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JUN 08 2000

ENGINEERING DATA TRANSMITTAL

Page 1 of 1

1. EDT 628749

2. To: (Receiving Organization) Characterization Project	3. From: (Originating Organization) Characterization Engineering	4. Related EDT No.: N/A
5. Proj./Prog./Dept./Div.: Characterization	6. Design Authority/Design Agent/Cog. Engr.: GP Janicek	7. Purchase Order No.: N/A
8. Originator Remarks: This report documents the formal design review conducted (01/27/97 to 03/27/98) on portable exhausters used with Rotary Mode Core Sampling (RMCS) of Hanford waste tanks in order to meet primarily flammable gas contract requirements.		9. Equip./Component No.: N/A
		10. System/Bldg./Facility: 200 G
		12. Major Assm. Dwg. No.: N/A
11. Receiver Remarks:	11A. Design Baseline Document? ☐ Yes ☒ No	13. Permit/Permit Application No.: N/A
		14. Required Response Date: N/A

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(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	(F) Approval Designator	(G) Reason for Transmittal	(H) Originator Disposition	(I) Receiver Disposition
1	HNF-2369	--	0	Design Review Report for Formal Review of Safety Class Features of Exhauster Systems for Rotary Mode Core Sampling	n/a	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 2. Release 3. Information	4. Review 5. Post-Review 6. Dist. (Receipt Acknow. Required)	1. Approved 2. Approved w/comment 3. Disapproved w/comment	4. Reviewed no/comment 5. Reviewed 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 GP Janicek		6/7/00	S7-12	1	1	Char Eng Mgr RM Boger		6/8/00	S7-12
		Design Agent									
1	1	Cog. Eng. EJ Waldo		6/8/00	S7-12						
1	1	Cog. Mgr. JS Schofield		6/8/00	S7-12						
		QA									
		Safety									
		Env.									

18.	19.	20.	21. DOE APPROVAL (if required)
GP Janicek 6/7/00 Signature of EDT Originator — Date	RM boger 6/8/00 Authorized Representative for Receiving Organization — Date	JS Schofield 6/8/00 Design Authority/ Cognizant Manager — Date	Ctrl No. ____ ☐ Approved ☐ Approved w/comments ☐ Disapproved w/comments

BD-7400-172-2 (10/97)

BD-7400-172-1

DESIGN REVIEW REPORT FOR FORMAL REVIEW OF SAFETY CLASS FEATURES OF EXHAUSTER SYSTEM FOR ROTARY MODE CORE SAMPLING

G. P. JANICEK
CH2M HILL HANFORD GROUP, INC
Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-99RL14047

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Key Words: Core Sampling, Exhauster, RMCS, Flammable Gas Modifications, Design Review Report

Abstract: Report documenting Formal Design Review conducted on portable exhausters used to support rotary mode core sampling of Hanford underground radioactive waste tanks with focus on Safety Class design features and control requirements for flammable gas environment operation and air discharge permitting compliance.

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DESIGN REVIEW REPORT FOR FORMAL REVIEW OF SAFETY CLASS FEATURES OF EXHAUSTER SYSTEM FOR ROTARY MODE CORE SAMPLING

G. P. Janicek

CH2M HILL Hanford Group, Inc.
Richland, WA

June 2000

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DESIGN REVIEW REPORT FOR FORMAL REVIEW OF SAFETY CLASS FEATURES OF EXHAUSTER SYSTEM FOR ROTARY MODE CORE SAMPLING

1.0 BACKGROUND

This report documents the completion of a formal design review conducted on the portable exhauster(s) used to support Rotary Mode Core Sampling (RMCS) operations in Hanford waste tanks. The review commenced on January 21, 1997, and was formally closed, in its entirety, on March 27, 1998. A number of actions occurred between these dates that changed the scope and bases of the review, resulting in the extended duration of the review and the need to document a certain portion of this formal design review in a separate report (Corbett 1997).

The review initially focused on "selected modifications" of the exhauster system being implemented in order to comply with waste tank flammable gas control requirements then governed by the RMCS system-specific safety basis (WHC,1996a). These "selected modifications" had previously undergone a formal design review in 1996 (WHC 1996b), but because of a newly discovered safety system inadequacy in the design (documented in Thomson 1997), the manager of Characterization Engineering requested that a second, formal design review, be performed. This second review covered six separate review packages, DRC-97-001 through DRC-97-006. Except for DRC-97-004 and -006, all packages were reviewed, closed, and documented in Corbett 1997. This report documents formal design review closure on review package DRC-97-004 and its five supplementary packages, DRC-97-004a through DRC-97-004e, as well as DRC-97-006.

Review package DRC-97-004 was first distributed for review at a design review briefing on February 3, 1997. Initially, the scope of this package included exhauster adjunct equipment designed to attach to a tank riser (to which the exhauster itself is attached), monitor flammable gas parameters, and cause shutdown of sampling operations if certain parameter limits were exceeded. This adjunct equipment was dubbed the Hydrogen Exhauster Interlock System (HEIS). Shortly thereafter, by request of the Manager of Characterization Engineering (R E. Raymond), the scope of the review was expanded to include a re-review of all Safety Class (SC) structures, systems, and components (SSCs) associated with the complete exhauster system. In March 1997, before the review was complete, the Characterization Project decided to replace (in anticipation of actual replacement approved in August 1997) the flammable gas controls derived from the original, and primary, Authorization Basis (AB) document for RMCS (WHC 1996a) with those derived from the Justification for Continuing Operation (JCO) being used to govern the remainder of tank farm operations (LMHC 1997a). The net result of this decision was twofold: (1) it negated the entire review scope documented in the earlier design review report (Corbett, 1997), and the adjunct equipment portion (original HEIS scope) of review package DRC-97-004, as well as all of DRC-97-006, and (2) it necessitated that additional modifications be made to the exhauster skid itself. Formal review of the resultant remaining and added review scope of the exhauster system was completed in August 1997 and the formal

design review was officially (and initially) declared closed. However, the review had to be extended when it was determined that the current Notice of Construction (NOC) (DOE/RL 1995) for the portable exhauster systems was being revised by the Washington State Department of Health (WDOH), imposing additional requirements (WDOH 1997). Thus it wasn't until March 1998, concurrent with final NOC approval by WDOH, that open items remaining from the extended review and a reconciliation with changes still being made to the exhauster system allowed definitive closure of the formal design review.

2.0 SCOPE

2.1 REVIEW OBJECTIVE

The commissioned objective of the formal design review was to perform design verification of all exhauster system SC SSCs. This included a re-verification of original and remaining (unmodified) SC SSCs as well as those SC SSCs added during exhauster modifications. The Design Review Committee (DRC), of its own accord, elected to comment on and require satisfactory disposition of other technical inadequacies, of an obvious nature, discovered during the review.

2.2 DESIGN DESCRIPTION

The RMCS exhauster is an electrically operated, portable, single train, skid-mounted unit used in conjunction with rotary mode core sampling of passively vented, single-shell waste tanks. Its primary purpose is to maintain the waste tank internal airspace at or below local atmospheric pressure by overcoming the purge gas volumetric flow being added to the tank as a necessary part of core sampling operations. Secondarily, it must comply with other requirements and controls. Most notable, with respect to this review, are those that cause portions of the exhauster to be classified as SC. The exhauster is connected to a riser of the waste tank by a flexible duct. Tank vapors and gases are drawn from the tank, through the flexible duct, then through the exhauster train by an inline, direct-driven, 200 scfm, exhaust fan before being vented to the atmosphere through a 4-inch diameter, 15 foot high exhaust stack. The exhauster train between the fan and the flexible duct consists of a heater section, a prefilter section, and a high efficiency particulate air (HEPA) filter set of sections. The heater section is a tubular heat exchanger supplied with an electrically heated and circulated glycol/water solution. The purpose of the heater section is to maintain the airstream temperature above its dewpoint sufficient to prevent downstream condensation of airstream-entrained water vapor. The purpose of the prefilter section is to filter the airstream of gross particulate matter and protect the HEPA filters immediately downstream. The HEPA filter set of sections consists of two stages of HEPAs in series, with each stage separately testable (includes a test section) and monitored for differential pressure across the filter media. The purpose of the HEPAs is to ensure against release of unacceptable radiological emissions to the immediate atmosphere/environment.

Exhauster operating conditions are monitored and recorded on a datalogger located in the exhauster instrument/control cabinet. The exhauster is designed to shut down automatically when waste tank pressure falls below -3 inches water gage, when exhauster stack flow rises above 250 scfm or falls below 150 scfm, or when differential pressure across the HEPA filter

section exceeds a predetermined value. The exhauster is equipped with an electrical interlock circuit that will cause shutdown of RMCS truck (with purge gas) operation if the exhauster itself shuts down.

2.3 REVIEWED DOCUMENTS

The following design review packages, with associated reference documentation, were reviewed and approved (as applicable), as part of the formal design review [Note: documents preceded by an asterisk are those negated by the switch in the AB for flammable gas controls, and thus, are not representative of the exhauster system final configuration:

DRC-97-004 containing the following released drawings and released ECNs and predicated on the initial, and primary, AB document (WHC 1996a) for flammable gas waste tank operation:

*H-14-100519, 520, sheets 1-3 each, (9/96 released drawings), FGAS Exhauster Interlock Elementary Diagram, for carts 2205 and 2206, respectively.
*H-14-100521, sheets 1-16, (9/96 released drawing), FGAS Exhauster Interlock Cart 2205/2206 Assemblies.
*H-14-100522, sheets 1-4, (9/96 released drawing), FGAS Exhauster Cable Arrangement and Assemblies.
*H-14-100523, sheets 1-3, (9/96 released drawing), Combination Sampler Spool Piece Installation.
*H-14-100524, sheets 1-9, (9/96 released drawing), Combination Sampler Spool Piece (Assembly).
*H-14-100530, sheets 1-5, (9/96 released drawing), FGAS Exhauster Interlock Power Distribution Skid.
*H-14-100531, 532, sheets 1-3 each, (9/96 released drawings), Exhauster Interlock Cart Interconnection Diagram, for carts 2205 and 2206, respectively.
H-14-100739, sheets 1-2, (9/96 released drawing), RMCS Exhauster Heater Assembly.
*H-14-100741, sheet 1/1, (9/96 released drawing), RMCS FGAS Exhauster Regulator Assembly.
H-14-100742, sheets 1-3, (9/96 released drawing), Breather Vent Stack Assembly.
*H-14-100771, sheet 1/1, FGAS Exhauster Interlock Loop Diagram.
H-2-821455, sheets 1-5, (6/95 released drawing), RMCS Exhauster Assembly II.
H-2-821456, sheets 1-2, (6/95 released drawing) RMCS Exhauster Skid Assembly II.
*ECN 636516, (released 9/20/96), to drawings H-14-100519, 520, 521, 531, 532.
*ECN 636576, (released 10/22/96), to drawings H-14-100523, 524.
ECN 628744, (released 5/31/96), to drawing H-2-821455.
ECN 630002, (released 11/12/96), to drawing H-2-821455.
ECN 632390, (released 5/31/96), to drawings H-14-030122.
ECN 632406, (released 5/31/96), to drawing H-2-821456.
ECN 634030, (released 7/17/96), to drawings H-14-030122, H-2-821455, 456.
ECN 634031, (released 9/20/96), to drawings H-14-030122, H-2-821455.
ECN 634083, (released 8/12/96), to drawing H-14-030122.
ECN 636502, (released 8/29/96), to drawing H-2-821456.

ECN 636503, (released 9/20/96), to drawing H-2-821455.
ECN 636513, (released 9/18/96), to drawing H-14-100740.
ECN 636515, (released 12/4/96), to drawing H-14-100740.
ECN 636940, (released 12/4/96), to drawing H-14-100740.
ECN 639170, (released 12/20/96), to drawing H-14-100742.

DRC-97-006 containing the initial draft ECN resulting from DRC-97-004:

*ECN 631342, (drafted 3/3/97), to drawings H-14-100519, 520, 521, 523, 524, 531, 532, 771, and H-14-030122. Added flammable gas sampling vacuum pump automatic shutdown capability. [Note: this ECN was subsequently cancelled.]

DRC-97-004a containing only those documents remaining from DRC-97-004 after the switch to the JCO as the Authorization Basis for flammable gas waste tank operation:

H-14-100739, sheets 1-2, (9/96 released drawing), RMCS Exhauster Heater Assembly.
H-14-100741, sheet 1/1, (9/96 released drawing), RMCS FGAS Exhauster Regulator Assembly.
H-14-100742, sheets 1-3, (9/96 released drawing), Breather Vent Stack Assembly.
H-2-821455, sheets 1-5, (6/95 released drawing), RMCS Exhauster Assembly II.
H-2-821456, sheets 1-2, (6/95 released drawing) RMCS Exhauster Skid Assembly II.
ECN 628744, (released 5/31/96), to drawing H-2-821455.
ECN 630002, (released 11/12/96), to drawing H-2-821455.
ECN 632390, (released 5/31/96), to drawings H-14-030122.
ECN 632406, (released 5/31/96), to drawing H-2-821456.
ECN 634030, (released 7/17/96), to drawings H-14-030122, H-2-821455, 456.
ECN 634031, (released 9/20/96), to drawings H-14-030122, H-2-821455.
ECN 634083, (released 8/12/96), to drawing H-14-030122.
ECN 636502, (released 8/29/96), to drawing H-2-821456.
ECN 636503, (released 9/20/96), to drawing H-2-821455.
ECN 636513, (released 9/18/96), to drawing H-14-100740.
ECN 636515, (released 12/4/96), to drawing H-14-100740.
ECN 636940, (released 12/4/96), to drawing H-14-100740.
ECN 639170, (released 12/20/96), to drawing H-14-100742.

DRC-97-004b containing new ECNs designed to allow RMCS flammable gas waste tank operation with active ventilation systems as opposed to using a portable exhauster system:

ECN 642940, (released 7/15/97), to drawing H-2-690071, ties in pressure switch shutdown to RMCS truck control console. [Note: this was initially issued as a temporary ECN and was then made a permanent change by ECN 640484 released 3/4/98.]
ECN 642941, (released 7/15/97), to drawing H-2-690127, adds a portable pressure switch to be used in lieu of portable exhauster shutdown capabilities when deployed in tanks with active ventilation.

DRC-97-004c containing new ECNs modifying exhauster due to new criteria:

> ECN 631344, (released 9/18/97), to drawing H-2-821455, adds 2nd stage testable HEPA unit and exhauster emissions monitoring capability per revised air operating permit.
> ECN 631345, (released 9/17/97), to drawing H-2-821456, modifies exhauster skid and relocates heater.
> ECN 631346, (released 9/18/97), to drawing 821455, details addition of differential pressure monitoring equipment to HEPA train.

DRC-97-004d containing new ECN to address additional improvements for ECN 642941 reviewed by DRC-97-004b:

> ECN 640442, (replaces draft ECN 642911 for review), (released 9/16/97), to drawing H-2-690127, adds a weather resistant pressure switch assembly.

DRC-97-004e containing new ECN to address "major stack" designation of exhauster air discharge stack:

> ECN 642928, (released 11/14/97), to drawings H-2-821455, 828083, 829086, 829087, 829108, 829110, adds beta particle continuous air monitor.

2.4 REVIEW BASES

The initial bases for conducting the formal design review (predicated on using the HEIS) were requirements derived from the then current revisions of; the Functional Design Criteria, with outstanding ECNs (WHC 1995a); the Safety Analysis document, Rev. 0-a, (WHC, 1996a); and the governing Safety Equipment List (SEL) (Smalley 1996), itself derived from the same Safety Analysis, and the JCO. Initially design review checklists were generated by the DRC modeled after the generic format for such a checklist given in the Engineering Practices Guidelines, WHC-IP-1026, EPG-4-1 (see Section 5.1). Subsequently, and for finally completing the review, the DRC developed an exhauster system-specific Design Compliance Matrix (DCM) which took the place of the generic checklist. The concept of a DCM was born out of an internal review of Characterization Engineering which was critical of the lack of formal documentation of requirements for existing equipment when performing design modification work to that equipment. Characterization took the concept a step further in formatting the DCM to include "design requirements," "design solution," and "design verification" sections. The DRC reviewed the documents listed above, as well as other criteria documents (LMHC 1997b) (LMHC 1995b), that represented the full exhauster system design review scope and gleaned from them the requirements used to populate the "design requirements" section of the DCM. The DRC then used this listing to verify that the "design solution," as presented, fulfilled the requirements. It should be noted that the DCM was a comprehensive listing, but that only those requirements specific to SC SSCs were within the DRC's purview. The final DCM used for the design review is included in Section 5.1 of this report. It should be noted, also, that this activity was itself a review of the DCM that was subsequently approved and issued as a Supporting Document [illegible] (Rev. 0) in December 1997 (LMHC 1997c).

3.0 SUMMARY

3.1 REVIEW DESCRIPTION

The DRC was initially composed of seven members. The DRC chairman was appointed by the Characterization Engineering Manager and the Chairman selected the remaining six members in accordance with TWRS procedure HNF-PRO-445, "Design Verification Requirements". Over the time period involved for the review, but at different times, two members (Corbett, Frater) left the DRC because of other opportunities, and three members (Frater, Kriskovich, Dormant) were added. The DRC members and their areas of responsibility are identified in Section 5.3 documentation.

Design review meetings (briefings, comment input, comment resolution, checklist (DCM) generation, etc.) were held as required and included issuance of agendas and meeting minutes, which are included in Sections 5.5 and 5.6 documentation, respectively.

The DRC, as a body, conducted a review of the material presented in Section 2.3 over twenty meetings. The first meeting was held on February 3, 1997, and the last on October 23, 1997. Additional one-on-one meetings were held between the Chairman and certain DRC members to close RCR comments and open items or to perform reconciliation checks.

A Flammable Gas Equipment Advisory Board (FGEAB) had been established to rule on adherence to flammable gas requirements resulting from JCO controls, or equivalency in meeting those requirements. A ruling on certain components of the exhauster system meeting those requirements was given by the FGEAB and is documented in a report, FGEAB-97-029, included in Section 5.7 of this report.

3.2 CONCLUSIONS AND OPEN ITEMS

The formal design review was initially thought closed, except for four punchlist items, and a DSI to this effect (see Section 5.7), was sent to D.H. Shuford on August 8, 1997.

Punchlist items 1 and 4 required reconciliation between the draft DCM (used to conduct the design review) and the final, approved version. This was accomplished by subsequent review, and issuance, of the DCM in December 1997 (see Section 5.2).

Item 3 required reconciliation between the draft DCM and its requirements source documents (FDC, SEL, and AB transition). DRC assignments in this regard were made at a meeting held on August 14, 1997, and closure was obtained during a series of subsequent meetings held shortly thereafter. However, formal closure could not be stated until FDC revision (LMHC 1997d), SEL revision (LMHC 1998), and the DCM was approved and issued (as was necessary for items 1 and 4).

Item 2 required compliance with both the DCM and the NOC. It was the NOC that drove the design review activity to reopen. The NOC was formally approved within this same time frame, but the WDOH added 18 new conditions. One of these conditions stipulated upgrading the

exhauster to a "major stack" designation. This necessitated additional modifications to the exhauster. ECN 642928 for the modifications was reviewed at a DRC meeting on October 23, 1997, and approved and released on November 14, 1997 (see Section 5.7). The actual modifications were work completed on March 5, 1998.

The design review was finally declared closed on March 27, 1998, in a DSI to D. H. Shuford (see Section 5.7). A remaining part of punchlist item 3, ensuring that the exhauster operating procedure incorporates the actual controls called for by the AB, was closed by transferring it to the exhauster startup readiness checklist.

4.0 REFERENCES

Corbett, J. E., 1997, "Design Review Report for Modifications to RMCS Safety Class Equipment," HNF-SD-WM-DRR-062, Rev. 0, Lockheed Martin Hanford Corporation, Richland, Washington.

DOE/RL 1995, "Radioactive Air Emissions Program NOC for the Rotary Mode Core-Sampling Systems Three and Four," DOE/RL-94-118, Rev. 1, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

LMHC 1997a, "Flammable Gas/Slurry Growth Unreviewed Safety Question: Justification for Continued Operation of the Tank Farms at the Hanford Site," WHC-SD-WM-JCO-007, Rev. 1, Lockheed Martin Hanford Corporation, Richland, Washington.

LMHC 1997b, "Functional Design Criteria for the Rotary Mode Core Sampling Exhauster," HNF-SD-WM-FDC-025, Rev. 1, Lockheed Martin Hanford Corporation, Richland, Washington.

LMHC 1997c, "Baseline Design Compliance Matrix for the RMCS System," HNF-SD-WM-CR-062, Rev. 0, Lockheed Martin Hanford Corporation, Richland, Washington.

LMHC 1997d, "Functional Design Criteria for the Rotary Mode Core Sampling Exhauster," HNF-SD-WM-FDC-025, Rev. 2, Lockheed Martin Hanford Corporation, Richland, Washington.

LMHC 1998, "A Safety Equipment List for Rotary Mode Core Sampling Systems Operation in Single Shell Flammable Gas Tanks," HNF-SD-WM-SEL-044, Rev. 1, Lockheed Martin Hanford Corporation, Richland, Washington.

Smalley, J. L., 1996, "Rotary Mode Core Sampling Safety Equipment List," WHC-SD-WM-FDC-032, Rev. 1 (with ECNs 636964 and 636966), Lockheed Martin Hanford Corporation, Richland, Washington.

Thomson, J. D. 1997, "Review of Characterization Engineering Hydrogen Exhauster Interlock System Design Process," Letter Report for R. E. Raymond, Anttonen Lucas Associates, Inc., Richland, Washington.

WDOH 1997, Letter, A. W. Conklin to J. E. Rasmussen (DOR/RL), "Notice of Construction, DOE/RL-94-118, Rev. 1," #AIR 97-901, dated September 3, 1997, State of Washington Department of Health, Olympia, Washington.

WHC 1995a, "Flammable Gas Detection and Shutdown System Functional Design Criteria," WHC-SD-WM-FDC-045, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

WHC 1995b, "Functional Design Criteria for Core Sampling in Flammable Gas Watchlist Tanks," WHC-SD-WM-FDC-048, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

WHC 1996a, "A Safety Assessment of Rotary-Mode Core Sampling in Flammable-Gas Single-Shell Tanks: Hanford Site, Richland, Washington," WHC-SD-WM-SAD-035, Rev. 0a, Westinghouse Hanford Company, Richland, Washington.

WHC 1996b, "Final Design Review Report for the RMCS Flammable Gas Detector Interlock," WHC-SD-WM-DRR-051, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

5.0 SUPPORTING DOCUMENTATION

The remainder of this report, Sections 5.1 through 5.7, provides supporting documentation to the formal design review and is referenced in the foregoing body of the report.

5.1 DRAFT DESIGN COMPLIANCE MATRIX (DESIGN REVIEW CHECKLIST)

DON'T SAY IT --- *Write It!*

DATE: 08/04/97

TO: JM Dormant R3-47
GT Frater K9-46
GP Janicek S7-12
TD Jarecki S7-03
JR Kriskovich R1-56
ML McElroy S7-07
NJ Milliken R1-43
JA Ranschau S7-07
CC Scaief R1-56

cc: RE Raymond S7-12

FROM: GP Janicek S7-12
Telephone: 376-2225

SUBJECT: Exhauster Design Compliance Matrix

Attached is the subject DCM for which we are to complete the verification section. Recall that the scope of our review as the Design Review Committee (DRC) was to encompass all Safety SSCs.

Please do two things preparatory to our Thursday meeting (08/07/97) to assist coming to closure on the DCM verification.

1. Review the previous copy of the DCM you have, which was based on the old authorization basis, and be prepared to verify the same particular, or category of, requirements for which you were assigned responsibility previously.

2. Review your new RCR comments, which were re-generated from your prior RCR comments, subsequently dispositioned, and then approved by you based on an understanding (verbally conveyed) of what the new authorization basis was to be, to see if they are still valid or whether any changes are necessitated.

Assuming all other supporting activities go as planned, e.g., AB amendment process, the DCM verification will close our design review of the Exhauster system and system modifications for flammable gas operation.

Need anything? Let me know.

Thanks,

George

A-3000-723 (01/95) GEF014

Author: Lisa R Montague at ~CCHIG002
Date: 7/31/97 3:10 PM
Priority: Normal
TO: Jean-marc Dormant at ~HANFORD06C
TO: G T (Tom) Frater at ~HANFORD10D
TO: George P Janicek at ~HANFORD10D
TO: Theodore D Jarecki at ~HANFORD11E
TO: James R Kriskovich at ~HANFORD05B
TO: Michael L McElroy at ~HANFORD11A
TO: Nancy J Milliken at ~HANFORD12B
TO: Lisa R Montague at ~HANFORD11E
TO: J A (Jeff) Ranschau at ~HANFORD10C
TO: C C III (Chuck) Scaief at ~HANFORD04B
Subject: LANCal: 08/07/1997, 9:00a-12:30p

---------- Message Contents ----------

Meeting Time: Thursday August 7, 1997, 9:00am-12:30pm

Description: DESIGN REVIEW COMMITTEE MTG FOR EXHAUSTER
DESIGN COMPLIANCE MATRIX VERIFICATION
2704HV/G108A POC:George 6-2225/Lisa 3-5508

Scheduled by: Montague, Lisa R
July 31, 1997, 3:09pm

Attendees: Dormant, Jean-marc
Frater, G T (Tom)
Janicek, George P
Jarecki, Theodore D
Kriskovich, James R
McElroy, Michael L
Milliken, Nancy J
Montague, Lisa R
Ranschau, J A (Jeff)
Scaief, C C III (Chuck)

DON'T SAY IT --- *Write It!*

DATE: August 4, 1997

TO: GP Janicek S7-12

FROM: KV Scott S7-12
Telephone: 376-5445

cc: JD Criddle Jr. S7-12
CE Hanson S7-12
AJ Kostelnik S7-12
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SUBJECT: RMCS EXHAUSTER DESIGN COMPLIANCE MATRIX

Attached please find 10 copies of the subject Design Compliance Matrix (DCM) for distribution to the Design Review Team.

Please note that these tables will become a part of an overall DCM for the RMCS system. The other sections for this will follow, but as agreed, this exhauster portion is required to complete the Design Review for deployment to the field.

If you have any questions on this please call me on 376-5445.

54-3000-101 (12/92) GEF014

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TABLE 1

BASIC FUNCTIONAL CHARACTERISTICS AND CONSTRAINTS FOR THE RMCS EXHAUSTER DESIGN

FUNCTIONAL CHARACTERISTICS
Performance and External Interface Requirements
• The exhauster shall maintain the tank vapor space below atmospheric pressure during rotary mode core sampling by removing potentially flammable vapor while the drill string nitrogen purge is adding nitrogen to the tank
• The exhauster shall be moved from tank to tank to support RMCS operations
• The exhauster shall function in the Hanford climate
• The exhauster materials shall be compatible with the Hanford environment and tank vapor stream
• The exhauster shall interface with the RMCS truck (Trucks 3 and 4), a power supply, the tank riser, and aerosol testing equipment

CONSTRAINTS
Safety Requirements
• The exhauster shall not provide an ignition source in the tank vapor stream (East and West Tank Farms Standing Order 97-01 Rev. 2)
• The exhauster shall operate within the toxicological exposure limits and tank design limits (WHC-SD-WM-SAD-035, Rev. 0a)
• The loads imposed by the exhauster on the tank shall not damage the tank (WHC-SD-WM-OSR-005)
• Personnel radiation exposure shall be ALARA (HNF-IP-1043)
Environmental Regulations
• Exhauster air emissions shall be acceptable (DOE/RL-94-118 Rev. 0)
Major Design Codes
• Prevailing and relevant design standards shall be followed
Other Requirements
• Operation aides shall be provided as necessary to reduce operator error and ease operation

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Table 2. RMCS Exhauster DCM

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The exhauster is to safely maintain the tank vapor space at or below atmospheric pressure during rotary mode core sampling by removing potentially flammable tank vapor at a rate of 200 cfm. The exhauster is to be portable.

BASELINE DESIGN COMPLIANCE MATRIX - EXHAUSTER SYSTEM

	REQUIREMENTS					SOLUTION			VERIFICATION	
Count	Criteria	Source	Reference	Requirement Type	Notes/Assumptions/Implications	Design Attribute	Component	Config. Control Ref.	Engineering Evaluation Description	Verified By?
	enter functional or design criteria exactly as stated in the requirements source document	enter source doc.	enter origin of requirement if other than Source	Performance Ext. Interface Safety Environmental Design Code Other	enter all additional information which amplifies, qualifies, justifies, ...etc. the criteria statement	describe the manner in which the design purports to fulfill the criteria statement - be as specific as possible.	enter component name if Source is specific	provide ref. for design attribute (drawing, procedure, spec....etc.)	provide discussion on method, evidence, reasoning used, ...etc., to verify that the design complies with requirements - be specific - include any qualifications, if appropriate.	person or group attesting to verif (initialed)
1	The system shall be designed to prevent HEPA bypass and fugitive emissions.	HNF-SD-WM-FDC-025 Rev. 1		1 Performance	General Construction	Meets DOE/RL-94-118 Rev. 0	Filter Train	H-2-821455	NOT APPLICABLE	ALL
2	The skid shall be suitable for transportation between tanks, between tank farms, and on public highways.	HNF-SD-WM-FDC-025 Rev. 1		1 Performance	General Construction	Transportable and compliant with standards for public highways	Skid	H-2-821456	N/A	ALL
3	The RMCS exhauster is necessary to keep tank pressure at or below atmospheric pressure even in cases of maximum purge gas (2.8 cubic meters per min. or 100 scfm) usage.	HNF-SD-WM-FDC-025 Rev. 1		1 Performance	The system and exhaust fan are sized to remove in excess of 100 scfm	Exhauster flow greater than 100 scfm	System	H-2-821455 H-2-818186	KRASKOVICH	FK
4	The exhauster shall flow a constant nominal 5.66 cubic meter per minute +/-1.42 (200 +/-50 scfm) flow from the stack	HNF-SD-WM-FDC-025 Rev. 1		1 Performance	The exhauster is sized and set to remove 200 scfm	Exhauster flow of 200 +/-50 scfm	System	H-2-821455 H-2-818186	N/A	ALL
5	All supplied equipment shall be new and suitable for use in the environment.	HNF-SD-WM-FDC-025 Rev. 1		1 Performance	General Construction	Equipment is compatible with Environmental Conditions (Table 3)	System	H-2-821455 H-2-818186	N/A	ALL
6	All materials used shall be new, free of defects, and suitable for use in the environment.	HNF-SD-WM-FDC-025 Rev. 1		1 Performance	General Construction - Materials shall be *compatible with their* working environment as described in the table of Environmental Conditions	Material is compatible with the Environmental *Conditions (Table 3)*	System	H-2-821455 H-2-818186	N/A	ALL
7	All o-ring and seal material in contact with waste or waste gases shall be checked for compatibility with high ammonia concentrations and replaced as necessary.	WHC-SD-WM-FDC-048		1 Performance		O-ring compatible with the waste environment	Gaskets	VI #22660 H-2-8218202 15,16,17,19, 20	N/A	ALL

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	REQUIREMENTS					SOLUTION			VERIFICATION	
Count	Criteria	Source	Reference	Requirement Type	Notes/Assumptions/Implications	Design Attribute	Component	Config. Control Ref.	Engineering Evaluation Description	Verified By?
8	Core Sampling Systems (CSS) suitable for sampling in any high level waste tank, including FGWL tanks.	WHC-SD-WM-FDC-048		1 Performance	The NOC for RMCS exhauster use is for the SSTs only	Interfaces with all SSTs (12 inch risers) and is in compliance with all constraints	System	H-2-821455 H-2-818186	N/A	ALL
9	CSS shall operate at all of the single shell and double shell tank farms located within the Hanford Site 200 East area and 200 West area Tank Farm Facilities	WHC-SD-WM-FDC-048		1 Performance	The NOC for RMCS exhauster use is for the SSTs only	Interfaces with all SSTs (12 inch risers) and is in compliance with all constraints	System	H-2-821455 H-2-818186	N/A	ALL
10	All aluminum potentially in contact with tank waste shall be eliminated.	WHC-SD-WM-FDC-048		1 Performance		No aluminum allowed in contact with tank waste	System	H-2-821455 H-2-818186	N/A	ALL
11	All core sampling equipment is designed to be mobile/portable.	WHC-SD-WM-FDC-048		1 Performance	Modifications shall not compromise existing traffic safety requirements or handling provisions.	Exhauster can be transported	System	H-2-821455 H-2-818186	N/A	ALL
12	All controls, instrumentation, hydraulic lines and reservoirs shall be weather resistant from sunlight, dust, rainwater, snow, and ice.	WHC-SD-WM-FDC-048		1 Performance	This requirement applies to all components - All components must be compatible with the environmental conditions	Weather resistant	System	H-2-821455 H-2-818186	N/A	ALL
13	The CSS shall have a design life of 5 years minimum	WHC-SD-WM-FDC-048		1 Performance	Replaceable equipment and components may have a design life of fewer years.	Materials are compatible with the Environmental Conditions and failure is not expected	System	H-2-821455 H-2-818186	N/A	ALL
14	The Rotary Mode Core Sampling generator will provide a 480 volt, three-phase source for exhauster operation	HNF-SD-WM-FDC-025 Rev. 1		2 External Interface	General Construction	Compatible connection with power supply	480V connection	H-2-818201 H-2-821455-36	N/A	ALL
15	The duct connection shall connect to a 12 inch riser flange	HNF-SD-WM-FDC-025 Rev. 1		2 External Interface	General Construction	Compatible dimensions with the riser	Riser Connection	H-14-100740 1	N/A	ALL
16	The exhauster shall automatically shut off when pressure across the HEPA filter bank exceeds the operational limit (currently 5.9 inches w.c.)	HNF-SD-WM-FDC-025 Rev. 1	WHC-SD-WM-SAD-035 Rev. 0a Rev 1	3 Safety/ AB	Required Alarms and Shutdowns	Compatible with ISB, meets ignition source control set 2, can be calibrated to a contractor's approved calibration procedure over the operating range	Differential Pressure Switch	H-2-821455 H-14-030122	KRISKOVICH MILLIKEN SCAIEF	JRK CCS
17	Any exhauster elec. components in contact with the tank ventilation airstream shall be suitable for operation in a Class 1, Division II, Group B atmosphere as defined in the 1996 edition of the NEC or shall be approved for the application by the FGEAB.	HNF-SD-WM-FDC-025 Rev. 1	East and West Tank Farms Standing Order 97-01 Rev. 2	3 Safety/ AB	Ignition Sources - Electrical components in contact with the tank airstream will meet one of the criterion listed	Refer to SEL (HNF-SD-WM-SEL-044) Rev 1	Electrical Components in ventilation airstream	H-2-821455 H-2-818186	MILLIKEN SCAIEF	NM CCS

Table 2. RMCS Exhauster DCM

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	REQUIREMENTS					SOLUTION			VERIFICATION	
Count	Criteria	Source	Reference	Requirement Type	Notes/Assumptions/Implications	Design Attribute	Component	Config. Control Ref.	Engineering Evaluation Description	Verified By?
18	Any exhauster mechanical equipment in contact with the tank ventilation airstream shall be qualified for use in hydrogen environments which exceed the LFL.	HNF-SD-WM-FDC-025 Rev. 1	East and West Tank Farms Standing Order 97-01 Rev. 2	3 Safety/ AB	Ignition Sources. They shall be tested per national standards to show they are nonsparking or analyzed and shown not to be capable of causing an ignition. Equipment shall be approved for application by the FGEAB.	Fan is designed to meet ignition source control set 1 REVISE	Fan (Mechanical components in ventilation airstream. A categorical exclusion exists in SO 97 01 for non-moving parts)	H-2-821455-99	KRISKOVICH MILLIKEN	22K UM
19	The exhauster shall automatically shut off if the exhaust stack flow increases above 7.1 cubic meters per min (250 scfm) for a period of 5 min or immediately when flow falls below 4.2 cubic meters per min. (150 scfm).	HNF-SD-WM-FDC-025 Rev. 1	WHC-SD-WM-SAD-035, Rev 0a	3 Safety/ AB	Required Alarms and Shutdowns - The exhauster will shutdown automatically after 5 minutes of high flow but shutdown immediately for low flow	The Masstron meets ignition control set 2, and can be calibrated to a contractor's approved calibration procedure over the operating range REVISE	Masstron Stack Flow Transmitter	VI #22660 H 14-030122	SCAIEF MILLIKEN	CCS UM
20	Any non metals exposed to the airstream shall be constructed from an electrostatic dissipative (ESD) material with a surface resistivity of less than 10E12 OHMS per square per ASTM D-257 and shall be tested per military std. MIL-B-81705C	HNF-SD-WM-FDC-025 Rev. 1	East and West Tank Farms Standing Order 97-01 Rev. 2	3 Safety/ AB	Ignition Sources. All non metals exposed to the airstream shall be tested	Surface resistivity of less than 10E12 OHMS/square REVISE	Riser connection, Bellows, Gaskets (Non-metals in airstream)	H-2-821455-98/ H-2-821455-55	MILLIKEN JARECKI	UM
21	The exhauster shall be constructed as to ensure that all of the ESD components are bonded via intimate contact with the surrounding metal components	HNF-SD-WM-FDC-025 Rev. 1	East and West Tank Farms Standing Order 97-01 Rev. 2	3 Safety/ AB	Ignition Sources. All non metals exposed to the airstream are bonded to metals	Riser connection, bellows, and gaskets are in intimate contact with metal components REVISE	Riser connection, Bellows, Gaskets (Non-metals in airstream)	H-2-821455-98/ H-2-821455-55/ H 2-8218202-15,16,17,19, 20	MILLIKEN JARECKI	UM
22	The exhauster shall automatically shut off when tank vacuum pressure exceeds the specific tank maximum vacuum pressure (Nominal -5.6 mm Hg (3 inches w.g.vacuum)	HNF-SD-WM-FDC-025 Rev. 1	WHC-SD-WM-SAD-035, Rev. 0a	3 Safety/ AB	Required Alarms and Shutdowns	Compatible with ISB, meets ignition source control set 2, can be calibrated to a contractor's approved calibration procedure over the operating range REVISE	Tank Pressure Sensor	H-2-821455-110/ H-14-030122	SCAIEF MILLIKEN	CCS UM
23	A normally open dry electrical contact that actuates upon loss of exhaust stack flow shall be provided for core sample truck connection.	HNF-SD-WM-FDC-025 Rev. 1	WHC-SD-WM-SAD-035, Rev 0a	3 Safety/ AB	Required Alarms and Shutdowns - Truck/Exhauster Interlock	Fail safe operation (fail open)	Truck Shutdown Relay	VI #22660 H 14-030122	MILLIKEN SCAIEF	UM CCS
24	Potential ignition from rotating equipment located in waste or waste gases will be minimized through the use of spark-resistant, conductive materials and/or nitrogen purge	WHC-SD-WM-FDC-048	REVISE	3 Safety/ AB		Meets ignition source control set 1 REVISE	Fan	H-2-821455-99	MILLIKEN JARECKI	UM

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	REQUIREMENTS					SOLUTION			VERIFICATION	
Count	Criteria	Source	Reference	Requirement Type	Notes/Assumptions/Implications	Design Attribute	Component	Config. Control Ref.	Engineering Evaluation Description	Verified By?
25	Exhauster components shall be fabricated and positioned on the transport skid in such a manner that will minimize airborne contaminant capture in exterior folds, pleats, seams, or joints.	HNF-SD-WM-FDC-025 Rev. 1	WHC-IP-1043	3 Safety/ ALARA	General Construction - Radiological Control	Smooth surfaces and component spacing to minimize crevices	All exterior surfaces	H-2-821455 H-2-818186	N/A	ALL GRD
26	The HEPA filter housing design shall emphasize ease of exterior decontamination and shall be of the bag-in/bag-out type design	HNF-SD-WM-FDC-025 Rev. 1	ASME N509 WHC-IP-1043	3 Safety/ ALARA	General Construction - Radiological Control	Minimize effort for exterior decontamination and is bag-in/bag-out design	Filter Train	H-2-821455	N/A	ALL GRD
27	Insulation shall be of closed cell type and shall not be exposed to the airstream to prevent moisture and contamination build-up	HNF-SD-WM-FDC-025 Rev. 1	WHC-IP-1043	3 Safety/ ALARA	General Construction - Radiological Control	Closed cell type	Insulation	VI #22660 H 2-821455	N/A	ALL GRD
28	The connection between the exhauster and the tank riser shall be flexible to allow for misalignment and elevation differences. This connection shall be fabricated in such a manner that will minimize particulate capture in folds, pleats, seams, or joints.	HNF-SD-WM-FDC-025 Rev. 1	WHC-IP-1043	3 Safety/ ALARA	General Construction - Radiological Control	Minimizes particulate capture	Riser Connection	H-2-821455-98	N/A	ALL GRD
29	As this exhauster is intended to move between tank farms, the design shall provide for containment during transportation.	HNF-SD-WM-FDC-025 Rev. 1	WHC-IP-1043	3 Safety/ ALARA	General Construction - Radiological Control	Meets transportation design requirements for contaminated components	System	H-2-821455 H-2-818186	N/A	ALL GRD
30	Where practical provide washable protective coatings on surfaces which have a potential for contamination	WHC-SD-WM-FDC-048	WHC-IP-1043	3 Safety/ ALARA		Washable exterior surfaces	All exterior surfaces	H-2-821455 H-2-818186	N/A	ALL GRD
31	The system shall be designed to facilitate decontamination and decommissioning tasks	WHC-SD-WM-FDC-048	WHC-IP-1043	3 Safety/ ALARA		Ease of decontamination and waste packaging	System	H-2-821455 H-2-818186	N/A	ALL GRD
32	Where practical provide fully drainable systems that carry contaminated or potentially contaminated liquids	WHC-SD-WM-FDC-048	WHC-IP-1043	3 Safety/ ALARA		Drainable condensate pipes and seal loops	System	H-2-821455 H-2-818186	N/A	ALL GRD
33	Where practical minimize long runs of internally contaminated ductwork.	WHC-SD-WM-FDC-048	WHC-IP-1043	3 Safety/ ALARA		Minimize length of ducts	System	H-2-821455 H-2-818186	N/A	ALL GRD
34	Minimize folds, pleats, seams, and joints in internally contaminated ductwork	WHC-SD-WM-FDC-048	WHC-IP-1043	3 Safety/ ALARA		Minimize crevices on inside surface of ducts	System	H-2-821455 H-2-818186	N/A	ALL GRD
35	The system shall be designed in accordance with the industrial safety requirements of Occupational Safety and Health Administration, Code of Federal Regulations , 29 CFR 1910, DOE Order 5480.1B, "Environ Safety & Health Program for the DOE Operations."	WHC-SD-WM-FDC-048		3 Safety/ DOE/ OSHA	The design shall ensure that a single failure does not result in the loss of capability of a safety class system to perform its safety function.	System meets functional requirements and constraints	System	H-2-821455 H-2-818186	N/A	ALL GRD

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	REQUIREMENTS					SOLUTION			VERIFICATION		
Count	Criteria	Source	Reference	Requirement Type	Notes/Assumptions/Implications	Design Attribute	Component	Config Control Ref.	Engineering Evaluation Description	Verified By?	
36	Core sampling design and equipment operation shall not violate , or cause a violation, of the controls established in the Fire Protection review for the Rotary Mode Core Sampling System.	WHC-SD-WM-FDC-048		3 Safety/ Fire		In compliance with fire protection controls	System	H-2-821455 H-2-818186	N/A	ALL	
37	The filter train shall include a prefilter, HEPA filter, test section, and a second HEPA filter in series	HNF-SD-WM-FDC-025 Rev. 1	ASME N509	4 Environmental	General Construction	Complies with DOE/RL-94-118 Rev. 0	Filter Train	H-2-821455	KRISKOVICH		OPEN 8/8/97
38	The system shall be 99.95% efficient as tested per ASME Standard N510	HNF-SD-WM-FDC-025 Rev. 1	WHC-CM-4-27 Section 3.2	4 Environmental		Particulate removal efficiency of 99.95%	Filter Train	H-2-821455	KRISKOVICH		OPEN 8/8/97
39	The HEPA filters shall be individually testable when installed	HNF-SD-WM-FDC-025 Rev. 1		4 Environmental		Individually testable HEPA filters	Filter Train	H-2-821455	KRISKOVICH		OPEN 8/8/97
40	The stack temperature and flow velocity shall also be instrumented. The flow sensor must be arranged such that it will provide flow totalization	HNF-SD-WM-FDC-025 Rev. 1	DOE/RL-94-118 Rev. 0	4 Environmental	Emissions requirement - Stack flow and temperature will be displayed	Temperature sensor - sensing capability in the range of interest. Flow transmitter - meets ignition source control set 2, and can be calibrated to a contractor's approved calibration procedure over the operating range.	Masstron Stack Flow Transmitter	VI #22660	N/A	ALL	
41	Periodic and confirmatory monitoring shall be accomplished using either an automatically controlled, isokinetically aspirating sampling probe, a shrouded fixed flow rate probe, or other probe design subject to approval of the regulatory authority (WDOH).	HNF-SD-WM-FDC-025 Rev. 1	DOE/RL-94-118 Rev. 0	4 Environmental	Emissions requirement	Monitoring approved by WDOH	Record Sample System	VI #22660	N/A	ALL	
42	Sampling ports shall be available for sampling the air stream within the stack as required for periodic and/or confirmatory sampling.	HNF-SD-WM-FDC-025 Rev. 1	DOE/RL-94-118 Rev. 0	4 Environmental	Emissions requirement - Sampling ports will be provided on the stack	Compatible with sampling equipment	Sample Ports	H-2-821455	N/A	ALL	
43	The CSS shall be designed to provide for confinement barriers and air filtration systems for contamination control.	WHC-SD-WM-FDC-048		4 Environmental	Air emission of radioactive particles shall be controlled	The CSS is in compliance with DOE/RL-94-118 Rev. 0	System	H-2-821455 H-2-818186		JRK	
44	The design shall comply with all applicable State and Federal laws and standards, including applicable waste volume reduction requirements	WHC-SD-WM-FDC-048		4 Environmental		System meets the funtional requirements and constraints	System	H-2-821455 H-2-818186	N/A	ALL	
45	Dampers shall meet ASME N509 Construction Class A and shall be Leakage Class I, (bubble tight).	HNF-SD-WM-FDC-025 Rev. 1	ASME N509	5 Design Code		Meets N509 and is leak tight	Dampers	H-2-821455 H-2-818186	N/A	ALL	

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	REQUIREMENTS					SOLUTION			VERIFICATION	
Count	Criteria	Source	Reference	Requirement Type	Notes/Assumptions/Implications	Design Attribute	Component	Config. Control Ref.	Engineering Evaluation Description	Verified By?
46	The housing shall comply with the requirements of American Society of Mechanical Engineers (ASME) standard N509.	HNF-SD-WM-FDC-025 Rev. 1	ASME N509	5 Design Code	General Construction	Complies with DOE/RL-94-118 Rev. 0	Filter Train	H-2-821455	N/A	ALL GRD
47	The housing shall be leak tested per ASME N510 section 6.5.3 at a test pressure of -5.98 kPa (24 in. W.G. vacuum)	HNF-SD-WM-FDC-025 Rev. 1	ASME N509	5 Design Code	General Construction	Leak tight	Filter Train	H-2-821455	N/A	ALL GRD
48	The HEPA filter mounting frames shall be leak tested per ASME N510 sections 7 and 6.5.3 at a test pressure of -2.49 kPa (10 inches W.G. vacuum)	HNF-SD-WM-FDC-025 Rev. 1	ASME N509	5 Design Code	General Construction	Leak tight	Filter Train	H-2-821455	N/A	ALL GRD
49	Piping shall comply with ASME B31.3	HNF-SD-WM-FDC-025 Rev. 1		5 Design Code	General Construction	Complies with code	Piping and Duct	H-2-821455	N/A	ALL GRD
50	The duct shall be capable of withstanding a pressure equal to the fans maximum suction capability (currently 24 inches W.G. vacuum)	HNF-SD-WM-FDC-025 Rev. 1		5 Design Code	General Construction	Strength to withstand 24 inches W.G. vacuum	Riser Connection	H-2-821455-98	N/A	ALL GRD
51	The skid and mounted equipment shall be capable of withstanding the transportation, environmental, and operational loads incurred	HNF-SD-WM-FDC-025 Rev. 1		5 Design Code	General Construction	The skid meets relevant design codes for the expected transportation, and operational loads and meets environmental regulations (DOE/RL-94-118 Rev. 0)	Skid	H-2-821456	N/A	ALL GRD
52	The exhauster and all of the associated components shall comply with the 1996 edition of the National Electric Code (NFPA-70)	HNF-SD-WM-FDC-025 Rev. 1	NEC (NFPA 70)	5 Design Code	General Construction	Compliance with NEC	System	H-14-030122 H-14-100739 H-14-100740 H-14-100741	N/A	ALL GRD
53	All welding shall be performed and inspected per ASME N509, ASME AG-1, AWS D1.1, and AWS D9.1 as applicable	HNF-SD-WM-FDC-025 Rev. 1		5 Design Code	General Construction	Welding is per listed standards	System	H-2-821455 H-2-818186	N/A	ALL GRD
54	The peak (air stream) temperature shall not exceed the maximum allowable for the HEPA filter	HNF-SD-WM-FDC-025 Rev. 1		5 Design Code		Temperature sensor - sensing capability in the range of interest	Temperature Sensor	H-14-030122	N/A	ALL GRD
55	Differential pressure across each HEPA filter and across the entire HEPA filter train shall be indicated	HNF-SD-WM-FDC-025 Rev. 1		6 Other	Operator Aids	Can be calibrated to a contractor's approved procedure over the operating range, compatible with the ISB, meets ignition source control set 2.	Differential Pressure Switch	H-2-821455	N/A	ALL GRD
56	Vibration isolation shall be provided at the fan connections.	HNF-SD-WM-FDC-025 Rev. 1		6 Other	General Construction	Vibration isolation	Fan	H-2-821455-99	N/A	ALL GRD

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Count	Criteria	Source	Reference	Requirement Type	Notes/Assumptions/Implications	Design Attribute	Component	Config. Control Ref.	Engineering Evaluation Description	Verified By?
57	Final configuration of the exhauster and all components shall allow HEPA filter change out without component disassembly or removal of any portion of the exhauster (except doors)	HNF-SD-WM-FDC-025 Rev. 1	ASME N509	6 Other	General Construction	Minimize effort for consumable material (HEPA) removal	Filter Train	H-2-821455	N/A	ALL GD
58	The HEPA filter housing shall be of welded construction wherever possible. The housing shall be fabricated from 300L series stainless steel	HNF-SD-WM-FDC-025 Rev. 1	ASME N509	6 Other	General Construction	Housing is 300L series stainless steel if of welded construction	Filter Train	H-2-821455	N/A	ALL GD
59	The HEPA filters shall meet the requirements of procurement specification HS-V-P-4042	HNF-SD-WM-FDC-025 Rev. 1	ASME N509	6 Other	General Construction	See procurement specification	Filter Train	H-2-821455	ERISKOVICH	JRK
60	The HEPA filters shall be fire and moisture resistant	HNF-SD-WM-FDC-025 Rev. 1	ASME N509	6 Other	General Construction	Resistant to fire and moisture	Filter Train	H-2-821455	N/A	ALL GD
61	The prefilter shall be listed as UL Class 1	HNF-SD-WM-FDC-025 Rev. 1	ASME N509	6 Other	General Construction	UL class 1	Filter Train	H-2-821455	N/A	ALL GD
62	Consideration should be given for ease of removal and disposal of the HEPA filters (bag-in/bag-out housing design)and other consumable components in contact with the airstream that may become contaminated during exhauster operation.	HNF-SD-WM-FDC-025 Rev. 1	WHC-IP-1043	6 Other	O&M Requirements - Radiological Control	Minimize effort for consumable material removal	Filter Train	H-2-821455	N/A	ALL GD
63	A closed loop water heater with heat exchanger shall be used to lower the relative humidity to ensure that the airstream remains below 70% relative humidity prior to entering the HEPA filters	HNF-SD-WM-FDC-025 Rev. 1		6 Other		Heater - Adequate heating to maintain airstream humidity below 70% under environmental conditions. Relative Humidity Transmitter - Safety Class sensor with sensing capability in the range of interest	Heater/Relative Humidity Transmitter	VI #22660 H-2-821455-49	N/A	ALL GD
64	Maximum continuous air stream temperature shall be less than 93C (200F)	HNF-SD-WM-FDC-025 Rev. 1		6 Other		Temperature sensor - sensing capability in the range of interest	Heater/Temperature Sensor	VI #22660 H-2-821455	N/A	ALL GD
65	Lift points and methods shall comply with the Hanford Site Hoisting and Rigging Manual (DOE-RL-92-36)	HNF-SD-WM-FDC-025 Rev. 1	DOE-RL-92-36	6 Other	O&M Requirements	Lift points comply with Hoisting and Rigging Manual	Lift Points	H-2-821456	N/A	ALL GD
66	Hoisting and rigging ease shall be considered for the deployment of the exhauster during setup and take down at each tank	HNF-SD-WM-FDC-025 Rev. 1		6 Other	O&M Requirements	Lift points comply with Hoisting and Rigging Manual	Lift Points	H-2-821456	N/A	ALL GD
67	Ducts between the heater, HEPA filter housing, and fan shall be fabricated from 300 series stainless steel	HNF-SD-WM-FDC-025 Rev. 1		6 Other	General Construction	Material is 300 series stainless steel	Piping and Duct	VI #22660	N/A	ALL GD
68	All piping and tubing and fittings shall be 300 series stainless steel.	HNF-SD-WM-FDC-025 Rev. 1		6 Other	General Construction	Material is 300 series stainless steel	Piping and Duct	H-2-821455	N/A	ALL GD

Table 2. RMCS Exhauster DCM

DRAFT 8/4/97

	BASELINE DESIGN COMPLIANCE MATRIX - EXHAUSTER SYSTEM									
	REQUIREMENTS					SOLUTION			VERIFICATION	
Count	Criteria	Source	Reference	Requirement Type	Notes/Assumptions/Implications	Design Attribute	Component	Config. Control Ref.	Engineering Evaluation Description	Verified By?
69	Provisions shall be made for the collection and removal of condensate from the system on a regular basis.	HNF-SD-WM-FDC-025 Rev. 1		6 Other	General Construction	Drainable condensate collection container	Piping and Duct	H-2-821455	N/A	ALL GD
70	Condensate lines shall be heat traced to eliminate the possibility of freezing during severe cold.	HNF-SD-WM-FDC-025 Rev. 1		6 Other	General Construction	Heat tracing	Piping and Duct	H-2-821455	N/A	ALL GD
71	Welded components shall be 300L series stainless steel.	HNF-SD-WM-FDC-025 Rev. 1		6 Other	General Construction	Material is 300L series stainless steel	Piping and Duct	H-2-821455	N/A	ALL GD
72	All drains shall be sloped 1/8 inch per foot minimum.	HNF-SD-WM-FDC-025 Rev. 1		6 Other	General Construction	Drain piping is sloped	Piping and Duct	H-2-821455	N/A	ALL GD
73	High relative humidity shall be indicated with an alarm to notify the operator of a problem	HNF-SD-WM-FDC-025 Rev. 1		6 Other	Operator Aids	Relative Humidity Transmitter - meets ignition source control set 2. Alarm - compatible with humidity transmitter	Relative Humidity Transmitter	H-2-021455-49/ H-14-030122	N/A	ALL GD
74	The stack shall have sampling ports provided for aerosol testing the HEPA filters per ASME N509	HNF-SD-WM-FDC-025 Rev. 1		6 Other	General Construction	Ports meeting ASME N509	Sample Ports	H-2-821455	KRISKOVICH	OPEN 8/8/97
75	Power distribution and reduction for the various components located on the exhauster skid shall be accomplished on the exhauster skid.	HNF-SD-WM-FDC-025 Rev. 1		6 Other	General Construction	Power needs for components on the skid are met with compatible electrical connections on the skid	Skid	H-2-818201	N/A	ALL GD
76	The complete (excluding any remote mounted equip. or instruments) exhauster shall be mounted on a single skid.	HNF-SD-WM-FDC-025 Rev. 1		6 Other	General Construction	The skid is large enough to accommodate placement of all the exhauster components	Skid	H-2-821456	N/A	ALL GD
77	The stack shall also be fabricated from 300 series stainless steel.	HNF-SD-WM-FDC-025 Rev. 1		6 Other	General Construction	Material is 300 series stainless steel	Stack	H-2-818188	N/A	ALL GD
78	The stack shall be mounted on the same skid as the filter housing and fan.	HNF-SD-WM-FDC-025 Rev. 1		6 Other	General Construction	See item 39E	Stack	H-2-821455 H-2-818186	N/A	ALL GD

Table 2 RMCS Exhauster DCM

DRAFT 9/4/97

BASELINE DESIGN COMPLIANCE MATRIX - EXHAUSTER SYSTEM										
	REQUIREMENTS					SOLUTION			VERIFICATION	
Count	Criteria	Source	Reference	Requirement Type	Notes/Assumptions/Implications	Design Attribute	Component	Config. Control Ref.	Engineering Evaluation Description	Verified By?
79	The exit of the stack shall be at least 3 m (10 ft) above grade when the exhauster is deployed on a level surface.	HNF-SD-WM-FDC-025 Rev. 1		6 Other	General Construction	Stack height > 3 m	Stack	H-2-818188	TARECKI	[illegible]
80	The stack velocity shall exceed 610 m/min (2000 feet/minute)	HNF-SD-WM-FDC-025 Rev. 1		6 Other	General Construction	Stack internal diameter	Stack	H-2-818188	N/A	ALL [illegible]
81	The exhauster shall be designed so that one RMCS operator will be required for operation.	HNF-SD-WM-FDC-025 Rev. 1		6 Other	O&M Requirements. Set-up/Start-up of the exhauster may require more than one operator.	Sequential operations and automation as required	System	H-2-821455 H-2-818186	N/A	ALL [illegible]
82	Following the initiation of exhauster startup the components of the system shall be fully operational/stable within 1 hour of being energized	HNF-SD-WM-FDC-025 Rev. 1		6 Other		The system reaches stable condition within 1 hour	System	H-2-821455 H-2-818186	N/A	ALL [illegible]
83	The pressure of the tank being exhausted shall be indicated	HNF-SD-WM-FDC-025 Rev. 1		6 Other	Operator Aids	Can be calibrated to a contractor's approved procedure over the operating range, compatible with the ISB, meets ignition source control set 2.	Tank Pressure Sensor	H-2-821455-110	N/A	ALL [illegible]
84	All controls and displays added for operation of the CSS in FGWL tanks shall be located where they can be clearly seen and easily reached by the operator.	WHC-SD-WM-FDC-048		6 Other	O&M Requirements	Operable equipment and readable displays	System	H-2-821455 H-2-818186	N/A	ALL [illegible]
85	The design or placement of controls shall minimize the likelihood of an operator inadvertently operating the wrong item by	WHC-SD-WM-FDC-048		6 Other	O&M Requirements	Ergonomic design and interlocks as necessary	System	H-2-821455 H-2-818186	N/A	ALL [illegible]
86	Digital displays and indicating lights shall be readable by operators in bright or hazy sunlight	WHC-SD-WM-FDC-048		6 Other		Readable displays	System	H-2-821455 H-2-818186	N/A	ALL [illegible]

Dmer 8/4/97

TABLE 3
ENVIRONMENTAL CONDITIONS

Climate and Natural Phenomenon	The weather which is experienced on the Hanford Site includes sun, snow, rain, blowing dust and extreme temperatures.
	The maximum wind speed is 120 km/hour (80MPH) and may be accompanied by snow, rain or blowing dust.
	The exhauster shall be capable of operation under the Hanford environmental condition with temperature extremes of -7 to 43°C (20 to 110°F), sustained wind up to 32 km/hr (20 MPH).
	The temperatures range from -23°C to 43°C, (-10°F to 110°F)
	The ground snow load is .7 kPa (15 psf).
	Consideration should be given for operation in direct sunlight, rain and snow loads.
	The exhauster shall not be damaged if stored outdoors within the temperatures of -29 and 49°C (-20 and 120°F), during rain, snow load, direct sunlight, and sustained high winds of up to 112km/hr (80MPH).
	The filter housing shall be seismically qualified for use at the DOE Hanford Washington State site, by dynamic analysis based on a free field horizontal acc. of .12g. a free-field vertical acc. of .08g and 5% critical damping.
Tank Vapor	The underground storage tanks are within the temperature range of 0 and 71°C (32 and 160°F) and the airstream at the top of the tank riser shall be assumed to be within the same range.
	The airstream which will be exhausted from the tank is expected to range between 15% and 100% relative humidity.
	The moisture within the air stream is expected to have a pH factor between 12 and 14.

5.2 DRAFT DESIGN COMPLIANCE MATRIX PUNCHLIST W/CLOSURE DOCUMENTATION

DCM Punch list items

- 16. Ensure cal. proc. 6-ES-460 sets shutdown at open limit ($5.9^{+0}_{-.1}$)
- 17. Add ICS 2 to des. attrib
- 18. Change des. attrib to ICS 2
- 19. Take out ICS 2
  Add shutdown attribute
  Check if shutdown occurs within 5 min period
- 20. Add ICS2 to attrib
- 21. " " " "
- 22. Remove ICS2 to attrib
  Add shut down signal to attrib (check cal. proc. 6-ES-460)
- 24 Change to ICS2 (not 1)
  Add S/D in red ell

37
38
39
74.

ensure design meets N.O.C. approach take

- D.S.I. on potential for Al. fan blade to deteriorate due to condensing vapors from tank.

TOPS 35500

COMMENTS ON THE EXHAUSTER DESIGN COMPLIANCE MATRIX
CC Scaief III

Environmental Limits:

Operating Temperature:	10°F to 110°F
Maximum Ambient (storage):	-20°F to 120°F
Relative Humidity:	15% to 100%
pH of exhaust stream moisture:	12 to 14

Item 16
Shutdown exhauster on excessive HEPA DP (5.9 inWG)

This requirement is achieved with a Dwyer Model 1950-10 differential pressure switch. The contacts (NC) from the pressure switch are wired into the Variable Frequency Drive (VFD) for the fan motor and provide a shutdown interlock. The pressure switch contacts open upon detection of excessive DP.

The pressure switch is rated for operation from -40°F to 140°F. The switch is connected across the filter using static pressure lines that are exposed to the ambient environment. Per FDC-025, the tank vapor stream maximum temperature is 160°F. If the tank vapor were at 160°F, it is inconceivable that the static pressure lines could transmit enough heat to place the switch out of its recommended operating temperature range. No relative humidity range was specified, however, the enclosure is rated as weatherproof.

The VFD is specified to operate from 0°C to 50°C (32°F to 122°F). The storage temperature range is -40°C to 85°C (-40°F to 185°F). An RCR comment (#5) was submitted by J. Dormant regarding the temperature range. The manufacturer's response to questions (per JD Criddle Jr) regarding performance at lower temperatures was that it will probably operate at the lower temperature and if it won't, it simply will not run. It is doubtful that the lower temperature would affect the shutdown function (my comment). The VFD is in a weatherproof enclosure.

Item 17
Any exhauster electrical components exposed to the air stream meet Standing Order 97-01.

The equipment in the gas sample monitoring cabinet has been reviewed by the FGEAB, Report number FGEAB-97-029. Other equipment such as the pressure switches, temperature sensor, and the humidity sensor are approved for use in a Class I, Division 2 location as a minimum. The pressure switches use an Intrinsic Safety Barrier (Crouse-Hinds GHG12230) to achieve compliance. These barriers are located within the sample monitoring cabinet that is environmentally controlled. As such, they will meet the temperature and humidity requirements. No attempt has been made to assess the effect of temperature and humidity on the ability of the other components to meet the ignition requirements of Standing Order 97-01. These devices were approved by the FGEAB based on their non-sparking operation under normal conditions. This is not expected to be altered by the temperature and humidity ranges they will encounter.

Item 19
Shutdown exhauster on hi and low flow.

This is accomplished using the Masstron flow monitor and a Yokogawa controller. The controller provides outputs to Relays K5 and K6 which are used to shut down the VFD. These relay contacts are in the same shutdown circuit as the DP switch (Item 16). These components are all located in the air sampling cabinet which is environmentally controlled.

Item 22
Shutdown exhauster when vacuum exceeds 3 inWG.

This is accomplished with a Dwyer pressure switch, Model 1950-05 and operates in an identical fashion to the DP switch with an interlock to the VFD. The discussion above (Item 16) regarding all the components is identical.

pH Requirement
The pH of the moisture within the air stream is not expected to have any immediate effect on any of the instrumentation exposed to the air stream. The caustic nature of any condensed moisture might have a long term effect on some components, however, any degradation is expected to be determined through normal calibration and operational checks.

DON'T SAY IT --- *Write It!*

DATE: December 12, 1997

TO: G. P. Janicek S7-12

FROM: C. E. Hanson S7-12
Telephone: 376-4810

cc: R. M. Boger S7-12
K. V. Scott S7-12
File/LB CEH

SUBJECT: REVIEW COMMENT RECORDS ON THE DESIGN COMPLIANCE MATRIX FOR THE RMCS, HNF-SD-WM-CR-062, REV. 0

The completed review comment records for the subject report are attached. All comments were resolved, and the reviewers approved the report.

If you have any questions, please contact me at the number above or Keith Scott at 376-5445.

meg

Attachment

A-3000-723 (01/95) GEF014

Attachment to DSI

REVIEW COMMENT RECORDS ON
THE DESIGN COMPLIANCE MATRIX FOR
THE RMCS. HNF-SD-WM-CR-062. REV. 0

Consisting of 12 Pages
(including cover page)

A-3000-723 (01/95) GEF014

REVIEW COMMENT RECORD (RCR)

1. Date	2. Review No.
10-28-97	rcrcr62.jr
3. Project No.	**4. Page**
CPO	1 of 2

5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
HNF-SD-WM-CR-062, Baseline Compliance Matrix for the RMCS System	CPO/RMCS System	Jeff Ranschau	TWRS-NS/CPO	2704HV/373-4462

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

11-17-97 Date — Reviewer/Point of Contact

Author/Originator

11. CLOSED

11-17-97 Date — Reviewer/Point of Contact

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	Page 12, section 8.0: Add HNF-SD-WM-TSR-006 to the list of references.		Accepted	
2	Page 13, table 1, 3rd bullet under "Safety Requirements": Clarify this statement to indicate that "loads" pertains to pressure loads on the tank - not dome loading. Also, include LCO 3.7.3 to the OSR-005 reference.		Accepted	
3	General comment: The RMCS system, together with the various support systems, must be evaluated for dome loading of the tanks. Suggested action: Evaluate the RMCS system (with support systems) to ensure that tank dome loading limits will not be exceeded. Include statements in table 1 and other applicable sections of this document to indicate that dome loading has been evaluated.		It is a fact that dome loading must be controlled but the weight of the RMCS was not considered in the design. Dome loading is administratively controlled. The RMCS system weight is less than one-half the available dome load allowable of approximately 100 tons live load.	
4	Table 2, item 12: Include a statement in the Notes/Assumptions/Implications column stating what testing, approvals, etc. are required to verify that the criteria statement is met.		A statement has been added to show the approval of the FGEAB is an acceptable alternative to testing or other evaluation.	

A-6400-090.1 (03/92) WEF011

REVIEW COMMENT RECORD (RCR)

1. Date	2. Review No.
10-28-97	rcrcr62.jr
3. Project No.	**4. Page**
cpo	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
5	Table 2, item 14: Exposed polymer materials must be procured with the appropriate testing having been performed or they must be approved for use by the FGEAB. Include a statement in the Notes/Assumptions/Implications column that FGEAB approval is required if appropriate testing can not be verified.		Accepted	
6	Table 2, item 24: Provide a statement in the Notes/Assumptions/Implications column stating how compliance with this requirement will be ensured - periodic monitoring, alarm, etc.		Accepted	
7	Table 2, item 25: List the controls, from the report, that are applicable for the exhauster in the criteria column. Also, state the control number of the report.		Deleted item 25. There are no fire protection requirements for the exhauster in the fire protection review.	
8	Table 2, item 25: Provide a statement in the Notes/Assumptions/Implications column stating how the controls will be met.		Deleted item 25.	
9	Table 2, item 58: Verify that DOE/RL-94-118 Rev. 0 is the correct document in the Design Attribute column.		Deleted reference and accompanying statement about environmental regulations.	
10	Page 23, table 3: Please clarify the temperature requirements in the Climate and Natural Phenomena section. There are currently 3 statements pertaining to temperature ranges - could this be changed to just an operating range and an environmental (extremes) range?		Deleted one unnecessary temperature range.	

A-6400-090.1 (03/92) WEF011

REVIEW COMMENT RECORD (RCR)	1. Date 10-28-97	2. Review No. rcrcr62.jr
	3. Project No. cpo	4. Page 3 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
11	Page 23, table 3: Add a statement to the Tank Vapor section stating what the expected radiation levels are.		Radioactive particles will be trapped by the HEPA filters. There is a requirement in the criteria table that the dose rate on contact be limited to <100 mrem/hr. The radiation from the vapor will be even less and insignificant to the materials of construction and therefore the radiation from this source is not listed.	

A-6400-090.1 (03/92) WEF011

REVIEW COMMENT RECORD (RCR)

1. Date	2. Review No.
10/21/97	CP97-016
3. Project No.	**4. Page**
N/A	1 of 2

5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
BASELINE DCM FOR RMCS SYSTEM, HNF-SD-WM-CR-062, EDT-622113	CHARACTERIZATION PROJECT	M.L. MCELROY	CPQA/7B400	2704HV/B-122/ 373-5588

17. Comment Submittal Approval:

N/A
Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

11-18-97
Date

Michael E. McElroy
Reviewer/Point of Contact

K C Scott
Author/Originator

11. CLOSED

11-18-97
Date

Michael E. McElroy
Reviewer/Point of Contact

K C Scott
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.	Some "Table of Contents" page numbers do not match the document.		Accepted	CLOSED
2.	Page 4, 1.0 BACKGROUND--It lists the nine RMCS subsystems, there should be a "tenth", the Nitrogen Supply System (or trailer).	MLM	Accepted	
3.	Page 10, Need to include a 6.10 section for the Nitrogen Supply Trailer.	MLM	Accepted	
4.	Page 13, OTHER REQUIREMENTS--Should include, "Aerosol testing standards shall be followed (ASME N509 & N510).	MLM	ASME N509 was added to the sentence under "Major Design Codes". Testing requirements are described in FDC-025 and are in the criteria listing table in this report.	
5.	Page 14, IV-UTILITY TRAILER, should be changed to DISTRIBUTION TRAILER, to make it consistent with the body of the document.		Accepted	
6.	TYPOS--Table 2, ie. item 14, the word "potentioal" s/b "potential".		Accepted	
7.	Table 2, item 10, DESIGN ATTRIBUTE--What is the +L22 designation?		+L22 has been removed	

A-6400-090.1 (03/92) WEF011

REVIEW COMMENT RECORD (RCR)	1. Date 10/21/97	2. Review No. CP97-016
	3. Project No. N/A	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.	Page 23, TABLE 3--It lists that the housing will be seismically qualified. How and where is this being documented?		This has moved to the criteria table and will reflect the vendor information file as the source of the information.	CLOSED

A-6400-090.1 (03/92) WEF011

REVIEW COMMENT RECORD (RCR)

1. Date	2. Review No.
10/29/97	TDJ-97-017
3. Project No.	**4. Page**
N/A	1 of 3

5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
HNF-SD-WM-CR-062, Rev. 0	RMCS Sampling	Jarecki, TD	75160	373-5741

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

11/19/97
Date

Reviewer/Point of Contact

Author/Originator

11. CLOSED

11/19/97
Date

Reviewer/Point of Contact

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	Page 4, Sec. 2.0: Need to expand on how the "DCM supports configuration management"		Accepted	CLOSED
2	Page 5, Sec. 5.0, last sentence: Changes to the DCM will not ALWAYS require "Safety, Quality Assurance, and Environmental". Need to reword applying approval designator requirements.		Accepted	CLOSED
3	Page 6, Sec. 6.1.2.1: The BIO does NOT contain all the safety requirements related to sampling tanks containing flammable gases. Need to reword entire paragraph to accurately reflect authorization basis documentation including the SAD, BIO, TSR, and select IOSR requirements.		Wording will be added to reflect all AB documents. The SAD has some requirements not reflected in the OSR. In those cases the SAD will be referenced.	CLOSED
4	Page 7, Sec. 6.1.2.1: Although ALARA is mentioned here in reference to requirements in HNF-IP-0842, items in Table 2 do not reflect requirements from the ALARA Design Review Checklist as required per HNF-IP-0842. The same issue occurs in Table 2 where WHC-IP-1043 is listed as a basis but the same checklist is required per WHC-IP-1043. Suggest that the ALARA type requirements be revisited and compared to the items from the ALARA Design Review Checklist.		A review of the checklist reveals the design items that relate to the exhauster are listed in the DCM. For example, the checklist requires that accident conditions be considered in the design and this is covered by the SAD and BIO.	CLOSED

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REVIEW COMMENT RECORD (RCR)

1. Date	2. Review No.
10/29/97	TDJ-97-017
3. Project No.	**4. Page**
N/A	2 of 3

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
5	Page 7, Sec. 6.1.2.2: Need to review WHC-CM-7-5 to ensure that sections applicable to this DCM have not been superseded by HNF-PRO documents.		The pertinent section of CM-7-5 is "Air Quality". That section has not moved to the HNF-PRO series yet.	CLOSED
6	Page 11, Sec. 8.0: Need to rewrite list of references to include HNF-PRO documents, IOSR-005, TSR-006 and actual permits rather than just the WDOH letter dated September 3, 1997.		Accepted	CLOSED
7	Page 16: General comment on structure of information in the table; columns are not consistently filled out. Examples include FGEAB approval under Criteria on item 11 while item 13 has this under Notes. The Source on item 11 should be TSR-006 while the Basis is BIO-001. Exclusion information noted under Component on item 13 should fall under Notes or Criteria.		Accepted	CLOSED
8	Page 16, item 16 etc.: All items which mention SAD-035 under Basis should also include IOSR-005.		That is not always true but will be modified as appropriate	CLOSED
9	Page 18, item 36: It is my understanding that an interlock exists on the exhauster relative to radiological monitoring only while in "unattended mode". The criteria noted here is not consistent with pending design changes. Either this criteria is incorrect or the pending design needs to be revisited.		The criteria has been changed to "alarm" rather than "shutdown" on CAM input. It may be changed if the Facility Effluent Monitoring Plan allows the change or if Operations requires an interlock.	CLOSED

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REVIEW COMMENT RECORD (RCR)

1. Date	2. Review No.
10/29/97	TDJ-97-017
3. Project No.	**4. Page**
N/A	3 of 3

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
10	Table 2, general: Need to update Source and Basis columns as applicable for additional references on permits from Section 8.0.		The permit we have for radiological emissions is not consistent with our planned system. The source and basis columns will be changed as necessary to reference N509, AG-1, and the FEMP. Also, for requirements in the permit that are not being contended, the permit is referenced. A future revision to this document will add the reconciliation letters that are being prepared at this moment.	CLOSED
11	Page 19, items 41 and 42: The Design Attributes for both of these items relate to monitoring requirements rather than equipment necessary to perform monitoring.		Deleted- Not a design requirement	CLOSED
12	Page 20, item 57: Duct under Component should be deleted or the criteria be adjusted to exclude the duct from ASME B31.3 requirements.		Accepted	CLOSED
13	Page 20, item 60: Design Attribute is not consistent with Criteria which suggests alarm and/or interlock is required.		An alarm on high air stream temperature has been added.	CLOSED
14	Page 21, item 70: Design Attribute is not consistent with Criteria which suggests alarm and/or interlock is required.		Deleted requirement	CLOSED
15	Page 22, item 82: Design Attribute is not clear.		Accepted	CLOSED
16	Page 23, Table 3: As suggested in Section 6.1.1, the requirements in Table 3 are considered design criteria and therefore should be included in Table 2.		Moved Seismic requirements to table 2.	CLOSED

A-6400-090.1 (03/92) WEF011

REVIEW COMMENT RECORD (RCR)

1. Date	2. Review No.
3. Project No.	4. Page 1 of 1

5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
HNF-SD-WM-CR-062, Baseline Design Compliance Matrix for RMCS systems. Rev.0 HNF-SD-WM-FDC-025, Functional Design Criteria for the RMCS exhauster, Rev. 2	CHARACTERIZATION	JIM KRISKOVICH		

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

11-19-97 Date — Jim Kriskovich Reviewer/Point of Contact

Author/Originator

11. CLOSED

11-19-97 Date — Jim Kriskovich Reviewer/Point of Contact

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
	HNF-SD-WM-CR-062			
1	Section 5.0, What DA, the exhauster DA, or the other component DA? I think we need to be explicit here	jrk	In this section of the report, the RMCS design authority is the proper one. Since the design authority jurisdiction can change, further identification is not prudent.	GCK.
2	Section 6.0 Why is the purchase specification used as a driver for requirements. The purchase specification should rely on the FDC for the requirements, not the other way around.	jrk	In some cases, the purchase specification is the only record of criteria.	GCK
3	Section 6.0 "..some are prescribed by the design engineer." The design engineer should put the necessary requirements in the FDC, not design it based on feeling. I this is done this way a design verification or validation can not be completed.	jrk	These requirements are in the FDC.	GCK

A-6400-090.1 (03/92) WEF011

REVIEW COMMENT RECORD (RCR)

1. Date	2. Review No.
3. Project No.	4. Page 2 of 1

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
4	Section 6.1.2.1 Is environmental part of the Safety and Licensing criteria. I do not believe it is.	jrk	Environmental requirements are in 6.1.2.2. ACCEPT. REMOVED ENVIRONMENT FROM PARA.	GIK closed
5	Section 6.1.2.1 You need to add TSRs in this paragraph. The TSRs will be used for the flammable gas controls (i.e., the IC sets).	jrk	Accepted	GIK closed
6	Section 6.1.2.1 "... collect radioactive particles in the HEPA filters and on other exhauster components." The only abatement equipment credited is the HEPA filters, not other components, this needs to be changed.	jrk	The point in this sentence is not abatement of radioactive particle release, rather, it is of exposure of maintenance/operating personnel to gamma radiation.	GIK closed
7	Section 6.1.2.2 WHC-CM-7-5, I believe the number has changed. I do not know the new number but I believe it is a PRO number.	jrk	There is not yet a HNF-PRO released for AIR QUALITY.	GIK closed
8	Section 6.1.2.3 We need to add ASME AG-1 to this section, as well as to the reference section, etc....	jrk	Accepted	GIK closed
9	Section 6.1.2.3 "Compliance with N509 is accomplished according to the notice of construction...." What does this statement mean, and why are we not referencing the N509 compliance matrix in the FDC?	jrk	Accepted. Section 6.1.2.3 will be rewritten. The supplemental letters referred to in the rewrite include the N509 exceptions.	GIK closed
10	Section 8.0 Add ASME AG-1	jrk	Accepted	GIK closed
11	Table 1. (This comment applies more to the design of the system) Exhauster materials shall be compatible with the tank vapor space. What about the aluminum fan that is not coated? Are we sure this is compatible.	jrk	The fan has been in service, continues to function, and if it fails, can be replaced.	GIK closed

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REVIEW COMMENT RECORD (RCR)

1. Date	2. Review No.
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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
12	Table 2 # 11 This is a TSR control as well.	jrk	Accepted	
13	Table 2 # 30 The stack height is different than what the FDC states for a minimum.	jrk	The FDC says at least 10 feet. The DCM refers to permit requirements that state the actual height of 14 feet.	
14	Table 2 # 43 Why is the relative humidity set @ 80%, it is 70% in the FDC	jrk	The 80% relative humidity value is set by WDOE as a condition of the permit.	
15	Table 2 # 65 This should include ASME AG-1, and the document number for 4042 has changed to HNF-S-0552.	jrk	Accepted	
16	Table 3 The pH factor is very high, (this is a comment for the design) will the aluminum fan, since it is not coated, withstand this environment?	jrk	Moist vapor is unlikely to reach the fan because the heater operates at a temperature that maintains the relative humidity to 80% or less.	

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5.3 DESIGN REVIEW COMMITTEE MEMBERSHIP/CHARTER

Subject: CHARACTERIZATION PROJECT - DESIGNATION OF DESIGN REVIEW COMMITTEE FOR DESIGN VERIFICATION OF CHARACTERIZATION EQUIPMENT SAFETY CLASS DESIGN BASELINE DOCUMENTATION

Reference: HNF-CM-6-1, Standard Engineering Practices, Section EP-4.1, Design Verification Requirements.

The purpose of this memo is to re-establish a Characterization Project Design Review Committee (DRC) for conducting Formal Design Reviews in accordance with reference 1. The scope of DRC activities will address changes to Characterization Equipment Engineering design baseline(s). Particularly, elements classified as Safety Class Systems, Structures, and Components (SSCs). It is intended that this DRC remain together as a Team to address ongoing and future changes to the design baseline as might be required. This action is taken to compensate for the loss of qualified individuals (due to retirements, organizational changes,...etc.) from the previous DRC tasked for this purpose.

The Design Review Committee members and their primary areas of responsibility are listed below. The chairman was selected by the Project Manager, Characterization Equipment Engineering Projects, R. E. Raymond. The committee members were selected by the chairman with input from the Manager, Remote Sensing and Sampling Equipment Engineering, C. E. Hanson. Additional, ad hoc, members with specific expertise will be asked to participate in certain reviews as the need for their expertise arises.

DESIGN REVIEW COMMITTEE

G. P. Janicek	Design Review Chairman (Design Authority)
J. E. Corbett	Design Review Secretary (Mechanical Eng.)
T. D. Jarecki	Characterization Operations (Mech. Des. Eng.)
N. J. Milliken	Safety Analysis Engineering
C. C. Scaief L. F. Hill (alternate)	TWRS Equipment Engineering (Elec./I&C Eng.)
M. L. McElroy D. C. Board (alternate)	Quality Assurance
J. A. Ranschau J. A. Harvey (alternate)	Safety

G. P. Janicek, Design Authority
Design Review Chairman
Characterization Project Design Authority

Concurrence: R. E. Raymond, Project Manager
Characterization Equipment Engineering Projects

Janicek, George P

From:	George P Janicek
Sent:	Monday, January 20, 1997 4:16 PM
To:	Donald C Board; John E Corbett; Jerry A Harvey; Lowell F Hill; George P Janicek; Theodore D Jarecki; Michael L McElroy; Nancy J Milliken; J A (Jeff) Ranschau; C C III (Chuck) Scaief
Cc:	Carl E Hanson; Richard E Raymond; James A Robinson; Eric J Waldo
Subject:	DRC Design Review Briefing - RMCS Exhauster System

Design Review Committee Members:

Welcome. You have been selected to participate on this standing DRC because of your expertise in a particular area beneficial to these reviews. Please, make a cconcentrated effort to participate and respond in a timely manner.

The subject of this first review is the Rotary Mode Core Sampling (RMCS) Exhauster System. It is on the "critical path" for achieving RMCS operation scheduled for February 1997.

The subject Design Review Briefing will be held on January 21, 1997, in 2704HV/Room G-133, from 1:00-4:00 pm (I do not believe it will take that entire period of time, however). At that time you will be presented with a walkthrough of the recently revamped Exhauster System acquired to support RMCS operation in flammable gas waste tanks. The presentation will include a summary of concluded and ongoing activities necessary to allow the system to go operational. Following this generalized walkthrough you will be briefed on specific changes to the current design which will be the subject of your design review. You will be given a review package to review and provide comments on in Review Comment Record (RCR) format.

It might develop that comments can be resolved and dispositioned at this briefing. If not, all RCRs will be compiled and resolved at a subsequent Review Meeting to be announced.

Thank you,

George Janicek
DRC Chairman

1

The purpose of this memo is to document a revision to the Design Review Committee (DRC) previously established by Reference 1. Reference 1. allowed for this as the need arose for additional expertise in performing the design verification process. Reference 2. expanded the charter of the DRC from one of only reviewing "changes to the Exhauster Interlock System" to also reviewing the "entire design of both the Exhauster and Exhauster Interlock System" while specifically focusing only on safety structures, systems, and components (safety SSCs).

The DRC is herewith revised as follows:

> J. E. Corbett will leave the DRC as regards activities associated with the DRC's expanded scope. He will be replaced as Design Review Secretary and reviewer member of the DRC by G. T. Frater.
>
> J. R. Kriskovich, currently Ventilation Systems Design Authority and member of the Flammable Gas Board, is added to the DRC as a reviewer member.
>
> J. M. Dormant, a member of the Team that recently performed a critical review of Characterization Equipment Engineering's design process (along with DRC members Frater and Scaief), is added to the DRC in an advisory capacity.

The composition of the DESIGN REVIEW COMMITTEE is thus:

Subject: DRC INDIVIDUAL RESPONSIBILITIES FOR PERFORMING DESIGN VERIFICATION OF EXHAUSTER & EXHAUSTER INTERLOCK SYSTEM SAFETY SSC DESIGN.

DESIGN REVIEW COMMITTEE

G. P. Janicek	Design Review Chairman (Characterization Design Authority) - Overall review, adherence to all requirements, proper documentation, maintenance of configuration control, design authority purview.
G. T. Frater	Design Review Secretary (Electrical Eng.) - adherence to design verification process, review of electrical power/distribution portions of design.
T. D. Jarecki	Characterization Operations (Mech. Des. Eng.) - review of design from operability and maintainability perspectives, human factors, normal and abnormal conditions, worker safety.
N. J. Milliken	Safety Analysis Engineering - review of design for adherence to SA requirements, maintenance of safety functionality and reliability of that functionality, ensuring no degradation of safety functionality relied on for safe operation.
C. C. Scaief L. F. Hill (alternate)	TWRS Equipment Engineering (I&C Design Authority) - review of I&C portions of the design, including both hardware and software, flammable gas requirements pertinent to same.
M. L. McElroy D. C. Board (alternate)	Quality Assurance - overall review of design as pertinent to all areas of QA purview.
J. A. Ranschau	Safety - overall review of design as pertinent to all areas of Safety purview, including, radiological, toxicological potential releases and immediate worker exposure to same.
J. R. Kriskovich	TWRS Equipment Engineering (Ventilation Systems Design Authority) - overall review of exhauster system for adherence to ventilation requirements, flammable gas requirements, primarily mechanical and process portions.
J. M. Dormant	Characterization Project - overall review of design for proper interfacing with other portions of sampling system.

Janicek, George P

From:	George P Janicek
Sent:	Friday, February 21, 1997 12:07 PM
To:	George P Janicek; G T (Tom) Frater; Theodore D Jarecki; Nancy J Milliken; C C III (Chuck) Scaief; Lowell F Hill; Michael L McElroy; Donald C Board; J A (Jeff) Ranschau; James R Kriskovich; Jean-marc Dormant
Cc:	Carl E Hanson; Richard E Raymond; James D (Jim) Robinson; Lisa R Montague; Eric J Waldo; Ronald R Bafus
Subject:	DRC Reviewer Responsibilities

drc-004.mp

All,

I've revised the responsibilities slightly (see attached file) as discussed at our 02/20/97 DRC meeting and added some review direction.
If any changes or clarifications are necessary, please let me know.

Remember, RCR comments in electronic form are due to Tom Frater by close of business on Wednesday, 02/26/97. I will schedule an all day
comment/disposition resolution meeting for Friday, 02/28/97. That will give Jim Robinson a day to compose dispositions to the RCR comments for our consideration and approval (hopefully).

Remember also, (per Nancy's request) copy all other DRC members with
your RCR comments at the time you submit them to Tom.

Thanks,

George

1

File: DRC-004.RSP

Subject: DRC INDIVIDUAL RESPONSIBILITIES FOR PERFORMING DESIGN VERIFICATION OF EXHAUSTER & EXHAUSTER INTERLOCK SYSTEM SAFETY SSC DESIGN.

DESIGN REVIEW COMMITTEE

G. P. Janicek	Design Review Chairman (Characterization Design Authority) - Overall review, adherence to all requirements, proper documentation, maintenance of configuration control, design authority purview, mechanical design (prime).
G. T. Frater	Design Review Secretary (Electrical Eng.) - adherence to design verification process, review of electrical power/distribution portions of design, including grounding/bonding.
T. D. Jarecki	Characterization Operations (Mech. Des. Eng.) - review of design from operability and maintainability perspectives, human factors, normal and abnormal conditions, worker safety, mechanical design.
N. J. Milliken	Safety Analysis Engineering - review of design for adherence to SA requirements, maintenance of safety functionality and reliability of that functionality, ensuring no degradation of safety functionality relied on for safe operation.
C. C. Scaief L. F. Hill (alternate)	TWRS Equipment Engineering (I&C Design Authority) - review of I&C portions of the design, including both hardware and software, flammable gas requirements pertinent to same.
M. L. McElroy	Quality Assurance - overall review of design as D. C. Board (alternate) pertinent to all areas of QA purview per WHC-CM-4-2, Quality Assurance Manual.
J. A. Ranschau	Safety - overall review of design as pertinent to all areas of Safety purview, including, radiological, toxicological potential releases and immediate worker exposure to same.

J. R. Kriskovich	TWRS Equipment Engineering (Ventilation Systems Design Authority) - overall review of exhauster system for adherence to ventilation requirements, flammable gas requirements, primarily mechanical and process portions.
J. Dormant	TWRS Projects - advisor to design process, review of environmental qualification of design and equipment specification.

DESIGN REVIEW DIRECTION

Review of the design shall be conducted as if the design media we've been given represented a brand new design receiving final design verification. That is, all we have before us are design requirements and the design media purported to satisfy those requirements. We have no other knowledge or information. Nothing has been specified, procured, fabricated, or tested, as far as we know. The only exception to this is the software for the Interlock System PLC. Design verification for the software shall consist of review of the test plan, test procedure, and test results of the Qualification Testing performed in this regard. We will not review the software logic documentation as was done for the ECN changes recently reviewed by the DRC.

Each individual shall include interfaces with other SSCs as part of their review and area of responsibility (e.g., electrical, mechanical, I&C....etc.), as required.

Remember, the review is to concentrate only on safety SSCs. This not only includes all things inherent to a particular safety SSC required for it to reliably perform its safety function, but also, all other SSCs (and/or conditions, e.g., environmental) which could impact a particular safety SSC and/or its safety function.

If any reviewer picks up a deserving comment, which is not their immediate responsibility, pass it along electronically to the responsible individual (as a minimum) and make a note to ensure that it is captured at our comment resolution meeting(s).

NHC
Numatec Hanford Corporation
An SGN/Cogema, Inc. Company

January 31, 1997 NHC-9750857

G. P. Janicek, Chairman, Design Review Committee
Characterization Equipment Engineering
Lockheed Martin Hanford Corporation
P.O. Box 1500 MSIN S7-12
Richland, Washington 99352

Dear Mr. Janicek:

CHARACTERIZATION ENGINEERING DESIGN REVIEW OF THE EXHAUSTER INTERLOCK SYSTEM

References: 1) Internal Memo, G. P. Janicek, LMHC, to Distribution, "Characterization Project - Designation of Design Review Committee for Design Verification of Characterization Equipment Safety Class Design Baseline Documentation," 74740-97-002, dated January 20, 1997.

2) WHC-SD-WM-FDC-045, Rev. 0, "Functional Design Criteria for Flammable Gas Detection and Shutdown System."

3) WHC-SD-WM-SAD-035, Rev. 0-a, "A Safety Assessment for Rotary Mode Core Sampling in Flammable Gas Single Shell Tanks, Hanford Site, Richland, Washington."

I am requesting that the Design Review Committee (DRC), (Reference 1), expand its charter by conducting a second formal design verification process on the entire existing design of the Exhauster Interlock System.

Recent activities have revealed that environmental factors were not adequately evaluated in the specification and deployment of some components of this system. This demonstrates that performance requirements for this system, as specified in Reference 2, or as relied on in the Safety Assessment, (Reference 3), are not being universally met. It is imperative that all safety design related problems be identified, and that all requirements of the system are fully met before field deployment of the equipment.

Please expand the DRC charter to include review of the Exhauster Interlock System, with particular emphasis on Safety Class systems, structures, and components and their performance requirements. If necessary, supplement the membership of the DRC for accomplishing this task.

P.O. Box 1300, Richland, Washington 99352

NHC-9750857

This task must be completed as soon as possible, consistent with full rigor, to support completion of all engineering work before February 12, 1997. If you require my assistance in any manner, please see me personally or you may contact me on 373-3647.

R. E. Raymond, Project Manager
Characterization Equipment Engineering Projects
Tank Waste Remediation Systems

lrm

5.4 REVIEW COMMENT RECORD (RCR) FORMS

REVIEW COMMENT RECORD (RCR)

1. Date	2. Review No.
2/27/97	DRC-97-004a
3. Project No.	**4. Page**
CPO	1 of 2

5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
ENGINEERING DESIGN REVIEW FOR EXHAUSTER & INTERLOCK SYSTEM	CHARACTERIZATION PROJECT	M.L. MCELROY	CPQA/75820	2704HV/B122/ 373-5588

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

7-10-97
Date

Michael R. McElroy
Reviewer/Point of Contact

Author/Originator

11. CLOSED

7-10-97
Date

Michael R. McElroy
Reviewer/Point of Contact

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.	The list of drawings that are to be reviewed did not include any "interface" drawings. Interface drawings should be generated, as per EP 1.5, that spells out the interface requirements, such as mechanical, electrical, electronic, hydraulic, pneumatic, computer data links and software, which affect the physical or functional characteristics of the co-functioning items.		As a Post Start activity, Characterization Engineering will examine the interfaces between the exhauster, ~~interlock carts,~~ MM 7-10-97 generator, and RMCS truck. New drawings or ECNs will be generated as required.	CLOSED
2.	As per WHC-CM-4-2, QR 19.0, software configuration controls need to be implemented in a controlling document other that than the CSDD. This document would spell out the personnel authorized to make changes; the methods, procedures, and instructions to be used to control the identification of, access to, changes to, and the status of computer software.		An Authorization Basis (AB) ammendment has been approved which implements the Standing Order (SO) ignition control sets for Rotary Mode Core Sampling. The SO does not require the use of the current automatic flammable gas detection system and it will not be used. Continuous monitoring will be performed based on the SO/JCO (manual on 15 minute intervals). There is no software associated with the exhauster system.	CLOSED

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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.	COMMENT ONLY: I reviewed the ECN's for completeness, chronological order, traceability to drawings and other ECNs, signature approvals, references, etc. and no anomalies were discovered.			

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REVIEW COMMENT RECORD (RCR)

1. Date	2. Review No.
02/14/97	DRC-97-004a
3. Project No.	**4. Page**
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5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
H14-100519/520/521/522 H14-100739	Characterization	JM DORMANT	NHC	R3 47/3728071

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

7/23/97
Date

Reviewer/Point of Contact

Author/Originator

11. CLOSED

7/23/97
Date

Reviewer/Point of Contact

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	The drawings show the presence of plugs and cables for connecting together the different electrical equipment. 1)How does it guarantee that the equipment are correctly connected before begining operating? 2)Does an operating procedure exist to check it? 3)What happens if a connection is accidently disconnected during operation ? 4)What will the actuators state be ? 5)Is this state a safety state?		1) Each of the cable connectors is uniquely keyed to its mate, that is it will not hook up to another cable other than it's mate. 2) A procedure exists to hook the system up. If the following cables are not connected the truck will not operate: pressure transducer, cart to exhauster, hydrogen detection cell/SMC output to carts, motor starter control, and power cables. 3) Again, if one of the cables listed above is cut or disconnected, the truck will stop. 4/5) Actuating relays fail open, which is intended to be a safe state.	

REVIEW COMMENT RECORD (RCR)

1. Date	2. Review No.
02/14/97	DRC-97-004a
3. Project No.	4. Page
CPO	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
2	1)Where is the measurement of ventilation flowrate? 2) How is this flowrate adjusted?		1) Ventilation flowrate is measured at the stack outlet. 2) A mass flow transmitter sends a signal to a contoller (which also has the alarm setpoints for high and low flow). This controller sends a signal to the variable speed drive. The variable speed drive then adjusts fan motor speed as required.	
3	What are the controls done before operating which guarantee the ground connection?		Operating Procedure TO-020-451, Set Up and Take Down of Core Sampling Systems presents detailed instructions on grounding and Bonding. Resistance values are recorded on a Table on page 33 and system connection diagrams are shown on page 40 and 41.	
4	1)What happens when the emergency stop is put on ? 2)Have you expected any pre-testing ?		1) Both the exhauster and the truck shut down. 2) The emergency stop is checked as part of the software verification.	
5	3)What is the minimum temperature for using the variable frequency drive?		The variable frequency drive is in a NEMA 4 enclosure. The operating manual lists the minimun operating temperature as 0°C. The upper limit for the chassis components is listed at 50°C. The variable frequency drive is not in a controlled environment. It has performed without fail in all three exhausters at temperatures well below the recommended minimum temperature.	

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REVIEW COMMENT RECORD (RCR)

1. Date	2. Review No.
03/12/97	DRC-97-004a
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5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Design Review for Flammable Gas Exhauster and Interlock System Dwgs: H-14-100519 to 524, 530 to 532, 739, 741, 742, 771. H-2-821455, 456, H-14-030122; FDC-045.	Characterization Project	G.T. Frater	Characterization Program/Electrical Engr Review	2704HV/D-109 373-1627

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

7/17/97
Date

Reviewer/Point of Contact

Author/Originator

11. CLOSED

7/17/97
Date

Reviewer/Point of Contact

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.	Does the electrical power conditioning design take into account the range of voltage and frequency variations that may occur from both in farm power as well as that from the variety of portable generators that will be used for this equipment? Provide evidence (calculations, analysis, vendor info) that demonstrates a match for the range of input conditions was accounted for when selecting the conditioning equipment for the interlock and exhauster instrumentation.		Currently the RMCS equipment will not be connected to farm power. The portable generators were procurred per specification WHC-S-252. This specification requires that the frequency regulation be 60 Hz ± 0.5% and that voltage regulation be ± 2% of rated voltage from 0 to 100% load. The generators performance was verified both at the factory and by on-site ATP/OTP. These specifications are well within the tolerance for normal off-the-shelf equipment utilized in the RMCS system.	

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REVIEW COMMENT RECORD (RCR)

1. Date	2. Review No.
03/12/97	DRC-97-004a
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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
2.	Has a system approach to electrical grounding of all devices and panels including interconnecting each independent equipment item together e.g. interlock carts, exhauster skid, etc been done to show the entire assembly of systems will function together in a core drilling activity in a tank farm under a worst case scenario? Provide a copy of the inspection report showing the design and NEC code requirements were met.	TF	Since submittal of this comment an Authorization Basis (AB) ammendment has been approved which implements the Standing Order (SO) ignition control sets for Rotary Mode Core Sampling. The SO does not require the use of the current automatic flammable gas detection system and it will not be used. Additionally, grounding and bonding for the RMCS system is performed in accordance with an approved procedure, 6-TF-160. System operation and proper grounding and bonding was verified in the system ATP/OTP.	
3.	Have calculations been done and are they available for review to show the electrical system design for current loads when all items are or may be operating, including the fan motor starting "in-rush" current, is of adequate capacity? Provide a copy of the analysis/calculations to show conductor sizing.	TF	Actual power consumption was measured by Bruce Johns. The results were provided in an earlier Design Review Meeting for your review. The exhauster and interlock are protected by a 40 amp fuse. Evaluation 3-20-97. Accept. Comment closed.	
4.	Are the fan and fan motor bearings lubricated for service in the design low temperatures per the FDC of -15F? Provide vendor information to demonstrate these items are intended for service in the cold end of the design conditions.	TF	I spoke with Scot Hesselberth of Baldor Electric. He has stated that the motor used in our application is acceptable for use in any temperature range encountered in the Continental United States. Evaluated 3-20-97. Accept. Comment Closed.	

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REVIEW COMMENT RECORD (RCR)

1. Date	2. Review No.
03/12/97	DRC-97-004a
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CPO	3 of 4

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
5.	Have each (all) of the sensing elements, e.g. tank pressure sensor, humidity sensor, been evaluated for: *service in the worst case tank vapor contaminants *service for the lowest temperature vapor on the coldest typical operating day (i.e. if say it is 10F outside and the tank being sampled is at 65F the vapor stream will likely be somewhere in between)? The FDC-045 pg 2 of 6 states "...testing must include validation of detector immunity from masking or poisioning effects of the gas stream. Sensing longevity and recalibration requirements are also required." Provide evidence that this requirement has been met or accounted for and that each sensor exposed to the gas stream including moisture, especially including other contaminants such as ammonia gas, that may be highly corrosive and deleterious to the exposed components.	TF	Since submittal of this comment an Authorization Basis (AB) ammendment has been approved which implements the Standing Order (SO) ignition control sets for Rotary Mode Core Sampling. The SO does not require the use of the current automatic flammable gas detection system and it will not be used. FDC-045 is no longer applicable.	
6.	Has an analysis or determination of the method to ground the exhaust duct been done that corresponds to the type of duct material and total surface area necessary to ensure a proper connection of the mating surfaces? The concern is: a) It is important to have an effective conductive connection to preclude spark generation. Provide the analysis or other information to demonstrate whether the duct must be placed over the spool piece with a minimum overlap contact distance or if it is grounded in some other manner to achieve a functional ground.	TF	The requirement for the flexible duct pertains to accumulation of a static charge. This is related to properties of the material. The Design Attributes are specified in WHC-SD-SEL-032, "Resistivity less than 10^6 ohms measured across the duct diameter". The attributes are verified in accordance with IP-0842 procedures. There are no special requirements, relating to static charge accumulation, regarding connection to the spool piece.	

REVIEW COMMENT RECORD (RCR)	1. Date 03/12/97	2. Review No. DRC-97-004a
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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
7.	Observation: The exhauster platform has a grounding lug just under the VTP PNL 2202C with several ground wires coming from panels etc. There is one ground wire in the lug not routed to (connected) to anything. This was noted on Tuesday 2/25/97 in the field.	-	Noted - operations will correct.	
8.	The flexible duct needs to have certain physical characteristics to be suitable for the intended flammable gas service and preclude generating static charges. Are the characteristics documented in a manner that in the future if a substitute duct material is ordered it is clear which characteristics must be adhered to to provide the same or superior level of protection? State how this is accomplished?	TF	The Design Attributes are specified in WHC-SD-SEL-032, "Resistivity less than 10^6 ohms measured across the duct diameter". The attributes are verified in accordance with IP-0842 procedures. See comment 6.	
9.	The FDC-045, page 6 of 6, states the wind conditions at Hanford could reach 100 MPH. The design parameter used for exhauster toppling in high wind is 90 MPH per an earlier verbal statement. Please clarify whether the FDC value is incorrect or if the calculations must be amended for 100 MPH.	TF	Since submittal of this comment an Authorization Basis (AB) ammendment has been approved which implements the Standing Order (SO) ignition control sets for Rotary Mode Core Sampling. The SO does not require the use of the current automatic flammable gas detection system and it will not be used. FDC-045 is no longer applicable.	
10.	The heat exchanger for the exhauster must be qualified to operate in a flammable gas environment. Provide the vendor information to demonstrate how this was met.	TF	The heater is not an electrical device and requires no "code" type qualification. The system was analyzed in SAD-035 and deemed appropriate for this application.	

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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
11.	The Chromalox electric water heater has a thermostat device within the heater assembly head. Field inspection showed it has not been wired in. Provide documentation that demonstrates an alternate control has been provided or a suitable design to control the water heater.	TF	ECNs have been prepared to rectify this, ECN 640463 corrects all electrical discrepancies and ECN 640469 installs the heater per the manufacturers instructions. This work has been completed.	

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5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
H-14-100519 to 524, 530, 531, 532, 739, 741, 742, and 771. H-2-821455 and H-2-821456. ECN's 636516, 636567, 628744, 630002, 632390, 632406, 634030, 634031, 634083, 636502, 636503, 636513, 636515, 636940, and 639170.	RMCS Sampling	Jarecki, TD	75160	373-5741

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

7/17/97
Date

Reviewer/Point of Contact

Author/Originator

11. CLOSED

7/17/97
Date

Reviewer/Point of Contact

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-FDC-045 states "The internal operating conditions of the system may include relative humidity up to 100%, temperatures of 60 to 190...The proposed system must have documented testing results that validate the successful performance of the system in the operating environment." Other testing validation criteria is related to condensation at startup and masking effects of components in the process gas stream. Testing to date does not meet these criteria.	TDJ	An Authorization Basis (AB) ammendment has been approved which implements the Standing Order (SO) ignition control sets for Rotary Mode Core Sampling. The SO does not require the use of the current automatic flammable gas detection system and it will not be used. WHC-SD-WM-FDC-045 is not applicable, however WHC-SD-WM-FDC-025 is currently being revised.	CLOSED

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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
2	WHC-SD-WM-FDC-045 makes reference to interfaces with the "mobile/portable closed circuit television systems" as well as the RMCS truck and exhauster. This is obviously out of date and needs to be changed. Additional note: if an ECN is written to the FDC, the "SD" number at the top of each page is in error as it currently reads "WHC-FD-WM-FDC-045".	TDJ	An Authorization Basis (AB) ammendment has been approved which implements the Standing Order (SO) ignition control sets for Rotary Mode Core Sampling. The SO does not require the use of the current automatic flammable gas detection system and it will not be used. WHC-SD-WM-FDC-045 is not applicable, however WHC-SD-WM-FDC-025 is currently being revised.	CLOSED
3	WHC-SD-WM-FDC-045, Att. 2 requires design for HFGD system to operate in environmental conditions such as -20 to 115 deg. F. To date, this criteria has not been met nor is there documentation to quantify the temperature range and/or capabilities of the interim design configuration including the tent arrangement. More specifically, the control of temperature within a required range has not been determined or proven. For example, the heater thermostat will not be representative of the spoolpiece temperature depending on ambient conditions. The overall operational testing needs to address this criteria.	TDJ	An Authorization Basis (AB) ammendment has been approved which implements the Standing Order (SO) ignition control sets for Rotary Mode Core Sampling. The SO does not require the use of the current automatic flammable gas detection system and it will not be used. WHC-SD-WM-FDC-045 is not applicable, however WHC-SD-WM-FDC-025 is currently being revised.	CLOSED
4	WHC-SD-WM-FDC-045 requires that "the flammable gas sensing be performed on a sample that is representative of the gases presented to the potential energy sources within the tank volume or vapor confinement spaces". Is there documentation that addresses how this requirement is met?	TDJ	An Authorization Basis (AB) ammendment has been approved which implements the Standing Order (SO) ignition control sets for Rotary Mode Core Sampling. The SO does not require the use of the current automatic flammable gas detection system and it will not be used. WHC-SD-WM-FDC-045 is not applicable, however WHC-SD-WM-FDC-025 is currently being revised.	CLOSED

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5	WHC-SD-WM-FDC-045 requires that "detection of a step increase of flammable gases to the action threshold and subsequent shutdown of energy sources occur within a maximum of one minute." This is not consistent with WHC-SD-WM-SAD-035 or current design.	TDJ	An Authorization Basis (AB) ammendment has been approved which implements the Standing Order (SO) ignition control sets for Rotary Mode Core Sampling. The SO does not require the use of the current automatic flammable gas detection system and it will not be used. WHC-SD-WM-FDC-045 is not applicable, however WHC-SD-WM-FDC-025 is currently being revised.	CLOSED
6	WHC-SD-WM-SAD-035 requires that "All electrical equipment within the exhauster flow stream...NEC Class-I, Division-1, Group B...". I strongly suggest that a matrix be developed which documents the requirements and associated qualification of every component within the exhauster flow stream as well as all components inside enclosures adjacent to the flow stream.	TDJ	An Authorization Basis (AB) ammendment has been approved which implements the Standing Order (SO) ignition control sets for Rotary Mode Core Sampling. The FGEAB (Report # FGEAB-97-029) evaluated the exhauster and it is qualified per the revised AB.	CLOSED
7	H-2-821445/VI #22660 - configuration of the Air Monitor cabinets does not match that of the equipment on the exhauster. Similar issues exist with other components where the configuration is not documented on the parent drawings such as for the Whittaker cell chamber on H-14-100524. Configuration of components which are Safety Class or directly impact the function of a Safety Class component should not be controlled in this manner. Suggest that the configuration of these components be incorporated directly into the drawings and that the remainder of the VI files be maintained to document current configuration of the equipment in the field.	TDJ	Documentation for the exhauster is a combination of vendor information, Hanford Drawings, and associated ECNs. Although cumbersome, the documentation is in configuration control. Additionally, the exhauster drawings are currently being upgraded and will reflect the as-built configuration of the exhauster when completed.	CLOSED

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5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Rotary Mode Core Sampling Exhauster Assembly and Flammable Gas Tank Exhauster Interlock System/DRC Review of Overall Systems	Design Review Committee	Jeff Ranschau	CPS/NS	2704HV/373-4462

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

7-16-97
Date

Reviewer/Point of Contact

Author/Originator

11. CLOSED

7-16-97
Date

Reviewer/Point of Contact

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	Observation: The safety classifications of the safety equipment included in the exhauster and hydrogen interlock systems is questionable for several of the items identified as safety SSC's. Items such as the Inlet Breather Stack, while requiring certain design criteria, do not provide a "Safety Class" function and no operational requirements which are necessary and appropriate for Safety Class SSCs are prescribed for the items. Suggested Action: An independent review of the process and application of the codes and standards used by TWRS for identifying safety SSCs and assigning safety classifications should be performed by technical experts. Changes to the safety classifications of applicable equipment should be performed as necessary.		It was agreed during the design review meeting held on February 28th that the issue of placing items on the Safety Equipment List, upgrading items to safety equipment, and commercial grade item qualification were issues connected to the procedure (WHC-IP-0842, Section 3.11). It is understood that these issues will be resolved outside this design review. The procedure as written and implemented will stand for this review.	

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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
2	Observation: A requirement of WHC-SD-WM-FDC-045, is to provide a hydrogen flammable gas detection system which is suitable for year-round operation. While tests and evaluations are currently being conducted to verify that the hydrogen flammable gas detection system is suitable for year-round operation, it has not currently been verified that the system is suitable for year-round operation. Suggested Action: Verify that the hydrogen flammable gas detection system is suitable for year-round operation.		An Authorization Basis (AB) ammendment has been approved which implements the Standing Order (SO) ignition control sets for Rotary Mode Core Sampling. The SO does not require the use of the current automatic flammable gas detection system and it will not be used. Continuous monitoring will be performed based on the SO/JCO (manual on 15 minute intervals).	
3	Observation: WHC-SD-SEL-032, Rev. 1, Table A-9, states that the flame arresters must be certified by an approved testing laboratory for use with NFPA type Group B gases. It has been identified that the flame arresters located in the exhauster system are not suitable for the environment they are in (not qualified for H2 concentrations expected) as the system is currently configured. Suggested Action: Make changes to the exhauster and interlock system or perform applicable tests to verify that the systems and instruments within the systems meet applicable requirements.		Flame arrestors will not be used. An Authorization Basis (AB) ammendment has been approved which implements the Standing Order (SO) ignition control sets for Rotary Mode Core Sampling. The exhauster equipment has been evaluated by the FGEAB (Report No. FGEAB-97-029) and meets the applicable requirements.	

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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
4	Observation: WHC-SD-WM-SAD-035, Rev. 0-a, Appendix C, section C-7, last paragraph, fifth bullet states, "Ammonia concentrations must be monitored, and operations must be stopped when the ammonia concentration in the dome exceeds 5000 ppm." Appendix U, section U-2, last paragraph states, "The SMC sensor, if set to trip at 5000 ppm hydrogen equivalent, should sense both a 5000 ppm hydrogen concentration and a 12000 ppm ammonia concentration for alarm purposes if the gas was purely hydrogen or ammonia, respectively." It is not clear that a concentration of 5000 ppm ammonia will cause the SMC to go into an alarm state. It is also not clear that the tank dome is being monitored for ammonia concentrations. Suggested action: Verify that the dome space is monitored for ammonia concentrations and that controls are in place to stop operations when the ammonia concentration in the dome exceeds 5000 ppm.		An Authorization Basis (AB) ammendment has been approved which implements the Standing Order (SO) ignition control sets for Rotary Mode Core Sampling. The SO does not require the use of the current automatic flammable gas detection system and it will not be used. Continuous monitoring will be performed based on the SO/JCO (manual on 15 minute intervals).	
5	Observation: WHC-SD-WM-SEL-032, Rev. 1, table A-10, states that the Tank Pressure Sensor ISB must be certified by an approved testing laboratory to provide an intrinsically safe circuit in a NFPA Class 1, Div. 1, Group B environment. Suggested action: Verify that the Tank Pressure Sensor ISB was approved by an approved testing laboratory for a NFPA Class 1, Div. 1, Group B environment.		An Authorization Basis (AB) ammendment has been approved which implements the Standing Order (SO) ignition control sets for Rotary Mode Core Sampling. The SO does not require the use of the current automatic flammable gas detection system and it will not be used. Continuous monitoring will be performed based on the SO/JCO (manual on 15 minute intervals).	

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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
6	Observation: WHC-SD-WM-SEL-032, Rev. 1, table A-10, states that the Combustible Gas Sensor ISB must be certified by an approved testing laboratory to provide an intrinsically safe circuit in a NFPA Class 1, Div. 1, Group B environment. Suggested action: Verify that the Combustible Gas Sensor ISB was approved by an approved testing laboratory for a NFPA Class 1, Div. 1, Group B environment.		An Authorization Basis (AB) ammendment has been approved which implements the Standing Order (SO) ignition control sets for Rotary Mode Core Sampling. The SO does not require the use of the current automatic flammable gas detection system and it will not be used. Continuous monitoring will be performed based on the SO/JCO (manual on 15 minute intervals).	

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5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Exhauster and Interlock System drawing nos. H-14-100519 to 524, 530 to 532, 739, 741, 742, and 771 w/ECNs awaiting incorporation, H-2-821455 and 456, w/ECNs awaiting incorporation.	Characterization Project	G. P. Janicek	Characterization Equipment Engineering	2704HV/A104 376-2225

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated Comment Disposition(s)

07/11/97
Date

Reviewer/Point of Contact

Author/Originator

11. CLOSED

07/11/97
Date

Reviewer/Point of Contact

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.	H-14-100521-1 1)Three wheeled vehicles (in this case the cart) are prone to over-turning when making a turn at a given speed. Has an over-turning moment been calculated? 2)Is an administrative control (AC) required to limit movement of the cart, particularly in the tank farms? 3)Probably the weight and c/g of the cart should be put on the drawings as a minimum. (see next comment also in this regard)		Since submittal of this comment an Authorization Basis (AB) ammendment has been approved which implements the Standing Order (SO) ignition control sets for Rotary Mode Core Sampling. The SO does not require the use of the current automatic flammable gas detection system and it will not be used. Comment is not applicable	

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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
2.	H-14-100521-3 1) It is noted that the cart has four (4) hoist rings (PN 48) rated at 1800 lbs. each. Is the weight anywhere near the total load rating of the hoist rings? 2)Do the rings indicate that the cart is meant to be placed with a crane? 3)In any case, whether crane placed or towed-by-truck, has both the static and dynamic loads of deploying the cart addressed dome loading concerns, and been approved?		Since submittal of this comment an Authorization Basis (AB) ammendment has been approved which implements the Standing Order (SO) ignition control sets for Rotary Mode Core Sampling. The SO does not require the use of the current automatic flammable gas detection system and it will not be used. Comment is not applicable	
3.	H-14-100521-2 - Will movement of this cart from tank to tank, farm to farm, and to the maintenance and test areas, in any way impair its safety functional performance, i.e., can it pass the "shake, rattle, and roll" test? Does it need to? Provide evidence that this has been considered in the design (no springs, shocks, or similar mountings are in evidence) and/or in the moving of the cart from place to place.		Since submittal of this comment an Authorization Basis (AB) ammendment has been approved which implements the Standing Order (SO) ignition control sets for Rotary Mode Core Sampling. The SO does not require the use of the current automatic flammable gas detection system and it will not be used. Comment is not applicable	
4.	H-14-100521-2 - PN50/PN88 - Confirm (document) that the A/C and heater units being used to cool/heat the electronics can maintain temperatures required for proper performance over the full range of ambient conditions called for in the FDC environmental requirements section.		Since submittal of this comment an Authorization Basis (AB) ammendment has been approved which implements the Standing Order (SO) ignition control sets for Rotary Mode Core Sampling. The SO does not require the use of the current automatic flammable gas detection system and it will not be used. Comment is not applicable	

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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
5.	H-14-100521-2 - Confirm (document) that an analysis or test has been performed to ensure that the cart (and electronics enclosure) will not be deformed or damaged by crane pick using the four hoist rings. Such deformation/damage could potentially impair environmental protection of the electronics within.		Since submittal of this comment an Authorization Basis (AB) ammendment has been approved which implements the Standing Order (SO) ignition control sets for Rotary Mode Core Sampling. The SO does not require the use of the current automatic flammable gas detection system and it will not be used. Comment is not applicable	
6.	H-14-100521-7&9 - 1) It appears that the box portion covered by PN13, TOP DOOR ASSEMBLY, has an unsealed edge along the hinge side which will be subject to weather and windborne intrusive material. Can any of this foreign material make its way into the electronics enclosure? 2) Through the heater and/or the outlets mounted on the 1/8 inch partition wall (PN97)? [As an aside: This box area does not appear to be self-draining.]		Since submittal of this comment an Authorization Basis (AB) ammendment has been approved which implements the Standing Order (SO) ignition control sets for Rotary Mode Core Sampling. The SO does not require the use of the current automatic flammable gas detection system and it will not be used. Comment is not applicable	

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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
7.	H-14-100524-1&2 - It appears that portions of the "plumbing" on the sampler spoolpiece, 3-way valve (PN21), tubing (PN25), and bulkhead unions (PN12) are incorporated in the design to accommodate in-place calibration of the Whittaker (PN65) and SMC (PN67) combustible gas detectors. The 3-way valve could inadvertantly be left in an open-to-atmosphere position such that the detectors might not be able to perform their safety function during normal operations. The administrative control (AC) in calibration and/or operating procedures used to ensure that this valve remains in proper position should be replaced by an "engineered" solution. The ECN recently written to modify this plumbing to incorporate the pitot tube gas flow-through feature for the Whittaker cell will need to be changed in this regard also.		Since submittal of this comment an Authorization Basis (AB) ammendment has been approved which implements the Standing Order (SO) ignition control sets for Rotary Mode Core Sampling. The SO does not require the use of the current automatic flammable gas detection system and it will not be used. Comment is not applicable	
8.	H-2-821455, Sht 4 - This drawing was modified by ECN# 628744 to remove the electrical heater in the exhaust stream and replace it with a hydronic heater. The ECN change shows the electrical wiring removed, but does not show the water lines installed in this view (or any other view available). Needs to be shown and detailed to ensure proper piping and field connection for proper flow of hydronic heater fluid. (See following comments for additional clarification.)		An ECN has been prepared to rectify this, pages 5,6 & 7 of ECN 640469 show the location of the water/glycol piping and the direction of the flow.	

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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
9.	H-2-821455, Sht 1 - PN 32 of this drawing (Heater Housing from Charcoal Science Corp.) prior to ECN# 628744 contained an electric resistance heater rated at 2 Kw. Vendor file calculations show that the design spec for the heater was to raise the temperature of 200 cfm air flow for three potential inlet air conditions (100% saturated air at 60F, 120F, and 160F) so as to lower the relative humidity to 70%. The calculations indicate that only 0.8 Kw. (of the 2 Kw.) is needed to do that. Demonstrate that the hydronic system, as a minimum, matches the same specification. That is, the operation of the new Chromalux heater (H-14-100739, PN 8) in conjunction with the Hot Water Circulating Pump (H-14-100739, PN 9) can maintain the same reduction in relative humidity. This is evidently required in order to avoid "blowout" of the HEPA due to its becoming saturated by exhauster air condensates.		The reviewer has examined information given to the designers of the heat exchanger. That criteria was the same as the original criteria. Calculation were released by EDT#620272.	
10.	H-14-100739, Sht 1 - PN 9, Hot Water Circulating Pump, should show a flow direction "arrow" for proper installation. The behavior of the heating system would be very different, and might not perform properly if flow were reversed from design intent. (Flow is assumed to be from reservoir towards the heater, PN 8.)		An ECN has been prepared to rectify this, page 6 of ECN 640649 shows the Inlet Piping and the pages 5 & 7 show the direction of the flow.	

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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
11.	H-14-100739, Sht 1 - The hydronic heating system incorporates two shutoff valves in the piping (PN 18) which can effectively make the heater side a closed system (with energy input) if the two valves were left/placed in a closed position. This design should have a pressure/temperature relief valve between one of the valves and the heater.		There is no reason to have two shut-off valves as shown on H-14-100739, sht 1. The valves are eliminated with ECN 640649. Now the system is open to the atmosphere and cannot pressurize itself. No pressure relief valve is necessary. An Air Eliminator is installed at the highest point in the system to eliminated air pockets. Any air further down in the system will escape into the tank, but will not reach the pump inlet, as long as there is enough water/glycol in the tank. Bruce Johns is installing a level indicator with a shut-off for the system if the level is too low.	
12.	H-14-100739, Sht 1 - The discharge side of the heater (assumed to be the side away from the pump, PN 9) is shown to terminate with the valve, PN 18. The drawing should show that this piping should be extended to the heater housing (PN 32 on H-2-821455), similar to the piping from the reservoir.		An ECN has been prepared to rectify this, pages 5,6 & 7 of ECN 640649 show the run of all the piping necessary for the system.	

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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
13.	H-14-100739, Sht 1 - The discharge side of the heater and reservoir piping should not be "field run", but in fact, should be detailed. It is possible that given the variables of type of heat exchanger in the heater housing section of the exhauster, orientation of the heat exchanger, relative elevations and elevation changes of the components and piping of the system, type of pump, head vs. flow characteristics of the pump, entrained air in the water, and a few others that actual water flow through the system could be restricted or even stopped. The only way to positively ensure proper operation is to detail the flow path desired - usually continually rising in the direction of flow with air relief devices at the high points.		See answer of item 11.	

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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
14.	[INFO NOTE: Comments 1 thru 6 submitted prior to 2/28/97 DRC meeting; comment 7 submitted verbally at 2/28/97 meeting and submitted electronically prior to 3/5/97 DRC meeting; comments 8 thru 13 submitted electronically on 3/11/97 prior to 3/13/97 DRC mtg.] COMMENT: (added 3/26/97), H-14-100739, Sht 1 - Following the DRC meeting on 3/13/97 some members of the DRC were involved in a walkdown of the heater installation. This activity revealed that the heater was not installed on the exhauster skid in the horizontal position shown on the drawing, but at an angle to both the horizontal and the vertical. Furthermore, both positions (as drawn and as installed) were found to be "not correct" orientations for the heater per vendor installation information. Both of these "not correct" positions would have caused air to be trapped in the heater shell (see comment 13 above) restricting or stopping liquid flow in the overall system. In addition, these positions might cause portions of the electrical heating element to be exposed (not surrounded by liquid) in the heater shell with a possible generation of steam, again interfering with liquid flow through the system. There two problems here requiring correction. 1) The orientation of the heater must be revised to preclude the trapping of air and/or steam in the heater shell, along with non-immersion of the heating element, and 2) implementation of a "system" to ensure that the "as designed" configuration matches the "as installed/built" configuration (and not just for the heater).		1) The heater is installed per manufacturer's requirements with ECN 640649. It is installed horizontally, with the inlet and outlet in the up position, and as low as possible to insure it to be filled without the pump operating and the tank being at 40 % of being full. Bruce Johns level switch is set at 50%, at which level it will shut-off the system. 2) Post maintenance testing/inspection and performance of the system ATP/OTP verify system configuration.	

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15.	COMMENT: (added 3/26/97), ECN #632390 to H-14-030122, Sheets 1 and 3 - Part of the response given verbally to this reviewer in response to comment #9 was that the new heater is thermostatically controlled and can be set to maintain a selected water temperature. This adjustable thermostat is shown being included in the electrical circuitry on drawing sheet 3 (zone A-6), but not shown on drawing sheet 1 (zones D-7 and E-3). Furthermore, it was reported to me that it might not even be on, or wired in on, the actual exhauster. Subsequent inspection of the exhauster (by me) at the sheetmetal shop confirmed that the thermostat existed in the electrical housing for the heater, but was, in fact, not wired in to the heater circuitry. Electrical power, via the disconnect switch, was routed directly to the heating element - meaning energy would be inputted to the circulating liquid, continuously, once the switch is closed. This situation identifies four problems which require correction. 1) The thermostat is a necessary control feature and must be wired-in to the heater circuitry to avoid overheating of the circulating liquid and perhaps a boiling condition, if other liquid and air flow parameters are not as expected (see prior comments), 2) the thermostat should be shown in ALL electrical diagrams depicting this circuitry, 3) a system needs to be implemented that ensures that the "as designed" configuration matches the "as installed/built" configuration (see comment #14), and 4) it is imperative (for personnel safety and equipment protection) that a pressure-temperature relief valve be installed in the plumbing between the two shutoff valves (if retained) to the heater (see comment #11).		An ECN has been prepared to rectify this, ECN #640463 corrects all electrical discrepancies.	

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ATP-HEIS-001, and -002 WHC-SD-WM-OTP-212 SW ATP (no #) recv'd 2/7/97	Characterization	LF Hill		2750E/373-6424

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

7/16/97
Date

Reviewer/Point of Contact

Author/Originator

11. CLOSED

7/16/97
Date

Reviewer/Point of Contact

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	The Following design features do not appear to be (fully) tested by the test documents reviewed: item 4: One minute response to FG step increase. item 7: Operation over environmental conditions item 8: Detector immunity from extraneous gases item 9: Power removal on in-operable detection system item 10:Power removal on any single failure of HFGD item 35:(need "all operating parameters listed") item 41: Both should be tested at same alarm points - 5000 or 6250? item 42: Slow pressure increase. Redundant logic item 47: Exhauster cannot draw less than -3 in WC. item 48: Shutdown on >5.9" across HEPA or lo/hi flow. item 49: Detection or GRE		An Authorization Basis (AB) ammendment has been approved which implements the Standing Order (SO) ignition control sets for Rotary Mode Core Sampling. The SO does not require the use of the current automatic flammable gas detection system and it will not be used. Items 47 and 48, the only remaining applicable items, are tested during ATP/OTP and in the calibration procedure 6-ES-460.	

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2	Reqmt 49, "Continue Exhauster operation upon GRE", is in conflict with reqmts 33/48 which require shutdown on high tank pressure or HEPA DP. A GRE will likely produce a tank pressure increase and/or HEPA DP. How can both requirements be met? Or, which is the governing requirement?		An Authorization Basis (AB) ammendment has been approved which implements the Standing Order (SO) ignition control sets for Rotary Mode Core Sampling. The SO does not require the use of the current automatic flammable gas detection system and it will not be used.	
3	Reqmt 10 requires no single failure to compromise the ability of the system to shutdown the load (e.g. truck). The current approach of shutting down the exhauster, which then shuts down the truck, does not seem to meet this requirement - in that the single shutdown circuit could fail to shutdown the truck. Also, removal of power is required, whereas the interlock currently only sends a shutdown signal to another PLC. Reqmts 21 and 23 also discuss "redundant" shutdown, and imply the the redundancy is complete.		An Authorization Basis (AB) ammendment has been approved which implements the Standing Order (SO) ignition control sets for Rotary Mode Core Sampling. The SO does not require the use of the current automatic flammable gas detection system and it will not be used.	

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HEIS and Exhauster Documents	Characterization	CC Scaief III	TWRS Engineering	2750E/A-118/6-0491

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

7-10-97 — Date

C.C. Scaief III — Reviewer/Point of Contact

Author/Originator

11. CLOSED

7-10-97 — Date

C.C. Scaief III — Reviewer/Point of Contact

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	H-14-030122 and H-2-821455 General Just a comment - These drawings inadequately describe the instrumentation. It is unclear where components are mounted and how they relate to the interconnection diagram on 821455. The exhauster documentation should include an instrumentation engineering flow diagram with cross references between the process designation (e. g. PDIS-1) and the location and part number. This diagram should show the interface between the vendor supplied equipment such as the AMC cabinet and the H-2 and H-14 drawings.		The exhauster drawings are currently being upgraded and will reflect the as-built configuration of the exhauster at the completion of the upgrade.	
2	H-2-821455 and ECN 628744 Items 34 and 35 are replaced with items 109 and 110. These are a pressure gauge and a pressure switch. These appear to be located at the riser. They are not listed in the description of change; it is unclear whether they are DPIS-1, 2, or 3; they also appear to be shown as items 33 and 31 on Drawing H-14-100740 along with the Ashcroft/Yokogawa transmitters. They should not be called out on two parts lists. Is the switch PDIS-1?		Removed from H-14-100740 on the pressure switch ECN. See comment 1.	

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3	<u>H-2-030122 and ECNs 632390 and 634083</u> Sheet 2 of the drawing shows PDIS-3 with the notation (located on the exhauster). I am unable to find any pressure switch on the exhauster (H-2-821455). I am also unable to locate PDIS-1 and -2 although I suspect they may be at the riser. The ECNs mysteriously delete PDIS-2 although the description says they are being replaced for qualified ones. The ECNs add ISBs to the PDISs, however, they only show a wiring diagram. There is no detail for physical installation. There is a note that says field locate in AMC cabinet. There are marking and separation requirements for instrinsically safe wiring. The intrinsically safe wiring should be designated on the drawing. IS wiring can not be routed within the same raceway as non-intrinsically safe wiring. It appears from the sketch that the pressure switch wires no longer are in the raceway, however, there is no way to determine how they are mounted. The ECNs do not modify any parts list for call out of the ISBs. I am unable to ascertain that the Hazardous location installation requirements are met for the PDISs.		An Authorization Basis (AB) ammendment has been approved which implements the Standing Order (SO) ignition control sets for Rotary Mode Core Sampling. The SO does not require the use of the current automatic flammable gas detection system and it will not be used. Equipment no longer applicable. See comment 1.	
4	<u>ECN 628744 and 632390</u> These ECNs replace the humidity sensor (item 49) and show the new wiring. I am unable to ascertain how the sensor meets Hazardous location requirements.		FM Test Report is available.	

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5	H-14-100523, Sht 3, H-14-100524, Sht 9, and H-14-10071 Letter report 8C440-97-002, RE Raymond to DH Shuford, states (Table 3.0.1) that the SMC sensor is intrinsically safe. I was told (Criddle/Robinson) that rather than intrinsically safe, it is explosion proof. If it is explosion proof the intrinsically safe area is incorrectly designated on the drawings. If it is intrinsically safe, then the wiring from the SMC to the cart is incorrectly routed (per NFPA 70) with non intrinsically safe wiring.		An Authorization Basis (AB) ammendment has been approved which implements the Standing Order (SO) ignition control sets for Rotary Mode Core Sampling. The SO does not require the use of the current automatic flammable gas detection system and it will not be used.	
6	H-14-100771 This drawing is designated as the Exhauster Interlock Loop Diagram. It shows the interconnection of the carts with the exhauster and the truck. It is unclear how it connects to the exhauster since the reference drawing (Zn D,C-7) for the exhauster electrical connection (H-14-100521) is the cart mechanical drawing. I believe this should be H-14-030122.		An Authorization Basis (AB) ammendment has been approved which implements the Standing Order (SO) ignition control sets for Rotary Mode Core Sampling. The SO does not require the use of the current automatic flammable gas detection system and it will not be used. The drawing will be corrected.	
7	Some instruments have temperature limits that are less than required by the FDC, however, they may still be acceptable since operation will probably not continue at -20°F. They are: o Dwyer Magnehelic Series 2000 press indicator o Instrinsic Safety Barriers		An Authorization Basis (AB) ammendment has been approved which implements the Standing Order (SO) ignition control sets for Rotary Mode Core Sampling. The SO does not require the use of the current automatic flammable gas detection system and it will not be used.	
8	No temperature data has been found or provided on the following: o Humidity Xmitter: Hycal CT-880-C-H o Components within Air Monitor Cabinet o SMC detector		Components within the Air Monitor Cabinet are environmentally controlled. The SMC will not be used. The Hycal CT-880-C-H has an operating range of -40C to 80C.	

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9	DCM Item 7 - I don't know how this will be accomplished. We don't have testing performance data for the operating environment.		An Authorization Basis (AB) ammendment has been approved which implements the Standing Order (SO) ignition control sets for Rotary Mode Core Sampling. The SO does not require the use of the current automatic flammable gas detection system and it will not be used.	
10	DCM Item 10.2 - The required redundancy does not extend to the load disconnection.		An Authorization Basis (AB) ammendment has been approved which implements the Standing Order (SO) ignition control sets for Rotary Mode Core Sampling. The SO does not require the use of the current automatic flammable gas detection system and it will not be used.	

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DESIGN REVIEW - CORE SAMPLING	RMCS	Nancy Milliken	Nuclear Safety and Licensing/ Authorization Basis Management and Implementation	2750E/D191 376-7846

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

7/29/97
Date

Reviewer/Point of Contact

Author/Originator

11. CLOSED

7/29/97
Date

Reviewer/Point of Contact

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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1.	Per Design Review Direction, the review is to concentrate only on safety structures, systems, and components (SSCs). OBSERVATION: I find the safety classification of safety class and safety significant support systems to be suspect. EXAMPLE: For the Whittaker portion of the Hydrogen Interlock System, the thermocouple safety classification needs to be revised to accurately reflect the safety function of the component. The thermocouple and its associated interlock system directly support maintaining the Whittaker cell within its calibration/operational range. Failure to maintain the Whittaker within the specified temperature range would result in a failure to meet the components functional requirement (response time) in the event of flammable gas release. The thermocouple and its associated interlock system are a critical safety support system and, therefore, need to be the same safety classification as the Whittaker (safety class). SUGGESTION: Change the Safety Equipment List to recognize the thermocouple and its associated interlock system as a safety class SSC.		An Authorization Basis (AB) amendment has been approved which implements the Standing Order (SO) ignition control sets for Rotary Mode Core Sampling. The SO does not require the use of the Whittaker cell for flammable gas monitoring. The Whittaker cell will not be used and continuous monitoring will be performed based on the SO/JCO (manual on 15 minute intervals). The SEL, WHC-SD-WM-SEL-032, is being revised to HNF-SD-WM-SEL-044 will reflect this position.	

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2.	OBSERVATION: I find the safety classification of safety class and safety significant support systems to be suspect. EXAMPLE: For the Whittaker portion of the Hydrogen Interlock System, the sample delivery system has not been classified as safety class even though its failure could result in the failure of a safety class component. Without proper delivery of the sample into the Whittaker cell the Whittaker cell cannot support its safety function. The sample delivery system is a critical safety support system and, therefore, needs to be the same safety classification as the Whittaker (safety class). SUGGESTION: Change the Safety Equipment List to recognize the sample delivery system to recognize it as a safety class SSC.		An Authorization Basis (AB) amendment has been approved which implements the Standing Order (SO) ignition control sets for Rotary Mode Core Sampling. The SO does not require the use of the Whittaker cell for flammable gas monitoring. The Whittaker cell will not be used and continuous monitoring will be performed based on the SO/JCO (manual on 15 minute intervals). The SEL, WHC-SD-WM-SEL-032, is being revised to HNF-SD-WM-SEL-044 will reflect this position.	
3.	OBSERVATION: I find the safety classification of safety class and safety significant support systems to be suspect. SUGGESTION: Revise the Safety Equipment List to better represent the functional requirements for the safety SSCs. This will better the chances of not missing a safety support system in the future. I fully expect to see a larger Safety Equipment List result from this effort.		HNF-SD-WM-FDC-025, "Functional Design Criteria for the Rotary Mode Core Sampling Exhauster," is currently being revised. A Design Compliance Matrix will be developed per HNF-SD-WM-ETP-230, Rev. 1. The SEL, WHC-SD-WM-SEL-032, is being revised to HNF-SD-WM-SEL-044 and will be based on the functional requirements and safety functions identified in these documents.	

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4.	OBSERVATION: The Functional Design Criteria document, WHC-SD-WM-FDC-045, *Functional Design Criteria, Flammable Gas Detection and Shutdown System*, should be revised to better represent the system as it exists today and its functional requirements. Since the safety analysis was used to define functional requirements, in addition to Hanford Standard design criteria, WHC-SD-WM-FDC-045 should be revised to reflect those functional requirements. SUGGESTION: Revise WHC-SD-WM-FDC-045.		HNF-SD-WM-FDC-025 is being revised per comments 3.	
5.	OBSERVATION: Operationally the system fails to meet its ambient environmental condition requirement. The system will not operate from -20°F to 115°F. The system is limited by the operating range of the Whittaker configuration (60°F to 100°F). SUGGESTION: The long-term fix of the system should consider enclosing the Whittaker cell to better control its operating environment.		An Authorization Basis (AB) amendment has been approved which implements the Standing Order (SO) ignition control sets for Rotary Mode Core Sampling. The SO does not require the use of the Whittaker cell for flammable gas monitoring. The Whittaker cell will not be used and continuous monitoring will be performed based on the SO/JCO (manual on 15 minute intervals).	
6.	OBSERVATION: Since many of the administrative controls listed in WHC-SD-WM-SAD-035, *A Safety Assessment of Rotary Mode Core Sampling in Flammable Gas Single Shell Tanks: Hanford Site, Richland, Washington*, Section 6, "Controls," were fulfilled by design, the Functional Design Criteria document (WHC-SD-WM-FDC-045) should be revised to include those design requirements. SUGGESTION: Revise WHC-SD-WM-FDC-045. The listing of design requirements generated by the Design Review Committee may assist in this effort.		WHC-SD-WM-FDC-045 is no longer applicable. The Design Compliance Matrix will contain the requirements as they exist from their various sources.	

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7.	OBSERVATION: Document Applicability. There is concern that the safety analysis document (WHC-SD-WM-SAD-035) is not adequate to address ALL the tanks to be sampled. The safety analysis document is confusing on the topic of applicability. The document applies to 47 tanks, but the Authorization Basis states that rotary mode core sampling will be limited to four tanks. BACKGROUND: The document says many things. (1) The title, "A Safety Assessment of Rotary Mode Core Sampling in Flammable Gas Single Shell Tanks....," which can mean many things. (2) The scope and Section 2 say the safety assessment addresses single-shell tanks on the Flammable Gas Watch List (FGWL) or those tanks recommended by the contractor to be included on the FGWL. From Section 2 there are two lists, one for the 19 FGWL tanks and another for additional 34 that have been requested by the contractor to be included on the watch list. The lists are:		An Authorization Basis (AB) amendment has been approved which implements the Standing Order (SO) ignition control sets for Rotary Mode Core Sampling allowing for operation in all single shell tanks except A-106, C-107, C-103, BY-108 (possibly needing further evaluation prior to sampling), and seven other tanks currently excluded in SAD-035, APP. G, Table G-3. The revised AB and SER address applicability. The ferrocyanide issue was resolved by the letter DOERL, J. E. Kinzer to L. Trego, 96-WSD-195, Sept 4, 1996, and ECN 604113 which implemented WHC-SD-WM-SARR-038, Rev. 1, July 3, 1996. -- THIS DOCUMENT STILL EXCLUDES THEM FROM THE ANALYSIS. SAD-035 APPLIES TO ONLY 47 TANKS -- IN SX TANK FARM, THE ANALYSIS IS LIMITED TO SX-101, 102, 103, 104, 105, 106, AND 109.	

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7A.	FGWL 19 tanks: A-101, AX-101, AX-103, S-102, S-111, S-112, T-110, SX-101, SX-102, SX-103, SX-104, SX-105, SX-106, SX-109, U-103, U-105, U-107, U-108, and U-109. The additional 34 include: A-103, B-111, B-201, B-202, BX-107, BY-101, BY-102, BY-105, BY-106, BY-109, C-104, C-107, T-201, T-102, T-203, T-204, S-101, S-103, S-104, S-105, S-106, S-107, S-109, TX-102, TX-111, TX-112, TX-113, TX-115, TX-116, TX-117, U-102, U-106, U-110, and U-111. Giving a total of 53. (3) Section 7.0 of the safety document states many caveats that may reduce the number of tanks that the safety document applies to. No ferrocyanide tanks are addressed. Which doesn't eliminate any, but does cause a problem if this document is to be used as a basis for sampling in ferrocyanide tanks. This excludes: BY-103, BY-104, BY-105, BY-106, BY-107, BY-108, BY-110, BY-111, BY-112, C-108, C-109, C-111, C-112, T-107, TX-118, TY-101, TY-103, and TY-104. Which drops the number of tanks represented by the document from 53 to 51.			

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7B.	If the peak tank temperature is greater than 90 °C, then the analysis doesn't apply because the envelope testing doesn't apply. I believe this is OK, because as I recall the highest tank temperature is 90 °C (SX-108). (4) Appendix G states that only those tanks designated as flammable-gas tanks and that are listed in Table G-3 are within the scope of the SA. Table G-3 lists 133 tanks. Now, the trick is to figure out which of the 149 SSTs don't apply. All 200-series tanks: B-201, B-202, B-203, B-204, C-201, C-202, C-203, C-204, T-201, T-202, T-203, T-204, U-201, U-202, U-203, and U-204. Therefore, since 200-series tank were excluded, this drops the number of tanks that the document is applicable to from 51 now to 47. The SER identified the authorization basis as: the SER, the safety assessment (WHC-SD-WM-SAD-035 Rev 0-A), WHC Letter 9653662 R2 (that states: to reduce the accumulative risk of rotary-mode core sampling, sampling will be limited to four tanks (AX-101, AX-103, BX-110, and TY-102), and the IOSR (ECN 609990). BX-110 and TY-102 are not flammable gas tanks per WHC-SD-WM-SAD-035 but are included in the scope of the safety assessment by reference in Appendix G. SUGGESTION: Clarify applicability of WHC-SD-WM-SAD-035. No proof has been given that the system has been verified for use anywhere else.		

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8.	OBSERVATION: Are all of the items requiring controls in Chapter 4 reflected in Chapter 6? In my previous review I did find that all of the controls and numbers could be verified to be generated within the document. That means that everything is traceable to the document. Since the entire document is the authorization basis, controls/design features/key assumptions/etc. (even if not in chapter 6) are still requirements. SUGGESTION: Revise WHC-SD-WM-SAD-035, Section 2.0, "Description of Action" where it states: "The design features listed in Section 6 shall be used to assess the extent to which changes or modifications alter the functions or operational characteristics of the FG/RMCS processes, systems, or components. The Department of Energy (DOE) Order 5480.21, *Unreviewed Safety Questions* (USQs) process shall be used to assess which SA results could be altered or negated by said changes or modifications, and to what extent SA revisions could be required.". This statement isn't exactly true. Add to WHC-SD-WM-FDC-045 as appropriate to include any additional design requirements not in Section 6 of WHC-SD-WM-SAD-035.		See responses above.	

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9.	OBSERVATION: Exhauster Usage. The use of the portable exhauster and its associated interlock system is not clear for tanks that already have active exhausters. SUGGESTION: Since (1) tanks on existing active exhausters can not be easily isolated and (2) the existing systems cannot be turned off and (3) the design hasn't excluded the use of two exhausters, the design should address use of both exhausters or provide design verification that the existing systems meet the same qualification (intrinsically safe and provide for flammable gas detection). If this can not be done, then the "Applicability" of Comment #7 should also address the exhauster issue, limiting tanks as necessary.		The revised AB and SER address this issue. In addition, a revised NOC is being submitted to allow RMCS operation using the existing exhauster (SX). Note: The SER revision and NOC submittal are not currently approved.	
10.	OBSERVATION: WHC-SD-WM-SAD-035, Figure 2-11, FG/RMCS Process, Page 2-28. Shouldn't the feedback arrow feed into the next block ("Establish Nitrogen Purge....)? The exhauster is not started and stopped for every sample. SUGGESTION: Verify and correct Figure as required.		You are correct. Your comment has been forwarded to LANL and Characterization Engineering Management.	
11.	OBSERVATION: WHC-SD-WM-SAD-035, Section 2.5.3.1, Drilling, Page 2-32. Shouldn't bullet 4 come before bullet three? The exhauster should be operating prior to nitrogen purge. SUGGESTION: Verify and correct as required.		True, it should be operating prior to the start of sampling operations. Your comment has been forwarded to LANL and Characterization Engineering Management.	

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	3. Project No. CPO	4. Page 10 of 10

12.	OBSERVATION: WHC-SD-WM-SAD-035 has a few administrative errors in it, such as Appendix S of WHC-SD-WM-SAD-035 references WHC-SD-WM-SAD-008 (Marusich). The reviewer can provide a listing of those found if WHC-SD-WM-SAD-035 is to be revised. These errors are considered non-safety at this time. SUGGESTION: Delete reference to Marusich and replace it with another. Make additional corrections as required.		Your comment has been forwarded to LANL and Characterization Engineering Management.

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5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
See below for document numbers	CHARACTERIZATION RMCS EXHAUSTER	Jim Kriskovich	TWRS Design Authority	2750-E 373-3686

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

7-29-97 Date — Jim Kriskovich Reviewer/Point of Contact

Author/Originator

11. CLOSED

7-29-97 Date — Jim Kriskovich Reviewer/Point of Contact

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
	The following comments pertain to ECN 620764 (WHC-SD-WM-SDD-035)			
1	In this document they are stating there are two filters in series. There are two filters, however we can not claim both filters because we are unable to properly test the second filter. They do state they have agreement on this, however if you look at the NOC it states that a manifold is used to test the filters. The device they are using does not meet the definition of a manifold and does not provide an adequate test. Since the second filter is non-testable, what is the path forward as it pertains WHC-CM-7-5, Environmental Compliance Manual, which states multi-stage filtration is required in all areas of facilities that contain radioactive materials in dispersible form.... (Reference DOE/EV/1830-T5, Section 5.4) Please provide documentation /test results showing that the manifold is adequate to aerosol test the filters.	jrk	Work is currently in progress to replace the HEPA filter train to comply with the requirments. The NOC is being modified to reflect the changes and will be submitted to WDOH for approval. As a parallel path, a waiver is being submitted to request operation with the existing exhauster. For the purposes of this comment, the exhauster will be in compliance with the NOC, as finally approved by WDOH and the PHMC, prior to deployment.	

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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
2	Is the CAM being removed out of the system? The ECN written against OSR-005, which requires a CAM, to remove the requirement has not yet been approved by DOE. If it does not get approved, a CAM will be required. We are trying to resolve this issue with the salt well pumping exhauster but we have not had success as of yet. Please provide planned path forward.	jrk	Operation without CAMs is within the authorization basis, see USQ # TF-97-521.	
3	Under the size section (2.3.8), it does not mention the support carts that are needed for the operation of the system. Will these be included? Please provide description and function of system.	jrk	An Authorization Basis (AB) ammendment has been approved which implements the Standing Order (SO) ignition control sets for Rotary Mode Core Sampling. The SO does not require the use of the current automatic flammable gas detection system and it will not be used. Continuous monitoring will be performed based on the SO/JCO (manual on 15 minute intervals).	
4	There was a letter from DOE stating that they did not agree with the approach taken with not applying 6430.1A. What is the current status on that letter? Please provide documentation showing the closure of this issue.	jrk	The letter does NOT exist. The existing DOE letter #9309072, Kenneth T Lang to President Westinghouse Hanford Company, concurs that the WHC interpretation of DOE 6430.1a is correct (i.e. the exhauster is a portable piece of equipment, tool, taken into a facility for a specific task then removed, and does not meet the design mandates of 6430.1a but provides an equivalent level of protection). The ORR comment regarding this issue was a post start item on the RMCST #2 ORR. This item was closed out in WHC letter #9553581, L. F. Ermold to L. Erickson, Director Characterization Division, USDOE.	

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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
5	ECN 636966 (SEL-032) It states the filters are testable to N510. See comments above.	jrk	Work is currently in progress to replace the HEPA filter train to comply with the requirments. The NOC is being modified to reflect the changes and will be submitted to WDOH for approval. As a parallel path, a waiver is being submitted to request temporary operation with the existing exhauster.	
	The following comments apply to ECN 630001 (FDC-045)	jrk		
6	I did not see criteria for the sparkless fan. What about AMCA 99? This is currently the only criteria for fans in a flammable gas environment. There is not a specific requirement invoking this standard, however it is the only standard in place. Please provide documentation showing the fan meets the AMCA 99 criteria.	jrk	Fan material and configuration was analyzed and meets the requirements of the authorization basis (WHC-SD-WM-SAD-035, Rev. 0a, Section 4.1.1.4). FDC-045 does not apply to the exhauster. FDC-025 applies and is currently being revised.	
7	What is the function of the carts associated with the exhauster? Same comment as above.	jrk	An Authorization Basis (AB) ammendment has been approved which implements the Standing Order (SO) ignition control sets for Rotary Mode Core Sampling. The SO does not require the use of the current automatic flammable gas detection system and it will not be used. Continuous monitoring will be performed based on the SO/JCO (manual on 15 minute intervals).	

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REVIEW COMMENT RECORD (RCR)

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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	General comment: How were the safety class of the components determined? From the conversation the other day in the design review meeting it seems there are several questions out pertaining to this.	jrk	The safety class of the components were determined using the process desribed in Control Manual 4-46, Chapter 9. Both safety reviewers have agreed that the process is flawed. However it is the only process available.	

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5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
ECN# 642940, 642941, Portable Pressure Gauge Assembly -for SX tank farm sampling activities w/ Truck #4	Characterization Project	Design Review Committee (DRC)	TWRS	DRC Chairman: GP Janicek/376-2225

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

7/15/97 Date — Reviewer/Point of Contact

7/15/97 Author/Originator

11. CLOSED

7/15/97 Date — Reviewer/Point of Contact

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	What are the requirements for temperature and accuracy of the pressure switch? Does the Dwyer 43001 meet the requirements? (CC Scaief)		The low temperature for RMCST System operation is defined in operating procedure TO-080-518 @ 20 degrees F. The high temperature is based on the highest recordable temperature observed at the Hanford site. Dwyer 430001 pressure switch meets both these requirements @ 120 and 20 F. ACC - ±3% of RANGE (0-.5)	Closed CCS
2	What are the requirements and where are they identified? (JR Kriskovich)		The requirement for a this design are specified in SAD-035, 6.8.14.1. This control requires the automatic shutdown of the drill truck when exhauster operation is lost.	closed JRK
3	Does the design ensure that during operation the pressure switch remains within its operating temperature range for operating environmental extremes? (GP Janicek)		The pressure switch is protected by a rain and sun shield. The housing protects the internals from other hazards such as dust/dirt and other water sprays. This design aids in maintaining the ambient air temperature qualification.	closed GPJ

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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
4	The testing and acceptance criteria must be determined and documented. - Documented proof of testing and upgrade dedication must be completed. (ML McElroy)		An OTP/ATP will be performed and documented prior to field deployment. Calibration procedure 6-ES-461 is in final review for calibrating the pressure switch. A CGI form will be completed for SS dedication. This instrument will be included in the critical alarm checks procedure. 7/15/97	CLOSED MM
5	Does exhauster flow data for each applicable tank in 241-SX demonstrate that tank dome pressure will remain <0.1"w.c. during maximum purge gas flow from RMCS Truck? (TD Jarecki)		The pressure switch will shutdown the RMCST System when the ~~exhauster shutdown.~~ TANK DOME SPACE REACHES ≥ -.1 IN W.C.	CLOSED

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5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
ECN# 631344, 631345, 631346, RMCS EXHAUSTERS B & C, HEPA MODS	Characterization Project	Design Review Committee	TWRS	DRC Chairman: GP Janicek / 6-2225

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

9/18/97 Date — Reviewer/Point of Contact

Author/Originator

11. CLOSED

9/18/97 Date — Reviewer/Point of Contact

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
COMMENTS BELOW BY MIKE McELROY				
--ECN 631344				
1.	Page 5--The ECN NOTE, to "RELOCATE MOTOR STARTER AND SEAL POT HEAT PAD CONNECTION", needs to be more definitive.		Add to note instructions to field mount and field route conduit and j-box	Accept. MM
2.	Page 7, lower left--There are 2 "item" J's listed in the bubble.		J will change to K	MM
3.	Page 7--There is a box that appears on the side of the instrument cabinet that is not identified, see attachment.		Add note from comment 1	MM
4.	Page 9--TYPO-1st sentence, says to "see page X of this ECN", page "X" needs to be identified.		Incorporate	MM
5	Page 9--Item "C"-are these to be field located? If so this needs to be identified, or if not, then it will need to be dimensioned in ECN.		View D-D will include instructions to fiel;d locate to match PN 29	MM

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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
5.	Page 5, upper left--It states, "MODIFY FAN BY CUTTING INLET DUCT..." and to "SEE VIEW K". View K does not show this.		PN 40 will be added and "See" will be "Ref"	MLM
	--ECN 631345			
6.	Page 3, "DESCRIPTION OF CHANGE"--TYPOS, ie. "samper" S/B "sampler", and "doesl" S/B "does".		Incorporate	MLM
	--ECN 631346			
7.	Page 5--It lists "Sheets 3 and 4" of H-2-821244, it should read "Sheets 4 and 5".		Incorporate	MLM
8.	Page 7--Part number "28" has no description and is not listed in the Parts List. Also, page 6, at top of page lists "PN 28" also.		PN 28 was added by ECN 628744 which has been work completed and is treated as if it were incorporated on the drawing.	MLM
	COMMENTS BELOW BY TED JARECKI			
9.	ECN 631344, Block 8: Approval Designator should include "E" for environmental due to permit implications relative to this ECN.		Incorporate	CLOSED 9/11/97
10.	ECN 631344, Block 10: ECN's 631345 and 631346 should be included as they are referred to on page 3 of this ECN. ECN 639182 should also be included as the ECN being superseded.		Change to "See Block 13" Added description to page 3.	CLOSED 9/11/97
11.	ECN 631344, Block 13a and 14b: Description of Change or Justification should discuss reasoning for superseding ECN 639182.		Incorporate	CLOSED 9/11/97

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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
12.	ECN 631344, Block 14a and 14b: Only one item should be marked in block 14a. Justification is not complete; need more detail consistent with item in block 14a.		"Criteria Change"	closed 9/9/97
13.	ECN 631344, Block 17 and 18: Cost and Schedule impacts **ARE DEFINITELY** applicable to this design change.		No action required. Blocks are intended for project cost control between contractors.	closed 9/9/97
14.	ECN 631344, Block 19 and 20: Vendor Information files should be updated to reflect changes per this ECN. It doesn't appear that 6-ES-460 is affected by this ECN.		6-ES-460 will be removed. HNF-SD-WM-ETP-230 does not identify VI file changes as required in the ABU. Discrepancy noted on Page 3 of ECN which identifies actions required.	closed 9/9/97
15.	ECN 631344, Page 3: Item "E" should have a quantity of "6". Quantities for items "T" and "X" should be 16 and 24 respectively.		~~6~~ 1 is correct for E. Incorporate 16 and 24 for T and X. 9/9/97	Closed 9/9/97
16.	ECN 631344, Page 5: Although HEPA train and heater are located via common center lines, some dimensions still need to be added and/or retained from existing drawing configuration.		Incorporate	closed 9/9/97
17.	ECN 631344, Page 5: Relocation of starter and seal pot heat pad J-box needs "field locate" note or dimensions.		Incorporate	closed 9/9/97
18.	ECN 631344, Page 5:Note on flexible duct between HEPA train and fan needs to be reworded and include location reference of" VIEW K".		Incorporate. Location reference is added by design drafting when incorporating the ECN.	closed 9/9/97
19.	ECN 631344, Page 5: Reference to ECN 63002 should be ECN 630002.		Incorporate	closed 9/9/97

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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.	ECN 631344, Page 4: Nut quantities for parts "T" and "X" incorrect. ~~Framework added under heater is not identified in this ECN.~~ M 9/10/97		Incorporate	CLOSED M 9/10/97
21.	ECN 631344, Page 7: Framework added under heater is not identified in this ECN; see also comment ~~#13~~ 25 below. M 9/10/97	M 9/10/97	~~No action~~. Framework is detailed on H-2-821456, and modified by ECN 631345 and does not require additional details on H-2-821455. ADDED DISCUSSION ON PAGE 3 OF ECN.	CLOSED M 9/10/97
22.	ECN 631344, Page 9: Part numbers "D" and "E" are reversed. Consider changing distance between welds on tubing items "F" and "G" unless only two welds are intended for each component.		No action required. ECN is correct. FOR PART #'S "D" AND "E". REVISED WELD SYMBOLS TO "3 PL EQ SP".	CLOSED M 9/10/97
23.	ECN 631344, Page 10: It appears a dimension is missing for the location of the upper angle with respect to the lower angle.		Dimension to define the location will be added.	CLOSED M 9/10/97
24.	ECN 631345, Block 10: Should include ECN 631344 and 631346 as related ECN's.		Same as TDJ comment 10 M 9/10/97	CLOSED M 9/10/97
25.	ECN 631345, Block 13a: This ECN also effects views changed on H-2-821455 which are changed by ECN 631344 in the same manner. The design change per ECN 631344 cannot be completed without changes per ECN 631345. The design change information per this ECN which directly impacts ECN 631344 should be included in ECN 631344.		Discussion of changes will be included in ~~the~~ ECN. 631344 TO DOCUMENT THAT CHANGES PER ECN 631345 ARE REQUIRED TO COMPLETE CHANGES PER ECN 631344. M 9/10/97	CLOSED M 9/10/97
26.	ECN 631345, Block 14a and 14b: Only one item should be marked in block 14a. Justification is not complete; need more detail consistent with item in block 14a.		"Criteria Change"	CLOSED M 9/10/97

COMMENTS BELOW DENOTE CHANGES MADE TO CORRECT ERRORS IDENTIFIED BY THE DESIGN AGENTS GALEN WILSON AND AL KOSTELNIK

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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.	ECN 631344		Insulation note 6 revised to include HEPA train.	
28.	ECN 631344		Page 7 Added ø 9/16 thru holes for heater mounting	
29.	ECN 631344		Revised Block Diagram on H-14-030122 and	
30.	ECN 631345		Revised note 5 for SST welding	
31.	ECN 631346 page 8		Identified weather cover in View BB-BB	
32.	Author change ECN 631346 Page 3		Described other document impacts and work required.	
	COMMENTS BELOW BY JIM KRISKOVICH			
	The following comments pertain to ECN 631345 4 JK 9/18/97			
33.	Approval designator should include Environmental		Incorporate	CLOSED JK 9-17-97
34.	Justification: This needs to be changed, the reason for the change is not due to the standing order.		Incorporate	CLOSED JK 9-17-97
35.	Page 5, modify note in left corner, difficult to understand		Incorporate	CLOSED JK 9-17-97
36.	Page 7, Need to locate the filter supports via a dimension or reference note. Also, were there any structural calculations completed that analyzed the supports? Keep in mind, it will not just be the weight of the housing, there will be insulation, filters, instrumentation, etc....		Incorporate	CLOSED JK 9-17-97
37.	Page 9, Has anyone performed the structural analysis on these supports, how far can they be extended?		Incorporate	CLOSED JK 9-17-97
38.	Page 10, Same as above, has anyone analyzed this support for the configuration that is shown?		Incorporate	CLOSED JK 9-17-97
	The following comments pertain ECN 631345			

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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
39.	Page 3, samper should be sampler. Replace DOP with aerosol. doesl should be does		Incorporate	closed TPK 9-17-97
40.	Page 4, why is part 4 on the skid being added, I can not tell what it is supporting.		Part 4 is the modified HEPA skid which was included as a component of the Air Mover Frame (PN-41). Part 4 is created to identify it as a modified vendor supplied component and to detail the fan support.	closed TPK 9-17-97
41.	Page 9, why is part 10 being modified, I do not see why the motor support is changing		Required for clearance of the new HEPA and provide access to condensate drain lines entering the seal pot.	closed TPK 9-17-97
	The following comments pertain to ECN 631346			
42.	Page 7, Insert a note to make sure the welding of the instrument rack is not welded directly to the housing, only the weather cap.		Incorporate	closed TPK 9-17-97
	COMMENTS BELOW BY JEFF RANSCHAU			
43.	ECN 631344, Page #1, block 14b: The first line states, ...TO COMPLY WITH STANDING ORDER... The exhauster modification is required to comply with emissions permit requirements, not Standing Order requirements. Suggested action: Replace "STANDING ORDER" with the correct source of the requirement.		Incorporate. Reworded to address air operating permit.	JR 9/17/97

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5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
ECN 642911, Modify Tank Pressure Switch for RMCS Operation	Characterization Project	Design Review Committee	TWRS	DRC Chairman: GP Janicek/6-2225

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

9/15/97 Date — Reviewer

Project/Cognizant Engineer

11. CLOSED

9/15/97 Date — Reviewer

Project/Cognizant Engineer

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	The "red numbered" original ECN form was marked up quite a bit and unclear. ECN # 640442 has been assigned to replace ECN # 642911. This is just an ECN number change, the scope/contents of the ECN will not be altered.	JA	Accepted.	JA 9/15/97
2	Approval (of pressure switch) from FGEAB for meeting equivalency of IC-SETS	JK	Accepted.	GK 9/15/97
3	ECN 642911, page 1, block 13a, add reason/explanation for change.	TJ	Accepted, explanation added to ECN.	TJ 9/15/97
4	ECN 642911, page 1, block 13a, reference ECN 642940L, it shows connection to core sample truck.	JK	Accepted, reference added.	GK 9/15/97
5	ECN 642911, page 1, change informal to formal in block 14b.	TJ	Accepted, change made.	TJ 9/15/97
6	ECN 642911, page 1, block 14b, delete the word "negative", we're trying to prevent positive pressure in the tank.	GJ	Accepted, change made.	GJ 9/15/97
7	ECN 642911, page 2, blocks 19 & 20, add SEL-044 and CGI form.	GJ	Accepted, change made.	GJ 9/15/97
8	ECN 642911, page 3, parts K & L quantities incorrect.	MM TJ	Accepted, corrections made.	MM 9/15/97 TJ 9/15/97

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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
9	ECN 642911, page 3, put 0 in front of .220 & change quantity of part T to 3.	JK	Accepted, change made.	JK 9-15-97
10	ECN 642911, page 5, parts E, F, and G, quantities incorrect.	MM	Accepted, corrections made.	MM 9/15/97
11	ECN 642911, page 6, reference where tube & wiring will be connected.	JK	Accepted, references added.	JK 9-15-97
12	ECN 642911, page 7, typographical error in view C.	TJ	Accepted, correction made.	TJ 9/15/97
13	USQ TF-97-0541, rev. 2, page 1, add L suffix to ECN 642940.	JK	Accepted, correction made.	JK 9-15-97
14	USQ TF-97-0541, rev. 2, page 1, revise USQ to reflect approval of pressure switch by FGEAB.	JR	Accepted, changes made.	JR 9/15/97
15	USQ TF-97-0541, rev. 2, page 2, change the following sentence in third paragraph: "Should the exhauster be lost however, the result on the tank pressure would be the same as for a large GRE that would send the tank pressure to zero."	JR	Accepted. Change from "... send the tank pressure to zero." to "... raise the tank pressure toward zero."	JR 9/15/97
16	USQ TF-97-0541, rev. 2, change Standing Order 97-01 revision number from 2 to current revision of 3.	JR	Accepted.	JR 9/15/97
17	USQ TF-97-0541, rev. 2, page 3, clarify first sentence in first paragraph "...RMCS must shut down if there is one and exhauster is lost....".	JR	Accepted.	JR 9/15/97

REVIEW COMMENT RECORD (RCR)

1. Date	2. Review No.
10/23/97	DRC-97-004e
3. Project No.	4. Page
CPO	1 of 3

5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
ECN 642928, Exhauster Modifications for Major Stack Designation	Characterization Project	Design Review Committee	TWRS	DRC Chairman: GP Janicek/6-2225

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

11/6/97
Date

Reviewer

Project/Cognizant Engineer

11. CLOSED

10/6/97
Date

Reviewer

Project/Cognizant Engineer

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	Verification that the probe is in a proper location for sampling. Adequate distance upstream & downstream of flow disturbances. Should be shown in details on H-2-829087. Also, the proper location for the probe in the center of the stack or air stream for proper sample.	JRK	Accepted. The revised Functional Design Criteria (HNF-SD-WM-FDC-025, rev. 2) references the Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities (ANSI N13.1). The sampling point should be a minimum of five duct/pipe diameters downstream of any abrupt changes in flow direction or prominent transitions (ANSI N13.1, section 4.2.1.2). The dimensions showing location of the probes will be placed on the drawing. Currently, View B shows the Beta CAM probe centered in the stack. Another view (View C) will be added to show the record sample probe in the center of the stack. The placement of both probes meets the design criteria.	JRK 11-5-97

A-6400-090.1 (10/90) (EF) WEF011
Review Comment Record (RCR)

REVIEW COMMENT RECORD (RCR)

1. Date	2. Review No.
10/23/97	DRC-97-004e
3. Project No.	**4. Page**
CPO	2 of 3

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
2	One line drawings should be generated to reflect the configuration. It is very difficult to follow the existing drawings. Also, since each exhauster will have it's own drawings, one lines should be included.	JRK	Accepted. The development of one-line drawings is on our schedule and is funded. The one-line drawings are scheduled to be completed, and released, prior to the Final Acceptance for Beneficial Use (ABU).	JRK 11-5-97
3	H-2-829087, sht. 1 - Need to verify that these mods are not adding weight and/or modifying profile to be negatively impacted under design basis wind loads (80 mph max)	GPJ	Accepted. This modification does not alter the external profile of the Exhauster. A Design Analysis (DA) had been performed and documented in WHC-SD-WM-DA-149, Analysis of Skid-Mounted Portable Exhauster. This analysis calculated wind loading using 80 mph wind speed. The calculations also used a total weight for the upper sample cabinet that included the Alpa CAM probe. The alpha CAM probe was removed some time ago. After subtracting the weight of the Alpha probe the result of the calculations was still within design limits.	11/04/97

A-6400-090.1 (10/90) (EF) WEF011
Review Comment Record (RCR)

REVIEW COMMENT RECORD (RCR)

1. Date	2. Review No.
10/23/97	DRC-97-004e
3. Project No.	**4. Page**
CPO	3 of 3

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
4	Insure that the CAM system is rated to be in the environment expected (ie. temperature/humidity ranges).	NJM	Accepted. The AMS-4 Beta CAM has an operating temperature range of 0°C to 50°C (32°F to 122°F), a storage temperature range of -20°C to 85°C (-4°F to 185°F) and an operating/storage range of 5-95% relative humidity (non condensing). The instrument enclosure is a temperature controlled environment with Air Conditioning and heating units. The Beta CAM probe assembly is in the upper sample cabinet which has a heater in it. While the cabinet is not actively cooled it does have a shade over it that prevents direct sunlight from striking much of the external surface of the cabinet. The Pacific Northwest National Laboratory (PNNL) conducted a test on the AMS-4 Beta CAM at 60°C (140°F) and found no degradation in performance (PNNL-10938). The Exhauster control system will not allow operation if the stack air temperature is above 150°F. A representative of the manufacturer said that the storage temperature could go as low as -40°C (-40°F). However, this could damage the detector element. If the detector where damaged during low temperature storage then a detector fail alarm would occur during initial start-up. Thus preventing operation of the exhauster with a faulty CAM detector.	Closed NJM 11/5/98
5				
6				
7				

A-6400-090.1 (10/90) {EF} WEF011
Review Comment Record (RCR)

5.5 DESIGN REVIEW COMMITTEE MEETING AGENDAS

AGENDA

DESIGN REVIEW COMMITTEE MEETING

CHARACTERIZATION EQUIPMENT

FEBRUARY 3, 1997

MEETING MINUTES:

1. Read and approve 01/29/97 meeting minutes.

2. Actions to prior meeting minutes.

CONTINUING ACTIVITIES:

1. Review #DRC-97-001 (ECN# 639111, Exhauster system transmitter modification).

   a. Checklist action items completed, final review, signoff.
   b. Review Comment Record (RCR) dispositions complete, signoff.
   c. Approve ECN.

2. Review #DRC-97-002 (ECN# 636965, Nickel plated drill rod).

   a. Review checklist.
   b. Review RCR dispositions.
   c. ECN approval status.

3. Review #DRC-97-003 (ECN# 639110, Revision to WHC-SD-WM-020, Flammable Gas Tank Exhauster Interlock (FGTEI) Computer Software Design Description).

   a. Review RCR comments and disposition.
   b. Review checklist.
   c. ECN approval status.

NEW ACTIVITIES:

1. Briefing: Review #DRC-97-004 (Exhauster Interlock System design).

   a. Scope, schedule, personnel.
   b. H-14 drawings with approved ECNs awaiting incorporation.
   c. Review supporting documents.
   d. Checklist review and assignments.

NEXT MEETING:

1. 02/05/97, 2704HV/G229.

   a. 1:00-2:00pm, Overview of SAD-035 (R. E. Raymond).
   b. 2:00-4:00pm, DRC review continuation.

ACTION ITEM SUMMARY:

AGENDA

DESIGN REVIEW COMMITTEE MEETING

CHARACTERIZATION EQUIPMENT

FEBRUARY 5, 1997

MEETING MINUTES:

1. Read and approve 02/03/97 meeting minutes.

2. Actions to prior meeting minutes.

CONTINUING ACTIVITIES:

1. Review #DRC-97-003 (ECN# 639110, Revision to WHC-SD-WM-020, Flammable Gas Tank Exhauster Interlock (FGTEI) Computer Software Design Description).

   a. Review RCR comments and disposition.
   b. Review checklist.
   c. ECN approval status.

2. Review #DRC-97-002 (ECN# 636965, Nickel plated drill rod).

   a. Review RCR dispositions.
   b. Review checklist.
   c. ECN approval status.

3. Review #DRC-97-004 (Exhauster ~~Interlock~~ System design).

   a. Charter/Scope (design verification vs. ORR).
   b. Additional review materials.
   c. Review checklist and assignments.
   d. Review aids (SAD-035 overview, requirements checklist).
   e. RCR comments, questions, discussion.

NEW ACTIVITIES:

1. ECN Preview: Thermocouple mount on field-deployed Whittaker Cell.

NEXT MEETING:

1. 02/ /97, 2704HV/

ACTION ITEM SUMMARY:

AGENDA

DESIGN REVIEW COMMITTEE MEETING

CHARACTERIZATION EQUIPMENT

FEBRUARY 10, 1997

MEETING MINUTES:

1. Read and approve 02/05/97 meeting minutes.

2. Actions to prior meeting minutes.

CONTINUING ACTIVITIES:

1. Review #DRC-97-003 (ECN# 639110, Revision to WHC-SD-WM-020, Flammable Gas Tank Exhauster Interlock (FGTEI) Computer Software Design Description).

   a. Review RCR comments and disposition.
   b. Review checklist.
   c. ECN approval status.

2. Review #DRC-97-004 (Exhauster ~~Interlock~~ System design).

   a. Requirements checklist.
   b. Re-look at Design Review Checklist.
   c. RCR comments, questions, discussion.

NEW ACTIVITIES:

1. ECN Preview: Thermocouple mount on field-deployed Whittaker Cell. (RR Bafus)

2. Walkthrough review of HNF-SD-WM-TC-073, "Flammable Gas Interlock Spoolpiece Flow Response Test Plan and Procedure". (TC Schneider)

NEXT MEETING:

1. 02/12/97, 2704HV/G133, 8:30am-noon

ACTION ITEM SUMMARY:

AGENDA

DESIGN REVIEW COMMITTEE MEETING

CHARACTERIZATION EQUIPMENT

FEBRUARY 13, 1997

MEETING MINUTES:

1. Read and approve 02/10/97 meeting minutes.

2. Actions to prior meeting minutes.

CONTINUING ACTIVITIES:

1. Review #DRC-97-003 (ECN# 639110, Revision to WHC-SD-WM-020, Flammable Gas Tank Exhauster Interlock (FGTEI) Computer Software Design Description).

   a. Review RCR comments and disposition.
   b. Review checklist.
   c. ECN approval status.

2. Review #DRC-97-005 (ECN# 168908, Thermocouples on field deployed Whittaker Electrochemical Cell (WEC)).

   a. Finalize Design Review Checklist.

3. Review #DRC-97-004 (Exhauster ~~Interlock~~ System design).

   a. Requirements checklist.
   b. Re-look at Design Review Checklist.

NEW ACTIVITIES:

NEXT MEETING:

1. 02/14/97, 2704HV/G229, 8:00am-4:00pm, Review #DRC-97-005 (only).

ACTION ITEM SUMMARY:

AGENDA

DESIGN REVIEW COMMITTEE MEETING

CHARACTERIZATION EQUIPMENT

FEBRUARY 14, 1997

MEETING MINUTES:

1. Read and approve 02/13/97 meeting minutes.

2. Actions to prior meeting minutes.

CONTINUING ACTIVITIES:

1. Review #DRC-97-003 (ECN# 639110, Revision to WHC-SD-WM-020, Flammable Gas Tank Exhauster Interlock (FGTEI) Computer Software Design Description).

   a. RCR comment disposition status report.
   b. Spoolpiece/WEC H2 test update.

2. Review #DRC-97-005 (ECN# , Thermocouple mount on field deployed Whittaker Electrochemical Cell (WEC)).

   a. Conduct/complete review of ECN.

3. Review #DRC-97-004 (Exhauster ~~Interlock~~ System design).

   a. ---no activity planned---

NEW ACTIVITIES:

NEXT MEETING:

1. TBD

ACTION ITEM SUMMARY:

AGENDA

DESIGN REVIEW COMMITTEE MEETING

CHARACTERIZATION EQUIPMENT

FEBRUARY 18, 1997

MEETING MINUTES:

1. Read and approve 02/14/97 meeting minutes.

2. Actions to prior meeting minutes.

CONTINUING ACTIVITIES:

1. Review #DRC-97-003 (ECN# 639110, Revision to WHC-SD-WM-020, Flammable Gas Tank Exhauster Interlock (FGTEI) Computer Software Design Description).

   a. New additions to ECN.
   b. RCR comments and disposition.
   c. Review checklist.
   d. ECN approval status.

2. Review #DRC-97-005 (ECN# 168908, Thermocouples on field deployed Whittaker Electrochemical Cell (WEC)).

   a. Status of ECN.
   b. Post review discussion.

3. Review #DRC-97-004 (Exhauster ~~Interlock~~ System design).

   a. SDD distribution.
   b. Requirements checklist.
   c. Re-look at Design Review Checklist.

NEW ACTIVITIES:

   a. ECN to modify WEC piping arrangement.

NEXT MEETING:

1. 02/20/97, 2704HV/G , 1:00pm-4:00pm

ACTION ITEM SUMMARY:

AGENDA

DESIGN REVIEW COMMITTEE MEETING

CHARACTERIZATION EQUIPMENT

FEBRUARY 19, 1997

MEETING MINUTES:

1. Read and approve 02/14/97 meeting minutes.

2. Read and approve 02/18/97 meeting minutes.

3. Actions to prior meeting minutes.

CONTINUING ACTIVITIES:

1. Review #DRC-97-003 (ECN# 639110, Revision to WHC-SD-WM-020, Flammable Gas Tank Exhauster Interlock (FGTEI) Computer Software Design Description).

   a. Continuation of 02/18/97 discussion on acceptability of low temperature setpoint for WEC in the software. Resolution.
   b. RCR comments and disposition.
   c. Review checklist.
   d. ECN approval status.

2. Review #DRC-97-004 (Exhauster ~~Interlock~~ System design).

   a. SDD distribution. (completed 02/18/97)
   b. Updated Admin. Control (AC) design requirements.
   c. Requirements checklist. (partially completed 02/18/97)
   d. Re-look at Design Review Checklist.
   e. Next meeting - Scope.

NEW ACTIVITIES:

a. ECN to modify WEC piping arrangement.

NEXT MEETING:

1. 02/20/97, 2704HV/G230, 1:00pm-4:00pm

ACTION ITEM SUMMARY:

AGENDA

DESIGN REVIEW COMMITTEE MEETING

CHARACTERIZATION EQUIPMENT

FEBRUARY 20, 1997

MEETING MINUTES:

1. Read and approve 02/14/97 meeting minutes.

2. Read and approve 02/18/97 meeting minutes.

3. Read and approve 02/19/97 meeting minutes.

4. Actions to prior meeting minutes.

CONTINUING ACTIVITIES:

1. Review #DRC-97-003 (ECN# 639110, Revision to WHC-SD-WM-020, Flammable Gas Tank Exhauster Interlock (FGTEI) Computer Software Design Description).

   a. ECN approval.

2. Review #DRC-97-004 (Exhauster & Interlock System design).

   a. Complete Requirements Checklist (to become Design Compliance Matrix (DCM)).
   b. Re-look at Design Review Checklist.
   c. RCR comment due date.
   d. RCR comment resolution meeting.

NEW ACTIVITIES:

1. ---NONE---

NEXT MEETING:

1. 02/28/97, 2704HV/G???, 8:00am-4:00pm.

ACTION ITEM SUMMARY:

AGENDA

DESIGN REVIEW COMMITTEE MEETING

CHARACTERIZATION EQUIPMENT

FEBRUARY 28, 1997

MEETING MINUTES:

1. Read and approve 02/18/97 meeting minutes.

2. Read and approve 02/19/97 meeting minutes.

3. Actions to prior meeting minutes.

CONTINUING ACTIVITIES:

1. Review #DRC-97-004 (Exhauster & Interlock System design).

   a. Complete Requirements Checklist (to become Design Compliance Matrix (DCM)).

   b. RCR comment resolution meeting.

NEW ACTIVITIES:

1. ---NONE---

NEXT MEETING:

1. ---TBD---

ACTION ITEM SUMMARY:

AGENDA

DESIGN REVIEW COMMITTEE MEETING

CHARACTERIZATION EQUIPMENT

MARCH 5, 1997

MEETING MINUTES:

1. Read and approve 02/28/97 meeting minutes.

2. Actions to prior meeting minutes.

CONTINUING ACTIVITIES:

1. Review #DRC-97-004 (Exhauster & Interlock System design).

   a. Action Items.

   b. RCR comment status.

NEW ACTIVITIES:

1. Review #DRC-97-006 (ECNs resulting from Review #DRC-97-004)

   a. ECN# _____, Vacuum pump shutdown addition. Briefing, RCR comments, comment resolution.

NEXT MEETING:

1. ---TBD---

ACTION ITEM SUMMARY:

AGENDA

DESIGN REVIEW COMMITTEE MEETING

CHARACTERIZATION EQUIPMENT

MARCH 13, 1997

MEETING MINUTES:

1. Read and approve 03/05/97 meeting minutes.

2. Actions to prior meeting minutes.

CONTINUING ACTIVITIES:

1. Review #DRC-97-006 (ECNs resulting from Review #DRC-97-004)

   a. ECN# 631342, Vacuum pump shutdown addition. Complete RCR comment resolution.

   b. Design Review Checklist.

2. Review #DRC-97-004 (Exhauster & Interlock System design).

   a. Action Items.

   b. RCR comment resolution.

   c. RCR comment status.

   d. Design Compliance Matrix (DCM).

   e. Design Review Checklist.

NEW ACTIVITIES:

1. ---none---

NEXT MEETING:

1. ---TBD---

ACTION ITEM SUMMARY:

AGENDA

DESIGN REVIEW COMMITTEE MEETING

CHARACTERIZATION EQUIPMENT

MARCH 20, 1997

MEETING MINUTES:

1. Read and approve 03/13/97 meeting minutes.
2. Actions to prior meeting minutes.

CONTINUING ACTIVITIES:

1. Cognizant Design Engineer change for Exhauster System.
2. Review #DRC-97-006 (ECNs resulting from Review #DRC-97-004)
   a. ECN# 631342, Vacuum pump shutdown addition. CANCELLED.
3. Review #DRC-97-004 (Exhauster & Interlock System design).
   a. Action Items.
   b. RCR comment resolution.
   c. RCR comment status.
   d. Design Compliance Matrix (DCM).
   e. Design Review Checklist.

NEW ACTIVITIES:

1. ---none---

NEXT MEETING:

1. ---TBD---

ACTION ITEM SUMMARY:

AGENDA

DESIGN REVIEW COMMITTEE MEETING

CHARACTERIZATION EQUIPMENT

MARCH 27, 1997

MEETING MINUTES:

1. Read and approve 03/20/97 meeting minutes.
2. Actions to prior meeting minutes.

CONTINUING ACTIVITIES:

1. Meeting objectives (GP Janicek/CE Hanson)
2. Exhauster System design re-direction
   a. Path-forward overview (CE Hanson)
   b. Exh. Sys. responsible design engineer(s) designation.
   c. Re-direction details (resp. des. engr.)
3. Exhauster System open issues.
   a. DRC overview (GP Janicek)
   b. RCRs and specific issue areas (indiv. DRC members)
4. DRC review #DRC-97-004 interim activities (housekeeping)
   a. Action Items.
   b. RCR comment resolution.
   c. RCR comment status.
   d. Design Compliance Matrix (DCM).
   e. Design Review Checklist.

NEW ACTIVITIES:

1. ---none---

NEXT MEETING:

1. ---TBD---

ACTION ITEM SUMMARY:

AGENDA

DESIGN REVIEW COMMITTEE MEETING

CHARACTERIZATION EQUIPMENT

JULY 10, 1997

MEETING MINUTES:

1. Previously met on 03/27/97 - dispense with meeting minutes. Distribute previous meeting agenda, in lieu of.

CONTINUING ACTIVITIES:

1. Meeting objectives (Janicek)
2. Exhauster System design re-direction (Criddle)
   a. Authorization Basis.
   b. Design impacts.
3. Existing #DRC-97-004 RCR's.
   a. Status. (Janicek)
   b. DRC-97-004 vs. DRC-97-004a. (Criddle)
4. Review/Resolution/Approval of ECNs ~~9~~6 42940, 642941. (Daniels)
5. Review/Resolution/Approval of DRC-97-004a RCRs. (Criddle)

NEW ACTIVITIES:

1. ECNs ~~9~~6 42940, 642941 per DRC-97-004b. (see item 4 above)

NEXT MEETING:

1. ---TBD---

ACTION ITEM SUMMARY:

AGENDA

DESIGN REVIEW COMMITTEE MEETING

CHARACTERIZATION EQUIPMENT

AUGUST 7, 1997

MEETING MINUTES:

1. Previously met on 07/10/97 - dispense with meeting minutes. Distribute previous meeting agenda, in lieu of.

CONTINUING ACTIVITIES:

1. Meeting objectives - Design Review Closure (Janicek)

2. DRC-97-004a RCR's completed (Criddle)

3. Design Compliance Matrix completion (All)

4. Design Review Checklist completion (All)

NEW ACTIVITIES:

1. Design Review Report (Janicek)

NEXT MEETING:

1. ---none---

ACTION ITEM SUMMARY:

AGENDA

DESIGN REVIEW COMMITTEE MEETING

CHARACTERIZATION EQUIPMENT

SEPTEMBER 9, 1997

MEETING MINUTES:

1. Previously met on 08/07/97 - dispense with reading of meeting minutes. DSI, GP Janicek to DH Shuford on "Closure of Exhauster "C" Formal Design Review", dated 08/08/97, attached.

CONTINUING ACTIVITIES:

1. N.O.C. Status, RMCS Exhauster & SX Farm Exhauster. (Janicek)

2. Meeting objectives - Approve new ECNs. (Janicek)

3. DCM - 2nd Unapproved Draft. (Janicek)

4. Review/Resolution/Approval of ECNs, 631344,45,46.

NEW ACTIVITIES:

1. ---TBD---

NEXT MEETING:

1. ---TBD---

ACTION ITEM SUMMARY:

AGENDA

DESIGN REVIEW COMMITTEE MEETING

CHARACTERIZATION EQUIPMENT

SEPTEMBER 10, 1997

MEETING MINUTES:

1. Previously met on 09/09/97 - No minutes. Continuation of 09/09/97 DRC meeting to be documented by same set of minutes.

CONTINUING ACTIVITIES:

1. Continue review/resolution/approval of ECNs, 631344,45,46, review #DRC-97-004c. (Wilson,Kostelnik)

2. Close Design Compliance Matrix checklist for DRC-97-004c. (DRC)

NEW ACTIVITIES:

1. Review/resolution/approval of ECN 642911, review #DRC-97-004d. (Akers)

NEXT MEETING:

1. ---TBD---

ACTION ITEM SUMMARY:

AGENDA

DESIGN REVIEW COMMITTEE MEETING

CHARACTERIZATION EQUIPMENT

OCTOBER 23, 1997

MEETING MINUTES:

1. Previously met on 09/10/97 - Review/Comment Resolution for ECNs 631344,45,46, and 642911.

CONTINUING ACTIVITIES:

1. ---none---

NEW ACTIVITIES:

1. Meeting scope. (GPJ)
2. Overview of changes necessitated by "Major Stack" designation. (Criddle)
3. Exhauster "Major Stack" Mods - Review/comment resolution/approval of ECN 642928. (Akers/Wilson)
4. DCM checklist verification. (All)

NEXT MEETING:

1. ---TBD---

ACTION ITEM SUMMARY:

5.6 DESIGN REVIEW COMMITTEE MEETING MINUTES

MEETING MINUTES

Subject: Formal Design Review

TO: Distribution **BUILDING** 2704HV/G230

FROM: G. Tom Frater, 373-1627
Secretary **CHAIRMAN** G. P. Janicek, 376-2225

Department-Operation-Component	Area	Shift	Date of Meeting	Number Attending
Characterization Equipment Engineering Projects	200E	Day	February 20, 1997	7

Attendees:

M. L. McElroy	(LMHC)	S7-07	C. C. Scaief	(LMHC)	R1-56
J. A. Ranschau	(LMHC)	R1-56	T. D. Jarecki	(LMHC)	S7-03
G. T. Frater	(LMHC)	S7-16	G. P. Janicek	(LMHC)	S7-12
J. D. Robinson	(SESC)	S7-12			

Approved Meeting Minutes: [signature] 2-3-97

The meeting was called to order by George Janicek at 12:35 pm.

Meeting minutes from the previous meeting are not yet available will be reviewed and approved after they are brought in later during this meeting.

Jim Robinson is present to obtain approval signatures on direct revision ECN 639110, to WHC-SD-WM-CS-DD-020, Rev 1. George Janicek and Mike McElroy signed the ECN.

Questions presented to Jim Robinson since he was present and available to respond.
Question: Will the Allen Bradley (Vendor) variable frequency drive for the exhauster fan withstand the ambient operating conditions outside i.e. -20F to 115F at Hanford. Jim said the device is installed in a NEMA IV cabinet and is rated by the vendor for 32F to 110F. Also the exhausters with this same drive unit have already operated for several years at Hanford demonstrating successful year around service in ambient conditions. To provide further assurance for qualified operation Chuck Scaief provided a suggestion on how to qualify the device for the full temperature range with standard formulas for heat transfer available in a manufacturers catalog which Chuck named.

Discussion on whether the humidity instrument and a pressure switch are explosion proof. No actions assigned.

ACTION: Jim Robinson agreed to talk to Ron Bafus (COG) for the wording in the calibration procedure on temperature value for the WEC.

Chuck Scaief responded to an earlier action to present the conductivity value for the duct material connecting the spool piece and the tank riser. Chuck said it is drainable provided volume resistivity is less than 10^{12} ohms-sq or surface resistivity is less than 10^{12} ohms per sq as it relates to an electrical charge accumulation. Follow up action for this subject will be covered by the upcoming scheduled design review.

George presented a comment from Will Pickett. The water heater circulation pump has an apparent limitation for indoor service?

Jim Robinson said that the pump and motor are rated for outside service but the electrical power connection box is not rated for outdoor use so an ECN to fabricate a protection shield for the connection box is now in progress.

We are committed to begin the design review on the exhauster and the interlock carts. RCR comments are due to the secretary by COB on Wednesday 2-26-97. An all day design review meeting will be held on Friday 2-28-97.

A question was raised before Jim Robinson was to leave. Chuck asked how many portable exhausters exist at Hanford (like the one modified for truck #4) to be used for tank service?

Jim answered that there are 3 total exhausters in Characterization and 1 interlock that is completed. Another interlock system is planned for fabrication at H&N electric in Pasco, with some of the equipment items located at Los Alamos. Merrick is the contractor but the task is on hold pending approval/funding issues to be resolved. Of the 3 total exhausters 1 exhauster is located/on loan at 244 AR Vault.

Exhauster "A" (for truck #2) is at 244 AR Vault.
Exhauster "B" (for truck #3) is yet to be modified.
Exhauster "C" (for truck #4) is modified.

The drawings for #3 and #4 exhauster modifications are identical.

George handed out the insert pages, with changes made, for the Design Requirements list produced by Nancy Milliken. We reviewed the list starting on page 7. Revised copies will be distributed to committee members electronically.

Determined that the SEL should be reviewed separately i.e. independently of the charter we are currently adhering to. We agreed for now to accept the SEL as is and later recommend a later review.

George Janicek handed out the one page list of individual responsibilities for the upcoming design review. Changes were noted and George agreed to make them and redistribute the list Friday 2-21-97.

A discussion of the 90 MPH requirement for the exhauster stack is not in the SAD-035 but was added by engineering to protect nearby equipment in the tank farm if the exhauster should topple during a wind storm.

Read the meeting minutes from the previous meeting on 2-14-97. Marked a number of editorial changes to be made by the secretary. Will resubmit the minutes at the next meeting for approval.

Next meeting is February 28, 1997, 8 am to 4:30 pm, location per LANCAL.

Meeting was adjourned at 3:35 pm.

ATTACHMENTS (1): Attendance Roster

2-20-97
12:30/ROOM 6-230

NAME	ORG./CO.	PHONE
MICHAEL L. McELROY	CPQA/LMHC	373-5588
Jeff Ranschau	CPS/LMHC	373-4462
Tom Frater	CP Office/LMHC	3731627
Jim Robinson	SESC/CEE	6-4717
Chuck Scaief	LMHC	6-0491
JARECKI, TD	LMHC	3-5741
G. P. JANICOK	LMHC	6-2225

MEETING MINUTES

SUBJECT: Formal Design Review Briefing

Approved Minutes

TO: Distribution		BUILDING 2704HV/G-133		
FROM: G. T. Frater, Secretary		CHAIRMAN G. P. Janicek		
DEPARTMENT-OPERATION-COMPONENT Characterization Equipment Engineering Projects	AREA 200E	SHIFT Day	DATE OF MEETING February 28, 1997	NUMBER ATTENDING 8

Attendees (DRC members [*]):

D. C. Board, LMHC	373-5191	*T. D. Jarecki, LMHC	373-9741
*J. M. Dormant, NHC	372-8071	*J. A. Ranschau, LMHC	373-4462
*G. T. Frater, LMHC	373-1627	J. D. Robinson, SESC	376-4777
*G. P. Janicek, LMHC	376-2225	*C. C. Scaief, III, LMHC	376-0491

Members absent: J. R. Kriskovich, M. L. McElroy, N. J. Milliken

The meeting was called to order by George Janicek at 8:10 am. The agenda for today's meeting was distributed.

1. Handed out the meeting minutes from previous meetings, 2-18-97 and 2-19-97, for review and approval. Meeting minutes from 2-18-97 were approved with comments and the minutes from 2-19-97 were approved as written.

2. Handed out a copy of the Excel file for a draft "Design Compliance Matrix" titled DCM-Exhauster System. This is a checklist developed to meet one of the recommendations from the Review of Characterization Engineering, Hydrogen Exhauster Interlock System Design Process Final Report. This matrix will ensure each requirement is addressed and will document the evidence that each item was reviewed.

3. We went through each numbered item on the matrix and assigned closure responsibility. Two of the matrix columns, "Engineering Evaluation Description" and "Verified By", will document how each criteria was met or how the condition or requirement is achieved.

4. Assigned each item to a responsible primary person. Those assignments will be added to the Excel table by George Janicek.

5. Decided to have, as a minimum, a primary and secondary name responsible for each requirement.

6. Jim Robinson was asked to get a copy of DOE Order 6430.1A interpretation letter for the file. This is an interpretation to exclude the design from DOE Order 6430.1A requirements as not applying to the portable exhauster design. Jim brought a copy of the letter to the meeting after the first break.

7. Jim Robinson's presentation, "RCR Comments and Preliminary Resolution"

   First topic: Flame Arresters, purpose is to bring the committee up to date. Air Monitor Corporation (CVI) drawing system schematic shown on overhead.

   Vacuum pumps and 2 pressure switches (NFPA 69) are unprotected.

   Chuck Scaief made a suggestion to add a block or isolation valve ahead of the vacuum pump tubing to serve as a barrier. Jim Robinson will pursue (liked the idea).

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MEETING MINUTES (Continued)

Started RCR comments and proposed resolution:

1. Jeff Ranschau
   Note: Comment #3, Jeff is to add the source of information that led to making the comment i.e. the source of the requirements

2. George Janicek comments
   Discussion notations made by Jim Robinson; will be dispositioned.

3. Mike McElroy
   Could not disposition #1; need further information (Don Board representing QA; Mike McElroy was not present.).

4. Tom Frater comments
   Note: FDC addresses the tank contaminants, see appendix.

5. Chuck Scaief comments; will be dispositioned.
   General Comments" listing, no need to respond by the DRC. For information, will include in the Design Review Report.

6. Ted Jarecki comments; will be dispositioned.

7. Nancy Milliken comments (Nancy not present today.)
   Jim Robinson to meet with Nancy Milliken to resolve comments since some of them require her participation. Jim to share the comments with Jim Kriskovich, for his input and participation.

8. Jean Marc Dormant comments; will be dispositioned.

If variable frequency drive is subject to operating conditions in a non-conditioned enclosure exceeding the recommended vendor operating range, it could fail. Rewrite the RCR comment to ask this question. ACTION: Jean Marc Dormant is to submit this rewritten RCR comment. Jim would like a list (or help with identifying activities or actions resulting from the Design Review to be labeled as "pre-start" or "post-start." Specifically, Jim Robinson asks for help with doing so. George Janicek says not our call; however, previous direction from Rick Raymond has been all activities are "pre-start" until otherwise directed.
ACTION: Jim Robinson is to obtain single point failure analysis to Chuck Scaief and Tom Frater
ACTION: Jim Robinson to obtain CVI drawings, CVI #22660 specifically flow diagrams for items in contact with exhauster gas flow.
ACTION: Ted Jarecki is to obtain a copy of the OTP.
Jim Robinson needs 1 full day following receipt of RCR comments to properly address them.

George Janicek to DRC, ACTION: ALL committee members
Send comments as they are generated in groups, i.e. several, to minimize the impact on Jim Robinson by Wednesday of next week 3-5-97.

George Janicek asked each member to determine the number of actual hours to complete the overall review and a calendar date for completion.
ECNs pending review:

- Spool piece
- Drawing changes for clarification (not required)
- Block valve flow from vacuum pumps

George Janicek adjourned the meeting at 1:45 p.m.
Attached is a list of hours to complete and the completion date.

ATTACHMENT to Meeting Minutes, February 28, 1997

Formal Design Review Briefing

MEETING MINUTES

SUBJECT: Formal Design Review Briefing — Approved Minutes X

TO: Distribution		BUILDING 2704HV/G-131		
FROM: G. T. Frater, Secretary		CHAIRMAN G. P. Janicek		
DEPARTMENT-OPERATION-COMPONENT	AREA	SHIFT	DATE OF MEETING	NUMBER ATTENDING
Characterization Equipment Engineering Projects	200E	Day	March 5, 1997	7

Attendees (DRC members [*]):

*J. M. Dormant, NHC	372-8071	*M. L. McElroy, LMHC	373-5588
*G. T. Frater, LMHC	373-1627	J. D. Robinson, SESC	376-4777
*G. P. Janicek, LMHC	376-2225	E. J. Waldo, NHC	373-4065
*T. D. Jarecki, LMHC	373-9741		

Members absent: J. R. Kriskovich, N. J. Milliken, J. A. Ranschau, C. C. Scaief, III

The meeting was called to order by George Janicek at 1:10 p.m.

Handed out the agenda for this meeting, along with a copy of the meeting minutes from the previous meeting on 2-28-97 for review and approval.

1. Jim Robinson began by showing the schematic flow diagram for the record sample pumps and associated interconnections and controls on the overhead projector. Provided a brief system description and answered questions.

2. Handed out copies of the ECN to modify the system shutdown signal. Continued by paging through the ECN describing the changes made to accomplish vacuum pump shutdown when the interlock carts trip the sampling trucks. Decided the review of the ECN needs to be conducted after this meeting. It is too complex for a full review during the meeting.

3. Suggested the ECN approval designator be changed to ESQ from SQ. This will ensure no future questions or uncertainty whether Environmental was aware of the change to shutdown the record sample pumps.

4. Copy of the OTP was provided. Ted Jarecki action from 2-28-97 meeting completed. OTP was delivered to Chuck Scaief prior to this meeting.

Minutes from the 2-28-97 briefing were reviewed and approved with comments.

Jim Robinson provided the ECN number 631342 (See item #2) for the ECN written by George Vargo to de-energize the vacuum pumps.

<u>Previous Action Items</u>:

1. Rewrite the RCR comment to ask the question, "If the variable frequency drive is subject to operating conditions in a non-conditioned enclosure exceeding the recommended vendor operating range, could it fail?
   ACTIONEE(S): Jean Marc Dormant

2. Provide single point failure analysis and get copies to Chuck Scaief and Tom Frater. ACTIONEE(S): Jim Robinson

3. Provide CVI drawings to Ted Jarecki and to Chuck Scaief; CVI #22660 specifically, flow diagrams for items in contact with exhauster gas flow.
   ACTIONEE(S): Jim Robinson

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MEETING MINUTES (Continued)

Previous Action Items (cont.):

4. Provide a copy of the OTP.
   ACTIONEE(S): Ted Jarecki DUE DATE: COMPLETE

5. Send comments as they are generated in groups, i.e. several comments. Don't hold all comments until the last day in order to minimize the impact on Jim Robinson.
   ACTIONEE(S): All committee members DUE DATE: 3/5/97

6. George Janicek asked each committee member to determine the number of actual hours to complete the overall review and a calendar date for completion.

New Action Items:

Reminder from George Janicek to complete remaining open action items from the 2/28/97 meeting.
ACTIONEE(S): Committee members with listed actions.

Next Meeting: TBD

Meeting adjourned at 2:01 p.m.

MEETING MINUTES

SUBJECT: Formal Design Review Meeting — Approved Minutes

TO:	BUILDING
Distribution	2704HV/G-133
FROM:	**CHAIRMAN**
G. T. Frater, Secretary	G. P. Janicek

DEPARTMENT-OPERATION-COMPONENT	AREA	SHIFT	DATE OF MEETING	NUMBER ATTENDING
Characterization Equipment Engineering Projects	200E	Day	March 13, 1997	8

Attendees (DRC members [*]):

*J. M. Dormant	NHC	372-8071	*M. L. McElroy	LMHC	373-5588
*G. T. Frater	LMHC	373-1627	*J. A. Ranschau	LMHC	373-4462
*G. P. Janicek	LMHC	376-2225	J. D. Robinson	SESC	376-4777
*T. D. Jarecki	LMHC	373-9741	E. J. Waldo	NHC	373-4065

Members absent: J. R. Kriskovich, N. J. Milliken, C. C. Scaief, III

The meeting was called to order by George Janicek at 9:07 a.m.

Handed out the agenda for this meeting.

Meeting Minutes from the March 5, 1997 Formal Design Review Briefing were distributed for review and approval, along with a copy of the Design Compliance Matrix - Exhauster System.

The Minutes from March 5, 1997 were approved with comments.

We started by reviewing the RCR comments for ECN 631342, "Flammable Gas Interlock Modifications.

- Reviewed comments from Mike McElroy and Tom Frater; comments were accepted; will disposition.
- Reviewed and accepted comments from Jeff Ranschau.

Jim Robinson did not have overheads of comments from Ted Jarecki and George Janicek. We paused the meeting to have these made.

The overheads were made; Jim proceeded.

- Reviewed Ted Jarecki's comments. Cannot answer RCR comment number 5. Need to review with Carl Hanson. The WHC-SD-WM-SAD-035, Rev. 0a, Appendix B conditions were not met. We will evaluate and disposition all other comments as described.
- Eric Waldo was requested to present an RCR comment sheet for his comments. The committee is willing to accept comments from non-members.
- Reviewed George Janicek RCRs. Comments were accepted; will disposition.
- Jim Robinson is to verify which USQ is the correct one. USQ 0183 is not correct.
- George Janicek asked each member for his opinion on how to handle the design review checklist. Specifically, should we treat ongoing ECNs separately from the overall checklist? There was some limited discussion. No decision or consensus was made.
- Jim Robinson stated the ECN 631342, "Flammable Gas Interlock Modifications," is not ready. We plan to make all corrections ready to release it, but hold it until the decision is made whether this approach (ECN 631342) is the correct alternative.

MEETING MINUTES (Continued)

New Action Items:

1. Send a copy of all RCR comments to the members that could not be present for this meeting.
   ACTIONEE(S): Tom Frater DUE DATE:

2. Provide the ECN for the overall water heater system to the committee.
   ACTIONEE(S): Jim Robinson DUE DATE:

Meeting adjourned at 11:45 a.m.

Next meeting: TBD

Attachment: Design Compliance Matrix - Exhauster System

MEETING MINUTES

SUBJECT: Formal Design Review Meeting

Approved Minutes

TO:	BUILDING
Distribution	2704HV/G-108A
FROM:	CHAIRMAN
G. T. Frater, Secretary	G. P. Janicek

DEPARTMENT-OPERATION-COMPONENT	AREA	SHIFT	DATE OF MEETING	NUMBER ATTENDING
Characterization Equipment Engineering Projects	200E	Day	March 20, 1997	11

Attendees (DRC members [*]):

*J. M. Dormant	NHC	372-8071	*J. A. Ranschau	LMHC	373-4462
*G. T. Frater	LMHC	373-1627	J. D. Robinson	SESC	376-4777
*G. P. Janicek	LMHC	376-2225	*C. C. Scaief	LMHC	376-0491
*J. R. Kriskovich	LMHC	373-9741	G. T. Vargo	SESC	376-5387
*M. L. McElroy	LMHC	373-5588	E. J. Waldo	NHC	373-4065
*N. J. Milliken	DESH	376-7846			

Members absent: T. D. Jarecki

The meeting was called to order by George Janicek at 1:04 p.m.

Handed out the agenda for this meeting and Meeting Minutes from the last meeting on March 13, 1997 for review and approval.

Meeting Minutes from the March 13, 1997 Formal Design Review Briefing were approved with one change as a result of the departure of Jim Robinson to a new job offsite. Action item #2 (See "New Action Items") is to be reassigned to Will Pickett.

Continuing Activities

Item 1: Jim Robinson stated that George Vargo is to assume some of his immediate responsibilities, eg., the ECN for the short term fix for the vacuum pumps that collect the record samples from the stack. Another ECN is on its way for review: change the water heater to a vertical orientation to match vendor's mounting recommendations. The water heater is located on the exhauster to preheat vapor stream passing through the exhauster HEPA filters.

Item 2: The ECN 631342, "Flammable Gas Interlock Modifications" design has been cancelled. To be replaced with a new approach with ECN under development by George Vargo with an estimated 90-day completion schedule.

Item 3: Review DRC-97-004 (Exhauster and Interlock System Design)

a. Reviewed Action Items due.

b. Discussed RCR Comment resolution.
Read some comments from Jeff Ranschau.
Read comments from Tom Frater.
Motor bearings are factory sealed. Calculations for wire sizing, in particular, the fan motor, including in-rush current sized properly. Jim Robinson said no codes but field measurements made are 22, 15, 22 amps each leg, as of the field trip on August 1996. Tom Frater asked about request for NEC code inspections. Jim realized he was working from an old version of the RCR. Need to get the current revision.

Reviewed Nancy's comments. Seven of twelve are closed and 5 remain open.

Reviewed Jim Kriskovich RCR Comments. Discussion on interpretation of referenced documentation.

MEETING MINUTES (Continued)

George Janicek stated that he wants to close all possible RCR comments that each author and cog engineer Jim Robinson agree on. The question was asked, "Who will be responsible to close the remaining open items?" Jim Robinson said he will talk to Carl Hanson about this assignment and will make a copy of all his (Jim Robinson's) responses to RCR comments and forward to Tom Frater before he leaves the company.

Agreed we cannot yet close out the design review.
Jim Robinson made changes to some RCR comment resolutions. Presented these to the originators in order to close out the items that are in agreement.

Each member with remaining open RCR items will add any notations and send electronic copies to Tom Frater.

Previous Action Items:

1. Provide CVI drawings to Ted Jarecki and to Chuck Scaief; CVI #22660 specifically, flow diagrams for items in contact with exhauster gas flow.
   ACTIONEE(S): Jim Robinson DUE DATE: COMPLETED

2. Provide a copy of the OTP.
   ACTIONEE(S): Ted Jarecki DUE DATE: COMPLETED

3. Rewrite the RCR comment to ask the question, "If the variable frequency drive is subject to Hanford operating conditions, installed a non-conditioned enclosure exceeding the recommended vendor operating range, could it fail?
   ACTIONEE(S): Jean Marc Dormant

4. Provide single point failure analysis and get copies to Chuck Scaief and Tom Frater. ACTIONEE(S): Jim Robinson

5. Send comments as they are generated in groups, i.e. several comments. Don't hold all comments until the last day in order to minimize the impact on Jim Robinson.
   ACTIONEE(S): All committee members

6. George Janicek asked each committee member to determine the number of actual hours to complete the overall review and a calendar date for completion. This was obtained per telecon. ACTIONEE(S): All committee members

7. Reminder from George Janicek to complete remaining open action items from the 2/28/97 meeting. ACTIONEE(S): Committee members with listed actions.

8. Send a copy of all RCR comments to the members that could not be present for this meeting.
   ACTIONEE(S): Tom Frater DUE DATE:

9. Provide the ECN for the overall water heater system to the committee.
   ACTIONEE(S): Jim Robinson DUE DATE:

New Action Items:

None

Next meeting: TBD

MEETING MINUTES

SUBJECT: Formal Design Review Meeting — Approved Minutes _____

TO:	BUILDING
Distribution	2704HV/G-108A
FROM:	**CHAIRMAN**
G. T. Frater, Secretary	G. P. Janicek

DEPARTMENT-OPERATION-COMPONENT	AREA	SHIFT	DATE OF MEETING	NUMBER ATTENDING
Characterization Equipment Engineering Projects	200E	Day	March 27, 1997	15

Attendees (DRC members [*]):

R. R. Bafus	NHC	373-1741	C. G. Linschooten	NHC	373-1617
J. E. Daniels	NHC	372-0402	*M. L. McElroy	LMHC	373-5588
*J. M. Dormant	NHC	372-8071	*W. W. Pickett	FDNW	372-1151
*G. T. Frater	LMHC	373-1627	*J. A. Ranschau	LMHC	376-4462
*G. P. Janicek	LMHC	376-2225	*C. C. Scaief	LMHC	376-0491
*T. D. Jarecki	LMHC	373-5741	G. T. Vargo	SESC	376-5387
B. R. Johns	SESC	373-3429	E. J. Waldo	NHC	373-4065
*J. R. Kriskovich	LMHC	376-3616			

Members absent: N. J. Milliken
M. S. Hendrix was invited; yet, she was unable to attend.

The meeting was called to order by George Janicek at 1:04 p.m.

Handed out the agenda for this meeting and held the Meeting Minutes from the last meeting on March 20, 1997 until the end of this meeting, for review and approval.

During today's meeting, we will have a presentation of the new approach to the design issues in the form of an "information exchange" (i.e. between design team and DRC) for the permanent or long-term fix.

Carl Hanson was here to brief the DRC on the path forward for the exhauster and interlock carts.

Carl said they have dropped short-term vs. long-term fix since the two approaches were becoming indistinguishable.

Carl presented the approach to Rick Raymond on Friday, March 21, 97, to Mike Payne and Fran DeLozier on Tuesday, March 25, 1997, to DOE, and to Linc Hall on Friday, March 28, 1997.

Some of the planned concepts include creating 2 cabinets--one with qualified components and the other not having qualified components.

Eliminate the spool section. Locate flammable gas detectors inside a cabinet.

Eliminate "hot dog carts" and instead locate the PLC from carts and place in the non-qualified cabinet.

Design responsibility has been assigned to Jeff Smalley, Jim Criddle, and George Vargo.

Plan to proceed with this design under a "development control" approach, per procedure.

Meeting Minutes from the March 13, 1997 Formal Design Review Briefing were reviewed and accepted with no comments.

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MEETING MINUTES (Continued)

Remaining individuals that owe their final and best RCRs with disposition "accepted" or "not accepted" are Jim Kriskovich and Jeff Ranschau.

Plan to publish an interim status for the design review committee, representing where we are as of this juncture.

Committee remains intact with all existing members. We will be "on hold" pending a decision on which direction the design team will proceed. There are several alternatives under consideration.

Meeting adjourned at 2:28 p.m.

New Action Items:

Send copies of Ted Jarecki RCRs to each of the design engineers present (9): R. R. Bafus (didn't keep), J. D. Criddle, Jr., J. E. Daniels, B. R. Johns, A. J. Kostelnik, C. G. Linschooten, J. L. Smalley, G. F. Vargo, and E. J. Waldo.
ACTIONEE(S): Tom Frater

Previous Action Items:

1. Rewrite the RCR comment to ask the question, "If the variable frequency drive is subject to Hanford operating conditions, installed a non-conditioned enclosure exceeding the recommended vendor operating range, could it fail?
   ACTIONEE(S): Jean Marc Dormant DATE DUE: COMPLETED

2. Provide single point failure analysis and get copies to Chuck Scaief and Tom Frater. ACTIONEE(S): George Vargo

3. Send a copy of all RCR comments to the members that could not be present for this meeting.
   ACTIONEE(S): Tom Frater DUE DATE: COMPLETED

4. Provide the ECN for the overall water heater system to the committee.
   ACTIONEE(S): Jim Robinson DUE DATE: ON HOLD

Next meeting: TBD

MEETING MINUTES

SUBJECT: Authorization Basis/Safety Equipment List/Commercial Grade Item Reconciliation for Flammable Gas RMCS Truck #4/Exhauster "C" Operation

TO:	BUILDING
Distribution	2704HV/A108
FROM:	**CHAIRMAN**
G. P. Janicek, 376-2225	G. P. Janicek, 376-2225

DEPARTMENT-OPERATION-COMPONENT	AREA	SHIFT	DATE OF MEETING	NUMBER ATTENDING
Characterization Project Characterization Engineering	200E	Day	August 14, 1997	6

DISTRIBUTION:

R. M. Boger	S7-12	M. L. McElroy	S7-07
C. B. Bryan	S7-01	J. A. Ranschau	S7-07
J. E. Corbett	S7-01	R. E. Raymond	S7-12
J. D. Criddle	S7-12	J. S. Schofield	S7-12
T. D. Jarecki	S7-03	D. H. Shuford	S7-01
A. J. Kostelnik	S7-12	J. L. Smalley	S7-12
J. R. Kriskovich	R1-56	GPJ File/ AB/SEL/CGI.MIN	

ATTENDEES:

J. D. Criddle (SESC)	S7-12
G. P. Janicek (LMHC)	S7-12
A. J. Kostelnik (SESC)	S7-12
M. L. McElroy (LMHC)	S7-07
J. A. Ranschau (LMHC)	S7-07
J. L. Smalley (SESC)	S7-12

Meeting scheduled by GP Janicek (meeting notice attached). Meeting convened at 8:40 am.

MEETING PURPOSE

The purpose of the meeting was to reconcile that the revised AB controls were fully design implemented by a necessary and sufficient set of safety SSCs as identified in the new SEL, and had proper CGI dedication documentation. Reconciliation was planned and felt to be necessary due to the fact that the three activities of AB changes, SEL revision (new), and CGI documentation are normally performed in series, but, in this instance had been performed, in the interest of schedule, in parallel.

PROCESS

The first item of business was to decide on the process to use for determining AB/SEL/CGI reconciliation. The group consensus was to not rely on individuals having performed their respective tasks correctly, although in parallel, even though little changed between inception and completion of tasks in AB understanding. Instead, it was decided to walk through the actual AB changes, the old and new SEL, and the old and new documentation of commercial grade items for the designated set of safety SSCs.

The documents examined, and the process used, is depicted in the attached diagram:

The old AB, SAD-035 (LANL), was used to revise SEL-032, and the CGI dedication/classification for these safety SSCs was accomplished through a combination of closed NCRs and safety class procurements PRs. The process assumed that these previous documents were, themselves, fully reconciled.

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MEETING MINUTES (Continued)

- ECN revised the AB from SAD-035 (LANL) in its entirety to SAD-035 (LMHC), OSR-005, BIO/JCO, and TSR-006. The process assumed that the BIO/JCO was frozen as of the meeting date.

  SEL-044 consists of a combination of new safety SSCs derived from the new AB plus a residual set of safety SSCs identified in SEL-032 representing the non-flammable gas controls originally derived from SAD-035. Some controls which could not be implemented directly were determined to be met or have equivalency by FGEAB rulings.

  Out of the four documents establishing the new AB, only TSR-006 does not drive safety SSC classification in SEL-044.

  The full set of safety SSCs requiring new CGI dedication/classification consists of a portion of the previous NCR'd items and new items derived from SEL-044 directly. Thus, for RMCS Truck #4, the set of items originally procured as Safety Class, the set of NCR's remaining after some have been converted to CGIs, together with the new CGIs encompass the full set of safety SSCs identified in SEL-044.

  The four documents comprising the new AB also generate SLs, LCOs, and ACs which must be picked up in operations procedures and maintenance procedures. It was assumed that the AB Compliance Matrix preparation activity adequately addressed and reconciled operating procedures and procedure revisions required. Maintenance procedures, specifically calibration procedures (PMs) were reconciled within this process.

ACTIONS ASSIGNED (see attached diagram)

RANSCHAU - Compare ECN to SEL-032. Determine discarded and residual portions of SEL-032. Reconcile residual portion of SEL-032 and FGEAB reports with new SEL-044.

CRIDDLE - Reconcile ECN/OSR-005 with FGEAB reports and SEL-044.

SMALLEY, KOSTELNIK, CRIDDLE - Reconcile ECN/SAD/BIO/JCO with FGEAB reports and SEL-044.

JARECKI - Reconcile SEL-044 with PMs.

McELROY, JANICEK - Reconcile NCRs/PRs/CGIs with SEL-044.

NEXT MEETING

Attendees were requested to reconvene at 3:00 pm to ascertain action item status.

Initial meeting session adjourned at 10:15 am.

3:00 PM SESSION (08/14/97)

Meeting reconvened at 3:00 pm. Previous session attendees all present. Process diagram revised slightly to that depicted in attachment and described previously. Individual actions statused. Actions incomplete. Will reconvene tommorrow at 11:00 am.

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MEETING MINUTES (Continued)

3:00 pm session adjourned at 4:00 pm. [Chairman's note: JARECKI informed of action item following this session]

11:00 AM SESSION (08/15/97)

Meeting reconvened at 11:00 am. Previous session attendees all present, except A. J. Kostelnik and M. L. McElroy. J. R. Kriskovich attended briefly. J. E. Corbett attended for T. D. Jarecki.

Ranschau had list of open items needing clarification, which Smalley satisfactorily addressed. Attendees individually described and statused their action items. Some indiduals were asked to submit [for file purposes] reconciliation backup material (Ranschau, Corbett, Janicek). Agreement of all present that AB/SEL/CGI was satisfactorily reconciled.

11:00 am session adjourned at 12:00 noon.

REFERENCES

SAD-035 WHC-SD-WM-SAD-035, A SAFETY ASSESSMENT OF ROTARY-MODE CORE SAMPLING IN FLAMMABLE-GAS SINGLE SHELL TANKS: HANFORD SITE, RICHLAND WASHINGTON.

OSR-005 WHC-SD-WM-OSR-005, REV OG, SINGLE SHELL TANK INTERIM INTERIM OPERATIONAL SAFETY REQUIREMENTS.

BIO/JCO WHC-SD-WM-BIO-001, REV G, TANK WASTE REMEDIATION SYSTEM BASIS FOR INTERIM OPERATION.

TSR-006 WHC-SD-WM-TSR-006, REV J, TANK WASTE REMEDIATION SYSTEM TECHNICAL SAFETY REQUIREMENTS.

ECN ECN #173679, ROTARY MODE CORE SAMPLING AUTHORIZATION BASIS AMENDMENT, 08/08/97.

SEL-032 WHC-SD-WM-SEL-032, ROTARY MODE CORE SAMPLING SAFETY EQUIPMENT LIST, 1994.

SEL-044 WHC-SD-WM-SEL-044, REV 0, A SAFETY EQUIPMENT LIST FOR ROTARY MODE CORE SAMPLING SYSTEMS OPERATION IN SINGLE SHELL FLAMMABLE GAS TANKS, 1997.

Author: Lisa R Montague at ~CCHIG001
Date: 8/13/97 1:25 PM
Priority: Normal
TO: James D Jr (Jim) Criddle at ~HANFORD10D
TO: George P Janicek at ~HANFORD10D
TO: Theodore D Jarecki at ~HANFORD11E
TO: Alois J (Al) Kostelnik at ~HANFORD10D
TO: James R Kriskovich at ~HANFORD05B
TO: Michael L McElroy at ~HANFORD11A
TO: Lisa R Montague at ~HANFORD11E
TO: J A (Jeff) Ranschau at ~HANFORD10C
TO: John S Schofield at ~HANFORD11E
TO: Jeffory L Smalley at ~HANFORD10D
Subject: Reschedule: 08/14/1997, 8:30a-10:00a

---------- Message Contents ----------

*** THE FOLLOWING MEETING HAS BEEN RESCHEDULED ***

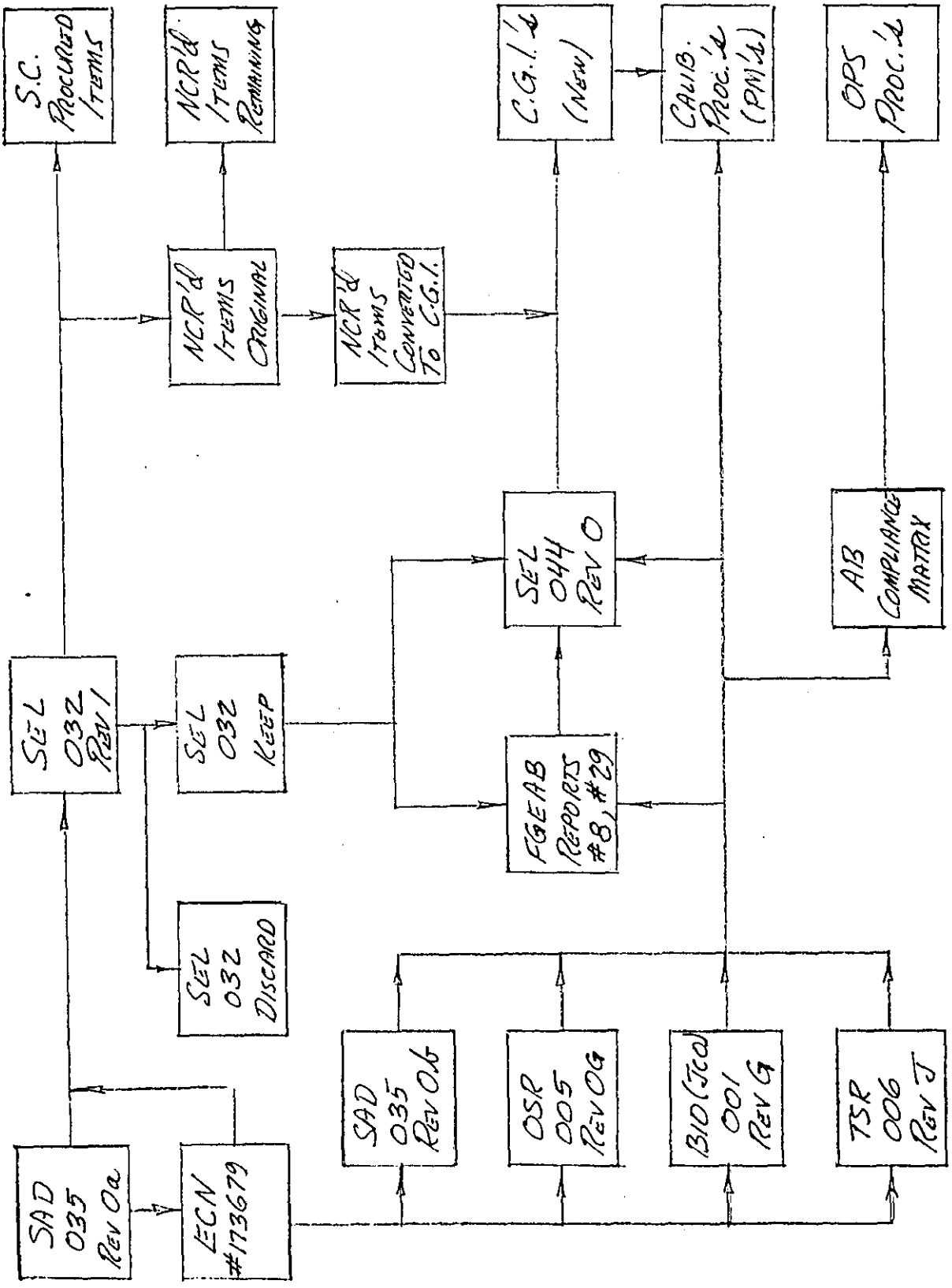
Old Time: Wednesday August 13, 1997, 8:30am-10:00am
New Time: Thursday August 14, 1997, 8:30am-10:00am

Description: AB/SEL/CGI RECONCILATION MEETING
2704HV/G108B
POC: George Janicek 6-2225/Lisa 3-5508

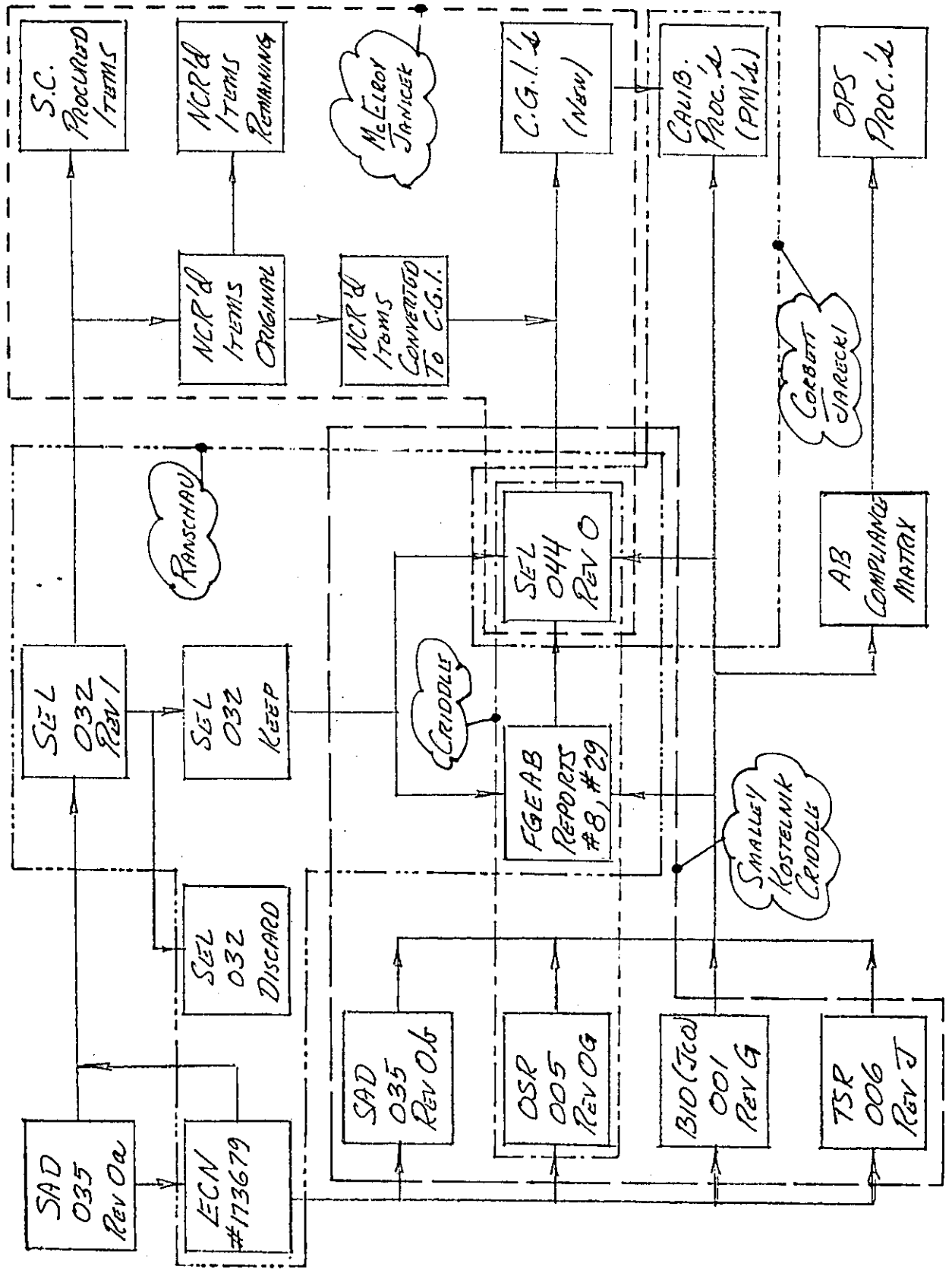
Scheduled by: Raymond, Richard E (LRM)

Canceled by: Montague, Lisa R
August 13, 1997, 1:24pm

Attendees: Criddle, James D Jr (Jim)
Janicek, George P
Jarecki, Theodore D
Kostelnik, Alois J (Al)
Kriskovich, James R
McElroy, Michael L
Montague, Lisa R
Ranschau, J A (Jeff)
Raymond, Richard E
notice sent to Montague, Lisa R
Schofield, John S
Smalley, Jeffory L



PROCESS FLOW DIAGRAM



RECONCILIATION ASSIGNMENTS

MEETING MINUTES

SUBJECT: EXHAUSTER "C" MODIFICATIONS DESIGN REVIEW - ECNs 631344, 631345, 631346

TO:	BUILDING
Distribution	2704HV
FROM:	CHAIRMAN
G. P. Janicek	G. P. Janicek, 376-2225

DEPARTMENT-OPERATION-COMPONENT	AREA	SHIFT	DATE OF MEETING	NUMBER ATTENDING
Characterization Project Characterization Engineering	200E	Day	September 9, 1997	8

DISTRIBUTION:

*J. Dormant	R3-47	C. E. Hanson	S7-12
*G. P. Janicek	S7-12	*T. D. Jarecki	S7-03
A. J. Kostelnik	S7-12	*J. R. Kriskovich	R1-56
*M. L. McElroy	S7-07	*N. J. Milliken	R1-43
*J. A. Ranschau	S7-07	*C. C. Scaief	R1-56
G. W. Wilson	S7-12		

* denotes Design Review Committee (DRC) member

Initial formal design review meeting convened, Tuesday, 09/09/97, at 7:30 a.m., 2750E/A229. All DRC members present. G. W. Wilson, requested to attend and lead DRC members through the ECNs presented for review, originally indicated he would be late, but in the end was not able to attend.

Subject of the review was three ECNs, #631344, #631345, and #631346 all intended to enable modification of the RMCS Exhauster "C" to bring it into compliance with ANSI N509/N510 requirements for two-stage, individually testable HEPA filters.

Chairman advised DRC members that at our previous meeting (08/07/97) we had officilly believed our review of the RMCS Exhauster to be closed and the Chairman had so informed Characterization Project Operations (D. H. Shuford). However, the N.O.C. for RMCS operation was approved, but with eighteen conditions, which requires (among other things) that the exhauster fully comply with N509/N510 and that the exhauster stack be upgraded from a "minor" designation to a "major" designation. The latter requirement will necessitate additonal ECN modifications and be the subject of DRC review at a later date.

In the absence of G. W. Wilson the DRC walked through the ECNs at hand and in the process generated a list of questions and RCR comments to be submitted to Wilson and Kostelnik. A followup meeting of the DRC was scheduled for the next afternoon. Scaief indicated he would not be able to attend. Meeting adjourned at 9:30 a.m.

09/10/97

Design review meeting reconvened at 2:30 p.m. All DRC members present except Dormant and Scaief. Cognizant design engineers Wilson (ECNs 631344 and 631345), Kostelnik (ECN 631346), Akers (ECN 642911 [subsequently replaced by ECN 640442]) present to lead respective ECN review and comment resolution.

NOTE: ECN 642911 (Akers) added to review items. This ECN changed the waste tank pressure switch previously approved by the DRC (Review #DRC-97-004b) for RMCS operation in SX farm (actively ventilated) to a model with a wider ambient temperature operating range, but without local pressure indication.

A-3000-480 (10/94) GEF011

MEETING MINUTES (Continued)

DRC members submitted RCR comments to Wilson/Kostelnik based on previous day's review. Additional comments were generated and submitted in writing at the meeting. Disposition to all comments was agreed to between submitters and cog design engineers. For the Wilson/Kostelnik ECNs, 37 comments were submitted by the DRC and 6 by the cog design engineers themselves.

Akers walked through ECN 642911, and hand recorded DRC comments with agreed-to dispositions on a blank RCR form. Sixteen comments were so submitted and dispositioned.

NOTE: A number of RCR comments had to do with the mechanics of the ECN form itself, a few had to with wording in the USQ accompanying the ECNs.

The cog design engineers agreed to make the necessary ECN changes and get back with the DRC for RCR comment closure by Friday (09/12/97).

Meeting adjourned at 5:15 p.m.

09/16/97

Akers able to meet with each DRC member submitting comments and obtain comment closure approval. All closed RCR comments are compiled on a single RCR form designated as Review No. DRC-97-004d. Due to the large number of comments and inability to make all changes on the original ECN form numbered 642911, the ECN was redone as ECN #640442. ECN #640442 was issued this date.

RCR comment closure for ECNs 632344,45, and 46 still require Kriskovich and Ranschau approval. Neither was available this date.

09/17/97

xxx

A-3000-480 (10/94) GEF011

5.7 DESIGN REVIEW CLOSURE CORRESPONDENCE W/BACKUP DATA

DON'T SAY IT --- *Write It!*

DATE: 08/08/97

TO: DH Shuford S7-01

FROM: GP Janicek S7-12
Telephone: 376-2225

cc: CB Bryan S7-01
RE Raymond S7-12
GPJ File/LB

SUBJECT: Closure of Exhauster "C" Formal Design Review

The purpose of this DSI is to inform you that the Design Review Committee (DRC) has completed its formal design review of Exhauster "C" Safety SSCs, based upon changes being made to the Authorization Basis (AB) for Rotary Mode Core Sampling (RMCS) operation as defined by ECN# 173679. A few punchlist items remain to be fulfilled, however, prior to exhauster "C" being able to be used for flammable gas RMCS operation, and are enumerated herein.

It is appropriate that the scope of the DRC review be understood. The DRC was initially commissioned to conduct design verification activities on the Hydrogen Exhauster Interlock System (HEIS) with "particular emphasis on Safety Class systems, structures, and components and their performance requirements." The scope was later extended to the complete exhauster system, and subsequent to that the HEIS was eliminated as a consequence of the AB change. The DRC added Safety Significant SSCs to its scope in the course of conducting its review. The review scope did not, and does not, include SSCs classified as General Service.

The DRC closed all member RCR comments as of 07/29/97. A final verification of the exhauster safety SSCs design against the Design Compliance Matrix (DCM), in effect the design review checklist for the review, was initiated at a meeting of the DRC on 08/07/97 and was completed (initialed by responsible DRC members) this morning.

PUNCHLIST ITEMS: (categorical)

1. The DCM used to conduct the review is a draft document. The DCM for the exhauster will require review/approval/issuance and a subsequent reconciliation check with the draft DCM used during review.

2. The draft DCM is predicated on compliance with N509/N510 or with the current N.O.C. The current design complies with neither. Reconciliation requires that the exhauster design be in compliance with one or the other.

3. Procedures used for operation/calibration must reflect control limits established in requirements documents. DCM to AB Compliance Matrix reconciliation check required.

4. Multiple errors noted in draft DCM with regard to source references and design attributes. These will need to be corrected in approved/issued DCM (for exhauster).

A-3000-723 (01/95) GEF014

DON'T SAY IT --- *Write It!*

DATE: 11/13/97

TO: DH Shuford S7-01

FROM: GP Janicek S7-12

Telephone: 376-2225

cc: RM Boger S7-12
RS Popielarczyk S7-01
GPJ File:DRC-SXPS.DSI

SUBJECT: Closure of Formal Design Review for RMCS Deployment in SX Farm

The purpose of this DSI is to inform you that, although the formal design review conducted by the Design Review Committee for the RMCS portable exhausters has not been formally closed (owing to required document reconciliations), it **IS CLOSED** with respect to safety SSCs required for RMCS deployment in SX Tank Farm.

Sampling operations in SX Farm tanks, being actively ventilated, does not require a portable exhauster. Instead, a Safety Class PRESSURE SWITCH (PS) is utilized to monitor tank pressure and cause shutdown of RMCS operations if necessary. This PS underwent formal design review as part of the same review for the portable exhauster, but as a separate activity (Review DRC-004d of ECN# 640442 and 640499). All Review Comment Record (RCR) items have been satisfactorily addressed and closed. There are no outstanding checklist items constraining use of the PS.

For your information, Work Package ES-97-501 was supposed to calibrate two pressure switches for eventual RMCS use in SX Farm. As of this date, I have only seen, and partially closed the CGI form in that WP, for one of those units, i.e., pressure switch VTP-PS-2203-A.

A-3000-723 (01/95) GEF014

Janicek, George P

From: Jeffery C Akers
Sent: Friday, September 12, 1997 4:32 PM
To: George P Janicek; Carl E Hanson
Subject: Report 029 Revision for Pressure Switch installation

97-029-3.rpt

Attached is the revised FGEAB report that blesses the Dwyer 1823 series of pressure switches.

I've ordered the switches, through Ray Falon, and the manufacturer has them in stock. I'm told that they'll be here soon.

The safety guy, Jeff Ranschau, had some additional comments on the USQ for the fabrication ECN. I've incorporated his comments into the group DRC RCR (ASAP, PDQ, RSVP, ETC.). We've made all the corrections/changes to the ECN and USQ except one. One comment that Ranschau had on the USQ I want to check out with the King Cog (Rob Dale) before we change the USQ. After we clear up that last USQ comment we're ready for sign off.

Jeff

_____ Forward Header

Subject: Report 029 Revision
Author: David_B_Smet@apimc01.rl.gov at ~EXCHANGE
Date: 9/12/97 3:25 PM

Attached

Dave Smet

1

FLAMMABLE GAS EQUIPMENT ADVISORY BOARD INTERPRETATION/RECOMMENDATION REPORT

Date: September 12, 1997 Report No: FGEAB-97-029, Rev. 3

Board Members at Hearing:		Report No:
R. A. Huckfeldt	*R. L. Schlosser*	FGEAB-97-029
D. B. Smet	*R. A. Wahlquist*	Revision 3
C. C. Scaief III	*J. R. Kriskovich*	Date: 9/12/97

Requestor/Presenters: JD Criddle Jr., Jeff Smalley, George Janicek

Problems/Issue Statement: Rotary Mode Core (Truck 4) Drilling Exhauster. Revision 1 addresses the Drill String, Sampler Assembly and Process. Revision 2 corrects wording of Drill String and adds evaluation of the pintle rod to the Sampler Assembly and Process. Revision 3 adds evaluation of the Dwyer dP Series 1823 switches.

Equipment/Activity Description: Use of gas sample monitoring equipment in the Air Monitor Corporation cabinet with regard to requirements of Standing Order 97-01. Evaluate the use of the drill string and sampler assembly/process for compliance or equivalence to the Standing Order and JCO.

Applicable Authorization Basis: Standing Order 97-01, Rev. 2 Dated: May 5, 1997
"Flammable Gas/Slurry Growth Unreviewed Safety Question: Justification for Continued Operation for the Tank Farms at the Hanford Site," HNF-SD-WM-JCO-007, Rev. 1

Does Equipment/Activity Comply with the AB Ignition Control Requirements?
[]Yes []No [x]Other

If No, Does Equipment/Activity Provide Equivalent Design/Measures/Controls?
[x]Yes []No []Other

Explanation/Justification:

The equipment reviewed is illustrated on Air Monitor Corporation drawings W21590AA, Revision 2 and W21590GA, Revision 1. Only the equipment exposed to the sample gas stream is in an ignition control area. All other components within the cabinet are in a non-intrusive area. The following is a description of the equipment:

Masstron Flow Transmitters

The Masstron (Air Monitor Corporation) flow transmitters FT-1, -2, -3, and -4 have previously been reviewed (FGEAB-97-012) and meet ISC 2 requirements for components exposed to the vapor stream.

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FLAMMABLE GAS EQUIPMENT ADVISORY BOARD INTERPRETATION/RECOMMENDATION REPORT

Date: September 12, 1997 Report No: FGEAB-97-029, Rev. 3

Explanation/Justification: (continued)

Veltron Vacuum Transmitter

The Veltron is identical to the Masstron except that it uses one less pressure transmitter and somewhat different electronics. All components exposed to the vapor stream meet ISC 2 requirements.

Electric Valves

Solenoid valves FCV-2, -3, and -4 and ICV-6 do not have any normally sparking components and electrical components are isolated from the vapor stream. Flow control valve FCV-5 is a motor actuated modulating ball valve. The motor and wiring are not exposed to the vapor stream. All these valves meet ISC 2 requirements for components exposed to the vapor stream.

Pressure Switch

Pressure switches PS-1 and PS-2 are Dwyer Model 1823-40. The low port is connected to the process vapor and the high port is vented to atmosphere. The electrical switch is isolated from the vapor stream by a diaphragm. The FGEAB has evaluated the 1823-XX Series switches (00 to 80) and has determined that they all meet ISC 2 requirements for use with the vapor stream on the low pressure port side (snap switch on the high pressure or atmosphere side.

Dwyer Capsu-Photohelic Switch/Gage Series 43000 will be used when sampling tanks in the SX Farm to monitor and shutdown upon sensing of tank pressurization. This device meets ISC 2 requirements for Dome Intrusive equipment as all ignition sources within the switch/gage are isolated form the vapor space by the silicon rubber diaphragm.

Vacuum Pump

The EG&G Rotron Blowers meet Type B Spark Resistant construction intent under AMCA Standard 99-0401-86, and thus are evaluated to be compliant with ISC 2 requirements for Dome Intrusive equipment.

Interpretation of Shutdown System Requirements for Dome Intrusive Equipment

The FGEAB has been requested to document that, per the current Flammable Gas USQ Authorization Basis, no automatic electrical shutdown system is required for Dome Intrusive equipment that is evaluated to meet ISC 2 controls (normally non-sparking). This clarification specifically addresses gas detection type shutdown systems.

It should also be noted that gas detection systems, per the AB, are not allowed to be used as primary ignition control interlocks in Dome Intrusive regions. They are only allowed as primary controls in Ex-Tank regions. This does not preclude them from being used for defense-in-depth configurations.

FLAMMABLE GAS EQUIPMENT ADVISORY BOARD INTERPRETATION/RECOMMENDATION REPORT

Date: September 12, 1997 Report No: FGEAB-97-029, Rev. 3

Explanation/Justification: (continued)

RMCS Drill String

Three ignition source modes were evaluated - 1) frictional heating by the waste intruding portion of the string, 2) torsional break of the string in the dome space and 3) mechanical sparks caused by inadvertent impact of carbon steel to carbon steel when assembling or dismantling the drill string in the ex-tank area. The following is the Board's decision for each of these scenarios:

1) The drill string design precludes rotation at greater than 55 rpm. The drill string is also purged with nitrogen, which provides additional cooling of waste intrusive region. Tests have shown that this design does not exceed the waste contacting temperature limit of 160 degrees Celsius. This is in compliance with ISC 1.

2) A torsional or shear break of the drill string could occur at its weak point if the drill bit becomes bound in the waste. This has occurred in the past when the Push Mode system was used in the rotary mode. The string's weak point would be at the sectional joint O-ring grooves somewhere in the middle of the string (highest stress point under this condition). The region within the drill string is nitrogen purged and interlocked, thus meeting ISC 1 conditions. The criterion for dome space controls rely primarily on normally non-sparking design of which this meets. Under the applied conditions of the drill string, it is a normally non-sparking piece of equipment and thus meets ISC 2 requirements.

3) Impact between two non spark-resistant materials when assembling or dismantling the drill string creates no more risk than the acceptable routine handling of any equipment that is made of carbon steel material. Controls for minimizing this risk are routinely installed in the work packages. In this case, it is evaluated that mechanical sparking with sufficient energy to combust hydrogen is not a 'normal use' scenario, but is 'failure' mode and thus compliant with ISC 2. However, due to the proximity of the ISC 1 region (interior of the drill string), the board requires that monitoring for flammable gases be performed at least once per hour during any phase of the assembly or dismantling activities if the drill string has been left in place without purge or inerting gas at hydrostatic head condition. The basis for the on hour comes from SAD-035 analysis, which establishes a 180 minute time frame before the LFL of flammable gas could actually accumulate within the drill string.

FLAMMABLE GAS EQUIPMENT ADVISORY BOARD INTERPRETATION/RECOMMENDATION REPORT

Date: September 12, 1997 Report No: FGEAB-97-029, Rev. 3

Explanation/Justification: (continued)

Sampler Assembly and Process

The sampler assembly is used to obtain and retrieve waste samples. It is mechanically operated and consists primarily of stainless steel components. There may be several carbon steel components (can't be verified without a destructive test) that actuate in a 'snap action' during the sample capture process or may drop due to a single failure;
however, as outlined below, the nitrogen purge system process ensures inerting of the environment inside of the sampler when the sampler is being operated, meeting ISC1 requirements.

The steps for operation of the nitrogen purging system for rotary mode core sampling, excluding the z-purge and riser liner purge, starting with connecting the quill rod to commence drilling is as follows:

Note: The configuration of the system would be that the drill string is open ended at the top (ie. the change out assembly has just been removed) and a sampler, with a one way chevron seal, is latched in place in the core barrel. The bottom end of the drill string with the core barrel and bit are embedded in the waste.

1) The core sample truck rotating platform is positioned so that the quill rod is over the open ended drill string and the quill rod is lowered and connected to the drill string.

2) The operator initiates purge gas flow down the drill string by turning on the Purge Gas Isolation Valve and adjusting flow with a needle valve. The flow is kept to a minimal amount to avoid disturbing the waste. The flow is verified by checking that the pressure in the drill string is at least 0 to .5 psig above the hydrostatic head pressure that was recorded during recovery of the previous sampler.

3) The operator then lowers the sample actuator (grapple) into the drill string to attach it to the pintle rod on the universal sampler.

4) After the grapple has been lowered the operator starts rotary mode core sampling for the current sample segment by increasing the purge gas flow rate to a minimum of 30 scfm using the needle valve, and initiating drill bit rotation. (note: the purge gas flow rate is measured by redundant turbine flow meters which have a calibrated range of 20 to 130 scfm)

5) When the current sample segment is complete the operator reduces the purge gas flow to a minimal rate using the needle valve while verifying the pressure is at least 0 to .5 psig above the hydrostatic head pressure that was recorded during recovery of the previous sampler.

6) The operator raises the sample actuator into the quill rod which activates the sampler valve closure mechanism, then closes the Purge Gas Isolation valve which

FLAMMABLE GAS EQUIPMENT ADVISORY BOARD INTERPRETATION/RECOMMENDATION REPORT

Date: September 12, 1997 Report No: FGEAB-97-029, Rev. 3

Explanation/Justification: (continued)

switches the Vent Line Isolation valve position to vent the grapple box and the drill string to the tank dome space. (If the upper limit proximity sensor fails to detect the raised position, the grapple will reach the physical stop, disengaging the pintle rod. The pintle rod will drop, impacting the sample chamber or drill string, a potential spark source.)

7) The quill rod is separated from the drill string and the cable spray washer and change out assembly are added (note: the change out assembly is an isolation ball valve that is used to provide containment of the drill string when the quill rod or shielded receiver is not attached. Also, the change out assembly has a nitrogen addition port below the isolation valve that is used to provide hydrostatic head gas to the drill string during sampler change out). The Pressurized Drill String line is attached to the change out assembly, the Pressurize Drill String isolation valve is turned on, and the Drill String Hydrostatic Head Flow ball valve is opened which initiates flow through the change out assembly, down the drill string, and out the face of the bit at approximately .3 to 8 scfm.

8) The rotating platform is positioned so that the shielded receiver assembly is positioned over the change out assembly and the shielded receiver is lowered and attached to the change out assembly.

9) The shielded receiver ball valve is opened (note: this valve is used to maintain containment of the shielded receiver and sampler hoist box when the shielded receiver is not connected to the drill string) and the Pressurize Shielded Receiver Isolation valve is turned on. The shielded Receiver Hydrostatic Head Flow ball valve is opened which initiates flow into the sampler hoist box and shielded receiver at approximately 0.3 to 8 scfm.

10) When the pressure in the shielded receiver equals the pressure in the drill string, the change out assembly valve is opened and the remote latch unit lowered to

11) The remote latch unit with the sampler attached is raised into the shielded receiver and the change out assembly valve is closed (note: the drill string still has nitrogen flow from the Pressurize Drill String line).

12) The Pressurize Shielded Receiver Isolation valve is turned off which vents the sampler hoist box and shielded receiver to tank dome space through the Vent Isolation valve.

13) The shielded receiver ball valve is closed, the shielded receiver is disconnected from the change out assembly, the rotating platform is positioned to deposit the sampler a cask and a pick up new sampler.

14) The rotating platform is positioned so that the shielded receiver assembly is positioned over the change out assembly and the shielded receiver is lowered and attached to the change out assembly.

FLAMMABLE GAS EQUIPMENT ADVISORY BOARD INTERPRETATION/RECOMMENDATION REPORT

Date: September 12, 1997 Report No: FGEAB-97-029, Rev. 3

Explanation/Justification: (continued)

15) The shielded receiver ball valve is opened and the Pressurize Shielded Receiver Isolation valve is turned on and flow is established in the sampler hoist box and shielded receiver at approximately .3 to 8 scfm.

16) When the pressure in the shielded receiver equals the pressure in the drill string, the change out assembly valve is opened and the remote latch unit lowered to deposit the new sampler.

17) The remote latch unit without the sampler attached is raised into the shielded receiver and the change out assembly valve is closed.

18) The Pressurize Shielded Receiver Isolation valve and Pressurize Drill String Isolation valve are turned off which vents the sampler hoist box and shielded receiver to tank dome space through the Vent Isolation valve.

19) The Crossover Vent Isolation ball valve is opened which allows the Pressurize Drill String line to vent to the tank dome space.

20) The shielded receiver ball valve is closed and the shielded receiver is disconnected from the change out assembly.

21) The change out assembly and cable spray washer are removed from the drill string and a new 19 inch section of drill rod is added.

22) The process is then repeated from step 1.

If Not Equivalent, What Changes are Necessary to Comply or Provide Equivalency?

FGEAB INTERPRETATION/RECOMMENDATION:

Equipment, Materials & Work Practices (1)	Location (2)	Ignition Control Set (3)	IC Set Met (4)	FGEAB Safety Equivalence Ruling (5)	Approved Exception (6)
Masstron Flow Transmitter	Dome Intrusive	ISC 2	No	Yes FGEAB-97-012	
Veltron Vacuum Transmitter	Dome Intrusive	ISC 2	No	Yes	
Electric Valves	Dome Intrusive	ISC 2	No	Yes	

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FLAMMABLE GAS EQUIPMENT ADVISORY BOARD INTERPRETATION/RECOMMENDATION REPORT

Date: September 12, 1997

Report No: FGEAB-97-029, Rev. 3

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FLAMMABLE GAS EQUIPMENT ADVISORY BOARD INTERPRETATION/RECOMMENDATION REPORT

Date: September 12, 1997 Report No: FGEAB-97-029, Rev. 3

FGEAB INTERPRETATION/RECOMMENDATION: (continued)

Equipment, Materials & Work Practices (1)	Location (2)	Ignition Control Set (3)	IC Set Met (4)	FGEAB Safety Equivalence Ruling (5)	Approved Exception (6)
Pressure Switches Dwyer 1823-XX Series (00 to 80); Dwyer Capsu-Photohelic Series 43000	Dome Intrusive	ISC 2	No	Yes	
Vacuum Pumps EG&G EN 523 Rotron Blower	Dome Intrusive	ISC 2	Yes	N/A	
RMCS Drill String	Waste Intrusive	ISC 1	Yes	N/A	
	Dome Space	ISC2	Yes	N/A	
	Ex-Tank	ISC 2	Yes	N/A	
Sampler Assembly/Process	Waste Intrusive	ISC1	Yes	N/A	

General Application of Finding, If Any:

FGEAB Representative: R. L. Schlosser Date: 9-12-97

Reviewer Signature: D. B. Smet Date: 9-12-97

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Janicek, George P

From: George P Janicek
Sent: Tuesday, September 30, 1997 1:56 PM
To: Theodore D Jarecki; Nancy J Milliken; C C III (Chuck) Scaief; Michael L McElroy; J A (Jeff) Ranschau; James R Kriskovich
Cc: George P Janicek
Subject: ECN 642991 (640442) Revision

DRC members,

The subject ECN we recently reviewed (DRC Review Meeting of 09/10/97) in draft form as #642991 and approved as #640442. As a reminder, this ECN changed out the waste tank pressure switch for sampling operations in SX farm. It turns out that some of the parts required to mount the PS are difficult to obtain or obtain in a timely fashion. Therefore a Change ECN, #640499, was written to enable using fasteners and connectors CPO has on hand in order to expedite fabrication. McElroy, Ranschau, and I have reviewed and approved the change ECN in our individual capacities. The remainder of you I could not reach by phone today to obtain a beforehand OK to approve the ECN as DRC chairman. I believe that to be necessary due to the initial ECN having undergone formal design review. In any case, I went ahead and approved the ECN and am asking for your OK after the fact. Either a positive response or a non-response to this message will indicate your approval of my action. Also, a copy of the change ECN is available if you want one for your files.

Thanks,

GPJ

1

DON'T SAY IT --- *Write It!*

DATE: 03/27/98

TO: DH Shuford S7-01

FROM: GP Janicek S7-12

Telephone: 376-2225

cc:

RM Boger	S7-12
JE Corbett	S7-01
JC Criddle	S7-12
CE Hanson	S7-12
JR Kriskovich	R1-56
RS Popielarczyk	S7-01
JS Schofield	S7-12

SUBJECT: Exhauster "C" Formal Design Review / NOC Reconciliation

REFERENCE: DSI, GP Janicek to DH Shuford, "Closure of Exhauster "C" Formal Design Review", dated 08/08/97.

A meeting was held on Monday, March 23, 1998 to ascertain if the recently approved Notice of Construction (No. NWP 95-RMCS(3)), for RMCS had changed in any way the basis for the Exhauster "C" formal design review as presented in the Design Compliance Matrix (DCM) checklist used for the review. Meeting attendees included Mssrs. JC Criddle, CE Hanson, JR Kriskovich, and myself. It was agreed that the DCM and NOC were fully reconciled.

The reference DSI had originally informed you that the formal design review was closed pending completion of four (4) punchlist items. Items #1 and #4 of that punchlist had to do with assuring that the final approved DCM was reconciled with the "draft" version used during the review. This was accomplished during the review and approval of the document (HNF-SD-WM-CR-062, BASELINE DESIGN COMPLIANCE MATRIX FOR THE RMCS SYSTEM), issued December 12, 1997. Item #2 of the punchlist had to do with reconciliation of the DCM with N509/N510/NOC and was accomplished in conjunction with the meeting described above. Punchlist item #3 had to do with ensuring that the AB control limits, incorporated in the DCM and used as part of the basis for review, were indeed implemented. My understanding is that this will be accomplished by the AB Compliance Matrix which is item #1 on a separate readiness checklist for Exhauster "C" which you are maintaining.

In conclusion, as chairman of the design review committee, I consider the formal design review for Exhauster "C" closed. I have a remaining responsibility to issue a Design Review Report (HNF-2369), and hope to accomplish this in the very near future.

If you have any questions, please call me.

Thank you.

GP Janicek

A-3000-723 (01/95) GEF014

N4H2D

ENGINEERING CHANGE NOTICE

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1. ECN 642928

Proj. ECN

2. ECN Category (mark one)	3. Originator's Name, Organization, MSIN, and Telephone No.	4. USQ Required?	5. Date
Supplemental [X] Direct Revision [] Change ECN [] Temporary [] Standby [] Supersedure [] Cancel/Void []	J. C. AKERS, SESC, S7-12, 372-2827	[X] Yes [] No	November 6, 1997
	6. Project Title/No./Work Order No. Characterization Project / N4H1A	7. Bldg./Sys./Fac. No. 200 G	8. Approval Designator EQS
	9. Document Numbers Changed by this ECN (includes sheet no. and rev.) See block 13a	10. Related ECN No(s). 630002	11. Related PO No. N/A

12a. Modification Work	12b. Work Package No.	12c. Modification Work Complete	12d. Restored to Original Condition (Temp. or standby ECN only)
[X] Yes (fill out Blk. 12b) [] No (NA Blks. 12b, 12c, 12d)	FS-97-521	EJW 3/5/98 APR 23 1998 Design Authority/Cog. Engineer Signature & Date	19. N/A Design Authority/Cog. Engineer Signature & Date

13a. Description of Change

13b. Design Baseline Document? [X] Yes [] No

ETN-97-0016

RMCST EXHAUSTER C.: THIS ECN ADDS SAFETY CLASS EQUIPMENT

H-2-821455, sht 1, rev 0, See page 3
H-2-829083, sht. 1, rev. 0, See pages 6-9
H-2-829086, sht. 3, rev. 0, See pages 10-13
H-2-829087, sht. 1, rev. 0, See pages 15-18
H-2-829087, sht. 5, rev. 0, See pages 23-26
H-2-829108, sht. 4, rev. 0, See pages 29-32
H-2-821455, sht 3, rev 0, See pages 4-5
H-2-829086, sht. 1, rev. 0, See page 10
H-2-829086, sht 4, rev 0, See page 14
H-2-829087, sht. 2, rev. 0, See pages 19-22
H-2-829108, sht. 2, rev. 0, See pages 27-28
H-2-829110, sht. 3, rev. 0, See page 33
H-2-829083, sht 2, rev 0, see pg 9 J.W. 11/11/97

NOTE: Add drawing sheets as required

14a. Justification (mark one)

Criteria Change	[X]	Design Improvement	[]	Environmental	[]	Facility Deactivation	[]
As-Found	[]	Facilitate Const	[]	Const. Error/Omission	[]	Design Error/Omission	[]

14b. Justification Details

A BETA PARTICLE CONTINUOUS AIR MONITOR IS BEING ADDED TO EXHAUSTER C TO COMPLY WITH STATE DEPT. OF HEALTH REQUIREMENTS. DESIGN VERIFICATION PERFORMED BY FORMAL REVIEW PER HNF-PRO-445. USQ TF-97-0783 REV. 0.

15. Distribution (include name, MSIN, and no. of copies)

J. C. Akers	S7-12	1 COPY	C. E. Hanson	S7-12	1 COPY
R. M. Boger	S7-12	1 COPY	G. P. Janicek	S7-12	1 COPY
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D. L. Dyekman	S7-01	1 COPY	E. E. Salinas	S7-12	1 COPY
M. L. McElroy	S7-07	1 COPY	E. J. Waldo	S7-12	1 COPY
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ENGINEERING CHANGE NOTICE	Page 2 of 33	1. ECN (use no. from pg. 1) 642928

16. Design Verification Required	17. Cost Impact						18. Schedule Impact (days)	
	ENGINEERING			CONSTRUCTION				
[X] Yes	Additional	[N/A]	$	Additional	[N/A]	$	Improvement	[N/A]
[] No	Savings	[]	$	Savings	[]	$	Delay	[]

19. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 13. Enter the affected document number in Block 20.

SDD/DD	[]	Seismic/Stress Analysis	[]	Tank Calibration Manual	[]
Functional Design Criteria	[X]	Stress/Design Report	[]	Health Physics Procedure	[]
Operating Specification	[]	Interface Control Drawing	[]	Spares Multiple Unit Listing	[X]
Criticality Specification	[]	Calibration Procedure	[X]	Test Procedures/Specification	[]
Conceptual Design Report	[]	Installation Procedure	[]	Component Index	[]
Equipment Spec.	[]	Maintenance Procedure	[]	ASME Coded Item	[]
Const. Spec.	[]	Engineering Procedure	[]	Human Factor Consideration	[]
Procurement Spec.	[]	Operating Instruction	[]	Computer Software	[]
Vendor Information	[X]	Operating Procedure	[X]	Electric Circuit Schedule	[]
OM Manual	[]	Operational Safety Requirement	[]	ICRS Procedure	[]
FSAR/SAR	[]	IEFD Drawing	[]	Process Control Manual/Plan	[]
Safety Equipment List	[X]	Cell Arrangement Drawing	[]	Process Flow Chart	[]
Radiation Work Permit	[]	Essential Material Specification	[]	Purchase Requisition	[]
Environmental Impact Statement	[]	Fac. Proc. Samp. Schedule	[]	Tickler File	[]
Environmental Report	[]	Inspection Plan	[]		[]
Environmental Permit	[]	Inventory Adjustment Request	[]	None	[]

20. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number Revision
6-TF-168 / Rev. 0	TO-060-347	Spares DataBase
HNF-SD-WM-FDC-025 / Rev. 0	HNF-SD-WM-SEL-044 / Rev. 0	CVI FILE # 22660

21. Approvals

	Signature	Date		Signature	Date
Design Authority J. R. Kriskovich		11-14-97	Design Agent		
Cog. Eng. E. J. Waldo		11-12-97	PE		
Cog. Mgr. J.S. Schofield		11/13/97	QA		
QA M.L. McElroy		11-6-97	Safety		
Safety J. A. Ranschau		11/13/97	Design		
Environ. D. L. Dyekman	per telecon Phil Miller	11-7-97	Environ.		
Other			Proj. Mgr. C. E. Hanson		11/10/97
DRC Chairman G. P. Janicek		11/6/97			
Design Engineer G. W. Wilson		11/6/97	DEPARTMENT OF ENERGY		
Design Engineer J. C. Akers		11/6/97	Signature or a Control Number that tracks the Approval Signature		
			ADDITIONAL		

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