richland, Washington

Dear Sir:

U.S. DEPARTMENT OF ENERGY ORDER 6430.1A APPLICABILITY FOR ROTARY MODE CORE
SAMPLING PORTABLE EXHAUSTER

Reference: Letter, R. S. Popielarczyk, WHC to R. E. Gerton, RL, same title as
above, dated December 7, 1993.

The Rotary Mode Sampling Exhauster is designed as a portable unit, taken into
a facility for a specific task and then removed. Department of Energy,
Richland Operations Field Office (RL) concurs with Westinghouse Hanford
Company's interpretation of the DOE Order 6430.1A.

If you have any questions, please contact Mr. John M. Clark of my staff on
376-2246.

Sincerely,

Kenneth T. Lang, Acting Manager
Office of Characterization

CHB:EMM



P.O. Box 1970 Richland, WA 99352

December 7, 1993

9359176

Mr. R. E. Gerton, Director
Tank Waste Storage Division
U.S. Department of Energy
Richland Operations Office
Richland, Washington 99352

Dear Mr. Gerton:

U.S. DEPARTMENT OF ENERGY ORDER 6430.1A APPLICABILITY FOR ROTARY MODE CORE
SAMPLING PORTABLE EXHAUSTER

This letter requests concurrence with Westinghouse Hanford Company's interpretation of the U.S. Department of Energy (DOE) Order 6430.1A as applied to the rotary mode core sampling exhaustor. The core sampling exhaustor is designed as a portable unit and, as such, it will support core sampling in both the 200 East and West areas.

Westinghouse Hanford Company has interpreted DOE Order 6430.1A as not applicable to portable systems. This interpretation is based on the following paragraph from Division 1, General Requirements:

"These criteria apply to any building acquisition, new facility, facility addition and alteration, and leased facility that is required to comply with DOE 4300.18. This includes on-site constructed"

DOE Order 6430.1A defines "facility" as:

"Buildings and other systems, their functional systems and equipment, and other *fixed* systems and equipment installed therein"

The exhaustor is a system used in a facility (tank farm); however, it is not a fixed system. Rather it is a tool, taken into a facility for a specific task and then removed when the job is complete.

While not meeting the design mandates of DOE Order 6430.1A, the exhaustor complies with the intent by providing an equivalent level of protection.

Mr. R. E. Gerton
Page 2
December 7, 1993

9353176

Your concurrence with this interpretation of DOE Order 6430.1A is requested.

Very truly yours,



R. S. Popielarczyk
Waste Tanks Design Engineering

gmw

RL - R. O. Puthoff
L. C. Williams

MEETING MINUTES**SUBJECT: Flammable Gas Safety Interlock FDC**

TO: Distribution		BUILDING ETC-1/3000		
FROM: Characterization Equipment Development		CHAIRMAN JD Robinson/ EH Kohlman		
DEPARTMENT-OPERATION-COMPONENT Characterization Equipment Development	AREA 3000	SHIFT D	DATE OF MEETING April 12, 1995	NUMBER ATTENDING 11

Attendance:

TL Moore	RJ Van Vleet
JD Robinson	GR Sawtelle
EH Kohlman	NJ Milliken
DB Smet	EK Straalsund
RH Webb	JD Dunks
RA Huckfeldt	

The subject meeting was held at 7:30 Wednesday morning, April 12, 1995 to discuss the Functional Design Criteria for the RMCS Exhauster System interlock and it's applicability to the Mobile Camera safety interlock system.

Tom Moore opened by discussing the purpose of the meeting and to instill in the group that DOE Order 6430.1A and Hanford Plant Standard, Standard Design Criteria 4.1, Design Loads for Facilities do not apply to the exhauster and camera systems. The basis for this is in the fact that both are portable systems, not facilities. There was no dissention from those present to this interpretation.

The meeting went on to establish, up front, that the camera and exhauster system should have the same criteria imposed on them. It was determined and agreed upon by the attendees that the two shall be similar with respect to the safety interlock requirements. With this established, the group then generated the necessary criteria to be imposed on the systems. The following four items were established as the minimum criteria:

- 1.) *The safety control system shall shut down power to electrical components at a hydrogen concentration no greater than 6250 ppm.*
- 2.) *The response time (complete shut down) of the safety control system shall be less than 1 minute.*

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- 3.) *The safety classification of the safety control system shall be SC 1 for the active shutdown of components, as determined by the design engineer. (Note: SC 1 criteria is defined as no single point failure).*
- 4.) *The tank vapor shall be sampled near the potential ignition source, as determined by the design engineer. (Note: the design engineer will furnish technical justification for location deviations).*

The meeting concluded with the intention to revise the FDC using the new criteria as stated above. The revised FDC would then be applicable to both the camera and core sampling flammable gas interlocks.

Eric Straalsund also offered his services and facility location to Dave Smet to test the current mobile camera gas sensing system.