

Sta 4 (2)

MAY 30 1997

ENGINEERING DATA TRANSMITTAL

Page 1 of 1

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5. Proj./Prog./Dept./Div.: Core Sampling / FGWL Tanks	6. Cog. Engr.: E. J. Waldo	7. Purchase Order No.: N/A
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1	HNF-SD-WM-DRR-062	ALL	0	Design Review Report for Modifications to RMCS Safety Class Equipment	SQ	1	1	1

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

SIGNATURE/DISTRIBUTION										(G)	(H)	
(See Approval Designator for required signatures)												
(G)	(H)	17.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(J) Name	(K) Signature	(L) Date	(M) MSIN	Reason	Disp.
Reason	Disp.											
1	1		Cog. Eng: EJ WALDO	<i>EJ Waldo</i>	5/19/97	S7-12	TD JARECKI	<i>TD Jarecki</i>	5/20/97	S7-03	1	1
1	1		Cog. Mgr: CE HANSON	<i>CE Hanson</i>	5/20/97	S7-12	N MILLIKEN	<i>N Milliken</i>	5/13/97	R1-43	1	1
1	1		QA: ML MCELROY	<i>ML McElroy</i>	5/13/97	S7-07	C SCATIEF	<i>C Scatief</i>	5/19/97	R1-56	1	1
1	1		Safety: JA RANSCHAU	<i>JA Ranschau</i>	5/24/97	S7-07						
1	1		Design Auth: GP JANICEK	<i>GP Janicek</i>	5/17/97	S7-12						
1	1		Chair: GP JANICEK	<i>GP Janicek</i>	5/17/97	S7-12						
1	1		Design Engr: J SMALLLEY	<i>J Smallley</i>	5/20/97	S7-12						

18. JE CORBETT <i>JE Corbett</i> 5/20/97 Signature of EDT Originator	19. GB BRYAN <i>GB Bryan</i> 5/20/97 Authorized Representative Date for Receiving Organization	20. JS SCHOFIELD <i>JS Schofield</i> 5/20/97 Cognizant/Manager Date	21. DOE APPROVAL (if required) Ctrl. No. ☐ Approved ☐ Approved w/comments ☐ Disapproved w/comments
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DESIGN REVIEW REPORT for MODIFICATIONS TO RMCS SAFETY CLASS EQUIPMENT

J. E. Corbett

Lockheed Martin Hanford Corporation, Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-87RL10930

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Abstract: This report documents the completion of the formal design review for modifications to the Rotary Mode Core Sampling (RMCS) safety class equipment. These modifications are intended to support core sampling operations in waste tanks requiring flammable gas controls. The objective of this review was to approve the Engineering Change Notices affecting safety class equipment used in the RMCS system. The conclusion reached by the review committee was that these changes are acceptable.

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STA: <i>4</i>	RELEASE	
MAY 30 1997		

Kara Brown
Release Approval

Release Stamp

5/30/97
Date

Approved for Public Release

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ACRONYMS

ATP	acceptance test procedure
CED	Characterization Equipment Design
CFE	Characterization Field Engineering
CFR	Code of Federal Regulations
CPO	Characterization Project Operations
DRR	design review report
ECN	engineering change notice
EP	Engineering Practices
FDC	functional design criteria
FGWL	flammable gas watch list
HEPA	high efficiency particulate air (filter)
ISB	intrinsic safety barrier
OTP	operability test procedure
RCR	review comment record
RMCS	rotary mode core sampling
SA	safety assessment
SCFM	standard cubic feet per minute
WHC	Westinghouse Hanford Company

Modifications for RMCS Safety Class Equipment Design Review Report

1.0 SCOPE

This report documents the completion of the formal design review for selected modifications to Rotary Mode Core Sampling (RMCS) safety class equipment, hereafter referred to as the "the safety equipment modifications." The safety equipment modifications are intended to support core sampling operations in waste tanks requiring flammable gas controls. This review included the engineering change notices (ECNs) listed in section 6.0.

This document and the formal design review are in support of design modifications to the core sampling systems used by Characterization Project Operations (CPO). These modifications are required to expand the scope of core sampling to include Flammable Gas Watchlist (FGWL) tanks, as well as any other tanks with flammable gas controls. The objective of this review was to provide a formal design verification for ECNs affecting safety class equipment used in the RMCS system. Design verification is performed to ensure equipment function, personnel safety, and compliance with WHC-CM-6-1, *Standard Engineering Practices*, section 2.2.4, and the quality assurance requirements of 10 CFR 830.120.

2.0 BACKGROUND

The Rotary Mode Core Sampling (RMCS) systems were designed for initial deployment into FeCN tanks, with later modifications intended to allow for deployment into Flammable Gas Watch List (FGWL) tanks. These modifications included mechanical and electronic components designed for intrinsic safety and part replacement where required for material compatibility with hazardous environments. The modifications included replacing or adding equipment to ensure that electrical components which are not classified for use in flammable atmospheres are isolated from potentially flammable atmospheres. This was accomplished by replacing these components with components approved for use in flammable atmospheres and controlling the potential for flammable atmospheres where possible to isolate non-classified electrical components from the hazard. The modifications also included part replacement where required for material compatibility associated with hazardous environments, and the addition of a flammable gas detector interlock. A safety equipment list was developed to list safety class safety equipment (WHC-SD-WM-SEL-032). The method of design verification selected for safety class equipment was formal review. This design review report covers the four ECNs listed in Section 6.0.

3.0 SUMMARY

The design review committee was selected in accordance with EP 4.1 and is documented in Section 11.0 of this report. A preliminary design review was not required due to the nature of the modifications required. A kickoff meeting for a 100% level design review was held on January 21, 1997. This meeting served as the design review briefing. Ten additional meetings were held to discuss the review materials, hand out additional materials, and complete review comment records (RCRs).

Twenty-three RCRs were completed during the course of the review. For a complete listing of RCRs, see section 9.0 of this report. Meeting minutes and the completed design review checklists are attachments to Section 11.0 of this report.

At the completion of the design review, the conclusion reached by the review committee was that the ECNs were acceptable. The design review chairman signed the ECNs to represent committee approval. Several ECNs were changed or superseded after the initial review with the individual committee members review and approval as directed by the chairman. A listing of open items can be found in section 10.0.

4.0 GENERAL DESIGN DESCRIPTION

The RMCS Exhauster is designed to filter and remove the additional gas volume from RMCS operations, to comply with emissions regulations and safety requirements. The exhauster is connected to the riser by a flexible connector. Tank vapors are drawn through the flexible duct, through the flammable gas detector spoolpiece, and into the exhauster heater which maintains airstream temperature above its dew-point using a hot water heat exchanger. The tank vapor then moves to a prefilter located in the filter housing immediately upstream of two high efficiency particulate air (HEPA) filters in series. Vapor is moved through the system by a direct driven fan/motor combination which provides a constant nominal flow of 200 scfm. After passing through the HEPA filters, the exhaust gas is released to the atmosphere through a four-inch diameter stack. Exhauster operating conditions are monitored and recorded on a data logger located in the exhauster instrumentation cabinet.

The exhauster is designed to shut down automatically when tank pressure falls below -3 inches water gage "wg", when exhaust stack flow increases above 250 scfm or falls below 150 scfm, or if pressure across the HEPA filter bank exceeds a predetermined value. A connection between truck and exhauster provides truck operators with an indication that the exhauster has shut down and results in a sample truck programmed shutdown. The sample truck shutdown can also be initiated due to flammable gas or tank pressure alarms on one of the two identical flammable gas detector carts.

5.0 MODIFICATION DESIGN DESCRIPTION

The modifications are described by the ECNs (see listing in Section 6.0). The operating temperature range for RMCS operations is significantly impacted by the modification described in ECN 639110.

6.0 LISTING OF REVIEW MATERIALS

The following ECNs were reviewed and approved as part of the formal design review:

ECN #	DESCRIPTION
639111	This supplemental ECN replaces the Ashcroft pressure transmitters with Yokogawa pressure transmitters. Data from the intrinsic barrier manufacturer indicates maximum voltage passed by the barrier to be twenty-eight (28). For use in Class 1, Div. 1, Group B applications, the Ashcroft pressure transmitters required the maximum to be limited to 22 volts. The replacement Yokogawa transmitters require a maximum of 30 volts to maintain this classification. Replacing the pressure transmitters will provide the Class 1, Div. 1, Group B qualification required by WHC-SD-SAD-035, Rev. 0a. Change ECN #639113 corrects a related clearance problem.
639965	This supersedure ECN changes the drill rod from carbon steel to nickel plated carbon steel in order to reduce the sparking potential of the exterior surface.
639110	This direct revision ECN describes software changes that will accommodate the increased pressure range of the newly installed pressure transmitters. Also described are the changes required to add an alarm and alarm signal upon outside thermocouple temperature exceeding predetermined values. Note: Outside temperature is hydrogen detection cell temperature. The hydrogen detection cell as used on the flammable gas interlock is temperature sensitive; that is, outside of established temperature limits the cell's performance degrades to unacceptable levels. The hydrogen detection cell is a safety class component.
168908	This supplemental ECN installs two (2), Type J thermocouples (T/C) on the Whittaker cell mounted on the exhaust spool-piece, and replaces VTP-TI-2207 and VTP-TI-2208 with an Omega DP25-TC-AR digital thermometer equipped with the alarm relay option. A normally closed contact of the alarm relay will be used to send a signal to the flammable gas detection PLC when a predetermined set-point temperature is exceeded. Additionally, this ECN changes the temperature monitored by VTP-TI-2207 and VTP-TI-2208 from the "OUTSIDE AIR TEMPERATURE" to the "WHITTAKER CELL TEMPERATURE."

Sheets 1 and 2 of the ECNs are provided as an attachment to this report (see Section 11.0). The complete ECNs are released documents and may be retrieved through Document Control.

7.0 SAFETY ASSESSMENT (SA) COMPLIANCE

Safety requirements for RMCS equipment and operations are defined in the RMCS SA for flammable gas tanks (WHC-SD-WM-SAD-035, Revision 0-a). Critical design characteristics for safety equipment are further described in the RMCS Safety Equipment List (WHC-SD-WM-SEL-032).

8.0 DESIGN REVIEW CHECKLIST

Formal design reviews, as described in WHC-CM-6-1, Standard Engineering Practices, are required to use a design review checklist that has been customized for the review. The checklists for this review were developed by the design review committee. The checklists were satisfactorily completed and are an attachment to Section 11.0 of this report. Items which will require further testing or calibration are considered open items. Work package closeout is a part of the normal course of business for equipment fabrication and modification and is therefore not assigned as an action item for the design review committee. All open items from the checklist are discussed in section 10.0 of this report.

9.0 REVIEW COMMENT RECORDS

The following table is a listing of all RCRs received during the design review. All RCRs were dispositioned and signed off as closed. A copy of each RCR is included as an attachment to Section 11.0 of this report.

Design Review RCRs

<u>ID# (ECN/reviewer/date)</u>	<u>RESP. ENGINEER</u>	<u>RCR STATUS</u>
111/Janicek/0123	Jim Robinson	closed 2/03/97
111/Corbett/0123	Jim Robinson	closed 1/27/97
111/Jarecki/0123	Jim Robinson	closed 1/27/97
111/Milliken/0122	Jim Robinson	closed 1/24/97
111/Scalef/0127	Jim Robinson	closed 2/03/97
111/McElroy/0124	Jim Robinson	closed 2/03/97
111/Ranchau/0129	Jim Robinson	closed 1/29/97
965/Janicek/0127	Jeff Smalley	closed 2/05/97
965/Corbett/0127	Jeff Smalley	closed 2/05/97
965/Jarecki/0127	Jeff Smalley	closed 2/05/97
965/Milliken/0124	Jeff Smalley	closed 2/05/97
965/Scalef/0127	Jeff Smalley	closed 2/05/97
965/McElroy/0127	Jeff Smalley	closed 2/05/97
965 Ranchau/0127	Jeff Smalley	closed 1/27/97
110/Janicek/0213	Jim Robinson	closed 2/13/97
110/Corbett/0206	Jim Robinson	closed 2/13/97
110/Jarecki/0206	Jim Robinson	closed 2/19/97
110/Milliken/0206	Jim Robinson	closed 2/19/97
110/Scalef/0206	Jim Robinson	closed 2/19/97
110/McElroy/0205	Jim Robinson	closed 2/19/97
110/Ranchau/0205	Jim Robinson	closed 2/13/97
110/Waldo/0206	Jim Robinson	closed 2/13/97
908/Composite/0214	George Vargo	closed 2/18/97

10.0 CONCLUSIONS AND OPEN ITEMS

With the approval of this report, the formal design review for the ECNs referenced in this report is completed. The following open items were noted during the design review. These items are scheduled to be completed as part of the normal course of business and are not action items for the design review committee. Therefore, these items are NOT considered to be "open action items" as described in WHC-CM-6-1, EP-4.1, paragraph 2.3.3.2, "Documentation of Action Item Completion."

OPEN ITEM: ATP/OTP testing to demonstrate requirements/operability (CED/CFE)

OPEN ITEM: operation and maintenance procedures revised to reflect modifications (CFE)

OPEN ITEM: close out fabrication and modification work packages (CPO)

OPEN ITEM: software design configuration management documentation established to ensure control of configuration (CED)

The following action items were noted during the design review. These "open action items" will be closed in accordance with the requirements described in WHC-CM-6-1, EP-4.1

ACTION ITEM: None

The conclusion reached by the design review committee is that the four ECNs listed in Section 6.0 are acceptable. There are no action items for the review committee.

11.0 DOCUMENTATION

The following items are provided as attachments to this report:

1. Listing of design review committee members
2. Design Review Checklists
3. Copies of RCRs
4. Meeting Minutes
5. ECNs (page 1 and 2 for ECNs listed in Section 6.0)

Review copies of all ECNs and drawings provided to committee members for review are available in the design review file. All released documentation referenced in the report will be available using the controlled document number located in the text where the document is cited.

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ATTACHMENT 1

Design Review Committee Members

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INTEROFFICE MEMO

LOCKHEED MARTIN



From: TWRS Facility Operations Design Authority 74740-97-GPJ-002
Phone: 376-2225
Date: January 20, 1997
Subject: CHARACTERIZATION PROJECT - DESIGNATION OF DESIGN REVIEW COMMITTEE
FOR DESIGN VERIFICATION OF CHARACTERIZATION EQUIPMENT SAFETY CLASS
DESIGN BASELINE DOCUMENTATION

To:	D. C. Board	S7-07	T. D. Jarecki	S7-03
	J. E. Corbett	S7-01	M. L. McElroy	S7-07
	J. A. Harvey	S7-07	N. J. Milliken	A3-37
	L. F. Hill	R1-56	J. A. Ranschau	S7-07
	G. P. Janicek	S7-12	C. C. Scaief	R1-56
	GPJ File/LB			
cc:	P. R. Angelier	S7-45	M. A. Payne	S7-84
	C. B. Bryan	S7-01	R. E. Raymond	S7-12
	J. M. Garcia	S7-07	S. H. Rifaey	R1-56
	G. W. Gault	A3-37	R. L. Schlosser	R1-56

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 the reference. 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.

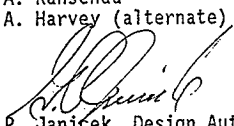
D. C. Board, et al.
Page 2
January 20, 1997

74740-97-GPJ-002

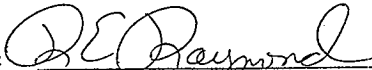
The committee will be supplemented by individuals with specific expertise as the need arises.

DESIGN REVIEW COMMITTEE

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


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

Concurrence:


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

ATTACHMENT 2

Design Review Checklists

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Review #: DRC-97-001

Design Review Checklist

Project or Facility: CHARACTERIZATION PROJECT / EXHAUSTER SYSTEM

Document(s) Reviewed: ECN #639111

Reviewer: DESIGN REVIEW COMMITTEE

Date: 02/03/97

Item	Review Consideration	Yes	No	NA	NR	Remarks
1	Has the "importance to safety" of the design modification been adequately identified?	X				
2	Has all information necessary to perform the design modification been adequately described in the ECN?	X				
3	Have all documents impacted by this design modification been adequately identified in the ECN?	X				
4	Is the design modification appropriate in terms of form, fit, and function with interfacing SSCs?	X				
5	Has the safety function(s) of any safety SSCs potentially impacted by this design modification been adequately described for the purposes of design verification?	X				
6	Has the safety function of any safety SSC directly or indirectly impacted by this design modification been maintained, enhanced, or at least not degraded?	X				
7	Are the materials of construction for the design modification adequate for the operating environment?	X				
8	Will the design modification to this SSC adversely impact its operability or maintainability?		X			
9	Does the design modification meet standards and codes appropriate to its safety classification?	X				

Item	Review Consideration					Remarks
		Yes	No	NA	NR	
10	Will the design modification to this SSC adversely impact its reliability of that of interfacing SSCs?		X			
11	Have assumptions necessary to perform the design task been adequately described and are they reasonable? Where necessary, have assumptions been identified for reverification when the design task has been completed?			X		
12	Have the appropriate Quality Assurance requirements been specified?	X				
13	Does the design meet the established requirements or design criteria?	X				
14	Does the design meet established requirements for associated system physical and functional interfaces?	X				
15	Has appropriate consideration been given to use of standardized parts, materials and processes, and have engineering standards and criteria been specified properly in the design?	X				
16	Does the design represent the simplest design consistent with functional requirements and expected service conditions?	X				
17	Can the equipment be readily assembled/disassembled as designed?	X				
18	Are the specified materials compatible with each other and interfacing materials?	X				
19	Have modifications to commercial grade items and any associated verification operations or tests been appropriately documented?			X		
20	Have qualified and certified parts been specified?			X		
21	Have available data on similar designs been used?			X		
22	Does the design meet functional requirements?	X				

Item	Review Consideration					Remarks
		Yes	No	NA	NR	
23	Will the design meet the following environmental conditions?					
	a. Temperature (steady-state and transient)	X				
	b. Flow (steady-state and transient) including induced vibration			X		
	c. Pressure (steady-state and transient)	X				
	d. Seismic/natural phenomena			X		
	e. Nuclear radiation	X				No vendor data available. Use of component in field acceptable per disposition to RCR comment #5 of CC Scaief.
	f. For seismic category I items, impact of non-seismically qualified equipment which is/will be near by (3 over 1 problem)			X		
24	Are the specified construction materials resistant to the following as applicable:	X				
	a. Moisture					
	b. Oxygen					
	c. Acids					
	d. Salts					
	e. Radiation					
25	Have non-corrosive materials been used where required?	X				
26	Can the assembly be stored for extended periods of time without degrading effects?			X		
27	Has the design appropriately considered maintenance, operation and reliability, including maintenance procedures and techniques, unique maintenance requirements and frequencies?	X				

Item	Review Consideration					Remarks
		Yes	No	NA	NR	
28	Can the design and its parts be easily inspected for conformance to engineering specifications?	X				
29	Has adequate accessibility been provided for in-service inspection?	X				
30	Has an acceptable level of radiation exposure been defined?			X		
31	Have personnel radiation protection requirements been considered and identified?			X		
32	Have nuclear criticality safety considerations been incorporated?			X		
33	Have necessary features been provided to maintain personnel radiation exposure as low as reasonably achievable?			X		
34	Can the hardware be adequately disposed of after use if it is radiologically or chemically contaminated?	X				
35	Have adequate acceptance criteria been specified and are the verification methods stated appropriately?	X				
36	Have any locking devices, that are critical to operation or that will be inaccessible after assembly, been sufficiently evaluated and tested to assure their adequacy?			X		
37	Have welding, bolting, joining methods been adequately specified?	X				
38	Have NDE methods been applied correctly?			X		
39	Will separate testing be required? - If yes, identify responsible organization(s) for preparation and issue (TBD if unknown)	X				Calibration testing required per PM # 6-ES-447
40	Have human factors engineering and operability been considered?	X				
41	Does the design use engineered safety and operational protection measures as opposed to relying on administrative controls?	X				
42	Are reliability requirements specified? If so, does the reliability analysis of the design meet the specified reliability requirements?		X			Not required

Review #: DRC-97-001

Item	Review Consideration	Yes	No	NA	NR	Remarks
43	Have all credible non-standard conditions been properly considered?	X				Not required
44	Has the need for safety analysis of this design been determined by Safety?	X				
45	Is the equipment, system, or facility covered by an existing Safety Analysis Report? If not, complete the safety analysis in time to incorporate findings of the analyzed in the design.	X				
46	Is a single point failure analysis required?		X			
47	Are all indication lights and electrical control considered fail-safe?			X		
48	Have availability of power requirements for the project been verified?			X		
49	Is the design in compliance with applicable regulatory requirements?			X		
50	Are design tolerances appropriate and applied in a cost-effective manner and are standard materials and material sizes used where practicable?	X				
51	Is all computer software and data properly identified and controlled?			X		

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Review #: DRC-97-002

Design Review Checklist

Project or Facility: CHARACTERIZATION PROJECT / SAMPLING EQUIPMENT

Document(s) Reviewed: ECN #636965

Reviewer: DESIGN REVIEW COMMITTEE

Date: 02/05/97

Item	Review Consideration	Yes	No	NA	NR	Remarks
1	Has the "importance to safety" of the design modification been adequately identified?	X				
2	Has all information necessary to perform the design modification been adequately described in the ECN?	X				
3	Have all documents impacted by this design modification been adequately identified in the ECN?	X				
4	Is the design modification appropriate in terms of form, fit, and function with interfacing SSCs?	X				
5	Has the safety function(s) of any safety SSCs potentially impacted by this design modification been adequately described for the purposes of design verification?	X				
6	Has the safety function of any safety SSC directly or indirectly impacted by this design modification been maintained, enhanced, or at least not degraded?	X				
7	Are the materials of construction for the design modification adequate for the operating environment?	X				
8	Will the design modification to this SSC adversely impact its operability or maintainability?		X			
9	Does the design modification meet standards and codes appropriate to its safety classification?	X				

Item	Review Consideration					Remarks
		Yes	No	NA	NR	
10	Will the design modification to this SSC adversely impact its reliability of that of interfacing SSCs?		X			
11	Have assumptions necessary to perform the design task been adequately described and are they reasonable? Where necessary, have assumptions been identified for reverification when the design task has been completed?	X				
12	Have the appropriate Quality Assurance requirements been specified?	X				
13	Does the design meet the established requirements or design criteria?	X				
14	Does the design meet established requirements for associated system physical and functional interfaces?	X				
15	Has appropriate consideration been given to use of standardized parts, materials and processes, and have engineering standards and criteria been specified properly in the design?	X				
16	Does the design represent the simplest design consistent with functional requirements and expected service conditions?	X				
17	Can the equipment be readily assembled/disassembled as designed?	X				
18	Are the specified materials compatible with each other and interfacing materials?	X				
19	Have modifications to commercial grade items and any associated verification operations or tests been appropriately documented?	X				
20	Have qualified and certified parts been specified?	X				
21	Have available data on similar designs been used?	X				
22	Does the design meet functional requirements?	X				

Item	Review Consideration					Remarks
		Yes	No	NA	NR	
23	Will the design meet the following environmental conditions?					
	a. Temperature (steady-state and transient)	X				
	b. Flow (steady-state and transient) including induced vibration			X		
	c. Pressure (steady-state and transient)	X				
	d. Seismic/natural phenomena			X		
	e. Nuclear radiation	X				
	f. For seismic category I items, impact of non-seismically qualified equipment which is/will be near by (3 over 1 problem)			X		
24	Are the specified construction materials resistant to the following as applicable:	X				
	a. Moisture					
	b. Oxygen					
	c. Acids					
	d. Salts					
	e. Radiation					
25	Have non-corrosive materials been used where required?	X				
26	Can the assembly be stored for extended periods of time without degrading effects?	X				
27	Has the design appropriately considered maintenance, operation and reliability, including maintenance procedures and techniques, unique maintenance requirements and frequencies?			X		
28	Can the design and its parts be easily inspected for conformance to engineering specifications?	X				
29	Has adequate accessibility been provided for in-service inspection?	X				

Item	Review Consideration	Yes	No	NA	NR	Remarks
30	Has an acceptable level of radiation exposure been defined?			X		
31	Have personnel radiation protection requirements been considered and identified?			X		
32	Have nuclear criticality safety considerations been incorporated?			X		
33	Have necessary features been provided to maintain personnel radiation exposure as low as reasonably achievable?			X		
34	Can the hardware be adequately disposed of after use if it is radiologically or chemically contaminated?	X				
35	Have adequate acceptance criteria been specified and are the verification methods stated appropriately?	X				
36	Have any locking devices, that are critical to operation or that will be inaccessible after assembly, been sufficiently evaluated and tested to assure their adequacy?			X		
37	Have welding, bolting, joining methods been adequately specified?	X				
38	Have NDE methods been applied correctly?	X				
39	Will separate testing be required? - If yes, identify responsible organization(s) for preparation and issue (TBD if unknown)		X			
40	Have human factors engineering and operability been considered?			X		
41	Does the design use engineered safety and operational protection measures as opposed to relying on administrative controls?	X				
42	Are reliability requirements specified? If so, does the reliability analysis of the design meet the specified reliability requirements?		X			Not required
43	Have all credible non-standard conditions been properly considered?	X				
44	Has the need for safety analysis of this design been determined by Safety?	X				Not required

Item	Review Consideration	Yes	No	NA	NR	Remarks
45	Is the equipment, system, or facility covered by an existing Safety Analysis Report? If not, complete the safety analysis in time to incorporate findings of the analyzed in the design.	X				
46	Is a single point failure analysis required?		X			
47	Are all indication lights and electrical control considered fail-safe?			X		
48	Have availability of power requirements for the project been verified?			X		
49	Is the design in compliance with applicable regulatory requirements?	X				
50	Are design tolerances appropriate and applied in a cost-effective manner and are standard materials and material sizes used where practicable?	X				
51	Is all computer software and data properly identified and controlled?			X		

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Review #: DRC-97-003

Design Review Checklist

Project or Facility: CHARACTERIZATION PROJECT / EXHAUSTER SYSTEM

Document(s) Reviewed: ECN #639110 (Revision to WHC-SD-CSDD-020, REV 2)

Reviewer: DESIGN REVIEW COMMITTEE

Date: 02/20/97

Item	Review Consideration					Remarks
		Yes	No	NA	NR	
1	Has the "importance to safety" of the design modification been adequately identified?	X				
2	Has all information necessary to perform the design modification been adequately described in the ECN?	X				
3	Have all documents impacted by this design modification been adequately identified in the ECN?	X				
4	Is the design modification appropriate in terms of form, fit, and function with interfacing SSCs?	X				
5	Has the safety function(s) of any safety SSCs potentially impacted by this design modification been adequately described for the purposes of design verification?	X				
6	Has the safety function of any safety SSC directly or indirectly impacted by this design modification been maintained, enhanced, or at least not degraded?	X				
7	Are the materials of construction for the design modification adequate for the operating environment?			X		
8	Will the design modification to this SSC adversely impact its operability or maintainability?	X				Will restrict operating temp. range.

Item	Review Consideration					Remarks
		Yes	No	NA	NR	
9	Does the design modification meet standards and codes appropriate to its safety classification?				X	N/A to this ECN. Will be considered as part of overall system review, #DRC-97-004
10	Will the design modification to this SSC adversely impact its reliability of that of interfacing SSCs?		X			
11	Have assumptions necessary to perform the design task been adequately described and are they reasonable? Where necessary, have assumptions been identified for reverification when the design task has been completed?	X				Assumes that rationale for setting low temp. setpoint is formally documented.
12	Have the appropriate Quality Assurance requirements been specified?		X			Missing Softwaree Design Config. Management doc. per WHC-CM-4-2 QR 19.0 & Software Practices Manual.
13	Does the design meet the established requirements or design criteria?	X				Net result will be to restrict oper. temp. range.
14	Does the design meet established requirements for associated system physical and functional interfaces?	X				
15	Has appropriate consideration been given to use of standardized parts, materials and processes, and have engineering standards and criteria been specified properly in the design?	X				
16	Is the design a reasonable approach, consistent with functional requirements and expected service conditions?	X				
17	Can the equipment be readily assembled/disassembled as designed?				X	
18	Are the specified materials compatible with each other and interfacing materials?				X	

Item	Review Consideration	Yes	No	NA	NR	Remarks
19	Have modifications to commercial grade items and any associated verification operations or tests been appropriately documented?			X		
20	Have qualified and certified parts been specified?			X		
21	Have available data on similar designs been used?			X		
22	Does the design meet functional requirements?	X				Net result will be to restrict oper. temp. range.
23	Will the design meet the following environmental conditions?					
	a. Temperature (steady-state and transient)	X				
	b. Flow (steady-state and transient) including induced vibration			X		
	c. Pressure (steady-state and transient)			X		
	d. Seismic/natural phenomena				X	Not required by SAD-035.
	e. Nuclear radiation	X				Radiation level acceptable to field personnel.
	f. For seismic category I items, impact of non-seismically qualified equipment which is/will be near by (3 over 1 problem)			X		
24	Are the specified construction materials resistant to the following as applicable:			X		
	a. Moisture					
	b. Oxygen					
	c. Acids					
	d. Salts					
	e. Radiation					

Item	Review Consideration	Yes	No	NA	NR	Remarks
25	Have non-corrosive materials been used where required?			X		System will be tested periodically.
26	Can the assembly be stored for extended periods of time without degrading effects?	X				
27	Has the design appropriately considered maintenance, operation and reliability, including maintenance procedures and techniques, unique maintenance requirements and frequencies?	X				Net result will be to restrict operating temperature range.
28	Can the design and its parts be easily inspected for conformance to engineering specifications?			X		
29	Has adequate accessibility been provided for in-service inspection?			X		
30	Has an acceptable level of radiation exposure been defined?			X		
31	Have personnel radiation protection requirements been considered and identified?			X		
32	Have nuclear criticality safety considerations been incorporated?			X		
33	Have necessary features been provided to maintain personnel radiation exposure as low as reasonably achievable?			X		
34	Can the hardware be adequately disposed of after use if it is radiologically or chemically contaminated?			X		
35	Have adequate acceptance criteria been specified and are the verification methods stated appropriately?	X				
36	Have any locking devices, that are critical to operation or that will be inaccessible after assembly, been sufficiently evaluated and tested to assure their adequacy?			X		
37	Have welding, bolting, joining methods been adequately specified?			X		
38	Have NDE methods been applied correctly?			X		

Item	Review Consideration					Remarks
		Yes	No	NA	NR	
39	Will separate testing be required? - If yes, identify responsible organization(s) for preparation and issue (TBD if unknown)	X				Work Package #ES-97-00022
40	Have human factors engineering and operability been considered?	X				
41	Does the design use engineered safety and operational protection measures as opposed to relying on administrative controls?	X				
42	Are reliability requirements specified? If so, does the reliability analysis of the design meet the specified reliability requirements?		X			
43	Have all credible non-standard conditions been properly considered?	X				
44	Has the need for safety analysis of this design been determined by Safety?	X				
45	Is the equipment, system, or facility covered by an existing Safety Analysis Report? If not, complete the safety analysis in time to incorporate findings of the analyzed in the design.	X				Not required by SAD-035.
46	Is a single point failure analysis required?		X			
47	Are all indication lights and electrical control considered fail-safe?	X				
48	Have availability of power requirements for the project been verified?			X		
49	Is the design in compliance with applicable regulatory requirements?			X		
50	Are design tolerances appropriate and applied in a cost-effective manner and are standard materials and material sizes used where practicable?			X		
51	Is all computer software and data properly identified and controlled?		X			Missing Software Design Config. Management doc. per WHC-CM-4-2 QR 19.0 & Software Practices Manual.

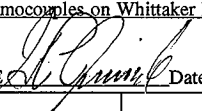
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Review #: DRC-97-005

Design Review Checklist

Project or Facility: CHARACTERIZATION PROJECT / EXHAUSTER & INTERLOCK SYSTEM

Document(s) Reviewed: ECN #168908 (Thermocouples on Whittaker Electrochemical Cell)

Reviewer: DESIGN REVIEW COMMITTEE  Date: 02/14/97

Item	Review Consideration					Remarks
		Yes	No	NA	NR	
1	Has the "importance to safety" of the design been adequately identified?	X				NFP-70
2	Has all information necessary to perform the design been adequately described?	X				
3	Have all documents impacted by this design been adequately identified?	X				
4	Is the design appropriate in terms of form, fit, and function with interfacing SSCs?	X				
5	Has the safety function(s) of any safety SSCs potentially impacted by this design been adequately described for the purposes of design verification?	X				
6	Has the safety function of any safety SSC directly or indirectly impacted by this design been maintained, enhanced, or at least not degraded?	X				
7	Are the materials of construction for the design adequate for the operating environment?	X				
8	Does the design adequately consider operability and maintainability of Safety SSCs?	X				
9	Does the design meet standards and codes appropriate to its safety classification?	X				
10	Will the design adversely impact reliability of Safety SSCs?		X			

Review #: DRC-97-005

Item	Review Consideration					Remarks
		Yes	No	NA	NR	
11	Have assumptions necessary to perform the design task been adequately described and are they reasonable? Where necessary, have assumptions been identified for reverification when the design task has been completed?	X				
12	Have the appropriate Quality Assurance requirements been specified?	X				
13	Does the design meet established requirements or design criteria?	X				
14	Does the design meet established requirements for associated system physical and functional interfaces?	X				
15	Are there any interface problems with the design?		X			
16	Has appropriate consideration been given to use of standardized parts, materials and processes, and have engineering standards and criteria been specified properly in the design?	X				
17	Does the design represent a reasonable approach consistent with functional requirements and expected service conditions?	X				
18	Can the equipment be readily assembled/disassembled as designed?	X				
19	Are the specified materials compatible with each other and interfacing materials?	X				
20	Have modifications to commercial grade items and any associated verification operations or tests been appropriately documented?			X		
21	Have qualified and certified parts been specified?		X			
22	Have available data on similar designs been used?				X	
23	Does the design meet functional requirements?	X				Overall system accuracy needs evaluation once operating temp. range is determined

Item	Review Consideration					Remarks
		Yes	No	NA	NR	
24	Will the design meet the following environmental conditions?					
	a. Temperature (steady-state and transient)	X				
	b. Flow (steady-state and transient) including induced vibration			X		
	c. Pressure (steady-state and transient)			X		
	d. Seismic/natural phenomena			X		
	e. Nuclear radiation	X				
	f. For seismic category I items, impact of non-seismically qualified equipment which is/will be near by (3 over 1 problem)			X		
25	Are the specified construction materials resistant to the following as applicable:	X				
	a. Moisture					
	b. Oxygen					
	c. Acids					
	d. Salts					
	e. Radiation					
26	Have non-corrosive materials been used where required?	X				
27	Does the design avoid use of any materials unproven for use in the anticipated environment?	X				
28	Can the assembly be stored for extended periods of time without degrading effects?	X				
29	Has the design appropriately considered maintenance, operation and reliability, including maintenance procedures and techniques, unique maintenance requirements and frequencies?	X				

Item	Review Consideration					Remarks
		Yes	No	NA	NR	
30	Can the design and its parts be easily inspected for conformance to engineering specifications?	X				See item #23 remarks.
31	Has adequate accessibility been provided for in-service inspection?	X				
32	Has an acceptable level of personnel radiation exposure been defined?			X		
33	Have personnel radiation protection requirements been considered and identified?			X		
34	Have nuclear criticality safety considerations been incorporated?			X		
35	Have necessary features been provided to maintain personnel radiation exposure as low as reasonably achievable?			X		
36	Can the hardware be adequately disposed of after use if it is radiologically or chemically contaminated?	X				
37	Have adequate acceptance criteria been specified and are the verification methods stated appropriately?					
38	Have any locking devices, that are critical to operation or that will be inaccessible after assembly, been sufficiently evaluated and tested to assure their adequacy?			X		
39	Have welding, bolting, joining methods been adequately specified?	X				
40	Have NDE methods been applied correctly?			X		Acceptance testing will be conducted.
41	Will separate testing be required? - If yes, identify responsible organization(s) for preparation and issue (TBD if unknown)	X				
42	Have human factors engineering and operability been considered?	X				
43	Does the design use engineered safety and operational protection measures as opposed to relying on administrative controls?	X				
44	Are reliability requirements specified? If so, does the reliability analysis of the design meet the specified reliability requirements?		X			

Review #: DRC-97-005

Item	Review Consideration					Remarks
		Yes	No	NA	NR	
45	Have all credible non-standard conditions been properly considered?	X				
46	Has the need for safety analysis of this design been determined by Safety?	X				
47	Is the equipment, system, or facility covered by an existing Safety Analysis Report? If not, complete the safety analysis in time to incorporate findings of the analyzed in the design.	X				
48	Does the design accommodate the intended (and possible abnormal) methods of operation of the system?	X				
49	Is a single point failure analysis required?		X			
50	Are all indication lights and electrical control considered fail-safe?	X				
51	Have availability of power requirements for the project been verified?			X		
52	Is the design in compliance with applicable regulatory requirements and commitments?			X		
53	Are design tolerances appropriate and applied in a cost-effective manner and are standard materials and material sizes used where practicable?	X				
54	Is all computer software and data properly identified and controlled?			X		
55	Are those portions of the system intended to exist in, or be connected to a source of, a flammable gas atmosphere properly designed and specified to ensure safe operation for this application?	X				
56	Will the flammable gas atmosphere to which portions of the system are exposed degrade, cause failure, or cause unreliable function of the system?		X			
57	Can any routine action(s) of field operations personnel cause unsafe conditions in the operation of this system?		X			
58	Can any routine action(s) of maintenance personnel cause unsafe conditions in the operation of this system?		X			

Item	Review Consideration	Yes	No	NA	NR	Remarks
59	Does the design of this system require any additional engineered safety barriers?		X			Shutdown temp. setpoints must account for accuracy of T/Cs for operation of the WEC.
60	Does the design assume or reveal any unsafe conditions (not already covered by Administrative Controls or identified in the Authorization Basis) which do not have a design solution?		X			

ATTACHMENT 3
Copies of RCRs

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REVIEW COMMENT RECORD (RCR)	1. Date	2. Review No.
	3. Project No.	4. Page
	01/23/97	DRC-97-001
	CP0	1 of 2

A-6400-090.1 (03/92) WEF011

REVIEW COMMENT RECORD (RCR)		1. Date 1/23/97	2. Review No. 1
		3. Project No. N/A	4. Page 1 of 1

5. Document Number(s)/Title(s) ECN 639111	6. Program/Project/ Building Number Characterization	7. Reviewer JE Corbett	8. Organization/Group CPO	9. Location/Phone S7-01/372-2001
17. Comment Submittal Approval:		11. CLOSED		
10. Agreement with indicated comment disposition(s)		Reviewer/Point of Contact <i>JE Corbett</i> Date <u>1/27/97</u>		
Organization Manager (Optional) _____		Reviewer/Point of Contact <i>James D. Pl.</i> Date <u>1/27/97</u>		
		Author/Originator <i>James D. Pl.</i>		

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	Block 14b. Justification Details: In the design review package, there is no test report, or vendor data provided or referenced to support statement of meeting ISB requirements.		Block 14b will be changed to read, "Data from the intrinsic barrier manufacturer indicates maximum voltage passed by the barrier to be 28. For use in Class 1, Div. I, Group B applications, the pressure transmitters originally specified required the maximum to be limited to 22 volts. The replacement Yokogawa transmitters require a maximum of 30 volts to maintain this classification. Replacing the pressure transmitters will provide the Class 1, Div. I Group B qualification required by WHC-SD-SAD-035, Rev. 0a."	
2	Block 20 should identify document numbers for items checked in block 19.		Accept. Document numbers will be placed in Block 20.	

REVIEW COMMENT RECORD (RCR)		1. Date	2. Review No.
		1/23/97	1
		3. Project No.	4. Page
		N/A	1 of 1

5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
ECN 639112	Characterization	JE Corbett	CPO	S7-01/372-2001
17. Comment Submittal Approval:				
10. Agreement with indicated comment disposition(s)		11. CLOSED		
Organization Manager (Optional) _____ Date: <u>1/27/97</u>		Reviewer/Point of Contact <u>JE Corbett</u> Date: <u>1/27/97</u>		
		Reviewer/Point of Contact <u>J.D. Robinson per Telecon</u> Author/Originator <u>J.D. Robinson per Telecon</u>		

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REVIEW COMMENT RECORD (RCR)				1. Date	2. Review No.
				1/23/97	1
				3. Project No.	4. Page
				N/A	1 of 28
5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone	
ECN 639109	Characterization	JE Corbett	CP0	S7-01/372-2001	
17. Comment Submittal Approval:					
Organization Manager (Optional)		10. Agreement with indicated comment disposition(s)		11. CLOSED	
		Date: 1/27/97 Reviewer/Point of Contact: JE Corbett Author/Originator: James D. Bell		Date: 1/27/97 Reviewer/Point of Contact: JE Corbett Author/Originator: James D. Bell	
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		

REVIEW COMMENT RECORD (RCR)

			1. Date	2. Review No.
			1/23/97	1
			3. Project No.	4. Page
			N/A	2 of 2
1	Block 14b. Justification Details: In design review package, there is no analysis, test report, or vendor data provided or referenced to support statement of improved sample delivery.	The spool piece locating the Whittaker and SMC sample ports incorporates a baffle to provide the pressure differential that moves the sample past the SMC detector. This baffle introduces turbulence downstream of its location. The turbulence has the effect of slightly changing the pressure (when measured at a single point) differential introduced by the baffle. This fluctuating pressure differential causes SMC sample flow to vary. This is illustrated by the rapid movement of the sample loop rotameter ball. The original sample loop design used a single point intake and exhaust. The proposed change functions the same as a transverse pitot tube; it averages pressure variances across the duct diameter. Informal testing has shown that rotameter readings are much more stable. Block 14 b will be changed to read, "This change will provide transverse intake and exhaust locations for the SMC sample loop. This change is expected to provide improved SMC sample delivery by reducing the effects of turbulence on sample flow."		
2	Blocks 19 & 20 should not be "None." As a minimum, Vendor Information file should be identified.	Disagree. Information on spoolpiece design is not in the vendor information file - it is on released Hanford Site drawings. This change does not effect any other document.		

REVIEW COMMENT RECORD (RCR)

1. Date 01/23/97		2. Review No. TDJ-97-011	
3. Project No. N/A		4. Page 1 of 2	

5. Document Number(s)/Title(s) ECN 639111	6. Program/Project/ Building Number RMCS Sampling	7. Reviewer Jarecki, TD	8. Organization/Group 75160	9. Location/Phone 373-5741
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17. Comment Submittal Approval:

Organization Manager (Optional): 1/27/97 [Signature] 1/23/97 [Signature]

Date Reviewer/Point of Contact Date Reviewer/Point of Contact

Author/Originator Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	Need to review USQ TF-97-40; not available in Core Sampling USQ Binder, Volume IV as listed in index?	Y	Reviewer was furnished with a copy of USQ TF 97-40	Closed
2	Block 8: Approval Designator should be "SQ" per CM-3-5, Sec. 12.7.	Y	Accept	Closed
3	Block 13a: H-14-100532 lacks reference to revision.	Y	Accept	Closed
4	Block 13a: "NOTE" is marginal, need to ensure no "effected drawing views" exist on other sheets.	Y	"NOTE" will be changed to read, "This ECN shows the changes made on all effected sheets but not all effected drawing views. When incorporating this ECN all effected views must be changed."	Closed
5	Block 14b: Justification Details do not include "enough detail to permit an assessment of the need for change" as required by CM-6-1, EP-2.2. It may be appropriate to include details of the output voltages for the existing and replacement transmitters.	Y	Block 14b will be changed to read, "Data from the intrinsic barrier manufacturer indicates maximum voltage passed by the barrier to be 28. For use in Class 1, Div. I, Group B applications, the pressure transmitters originally specified required the maximum to be limited to 22 volts. The replacement Yokogawa transmitters require a maximum of 30 volts to maintain this classification. Replacing the pressure transmitters will provide the Class 1, Div. I Group B qualification required by WHC-SD-SAD-035, Rev. 0a."	Closed

REVIEW COMMENT RECORD (RCR)

REVIEW COMMENT RECORD (RCR)					1. Date 01/23/97	2. Review No. TDJ-97-011
					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		
6	Block 14b: Must include "Formal Design Review".	Y	Accept	CLOSED		
7	Block 15: Should include Formal Design Review Chairman as minimum.	N	Accept, will also add Safety.	CLOSED		
8	Block 17: Suggest this block actually get used on this ECN.	N	Accept	CLOSED		
9	Block 18: Suggest this block actually get used on this ECN.	N	Accept	CLOSED		
10	Block 20: List affected document numbers from block 19 as stated in instructions in block 19.	Y	Accept	CLOSED		
11	Page ?, Item 7: Appears to reference "Zone D" or "Zone E", should be "Zone C"	Y	Accept	CLOSED		
12	Page ?, Item 8: Are Notes 5 and 6 to be eliminated? If not, do these notes need to be changed?	Y	Note 5 is changed to read, "Field locate on item 10. Template 4 mounting penetrations thru item 10 from connector (items 25 and 32). For labeling and connection see drawing H-14-100771."	CLOSED		
13	Page ?, Item 8: Which drawing, if any, details hardware for wiring and tubing connections to these transmitters and does this change affect it?	Y	Note 6 is changed to read, "Field locate on item 9, template drill and mount using vendor supplied hardware."	CLOSED		
			For labeling and electrical connection see drawing H-14-100771. Electrical connections do not change.			
			Note 8 to be added: "On each instrument field route high pressure side to atmosphere and low pressure side to part 23 on Item 1."			

REVIEW COMMENT RECORD (RCR)		1. Date	2. Review No.
		1/22/97	0
		3. Project No.	4. Page
		RMCS	1 of 1

5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Design Review Package 1/21/97 DRAFT Change ECN #639112, Flow Meter Range Change. DRAFT Supplemental ECN #639109, Sample Tube Extension. DRAFT Supplemental ECN #639111, Pressure Transmitter Change.	RMCS	Nancy Milliken	THRS SAR Engineering/DESH	825 Jadwin/332 376-7846

17. Comment Submittal Approval:

10. Agreement with indicated comment disposition(s)

11. CLOSED

Organization Manager (Optional)	Reviewer/Point of Contact Date	Author/Originator
	<i>N/A</i>	<i>[Signature]</i> 2/24/97

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REVIEW COMMENT RECORD (RCR)			
1. Date	2. Review No.		
1-27-97	N/A		
3. Project No.	4. Page		
N/A	1 of 12		

5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
ECN 639112, ECN 639109, and ECN 639111	Characterization	CC Scalet III	TWRS Engineering	2750E/A-118/6-0491

17. Comment Submittal Approval:	11. CLOSED	16. Status
Organization Manager (Optional) <i>C.P. Scalet III</i> Reviewer/Point of Contact <i>C.P. Scalet III</i> Author/Originator	2-3-97 Date	2-3-97 Date <i>C.P. Scalet III</i> Reviewer/Point of Contact <i>James D. H.</i> 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	ECN 639112: No comments			
2	ECN 639109: No comments			
3	ECN 639111: The entity parameters provided on the vendor data sheet from Yokogawa are within the parameters required by Factory Mutual for the R. Stahl associated apparatus (9303/1a-22-1b) as described in FM Job No. 4W2A8.AX Report. It is important, however, that we receive a controlled drawing from Yokogawa that specifies the entity parameters approved by FM.		The document requested will be acquired. Jim Criddle will review the entity parameters to ensure that they are met. See meeting minutes for 2/3/97 for documentation to close this comment. JPH 2/3/97	
4	I was unable to find specific requirements on the accuracy and response time of the pressure transmitter. SAD-035 only requires that the RMCS operation be terminated upon a change in pressure of 2 INWG in five minutes. The Yokogawa transmitter has an operating temperature range of -40°F to +180°F. The accuracy is a function of range, reading, and temperature.		1. Calibration accuracy requirements for the Yokogawa are the same as they were for the Ashcroft instruments. 2. WHC-SD-WM-SAD-035, Rev. 0a does not specify response time criteria. 3. Manufacturers data indicates that the functional temperature range for the Yokogawa is greater than that of the Ashcroft instruments being replaced.	

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	3. Project No.	4. Page
	1-27-97	N/A
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REVIEW COMMENT RECORD (RCR)		1. Date 1/24/97	2. Review No. CP97-002
		3. Project No. N/A	4. Page 1 of 2

5. Document Number(s)/Title(s) DESIGN REVIEW COMMENTS ON EGN'S 639112, 639109, & 639111	6. Program/Project/ Building Number CHARACTERIZATION PROJECT	7. Reviewer M.L. MCELROY	8. Organization/Group CHARACTERIZATION PROJECT QA/75220	9. Location/Phone 2704HV/B-122/ 373-5588
11. CLOSED				
10. Agreement with indicated comment disposition(s)				
2/3/97 Date		M.L. MCELROY Reviewer/Point of Contact		
2/3/97 Date		JAMES D. ILL Author/Originator		
17. Comment Submittal Approval:				
Organization Manager (Optional) 				

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REVIEW COMMENT RECORD (RCR)	1. Date	2. Review No.
	3. Project No.	4. Page
	2-29-97	ECN 639111
	CP0	1 of 1

5. Document Number(s)/Title(s) ECN 639111/Rotary Mode Core Sampling	6. Program/Project/ Building Number CPQ	7. Reviewer Jeff Ranschau	8. Organization/Group TWRS-Safety/CPQ	9. Location/Phone 2704HW/373-4462
17. Comment Submittal Approval:		11. CLOSED		
10. Agreement with indicated comment disposition(s)				
Organization Manager (Optional)		Reviewer/Point of Contact		
	Date	<i>Jeff Ranschau</i>	1-29-97	Date
				Author/Originator
				n/a

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REVIEW COMMENT RECORD (RCR)

1. Date 01/27/97		2. Review No. DRC-97-002	
3. Project No. CPO		4. Page 1 of 2	

5. Document Number(s)/Title(s) ECN 636965	6. Program/Project/ Building Number Characterization	7. Reviewer GP Janicek	8. Organization/Group Char. Equip. Engrg	9. Location/Phone 2704HY/6-2225
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10. Agreement with indicated comment/disposition(s) Date <u>2/5/97</u> Reviewer/Point of Contact <u>[Signature]</u> Author/Originator <u>[Signature]</u>		11. CLOSED Date <u>2/19/97</u> Reviewer/Point of Contact <u>[Signature]</u> Author/Originator <u>[Signature]</u>	
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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
1	Block 14b, - Expand "Justification Details" to define the safety classification and function of the "drill Rod" and how design modification will (or is intended to) impact this safety function or that of interfacing SSCs. Use attached 14b continuation sheet if necessary. This is a design modification to a Safety Class SSC and, thus, should provide more relevant justification detail.		Accept: The following was added to the ECN. This is a change to safety class SSP equipment. WMC-SD-WM-SAP-035 Revision 0-a requires that the drill rods be of the configuration and material tested by the Bureau of Mines and performance evaluated in this SA (section 6.8.3.1 page 6-27). The above drill rod was tested at the Bureau of Mines to reduce the frequency of failure to less than 1.0E-6 for the postulated accident of creating a spark and subsequent dome collapse during assembly/disassembly of the drill string caused by dropping or banging the drill rod section against the drill string while the drill string is in the waste (for further information see WMC-SD-WM-SAP-035 Revision 0-a section 4.3.3 page 4-35). The required Bureau of Mines testing is documented in Appendix X of WMC-SD-WM-SAP-035 Revision 0-a. Section 14b, - Justification Details, is added to the ECN and the drop tests of the drill rod are added to the testing and acceptance criteria. In brief, the reason for the tests is to show that the material used to manufacture the drill rod does not ignite a stoichiometric mixture of hydrogen and air. The results of these tests are documented in "Test Report for Ignitability Testing" WMC-SD-WM-TRP-257.	

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5. Document Number(s)/Title(s) ECN 636965	6. Program/Project/ Building Number Characterization	7. Reviewer J.E. Corbett	8. Organization/Group CPD	9. Location/Phone S7-01/372-2001
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17. Comment Submittal Approval:

10. Agreement with indicated comment disposition(s)
JE Corbett
 Reviewer/Point of Contact
2/5/97
 Date
JE Smalley
 Author/Originator

11. CLOSED
2/5/97
 Date
JE Corbett
 Reviewer/Point of Contact
JE Smalley
 Author/Originator

Organization Manager (Optional)

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REVIEW COMMENT RECORD (RCR)

1. Date 01/27/97		2. Review No. TDJ-97-012	
3. Project No. N/A		4. Page 1 of 3	
6. Program/Project/ Building Number RMCS Sampling		7. Reviewer Jarecki, TD	
5. Document Number(s)/Title(s) ECN 63965		8. Organization/Group 75160	
10. Agreement with indicated comment disposition(s)		11. CLOSED	
17. Comment Submittal Approval:		9. Location/Phone 373-5741	
Organization Manager (Optional)		Reviewer/Point of Contact Date: 2/5/97	
Author/Originator		Author/Originator	
12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)
1	Block 14b: The justification should discuss the reason that changes per the ECN being superseded are not longer necessary as well as noting SAD-035 requirements for material traceability relative to the changes added in this ECN.	Y	Accept: The following was added to the ECN. This is a change to safety class "SC" equipment. WMC-SD-WM-SAD-035 Revision 0-1 requires that the drill rods be of the configuration and material tested by the Bureau of Mines and performance evaluated in this SA (section 6.8.3.1 page 6-27). The above mentioned safety assessment takes credit for the fact that the drill rod was tested at the Bureau of Mines to reduce the frequency of failure to less than 1.0E-6 for the postulated accident of creating a spark and subsequent dome collapse during assembly/disassembly of the drill string caused by dropping or banging the drill rod section against the drill string while the drill string is in the waste (for further information see WMC-SD-WM-SAD-035 Revision 0-a section 4.3.3 page 4-22). The required change of mines testing is documented in Appendix I of WMC-SD-WM-SAD-035 Revision 0-a. Section 1-4, of Appendix I discusses the reason for performing the drop tests of the drill rod as well as the test results and acceptance criteria. In brief, the reason for the test is to show that the material used to manufacture the drill rod does not ignite a stoichiometric mixture of hydrogen and air. The results of these tests are documented in "Test Report for Ignitability Testing" WMC-SD-WM-TRP-257.
			16. Status closed

REVIEW COMMENT RECORD (RCR)

1. Date			2. Review No.	16. Status
3. Project No.			4. Page	
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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.)	Closed (over)
1		Y	Appendix T of WHC-SD-WM-SAD-035 Revision 0-a states "The Fe/RMCS equipment may be modified in the future. Any modifications made in drill bits, core samplers, drill rods or operating conditions specified in this appendix must be assessed against ignition test results given in the appendix. Design and parameter changes which are not addressed in this appendix will require performance of additional bounding tests. The USA process will be applied to ensure that any design or operational parameter changes are bounded by the results of the ignition testing in this SA". The exact material composition and hardness of the drill rods tested at the Bureau of Mines is not known. The drill rod used was from warehouse stock that was procured as safety class GS without material certification requirements. Since the exact material composition is not known a bounding material was chosen to meet the requirements of the SA. USQ IF-97-38 performed the required review of ignition testing and determined that nickel plated drill rods are bounded by the ignition tests since nickel plating will result in drill rods 38% prone to sparking than any carbon steel (see USQ IF-97-38). This ECN supercedes ECN 636530 which was written to allow the use of drill rod without o-ring grooves. The original design of the drill rod utilized o-rings to limit the leakage through the drill string assembly. Use of o-rings to seal the drill rod sections is not required per WHC-SD-WM-SAD-035 Revision 0-a (see discussion section 4.4.1 page 4-41), hence, ECN 636530 was written to allow for the option to utilize drill rod without o-ring grooves. Currently, the manufacturer of the drill rod without o-rings is Diamond Drill. However, Diamond Drill is not on the evaluated supplier list and since the drill rod is now defined as safety class they are being removed from the drawing as an acceptable supplier.	
2	Block 15: Should include Formal Design Review Chairman as minimum.	N	Accepted G.P. Janicek added.	Closed
3	Block 17: Suggest this block actually get used in this ECN.	N	Not Accepted: This block was filled out with NA. A cost estimate has been added: \$8000 for engineering costs and \$10/piece for construction.	Closed
4	Block 18: Suggest this block actually get used in this ECN.	N	Not Accepted: This block has been filled out with NA. A Schedule Impact is not applicable for this change. The result of not making this change would delay sampling. The result of making this change could delay sampling.	Closed
5	Block 19: Need to include "Operating Procedure"	Y	Accepted	Closed

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REVIEW COMMENT RECORD (RCR)	
1. Date	1/24/97
2. Review No.	0
3. Project No.	RMCS
4. Page	1 of 1

5. Document Number(s)/Title(s) Design Review Package 1/24/97 DRAFT Change ECN #636965, Nickel Plating of Drill Rods.	6. Program/Project/ Building Number RMCS	7. Reviewer Nancy Milliken	8. Organization/Group THRS SAR Engineering/DESH	9. Location/Phone 825 Jadwin/332 376-7846
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17. Comment Submittal Approval:	10. Agreement with indicated comment disposition(s) Date <u>2/5/97</u>	11. CLOSED Date <u>2/5/97</u>	Reviewer/Point of Contact <u>[Signature]</u> Author/Originator
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Organization Manager (Optional)	Reviewer/Point of Contact <u>[Signature]</u> Author/Originator
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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
1.	No comments on ECNs.		ACCEPT	
2.	General Comment, no response required. (1) A Safety Class designation is being used to prevent the potential for sparking through material control. (2) To maintain the assumptions used in the safety analysis, only drill rods qualified for use via the Bureau of Mines testing can be used (unless they are better). Since nickel bounds the tested carbon steel, it is considered better. Nickel plating is not the requirement, but the solution to the difficulty of verifying carbon content in carbon steel.		ACCEPT	
				A3-23

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	1-27-97	N/A
	3. Project No.	4. Page
	N/A	1 of 1

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REVIEW COMMENT RECORD (RCR)

5. Document Number(s)/Title(s) EON 636965; DESIGN REVIEW COMMENTS PROJECT		6. Program/Project/ Building Number CHARACTERIZATION PROJECT	7. Reviewer M.L. McElroy	8. Organization/Group CP-SQRC/QA/75820	9. Location/Phone 2704HW/B-122/ 373-5388	2. Review No. CP97-003
1. Date 1/27/97		3. Project No. N/A		4. Page 1 of 2		
17. Comment Submittal Approval:						
Organization Manager (Optional) M.L. McElroy Reviewer/Point of Contact J.P. Smalley Author/Originator		2.5.97 Date		2.5.97 Date		11. CLOSED
10. Agreement with Indicated comment disposition(s)						
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.)			
1.	Block 13a.---the word "entirety" is misspelled.		Accept: Spelling corrected			
2.	Block 14a.---the "Justification Details" should include basis for the requirement change. It should also designate that the item being change is a "safety class" item, as per Design Authority directions.	MLM	Accept: The following was added to the ECM. This is a change to safety class "MS" and is required. WMC-SD-WM-SAP-035 Revision 0 requires that the drill rods be of the configuration and material tested by the Bureau of Mines and performance evaluated in this SA (section 6.8.3.1 page 6-27). The above mentioned safety assessment takes credit for the fact that the drill rod was tested at the Bureau of mines to reduce the frequency of failure to less than 1.0E-6 for the postulated accident of creating a spark and subsequent dome collapse during assembly/disassembly of the drill string caused by dropping or banging the drill rod section against the drill string while the drill string is in the waste (for further information see WMC-SD-WM-SAP-035 Revision 0-a section 4.3.3 page 4-33). The required Bureau of Mines testing is documented in Appendix 1 of WMC-SD-WM-SAP-035 Revision 0-a. Section 1.4. of Appendix 1 discusses the reason for performing the testing. The drill rods were as the test setup and acceptance criteria. In brief, the tests show that the test rods do not ignite a stoichiometric mixture of hydrogen and air. The results of these tests are documented in "Test Report for Ignitability Testing" WMC-SD-WM-TRP-257.			

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12. Item	13. Comment(s)/Discrepancy(s) (Provide technical 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.			Appendix T of WHC-SD-WM-SAD-035 revision 0-a states "The IF/RMCS equipment may be modified in the future. Any modifications made in drill bits, core samplers, drill rods or operating conditions specified in this appendix must be assessed against ignition test results given in the appendix. Proposed design or operating parameter changes which are not bounded by the results of ignition testing discussed in this appendix will require performance of additional bounding tests. The USQ process will be applied to ensure that any design or operational parameter changes are bounded by the results of the ignition testing in this SA". The exact material composition and hardness of the drill rods tested at the Bureau of Mines is not known. The drill rod used was from warehouse stock that was procured as safety class GS without material certification requirements. Since the exact material composition is not known a bounding material was chosen to meet the requirements of the SA. USQ IF-97-38 performed the required review of ignition testing and determined that nickel plated drill rods are bounded by the ignition tests since nickel plating will result in drill rods less prone to sparking than any carbon steel (see USQ IF-97-38).	Closed		
3.	Block 17.---it lists "N/A" for any cost impact. Is this a true reflection of the change impact?		Accept: cost estimate added, \$8000 for engineering costs and \$10/piece for construction.			
4.	Block 19. ---Will there be any change impact on the drawings and drawing notes besides the "Parts/Materials Lists?"		no			
5.	A note should be added to the drawings, stating that the drill rod is designated "safety class" or "SC".	MLM	Not Accepted: There is not a procedural requirement to verify the satisfaction of comments on the design drawings. The Safety Engineer must verify these components by drawing and part number as safety class.			

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	1-27-97	636965
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5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
ECN 636965/Characterization Project 14H3B	CP0	Jeff Ranschau	TWRS-Safety/CP0	2704HW/373-4462

17. Comment Submittal Approval:

Organization Manager (Optional)	1-27-97	1-27-97	1-27-97
		Author/Originator	Author/Originator
		Reviewer/Point of Contact	Reviewer/Point of Contact
		N/A	N/A

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REVIEW COMMENT RECORD (RCR)

1. Date 02/06/97		2. Review No. TDJ-97-013	
3. Project No. N/A		4. Page 1 of 6	

5. Document Number(s)/Title(s) ECN 639110	6. Program/Project/ Building Number RMCS Sampling	7. Reviewer Jarecki, TD	8. Organization/Group 75160	9. Location/Phone 373-5741
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10. Agreement with indicated comment disposition(s) 11. CLOSED	
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17. Comment Submittal Approval:	02/14/97 Reviewer/Point of Contact Jarecki, TD Date 02/19/97 Reviewer/Point of Contact Jarecki, TD Date
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Organization Manager (Optional)	Author/Originator
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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
1	Block 10: Suggest additional reference ECN be added relative to the positioning of thermocouples. Verification of temperature measurement accuracy in the field may change due to testing which may effect setpoints in CSDD.	N	Additional reference ECN has been added. As discussed in the design review meeting on February 10, the thermocouples are being relocated to the hydrogen detection cell. The lower temperature limit would be as defined in HNF-SD-TRP-274 or as decided by the design review committee. The lower setpoint would not change or be dependent on cart location. The design review committee will review the thermocouple ECN. They would need to verify that the thermocouple location on the cell matches the requirements established in the referenced tests.	Closed
2	Block 12a, b, c: Although changes to this SDD and subsequent PLC changes do not constitute a physical modification, incorporation of this ECN should be tied to documented completion of the change to the PLC's. Unless another document will be changed to control the field configuration of the PLC's, this ECN must document a related work package.	Y	Block 12a will be checked "yes." The work package number in Block 12b will be ES-97-022. This is the work package that performs and documents results from the software verification.	Closed

REVIEW COMMENT RECORD (RCR)

				1. Date	2. Review No.	16. Status
				02/06/97	TUJ-97-013	
				3. Project No.	4. Page	
				N/A	2 of 6	
12. Item	13. Comment(s)/discrepancy(s) (Provide technical justification for the comment and detailed explanation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)			
3	Block 19: Need to mark Maintenance Procedure for changes to Critical Alarm Check PM as well as Operating Procedure for new alarm responses.	Y	Accept.	Closed		
4	Block 20: Need to add document reference for Critical Alarm Check PM and Operating Procedures.	Y	Accept. Critical alarm check procedure 6-ES-443, truck operating procedure 10-080-518 will be added to block 20. The exhaust procedure 10-060-347 is not affected, as the exhaust continues to run when temperature is out of range.	Closed		
5	Block 14b (cont.): Paragraph on page 3 misspelled and did not capitalize "Rotary Mode Core Sampling".	Y	Misspells will be corrected. The essential distinction in the use of capitals and lowercase letters at the beginnings of words lies in the individualizing significance of capitals as against the generalizing significance of lowercase. In this instance rotary mode core sampling is a general activity. It is site convention to capitalize acronyms.	Closed		
6	CSDD, 2.0: The last sentence notes safe ladder logic related to safe operation of the exhaust. Many of the related interlocks are actually associated with the RWCS truck as noted in section 3.0. Section 2.0 should also refer to safe operation of the truck.	N	Accept. The referenced sentence now reads, "The external FGTEI logic, using hard-wired relays, works in concert with the PLC ladder logic to provide operation of the portable exhaust and rotary mode core sampling drill truck as required by WMC-SD-WM-SAD-035, Rev. 0-a, A Safety Assessment of Rotary Mode Core Sampling in Flammable Gas Single Shell Tanks: Hanford Site, Richland Washington."	Closed		
7	CSDD, 3.1: Reference to "ambient temperature" should be changed if thermocouples are moved to the WEC.	Y	Accept, last bullet now reads, "Hydrogen detection cell temperature out of range."	Closed		

REVIEW COMMENT RECORD (RCR)

REVIEW COMMENT RECORD (RCR)					1. Date 02/06/97	2. Review No. TDJ-97-013
					3. Project No. N/A	4. Page 3 of 6
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	CSDD, 3.1: The last sentence refers to only the exhaustor and not the RMCS truck during the occurrence of a "shutdown condition". Should this include only the exhaustor, only the truck, or both?	Y	A sentence has been added to the paragraph as follows, "When the exhaustor is de-energized the RMCS drill truck alarms and does not operate."	Closed		
9	CSDD, 3.2.1: reference to "outside cabinet temperature" should be changed if T/C's are moved to the WEC.	Y	Last bullet in Section 3.2.1 now reads, "Hydrogen detector cell temperature."	Closed		
10	CSDD, 3.2.3: Middle of page 5, "Pressure within range..." - should this refer to - 3" W.C. absolute, 2" W.C. rise above baseline in 5 minutes, or both?	Y	The bullet now reads, "Pressure within range (a change of no more than +2" W.C. in five minutes or less, greater than -3" W.C., and less than the high pressure alarm setting of -0.1" W.C.)"	Closed		
11	CSDD, 3.2.3: Middle of page 5, last bullet - should be changed if T/C's are moved to WEC.	Y	The bullet now reads, "Hydrogen detector cell temperature within range."	Closed		

REVIEW COMMENT RECORD (RCR)

			1. Date	2. Review No.	16. Status
			02/06/97	TDJ-97-013	Closed
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			N/A	4 of 6	
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.)		
12	CSD, General: There are several other parameters which effect interlocks related to exhaust operation such as hepa filter dp; are all of these setpoints in a common SD? If not, how is the interface between these separate interlock systems controlled in terms of design configuration?	Y	The last paragraph in Section 2 now reads, "There are two important points to the operation of the FGTEI; any alarm that shuts down the exhauster will also shut down the truck and there are unique alarms on the exhauster. These exhauster alarms are described in WHC-SD-WM-SDD-035, Rev.2, <i>System Design Description for the Rotary Mode Core Sampling Exhauster</i> . Configuration control of these alarms is maintained on H-14-030122. Exhauster alarms are independent of the FGTEI, provide no input to the FGTEI, and do not rely on FGTEI output. However, it is possible (strictly from a software shutdown of the exhauster and not shutdown logic viewpoint) for the FGTEI to initiate a shutdown of the exhauster and not shutdown the truck. Truck shutdown in this instance is accomplished by the exhauster. Although the exhauster and FGTEI shutdown alarms are mechanically independent of each other, the systems (FGTEI and exhauster) are dependent."		
13	CSD, 3.2.4: "High or low ambient temperature" should be changed if I/C's are moved to WEC.	Y	Bullet now reads, "Hydrogen detector cell temperature."		
14	CSD, 3.2.4: "Two additional events..." does not discuss truck shutdown due to exhauster shutdown.	Y	The following has been added to the end of Section 3.1: "NOTE: When the exhauster is de-energized for any reason, the RMCS drill truck alarms and does not operate."		

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			1. Date	2. Review No.	16. Status
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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.)		
15	CSDD, General: This CSDD does not document related interlocks which may initiate an action required by the subject PLC. For example, this CSDD refers to exhaust shutdown events but doesn't account for shutdowns initiated by other interlocks on the exhaust skid itself. There should be, at minimum, some mention of these other initiating events so someone referring to this document doesn't overlook the interface with related interlocks.	Y	There are no related interlocks which initiate a required PLC action. Shutdowns emanating from the exhaust are independent of the PLC and do not impact its operation. The PLC will provide an output to exhaust shutdown, i.e., high tank pressure when the exhaust shuts down. Additional interlocks are referenced in Section 2 of the document under review. Also see response to comment 12 above.	Closed	
16	CSDD, 3.2.4.3: 1) What happens if the cabinet and "ambient" temperatures are both out of range; will the light flash or just be on? 2) Also, "ambient" should be changed if T/C's are moved to WEC.	Y	1) The network has been changed such that if both alarm conditions occur, hydrogen detection cell temperature out of range takes precedence and the lamp will flash. 2) The sentence now reads "... hydrogen detection cell ..."	Closed	
17	CSDD, 3.2.4.4: Numerous locations in this CSDD include mention of the "2" W.C. above baseline pressure" without including rate of rise and/or the 5 minutes in terms of accurately referring to the interlock setpoint while other "rate of rise" parameters are clearly referred to as such.	Y	The pressure algorithm is not a true rate of rise alarm as the hydrogen or combustible gas rate trips are. It is updated every two seconds to meet the requirement of detecting a 2" pressure increase in any five minutes. Every reference in the document to "baseline" pressure has been changed to "+2" W.C. in five minutes or less."	Closed	
18	CSDD, 3.2.4.10: Refers to a start-up sequence with the RWCS truck enable activated prior to starting the exhaust; is this reversed?	Y	The sentence now reads, "The start-up sequence must be performed to start the portable exhaust and enable the RWCS truck."	Closed	

REVIEW COMMENT RECORD (RCR)

			1. Date	2. Review No.
			02/06/97	TDJ-97-013
			3. Project No.	4. Page
			N/A	6 of 6
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
19	CSD, 4.2.1.1: Last comment of this nature - all references to "ambient temperature" should be changed if T/C's are moved to WEC.	Y	The sentence now reads, "... high or low hydrogen detector cell temperature condition..." A global document search and replace has eliminated all references to "ambient temperature" in this alarm context.	<i>closed</i>
20	CSD, 4.2.3: Need more information to compare pressure setpoints and range ratios of existing CSDD with the changes in this revision.	Y	A copy of Revision 1 is available for your review.	<i>closed</i>
21	CSD, 4.2.17: "(HITEMPABVAL - the low..." should be "(HITEMPABVAL - the high..."	Y	Accept. The sentence now reads, "... the high temperature abort ..."	<i>closed</i>
22	CSD, APP. B: Under "Discrete Internal Coils", 00301 should refer to "5 Minute" rather than "6 Minute".	Y	Accept. Has been changed to 5 minutes.	<i>closed</i>

REVIEW COMMENT RECORD (RCR)

1. Date 2/6/97				2. Review No. DRC-97-003	
3. Project No. RMCS				4. Page 1 of 3	
5. Document Number(s)/Title(s) Design Review Package 2/6/97 DRAFT Change ECN #639110, Revision to WHC-SD-CSD-020, Rev. 2.	6. Program/Project/ Building Number RMCS	7. Reviewer Nancy Milliken	8. Organization/Group TWRS SAR Engineering/DESH	9. Location/Phone 825 Jadwin/332 376-7846	
17. Comment Submittal Approval:					
Organization Manager (Optional)		11. CLOSED			
Date 2/19/97		Reviewer/Point of Contact <i>[Signature]</i>			
Date 2/19/97		Author/Originator <i>[Signature]</i>			
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.	No comments on ECNs.		OKAY		
2.	General Comment. Please provide reviewer with the USQD prepared for the use of a tent for temperature control. Also, provide the reviewer with a description of what equipment is to covered by the tent, and therefore, what is excluded.		There is no USQ prepared for the tent. The tent is merely a means of providing an environment for the hydrogen detector cells. The thermocouples provide protection against operation outside cell temperature range. If the tent is not there or does not function and the temperature is out of range - no operation occurs.		



REVIEW COMMENT RECORD (RCR)

1. Date 2/6/97			2. Review No. DRC-97-003
3. Project No. RMCS		4. Page 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.)
3.	WHC-SD-WM-FDC-045, <i>Functional Design Criteria, Flammable Gas Detection and Shutdown System</i>, Page 6, states that the temperature range for the system is -20 to 115 °F. 1)Comment on WHC-SD-WM-CSDD-020. What is being done to protect equipment at temperatures below 45 °F? At cabinet temperatures below 45 °F the heater will operate, but if the system is not energized (such that the heater is operational) what is being done to protect the equipment? Prior to and during tent use. 2)In addition, what is being done to protect the equipment in storage conditions?		1) The interlock carts are configured such that when power is applied the heater is on. If the PLC does not function due to low temperature; the heater continues to run until the PLC has reached an operating temperature. The PLC then takes control of the heating and cooling of the enclosure. Other safety class instruments within the enclosure have a lower temperature operating limit of 32°F. It is possible that the PLC will operate at a temperature lower than 32°. The software will be modified (Sections 3.2.4.3, 4.2.4, 4.2.6.3, 4.2.17, and Networks 5 and 17) to ensure that the exhaustor cannot be energized unless cabinet temperature is above 32°F. 2) The equipment is typically stored outside under cover. It is not energized during storage. Lower limit storage temperature for the PLC is -40 °F. System critical alarms are tested before rotary mode core sampling is started on each tank. Any alarm faults caused by low temperature storage would be identified during the pre operational testing which occurs prior to intrusive activities on each tank. Lower storage temperature limit on the safety class display instruments within the enclosure is -40°F.

REVIEW COMMENT RECORD (RCR)

REVIEW COMMENT RECORD (RCR)						
1. Date		2. Review No.		16. Status		
2/6/97		DRC-97-003				
3. Project No.		4. Page		3 of 3		
RMCS						
12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)			
4.	Continuation of thought from Comment #3. 1)WHC-SD-WM-CSDD-020, Page 12, "The calibrations used for all inputs are as follows: ... Temperatures: 0 - 4000 = 0 to 160 degrees F. (0.04°F/count)." What does this mean for temperatures below 0 °F? 2)Does this mean that until the system (cabinet) is warm or above 45 °F it should not be used or is unreliable? 3)Note: there is only a high temperature alarm for the cabinet. There is no alarm for low temperature.		1) The PLC treats temperatures below zero the same as temperatures at zero; that is zero counts. System response is the same for zero degrees or any temperature less than zero. 2) No, the lower operating limit of the cabinet is defined by the instruments within it and that is 32°F. This is now the lower cabinet alarm value.			
5.	WHC-SD-WM-CSDD-020 does not specify the temperatures for the ambient alarm and alarm signal. What is the functional criteria? -20 to 115 °F? Is this with or without the use of a tent? The answer should also state how these values were obtained or verified.		The values for the hydrogen detector cell alarm are 60°F and cell calibration temperature. The test(s) used to get the lower value or document accuracy dependence on temperature did not consider tent employment. If the temperature range can be maintained without a tent, that is acceptable. Temperature values are established in HNF-SD-TRP-274. This document is referenced in the software description. A copy is also available for your review.			

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REVIEW COMMENT RECORD (RCR)

1. Date 2/6/97		2. Review No.	
3. Project No.		4. Page 1 of 3	
5. Document Number(s)/Title(s) ECN-639110 to WMC-SD-WM-CSD-020, Rev 2	6. Program/Project/ Building Number LF Hill	7. Reviewer LF Hill	8. Organization/Group 2750/3-6424
9. Location/Phone			
10. Agreement with indicated comment disposition(s) 11. CLOSED			
17. Comment submittal Approval: Organization Manager (Optional) 2-19-97		Reviewer/Point of Contact 2-19-97 Date	
Author/Originator J.D. ROBINSON PER TELETYPE		Author/Originator J.D. ROBINSON PER TELETYPE	

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	This review attempts to limit its scope to the changed portions in the ECN. A more general review of the overall exhaust interlocks are planned separately.		Comment noted.	
2	Detailed verification that each constant in the logic is implemented correctly is considered beyond the scope of this review. It is assumed that a system ATP will be performed to assure that each required alarm or trip point occurs at the proper setpoint.		A software verification occurs immediately after software installation. At initial system set up on each tank a check of all critical alarms is conducted.	
3	New network #17 seems to appropriately perform the Hi/Low temperature checking.		Comment noted.	
4	Could not confirm whether the logic generating 00402 has (or needs?) adjustment for the new pressure range.		This is an I/O "health" register. If the signal from the pressure transducer falls below the value specified an action is taken. This is intended to insure pressure transducer cables are connected prior to operation.	

REVIEW COMMENT RECORD (RCR)				1. Date 2/6/97	2. Review No.
				3. Project No.	4. Page 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	The Network 3 description has a nice listing of the EUC involved in the constants initializations, while network 4 uses textual descriptions. Suggest a common format, and a review to assure all are described and properly resolved.		A table has been provided for network 4.		
6	Although no requirement for accuracy of pressure sensing is apparent, it is judged that the lower accuracy resulting from the range increase will still be acceptable. The accuracy is probably better than $1\pm 0.2"$, while the low pressure cutoff (3") is a full 1" above the LCO limit of 4".		Comment noted.		
7	The algorithm used to implement the "rate-of-rise" pressure calc could entirely miss a rise as large as 3.99" if that rise bridges the 5min baseline reset. What is the "accuracy" requirement for this calc? Considerable improvement could be made ("2.99" max miss) by simply adding a copy of the existing algorithm guaranteed to be offset by 2.5 min.		You are correct. This fault will be corrected and the changes forwarded to the committee for review.		

REVIEW COMMENT RECORD (RCR)	1. Date	2. Review No.
	3. Project No.	4. Page
		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
8	The Watchdog interrupts Exhauster Operation (via K3), but doesn't seem to drop the Truck Interlock (K10 output). Thus the network Logic could fail to execute, while the truck is allowed to continue operation. Seems that the Watchdog should also interrupt Truck Operation.		You are correct from a logic viewpoint. However, when the exhauster fan stops, for what ever reason, a relay unique to the exhauster opens and terminates truck operation. Truck termination is not solely dependent on watchdog shutdown. The following paragraph has been added to Section 2 of the software description, "These exhauster alarms are described in WHC-SD-WM-SDD-035, Rev.2, <i>System Design Description for the Rotary Mode Core Sampling Exhauster</i> . Configuration control of these alarms is maintained on H-14-030122. Exhauster alarms are independent of the FGI, provide no input to the FGI, and do not rely on FGI output. However, in at least one instance of software failure it is possible (strictly from a software logic viewpoint) for the FGI to initiate a shutdown of the exhauster and not shutdown the truck. Truck shutdown in this instance is accomplished by the exhauster. Although the exhauster and FGI shutdown alarms are mechanically independent of each other, the systems (FGI and exhauster) are dependent."	

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REVIEW COMMENT RECORD (RCR)

1. Date 2/5/97		2. Review No. CP97-004
3. Project No. N/A		4. Page 1 of 1

5. Document Number(s)/Title(s) WHIC-SD-WM-CSSD-020, REV 2; FGTEI COMPUTER SOFTWARE DESIGN DESCRIP.	6. Program/Project/ Building Number ENGINEERING DRC	7. Reviewer M.L. MCELROY	8. Organization/Group CPQA/75820	9. Location/Phone 2704HV/B-122/ 373-5588
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17. Comment submittal Approval:

Organization Manager (Optional) _____

10. Agreement with indicated comment disposition(s)

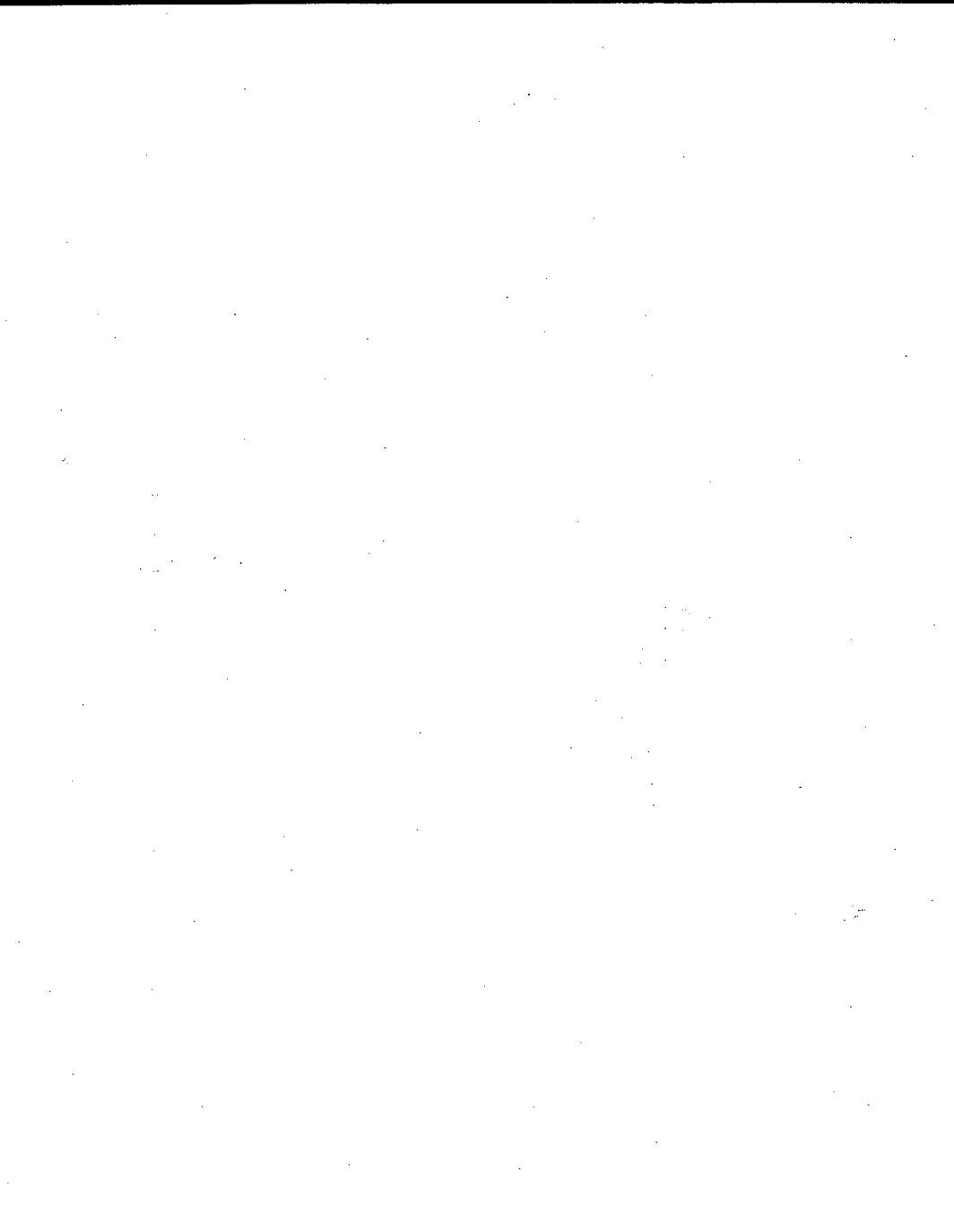
 Date 2.19.97 Reviewer/Point of Contact M.L. M'Elroy
 Date 2.19.97 Author/Originator J.D. ROBINSON PER TELLO & C

Author/Originator
J.D. ROBINSON PER TELLO & C

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.	With the addition of the ambient temperature range to the system, will there additional changes in the "MODSOFT" ladder logic, ie. page 45, 46, 47, etc.?		Pages 45 and 46 are the logic diagrams for inside cabinet temperature control. They will be changed to reflect the new 32° alarm value. Page 47 shows the network for temperature out of range (both cabinet and hydrogen cell), exhaust power, emergency stop, and high tank pressure. This network must change when the alarm for hydrogen cell temperature is installed. Page 47 has already been changed. Comments from other reviewers may force additional changes.	CLOSED
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2.	ECN 639110 should include the USQ number in block 13a.		Accept. The USQ number is TF-97-0070	
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REVIEW COMMENT RECORD (RCR)

1. Date 2-5-97		2. Review No. drc	
3. Project No. cpo		4. Page 1 of 2	
5. Document Number(s)/Title(s) ECN 639110/Rotary Mode Core Sampling		6. Program/Project/ Building Number CPO	7. Reviewer Jeff Ranschau
8. Organization/Group TWRS-NS/CPD		9. Location/Phone 2704-HW/373-4462	

17. Comment Submittal Approval:

10. Agreement with indicated comment disposition(s)
11. CLOSED

Organization Manager (Optional)
2-13-97 Date
Jeff Ranschau Reviewer/Point of Contact
James D. H. 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	typos - The USQ number is incomplete on page 1. The ECN numbers on pages 2 and 3 are different - page 2 shows 639109 and page 3 shows 639110.		Accept. Items are corrected.	
2	Page 6 of WHC-SD-WM-CSD0-020, Rev 2, section 3.2.4.1: It is stated here that "If a high hydrogen concentration (above 5000 ppm) is detected..." SAD-035, item number 6.5.2.2, states "> 5000 ppm hydrogen concentration equivalent". Verify that "5000 ppm hydrogen concentration" is the same as "5000 ppm hydrogen concentration equivalent".		USQ TF-96-11173 was written to clarify this question, although at a 1000 ppm level rather than 5000 ppm. I believe that the rationale applies. In part the USQ reads, "... the following statements can be made ... SAD-035 appears to use the terms flammable-gas concentration, hydrogen concentration and hydrogen-equivalent flammable gas concentration interchangeably ..." A copy of USQ TF-96-11173 is available for your review.	
3	Page 7 of WHC-SD-WM-CSD0-020, Rev 2, section 3.2.4.3: What is the acceptable range for ambient temperature? The temperature range must be set to permit proper operation of the Whittaker Cell. State the ambient temperature range.		The ambient temperature range has (as of 1400 hours on 12 February, 1997) a lower value of 60°F. The higher value will be the Whittaker cell calibration temperature. This value will vary from cell to cell and will be changed upon cell calibration. The software design description will be changed to describe and implement this arrangement.	

REVIEW COMMENT RECORD (RCR)

		1. Date		2. Review No.	
		2-5-97		drc	
		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	
4	Page 12 of WHC-SD-WM-CSDD-020, section 4.2.3: Last sentence of the second paragraph of this section states that the number 3000 will be entered into register 41303. Network #3 on page 41 shows the register to be 41302. Determine the correct number for the register and make the appropriate correction.		The document is accurate as written. Because 3000 is a value greater than one register can hold, register 41302 is in the network and holds the least significant bit. The remainder is in register 41303, which is in RAM and does not show up in the network on page 41.		

REVIEW COMMENT RECORD (RCR)

1. Date 2/5/97		2. Review No. CP97-004	
		3. Project No. N/A	
4. Page 1 of 1		9. Location/Phone 2704HV/B-122/ 373-5588	
6. Program/Project/ Building Number ENGINEERING DRC		8. Organization/Group CPQA/75820	
7. Reviewer M. L. MCELROY		11. CLOSED	
16. Comment Submittal Approval:		17. Comment Submittal Approval:	
Organization Manager (Optional)		Reviewer/Point of Contact Date	
13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed resolution of the action required to correct/resolve the discrepancy/problem indicated.)		14. Hold Point	
1. With the addition of the ambient temperature range to the system, will there additional changes in the "MODSOFT" ladder logic, ie. page 45, 46, 47, etc.?		15. Disposition (Provide justification if NOT accepted.)	
12. Item		16. Status	
2. ECN 639110 should include the USQ number in block 13a.		Accept. The USQ number is TF-97-0070	

REVIEW COMMENT RECORD (RCR)		1. Date February 14, 1997	2. Review No. DRC-97-005
		3. Project No.	4. Page 1 of 4

5. Document Number(s)/Title(s) ECN 168908	6. Program/Project/ Building Number CP0/2704HV	7. Reviewer Design Review Team	8. Organization/Group THRS/CP0	9. Location/Phone
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10. Agreement with indicated comment disposition(s)

John Corbett
Ron Bafus
C. C. Smith
Chuck Scaief
Ted Jarecki
George Janicek
Jeff Ranschau
Don Boyd
Nancy Dittiker
George Janicek

11. CLOSED
George Janicek
 DESIGN REVIEW CHAIRMAN
 DATE 2/19/97

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REVIEW COMMENT RECORD (RCR)

1. Date February 14, 1997	2. Review No. DRC-97-005
3. Project No. 1	4. Page 2 of 4

12. Item	13. Comment(s)/Discrepancy(es) (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.	Vargo - A sketch will be added to depict 1/4 npt threaded connection into a 1/4 inch in to stainless steel plate.		Accept. Add sketch as noted.	Open
2.	Jarecki - Block 20 needs to specifically identify ops procedures and all other documents marked in block 19.		Accept.	Open
3.	Jarecki - Block 19 needs to mark operating procedures.		Accept. Add operator procedure numbers.	Open
4.	Jarecki - Thermocouple plug connection does not meet requirements per SAD 035 control 6.6.6.3. Jarecki, Vargo, Scaief, Bafus Page 16, parts list Resolution: When calling out thermocouple wire use as required (50 ft). Hard wire at the spool piece with connection at the cart and have the connector. (Accept)		Accept as noted.	Open
5.	Corbett - Block 13A - Add USQ number (Accept)		Accept. Add USQ number.	Open
6.	Jarecki - Block 12 add "N/A"			Complete
7.	Jarecki - Need to identify formal design review			Complete
8.	Jarecki - Add the word "formal" to Block 21			Complete
9.	Janicek - Block 13A, mention which drawings are being changed		Add drawing numbers to Block 13A.	Open
10.	Jarecki - Block 14B, typo: change "in" to "is"			Complete
11.	Jarecki - Block 17 & 18 need to be filled out to identify cost and schedule impacts (general comment, not applicable to review team)		Not applicable to the Design Review Team	n/a
12.	Jarecki - Block 8: Need approval designator SQ in			Complete
13.	Jarecki - Block 9 needs to call out "see Block 13A"			Complete

REVIEW COMMENT RECORD (RCR)

			1. Date February 14, 1997	2. Review No. DRC-97-005
			3. Project No.	4. Page 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
14.	Jarecki - Need to mark SDD in left hand column Block 19		Not applicable to the Design Review Team.	Complete
15.	Corbett - Block 20: Changes to Block 20 documents will be considered open items but not action items for the design review (No action required by Vargo)		Will provide document numbers.	n/a
16.	Jarecki - Block 20: Provide document numbers		Accepted. Add flag note to sheet two that will direct to sheet one to direct how to install the sheet to the Whittaker cell.	Open
17.	Jarecki - Comment on Page 20, H-14-100524, The instructions need a mounting detail to show exactly how thermocouples are installed.		Accepted. Will add note to drawing.	Open
18.	Jarecki - 2 inch minimum spacing needs to be placed in a note attached to the drawing.		No action required by Design Review Team.	n/a
19.	Jarecki/Scaief - The use of the thermo wire as a 'barrier' as required by SAD-Q35, 6.6.6.3 should be considered in the USQ evaluation.		Accept as noted.	OPEN
20.	Jarecki - Need to show the thermo cable on the three pertaining drawings.		Accept as noted.	Open
21.	Scaief - Combine pages 23 & 24 with 6 & 7		Accept as noted.	Open
22.	Scaief - Combine pages 21 and 22 with 10 and 11.		Accept as noted.	Open
23.	Jarecki - Part 93 remove bubble from H14-10521, sheet 2 (sector A-7)		Accept as noted.	Open
24.	Add flag note on the parts list where the thermocouple and add back in 'field installed' Sheet 3 10521 drawing, parts 210 & 211 reference as field installation. Change bubble 93.		Accept as noted.	Open
25.	Vargo - Page 17 on ECN: Add flag note to his condition to reflect the field installation of the thermocouple to items 210 and 211. Add text on flag note sheet of drawing 14-10521.		Accept as noted.	Open

REVIEW COMMENT RECORD (RCR)

1. Date February 14, 1997	2. Review No. DRC-97-005
3. Project No.	4. Page 4 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
26.	Vargo - On page 16 add safety clips to list on Type J thermocouple connectors.		Accept as noted.	Open
27.	Vargo - Show thermocouple mounting on 100524 sheet 3, Section C-C.		Accept as noted.	Open
28.	Vargo - On drawing 100524, Sheet 4, show the penetrations of the thermocouple on view F-F and D-D		Accept as noted.	Open
29.	Block 14b: Make a statement that the changes in the thermocouple will involve changes to a safety SSC.		Complete	Complete
30.	Corbett - The description of change and justification details for Bafus's part of the ECN needs to be shown on sheet on Blocks 13A and 14B		Accept as noted.	Open
31.	Jarecki - Page 22 change wording from "Whittaker cell high temperature high temp system shutdown" to "Whittaker cell calibration system shutdown" 100519 and 520		Accept as noted.	Open
32.	Bafus - Ensure contact VTP-TI-2207, drawing 100519, sheet 2 and 100520, sheet 2, VTP-TI-2208, pg 24 makeup is correct.		Accept as noted.	Open
33.	Jarecki - Add zone to sheet reference 100519, sheet 2, and 100520, sheet 2.		Accept as noted.	Open
34.	Page 27 Revise information inside the cloud to eliminate numerical ambiguity.		Accept as noted.	Open

ATTACHMENT 4
Meeting Minutes

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MEETING MINUTES

SUBJECT: FORMAL DESIGN REVIEW BRIEFING

TO: Distribution		BUILDING 2704HV		
FROM: J. E. Corbett, 372-2001		CHAIRMAN G. P. Janicek, 376-2225		
DEPARTMENT-OPERATION-COMPONENT Characterization Equipment Engineering Projects	AREA 200E	SHIFT Day	DATE OF MEETING January 21, 1997	NUMBER ATTENDING 13

Attendees: **D. C. Board *G. P. Janicek *J. A. RanschauE. J. Waldo
 *J. E. Corbett *T. D. Jarecki J. D. Robinson
 C. E. Hanson *M. L. McElroy *C. C. Scaief
 **L. F. Hill *N. J. Milliken J. Thomson

*DRC Member / **DRC Alternate

The meeting was called to order by Carl Hanson, speaking on the behalf of Rick Raymond. Carl discussed the reasons a new Design Review Committee (DRC) has been formed, including the need to provide the rigor of a thorough formal review for changes made to safety class equipment. The original FY'97 activities were discussed including the current 3-week deployment schedule.

George Janicek, Design Review Chairman, introduced the meeting attendees and gave committee members assignments. All DRC members were in attendance.

The scope of the briefing was four (4) engineering change notices (ECNs). Three (3) written for changes related to the exhauster tank pressure transmitters and spool piece were provided in the Design Review package. An additional one (1) written for software changes is to be provided at a later date.

A Design Review Checklist will be sent out after the meeting.

Review Comment Records (RCRs) should be submitted electronically to the Design Review Committee Secretary, John Corbett.

Jim Robinson presented the review materials, and described the design requirements and design changes. During Jim's presentation, additional discussions on related topics included the following:

- Carl Hanson stated that reviewers' should keep in mind the safety function of the changes, which is to shutdown the sampling operation when temperature parameters are not met. Five (5) Whittaker cells are going through testing.
- Jim Thomson noted the need for a well-defined/"clean" process to develop an operating envelope from the lab test data.
- Nancy Milliken asked what the problem statement is, as defined during mission analysis. Carl replied that the objective is to solve the operating environment problem, which is the temperatures the Whittaker instrument is exposed to being outside the 70-120°F specifications from Whittaker.
- Jim Robinson described the specific safety function of the pressure transmitters (listed in the Safety Equipment List (SEL)).

MEETING MINUTES

SUBJECT: FORMAL DESIGN REVIEW BRIEFING

TO: Distribution		BUILDING 2704HV/G133		
FROM: J. E. Corbett, 372-2001		CHAIRMAN G. P. Janicek, 376-2225		
DEPARTMENT-OPERATION-COMPONENT Characterization Equipment Engineering Projects	AREA 200E	SHIFT Day	DATE OF MEETING January 24, 1997	NUMBER ATTENDING 7

Attendees:	C. E. Hanson (SESC)	S7-12	J. D. Robinson (SESC)	S7-12
	M. L. McElroy (LMHC)	S7-07	C. C. Scaief (LMHC)	R1-56
	N. J. Milliken (DESH)	A3-37	J. L. Smalley (SESC)	S7-12
	G. P. Janicek (LMHC)	S7-12		

*DRC Member / **DRC Alternate

Note: Design review packages were delivered to Ted D. Jarecki and Jeff A. Ranschau for review on Monday, January 27, 1997.

The meeting was called to order by George Janicek. The purpose of the meeting was to review the review comment records (RCRs) submitted to date, and to provide the committee another engineering change notice (ECN) to review.

RCRs written by John Corbett, Ted Jarecki, Nancy Milliken, and Michael McElroy were discussed. Jim Robinson provided the anticipated resolution to the comments received. It was agreed by all present that each committee member would document his/her acceptance on an ECN by submitting an RCR and signing closure once the disposition, if any, is complete. The Design Review chairman will sign the ECN as approved for the committee. All dispositioned RCRs will be distributed to each committee member.

A draft Design Review Checklist was handed out for review and comment. The scope of the review was discussed. The requirement for a formal design review is only applicable to safety class equipment.

Jeff Smalley presented a design change to the drill rod, ECN #636965. Included in the briefing was a discussion on the Bureau of Mines (BOM) testing, the Safety Equipment List (WHC-SD-WM-SAD-035), and drill string requirements. Design review packages were handed out, and the next meeting was scheduled for January 27, 1997, at 1 p.m.

1rm

MEETING MINUTES

SUBJECT: FORMAL DESIGN REVIEW BRIEFING

TO: Distribution		BUILDING 2704HV/G108B		
FROM: J. E. Corbett, 372-2001		CHAIRMAN G. P. Janicek, 376-2225		
DEPARTMENT-OPERATION-COMPONENT Characterization Equipment Engineering Projects	AREA 200E	SHIFT Day	DATE OF MEETING January 27, 1997	NUMBER ATTENDING 9

Attendees: J. E. Corbett (LMHC)	S7-01	T. D. Jarecki (LMHC)	S7-03
C. E. Hanson (SESC)	S7-12	J. D. Robinson (SESC)	S7-12
M. L. McElroy (LMHC)	S7-07	C. C. Scaief (LMHC)	R1-56
N. J. Milliken (DESH)	A3-37	J. L. Smalley (SESC)	S7-12
G. P. Janicek (LMHC)	S7-12		

*DRC Member / **DRC Alternate

All committee members were present.

The meeting was called to order by George Janicek. Review record comments (RCRs) and dispositions provided by Jeff Smalley were discussed for Engineering Change Notice (ECN) #636965.

RCR comments and dispositions provided by Jim Robinson were discussed for ECN #639109, ECN #63911, and ECN #639112. Completed RCRs were signed as closed.

The process for approval of safety class equipment ECNs was explained as follows:

- The review will be considered completed after closure of all related RCRs, and completion of the related Design Review checklist.

George Janicek handed out the checklist, and asked each committee member to designate each item on the list as 1) yes; 2) no; 3) not applicable for the ECN being reviewed; or 4) item not reviewed.

The next meeting was scheduled for January 29, 1997, at 11 a.m.

lrm

MEETING MINUTES

SUBJECT: FORMAL DESIGN REVIEW MEETING

TO: Distribution		BUILDING 2704HV/G133		
FROM: J. E. Corbett, 372-2001		CHAIRMAN G. P. Janicek, 376-2225		
DEPARTMENT-OPERATION-COMPONENT Characterization Equipment Engineering Projects	AREA 200E	SHIFT Day	DATE OF MEETING January 29, 1997	NUMBER ATTENDING 8

Attendees:	J. E. Corbett (LMHC)	S7-01	T. D. Jarecki (LMHC)	S7-03
	C. E. Hanson (SESC)	S7-12	J. A. Ranschau (LMHC)	S7-07
	M. L. McElroy (LMHC)	S7-07	J. D. Robinson (SESC)	S7-12
	G. P. Janicek (LMHC)	S7-12	C. C. Scaief (LMHC)	R1-56

During the meeting, Engineering Change Notice (ECN) #639109 and ECN #639112 were approved. RCRs related to ECN #639111 were closed out with an open action item from Chuck Scaief's RCR to obtain a controlled document from the vendor specifying the entity parameters approved by FM.

Jim Robinson presented an overview of the Software Design Description (SDD) change, which is to make the safety class thermocouple output a shutdown condition if outside a set temperature range. The temperature range is dependent on test results.

The unanimous decision of committee members present was to recommend relocating the thermocouples to the Whittaker body; otherwise, the committee must review analysis from tent test results to verify applicability of temperature limits to be implemented for sampling operations.

The Design Review Checklist was reviewed for ECN #639111. Action items were identified to provide verification that the design is compatible with the expected radiation condition (Jim Robinson), and determine if all credible non-standard conditions have been properly considered (Nancy Milliken).

The following Design Review Team Meetings have been scheduled as follows:

Design Review Team Continuous Meeting

February 3, 1997
1:00pm - 4:00pm
2704HV/G108B

Design Review Team Meeting

February 5, 1997
*1:00pm - 4:00pm
2704HV/G229

*Note: At the February 5th meeting, from 1:00pm - 2:00pm, Rick Raymond will be presenting an overview of WHC-SD-WM-SAD-035 (SAD-035).

lrm

MEETING MINUTES

SUBJECT: Formal Design Review Briefing

TO: Distribution		BUILDING 2704HV/G108B		
FROM: J. E. Corbett, 372-2001		CHAIRMAN G. P. Janicek, 376-2225		
DEPARTMENT-OPERATION-COMPONENT Characterization Equipment Engineering Projects	AREA 200E	SHIFT Day	DATE OF MEETING February 3, 1997	NUMBER ATTENDING 15

Attendees:

* J. E. Corbett (LMHC)	S7-01	* M. L. McElroy (LMHC)	S7-07
* J. Dormant (NHC)	R3-47	* N. J. Milliken (DESH)	A3-37
G. T. Frater (LMHC)	S7-06	J. A. Ranschau (LHMC)	R1-56
C. E. Hanson (SESC)	S7-12	J. D. Robinson (SESC)	S7-12
* G. P. Janicek (LMHC)	S7-12	* C. C. Scaief (LHMC)	R1-56
* T. D. Jarecki (LMHC)	S7-12		

*DRC Member / **DRC Alternate

The meeting was called to order by George Janicek.

Meeting minutes from January 29, 1997, were reviewed and approved with corrections.

The following three (3) open items from the January 29, 1997, meeting were "Closed":

- 1) The response to the Design Review Checklist Item #23 (Environmental Conditions - Nuclear Radiation) was presented by Jim Robinson, and is documented as an accepted Review Comment Record (RCR) disposition.
- 2) The response to the Design Review Checklist Item #43 (Non-Standard Conditions) was reported as "Yes" by Nancy Milliken.
- 3) Jim Robinson reported that the intrinsic safety barrier (ISB) parameter documentation received from Yokogama was reviewed by Jim Criddle and is acceptable. This action item is now "Closed."

Continuing Activities

The Design Review Checklist, DRC-97-001, was reviewed and approved with acceptable responses to each review consideration.

RCR dispositions for Engineering Change Notice (ECN) #639111 were signed off as "Closed" after the dispositions were discussed.

ECN #639111 was approved and this portion of the design review was considered "Closed."

ECN #636965 was not reviewed as the author was not able to be present.

ECN #639110 was presented by Jim Robinson. The scope of the review was clarified. This ECN concerns the software configuration change to provide truck shutdown on an out-of-temperature condition. ECN approval will not validate the temperature values used for the shutdown.

Action Item: Jim Robinson to provide Interlock Critical Alarms Check procedure to the Review Committee.

MEETING MINUTES (Continued)

Page 2 of 1

New Activities

Committee members were briefed on a new design review, 97-004, "Exhauster Interlock System Design." The background and scope of the review is addressed in letter No. NHC-9750857, which was issued to Committee members.

Review documentation was distributed including:

- Drawing package
- Released ECNs to the drawing package
- Functional Design Criteria (FDC)

Following a discussion of fail-safe cable connections and the previous Acceptance Test Procedure/Operational Test Procedure (ATP/OTP), the Design Review Checklist was reviewed. It was noted that the FDC is not a complete detailed listing of all requirements, since the SAD-035 and Safety Equipment List (SEL) were approved after the FDC was issued.

Action Item: Jim Robinson to provide additional drawings.

Action Item: Nancy Milliken to provide checklist of SAD-035 requirements.

Action Item: John Corbett to provide current SEL ECNs.

The next Formal Design Review Briefing meeting will be held on Wednesday, February 5, 1997.

lrm

MEETING MINUTES

HNF-SD-WM-DRR-062, Rev. 0
A4-9

SUBJECT: Formal Design Review Briefing

TO: Distribution		BUILDING 2704HV/G108B		
FROM: J. E. Corbett, 372-2001		CHAIRMAN G. P. Janicek, 376-2225		
DEPARTMENT-OPERATION-COMPONENT Characterization Equipment Engineering Projects	AREA 200E	SHIFT Day	DATE OF MEETING February 5, 1997	NUMBER ATTENDING 15

Attendees: R. R. Bafus (NHC) S7-12 * M. L. McElroy (LMHC) S7-07
 * J. E. Corbett (LMHC) S7-01 * N. J. Milliken (DESH) A3-37
 J. Dormant (NHC) R3-47 J. A. Ranschau (LHMC) R1-56
 G. T. Frater (LMHC) S7-06 J. D. Robinson (SESC) S7-12
 **L. F. Hill (LMHC) R1-56 * C. C. Scaief (LHMC) R1-56
 * G. P. Janicek (LHMC) S7-12 J. L. Smalley (SESC) S7-12
 * T. D. Jarecki (LMHC) S7-03 S. O. Smith (PLCS) L6-37
 E. J. Waldo (NHC) S7-12

*DRC Member / **DRC Alternate

The meeting began with an overview of WHC-SD-WM-SAD-035. This presentation was made by Rick Raymond, and included SAD-035 requirements and safety classification from previous training courses.

The Design Review meeting was called to order by George Janicek. Actions from prior meetings were discussed. Jim Robinson brought the additional exhaustor drawings in for the new design review (addressed later in the meeting). Nancy Milliken reported that she is still working on a requirements checklist. John Corbett reported that the most recent/current safety equipment list (for RMCS flammable gas mods) is provided by Engineering Change Notice (ECN) #636964, as modified by ECN #636966.

CONTINUING ACTIVITIES:

For review design review #97-002 (ECN #636965, Nickel Plated Drill Rod), Jeff Smalley gave a report on the Review Comment Record (RCR) dispositions. All RCRs were approved. Janicek lead the team through the review checklist, which was satisfactorily completed. ECN #636965 was approved without further comment.

For review design review #97-003 (ECN# 639110, revision to WHC-SD-WM-CSDD-020), Sam Smith gave a presentation of the changes made to the Computer Software Design Description. After lengthy discussion, committee members agreed to have RCRs filled in by close of business February 6, 1997.

Additional review materials (released ECNs and drawings) were distributed for review Design Review Checklist, #DRC-97-004 (Exhaustor System Design). The charter/scope of this review was clarified to include those activities necessary for design verification, but not operational readiness review (ORR) type activities (overview of procedures, operability tests, training, etc.). The review checklist to be used was reviewed and agreed to.

Janicek mentioned that the next ECN to be reviewed would be for a thermocouple mount on the field-deployed Whittaker Cell. Time and location of the next meeting is dependant on availability of the draft ECN and on RCR dispositions to ECN #639110. Committee members will be notified by e-mail.

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MEETING MINUTES

HNF-SD-WM-DRR-062, Rev. 0
A4-11

SUBJECT: Formal Design Review Briefing

TO: Distribution		BUILDING 2704HV/G229		
FROM: J. E. Corbett, 372-2001		CHAIRMAN G. P. Janicek, 376-2225		
DEPARTMENT-OPERATION-COMPONENT Characterization Equipment Engineering Projects	AREA 200E	SHIFT Day	DATE OF MEETING February 10, 1997	NUMBER ATTENDING 12

Attendees: R. R. Bafus (NHC) S7-12 * M. L. McElroy (LMHC) S7-07
 * J. E. Corbett (LMHC) S7-01 * N. J. Milliken (DESH) A3-37
 J. Dormant (NHC) R3-47 J. A. Ranschau (LMHC) R1-56
 * G. P. Janicek (LMHC) S7-12 J. D. Robinson (SESC) S7-12
 * T. D. Jarecki (LMHC) S7-03 * C. C. Scaief (LMHC) R1-56
 C. E. Hanson (SESC) S7-12 T. C. Schneider (NHC) S7-12

*DRC Member / **DRC Alternate

For the record, George Janicek reported that Engineering Change Notice (ECN) #639113 was released on February 6, 1997. This was a Change ECN to ECN #639111, and was signed by the Design Committee Chairman after contacting members by phone for approval.

Review of Design Review Comment (DRC), #DRC-97-003, (ECN #639110: revision to WHC-SD-WM-CSDD-020) continued.

Configuration control during software changes and testing was discussed. The committee has agreed that testing software changes will be required prior to final acceptance of the software design description changes. The software installed for testing must agree with ECN #639110. Any changes to this configuration due to test results, review comment record (RCR) dispositions, or other reasons must be documented and approved on a separate ECN.

ACTION ITEM: Mike McElroy to ensure exhaustor flammable gas detector (FGD) cart is properly "tagged" to preclude operational use prior to final acceptance of the software design description changes.

RCRs which had been dispositioned were discussed. Carl Hanson reported that an Acceptance for Beneficial Use (ABU) would be issued after the exhaustor safety equipment modifications were complete and tested. The committee agreed to allow some RCR dispositions to be carried as open items, and closed during testing. These items will be identified in the next meeting.

Review of DRC-97-004, Exhaustor/FGD interlock system) continued. A Requirements Checklist was provided by Nancy Milliken to committee members. The checklist includes equipment which is not part of the exhaustor/FGD interlock system, and is not necessarily comprehensive. George Janicek suggested committee members use the checklist as a tool in their review. Comments to the checklist are welcome.

The Design Review Checklist will be revised to reflect the scope of looking at safety system, structures, and components (SSCs) only.

Ron Bafus provided committee members with sketches and an explanation for a new thermocouple mount on the field deployed Whittaker cell. This is in response to the committee's previous recommendation. The committee noted that the design will need to provide protection from moisture and abuse, and must ensure that unqualified equipment are not located within 18 inches of the exhaustor duct (SAD-035, Control 6.6.6.3).

Tom Schneider provided committee members with copies of the draft test plan and procedure for the spool-piece testing, HNF-SD-WM-TC-073. The committee noted that the procedure must include an acceptance criteria statement.

ACTION ITEM: Jeff Ranschau to ensure an industrial safety review is completed for the test activity.

The next meeting is scheduled for Thursday, ^{Feb.}~~November~~ 13, 1997, in 2704HV/G230 at 8:30 a.m.

1rm

Attachments: ~~Attendance Roster~~

MEETING MINUTES

HNF-SD-WM-DRR-062, Rev. 0
A4-13

SUBJECT: Formal Design Review Briefing

TO: Distribution		BUILDING 2704HV/G230		
FROM: J. E. Corbett, 372-2001		CHAIRMAN G. P. Janicek, 376-2225		
DEPARTMENT-OPERATION-COMPONENT Characterization Equipment Engineering Projects	AREA 200E	SHIFT Day	DATE OF MEETING February 13, 1997	NUMBER ATTENDING 11

Attendees:

* J. E. Corbett (LMHC)	S7-01	* N. J. Milliken (DESH)	A3-37
J. Dormant (NHC)	R3-47	J. A. Ranschau (LMHC)	R1-56
* L. F. Hill (LMHC)	R1-56	* J. D. Robinson (SESC)	S7-12
* G. P. Janicek (LMHC)	S7-12	* C. C. Scaief (LMHC)	R1-56
* T. D. Jarecki (LMHC)	S7-03	E. J. Waldo (NHC)	S7-12
* M. L. McElroy (LMHC)	S7-07		

*DRC Member / **DRC Alternate

The meeting was called to order by George Janicek.

Meeting minutes from February 10, 1997, were reviewed and approved.

Both actions from that meeting had been completed.

Design Review #DRC-97-003 (ECN #639110, revision to WHC-SD-WM-CSDD-020):

- Carl Hanson briefed the committee on testing results for spool-piece testing. Testing has shown a calibration sensitivity which will need to be accounted for by additional changes to the software, as well as hardware (Pitot tube). The attached portion (pg. 7) of the test report was given to committee members. Jim Robinson described these changes for the committee.
- Review comment Record (RCR) comments and dispositions were discussed. Three (3) RCRs were closed, and an agreement was reached for the four (4) remaining dispositions.
- The Design Review Checklist was reviewed. Forty-two (42) items were closed out, and nine (9) items remain open for further information from RCR disposition incorporation. Engineering change notice (ECN) approval is scheduled for Tuesday, February 18, 1997, after all items are closed.
ACTION ITEM: Jim Robinson to provide the Exhauster System Design Description to committee.

Design Review #DRC-97-005 (ECN #168908, T/C on Whittaker Cell):

- The draft Design Review Checklist was handed-out.

Design Review #DRC-97-004 (Exhauster System Design):

- Additional pages (pgs. 41-47) to the System Requirements Checklist was handed-out. The Design Review Checklist was not addressed at this meeting.
- For this design review, it was suggested that RCR comments should be submitted to the Chairman, and copied to all other Design Review Committee members (using electronic mail).

The next meeting is scheduled for Tuesday, February 18, 1997, in 2704HV/G110 at 1:30 p.m.

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Attachment: HNF-SD-WM-TRP-274 (rev. 0)

HNF-SD-WM-TRP-274

Rev 0

- WEC 1 (HP data file 172) passed by 17.6 microvolts (176 ppm);
- WEC 2 (HP data file 272) passed by 51 microvolts (510 ppm);
- WEC 3 (HP data file 372) passed by 18.9 microvolts (189);
- WEC 4 (HP data file 472) passed by 70.4 microvolts (704 ppm);
- WEC 5 (HP data file 572) failed by 49.6 microvolts (496 ppm).

The temperature was increased to +80° F. The results are listed below:

- WEC 1 (HP data file 182) failed by 7 microvolts (70 ppm);
- WEC 1 (HP data file 183) passed by 6.6 microvolts (66 ppm);
- WEC 1 (HP data file 184) failed by 10.3 microvolts (103 ppm);
- WEC 2 (HP data file 282) passed 58.3 microvolts (583 ppm);
- WEC 4 (HP data file 482) passed 74 microvolts (740 ppm).

The temperature was increased to +100° F. The results are listed below:

- WEC 2 (HP data file 212) passed by 48.5 microvolts (485 ppm);
- WEC 4 (HP data file 412) passed 97.3 microvolts (973 ppm).

The temperature was increased to +120° F. The results are listed below:

- WEC 2 (HP data file 222) passed 64.3 microvolts (643 ppm);
- WEC 4 (HP data file 422) passed 64.7 microvolts (647 ppm).

WECs 2 or 4 can be used on the FGI as per the criteria stated in WHC-SD-WM-SAD-035. The WECs should be calibrated at a temperature of 100° F and operated between 80° F and 100° F. Alternately the WECs could be calibrated at 70° F or 80° F and operated from the calibration temperature down to 10° F below the calibration temperature. The WECs may be operated at temperatures less than the values stated above, however the SAD-035 limit of $\leq 1,000$ ppm prior to sampling will likely not be achievable. The WECs must be kept above 60° to maintain the 90% response in two minutes requirement of SAD-035. (REF: APPENDIX, "ANALYSIS OF TEMPERATURE EFFECTS ON WHITTAKER CELL CALIBRATION".)

4 TEST METHOD

4.1 TEST EXCEPTIONS

4.1.1 EXCEPTION #1

Before the testing began the testing team decided, after discussions with T. C. Schneider

MEETING MINUTES

HNF-SD-WM-DRR-062, Rev. 0
A4-15

SUBJECT: Formal Design Review Meeting

TO: Distribution		BUILDING 2704HV		
FROM: J. E. Corbett, 372-2001		CHAIRMAN G. P. Janicek, 376-2225		
DEPARTMENT-OPERATION-COMPONENT Characterization Equipment Engineering Projects	AREA 200E	SHIFT Day	DATE OF MEETING February 14, 1997	NUMBER ATTENDING 11

Attendees: R. R. Bafus (NHC) * N. J. Milliken (DESH)
 ** D. C. Board (LMHC) * J. A. Ranschau (LHMC)
 * J. E. Corbett (LMHC) R. E. Raymond (NHC)
 * G. P. Janicek (LHMC) C. A. Reed (LHMC)
 * T. D. Jarecki (LMHC) * C. C. Scaief (LHMC)
 J. L. Smalley (SESC)

*DRC Member / **DRC Alternate

The Design Review meeting was called to order by George Janicek.

- Design review #97-003 (ECN 639110, revision to WHC-SD-WM-020, Flammable Gas Tank Exhauster Interlock Computer Software Design Description):

Carl Hanson presented the status of the spoolpiece/Whittaker Electrochemical Cell (WEC) H2 tests. Tests to date demonstrated that the response time for the WEC could not be met with the current configuration: however, with a modification to add a down stream facing pitot tube to the WEC calibration port, acceptable response times were achievable. Ambient temperature for these tests was approximately 70 degrees F.

Since the WEC tests are continuing and the test results could impact the modification to the interlock software, further discussion for this portion of the design review was tabled for the day.

- Design review #97-005 (Thermocouple mount on field deployed WEC):

The team reviewed Engineering Change Notice (ECN) #168908 for the thermocouple mount, as recorded in the composite RCR (review comment record). The RCR dispositions were agreed to with the understanding that the design review chairman would approve the ECN after verifying all RCR dispositions had been closed.

The checklist review was completed for design review checklist #DRC-97-005. The meeting was then adjourned.

MEETING MINUTES

HNF-SD-WM-DRR-062, Rev. 0
A4-16

SUBJECT: Formal Design Review Briefing

TO: Distribution		BUILDING 2704HV/G110		
FROM: J. E. Corbett, 372-2001		CHAIRMAN G. P. Janicek, 376-2225		
DEPARTMENT-OPERATION-COMPONENT Characterization Equipment Engineering Projects	AREA 200E	SHIFT Day	DATE OF MEETING February 18, 1997	NUMBER ATTENDING 11

Attendees:

* J. E. Corbett (LMHC)	S7-01	* M. L. McElroy (LMHC)	S7-07
J. Dormant (NHC)	R3-47	* N. J. Milliken (DESH)	A3-37
G. T. Frater (LMHC)	S7-16	J. A. Ranschau (LMHC)	R1-56
* L. F. Hill (LMHC)	R1-56	J. D. Robinson (SESC)	S7-12
* G. P. Janicek (LMHC)	S7-12	* C. C. Scaief (LMHC)	R1-56
* T. D. Jarecki (LMHC)	S7-03		

*DRC Member / **DRC Alternate

The meeting was called to order by George Janicek.

Meeting minutes from February 13, 1997, were reviewed and approved with comment.

Two (2) open items were closed:

- Jim Robinson provided the Exhauster System Design Description (SDD) (WHC-SD-WM-SDD-035, revised by Engineering Change Notice (ECN) #620764), and telephone conference memo's for storage temperature requirement discussions with Modicon and Newport. The memos will be included in the Design Review Report.

For Design Review ~~Comment~~ ^{Item} #DRC-97-005 (ECN #168908), the following comments were made:

- The ECN was released today. Three (3) members of the committee approved the ECN based on satisfactory closure of the composite review comment record (RCR) dispositions. George Janicek signed the RCR "closed."
- The single composite RCR incorporating all comments on one (1) RCR was considered an effective and efficient tool for design review.

For Design Review ~~Comment~~ ^{Item} #DRC-97-004 (Exhauster System Design), committee members were given copies of the System Design Description (SDD). The Requirements Checklist was reviewed to determine which had safety implications for the exhaust system.
ACTION ITEM: Jeff Ranschau to review SAD-035, Appendices C & U, and list applicable design requirements for redundant ammonia monitoring systems.

For Design Review ~~Comment~~ ^{Item} #DRC-97-003 (Computer Software Design Description (CSDD)):

- Committee members were given a briefing on networks 17, 18, and 19 per CSDD-020 (WHC-SD-WM-SDD-020), pgs. 22, 23, and 57-59 (rev. 2, February 18, 1997> DRAFT). No new RCRs were generated. Final copy of the ECN and CSDD were not available.
ACTION ITEM: Jim Robinson to add Ramp Pressure Rise Test to Software V & V. Steps were added to Work Package ES-97-0022 for this item in accordance with discussion between Jim Robinson and Lowell Hill.

Note: Design Review ~~Continues~~ Meeting to be continued on February 19, 1997, in 2704HV/G108A from 1:00 p.m. to 4:00 p.m., "Low Temperature Software Set-Point."

1rm

MEETING MINUTES

HNF-SD-WM-DRR-062, Rev. 0
A4-17

SUBJECT: Formal Design Review Briefing

TO: Distribution		BUILDING 2704HV/G108A		
FROM: J. E. Corbett, 372-2001		CHAIRMAN G. P. Janicek, 376-2225		
DEPARTMENT-OPERATION-COMPONENT Characterization Equipment Engineering Projects ⁿ	AREA 200E	SHIFT Day	DATE OF MEETING February 19, 1997	NUMBER ATTENDING 9

Attendees:

R. R. Bafus (NHC)	S7-12	* T. D. Jarecki (LMHC)	S7-03
* J. E. Corbett (LMHC)	S7-01	* M. L. McElroy (LMHC)	S7-07
G. T. Frater (LMHC)	S7-16	* N. J. Milliken (DESH)	A3-37
C. E. Hanson (SESC)	S7-12	* C. C. Scaief (LMHC)	R1-56
* G. P. Janicek (LMHC)	S7-12		

*DRC Member / **DRC Alternate

The meeting was called to order by George Janicek.

Note: Design Review Comment (DRC) #DRC-97-003 continued:

→ Carl Hanson reported that test data from the Whittaker response time vs. temperature tests were interpolated and confirmed that the test results justify the 60°F low-temperature set-point for the programmable logic controller (PLC) software. The graphical data (attached) presented to the committee showed a positive margin (for a 2-minute response time) at a temperature of 55°F. The accepted error band is 5°F.

Documentation to show that the Whittaker Cells have successfully passed required testing will be incorporated onto the Commercial Grade Item (CGI) Form, or a supporting document approved by the Design Authority. This was acceptable to the committee.

All outstanding record comment reviews (RCRs) were approved, and the remaining nine (9) Design Review Checklist items were "closed." This action, when combined with completion of RCR dispositions and engineering change notice (ECN) approval, completes the Design Review.

1rm

Attachment: Graphical Data

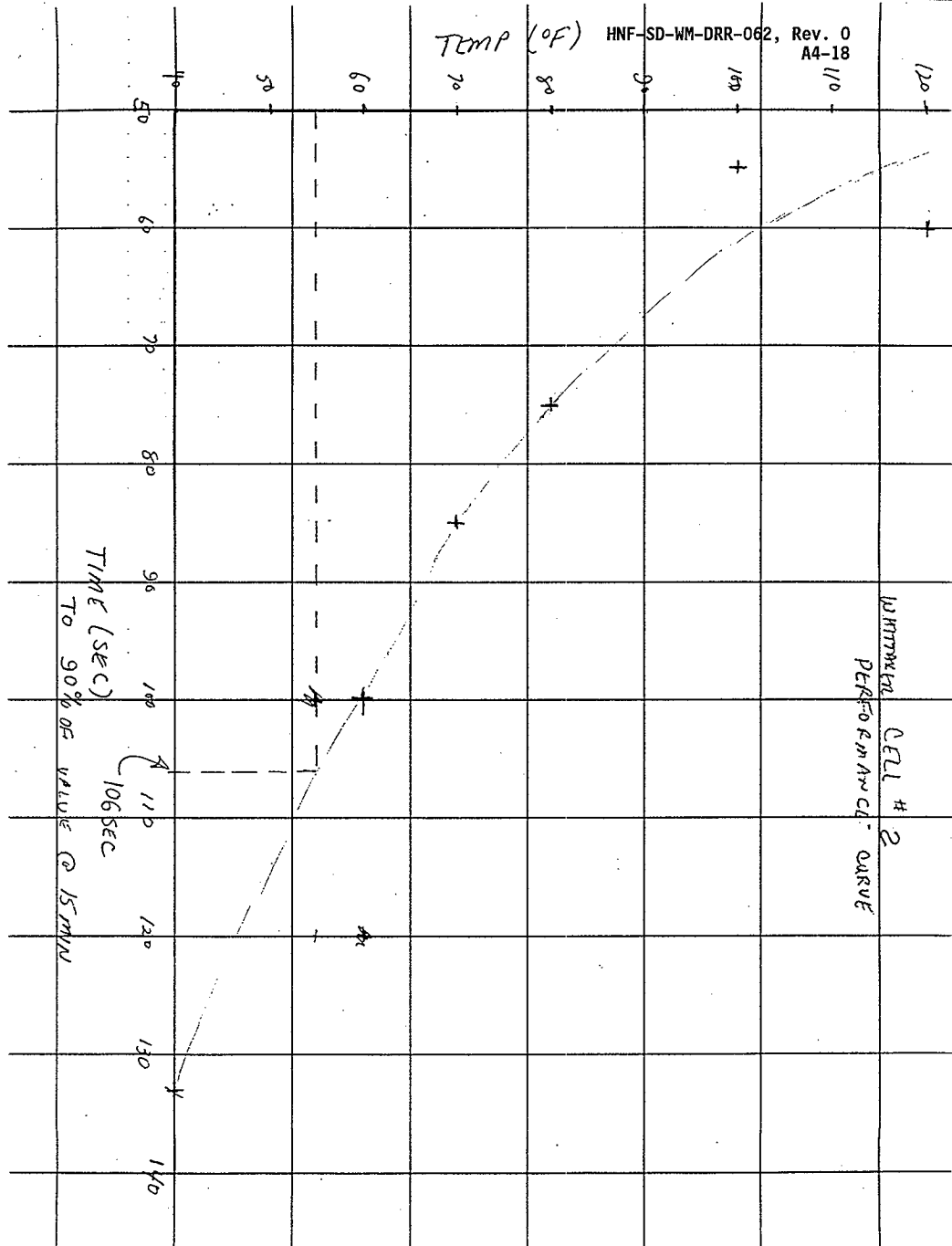
TEMP (°F)

UHMWPE CELL # 2

PERFORMANCE CURVE

TIME (SEC)
TO 90% OF VALUE @ 15 MIN

106 SEC



ATTACHMENT 5

ECNs
(Pages 1 & 2 for Reference Only)

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ENGINEERING CHANGE NOTICE

Page 1 of 6

1. ECN 639111

Proj.
ECN

2. ECN Category (mark one) Supplemental ☒ [X] Direct Revision ☐ [] Change ECN ☐ [] Temporary ☐ [] Standby ☐ [] Supersedeure ☐ [] Cancel/Void ☐ []	3. Originator's Name, Organization, MSIN, and Telephone No. JD Robinson, 08E00, S7-12, 376-4777		4. USQ Required? ☒ [X] Yes ☐ [] No	5. Date January 27, 1997
	6. Project Title/No./Work Order No. Rotary Mode Core Sampling		7. Bldg./Sys./Fac. No. 200G/241G	8. Approval Designator SQ
	9. Document Numbers Changed by this ECN (includes sheet no. and rev.) See Block 13a for list		10. Related ECN No(s). N/A	11. Related PO No. N/A
12a. Modification Work ☒ [X] Yes (fill out Blk. 12b) ☐ [] No (NA Blks. 12b, 12c, 12d)	12b. Work Package No. ES-97-20	12c. Modification Work Complete Design Authority/Cog. Engineer Signature & Date	12d. Restored to Original Condition (Temp. or Standby ECN only) Design Authority/Cog. Engineer Signature & Date	
13a. Description of Change ETN 95-0052 This ECN effects drawings H-14-100523, Rev. 0, Sheets 1 and 2, H-14-100524, Rev. 0, Sheet 9, H-14-100531, Rev. 0, Sheet 2, H-14-100532, Rev. 0, Sheet 2, H-14-100740, Rev. 0, Sheet 1 and H-14-100771, Rev 0, Sheet 1. See Continuation Sheets for change details. NOTE: This ECN shows the changes to be made on all effected sheets but not all effected drawing views. When incorporating this ECN all effected views must be changed. <i>This ECN covered by USQ TF-97-41</i>				
14a. Justification (mark one) Criteria Change ☐ [] Design Improvement ☐ [] Environmental ☐ [] Facility Deactivation ☐ [] As-Found ☐ [] Facilitate Const ☐ [] Const. Error/Omission ☐ [] Design Error/Omission ☒ [X]				
14b. Justification Details Data from the intrinsic barrier manufacturer indicates maximum voltage passed by the barrier to be 28. For use in Class 1, Div. 1, Group B applications, the pressure transmitters originally specified required the maximum to be limited to 22 volts. The replacement Yokogawa transmitters require a maximum of 30 volts to maintain this classification. Replacing the pressure transmitters will provide the Class 1, Div. I Group B qualification required by WHC-SD-SAD-035, Rev. 0a.				
15. Distribution (include name, MSIN, and no. of copies) EJ Waldo S7-12 (1) KL Drury S7-12 (1) JD Robinson S7-12 (1) RE Raymond S7-12 (1) EE Salinas S7-12 (1) JA Ranschau S7-07 (1) ML McElroy S7-07 (1) Sta. 15 E6-12 (1) Sta. 1 S5-59 (1) Sta. 16 S5-00 (1) Sta. 2 S6-81 (1) Sta. 20 T4-00 (1) GP Janicek S7-12 (1)			RELEASE STAMP DATE: STA: 4 FEB 03 1997 HANFORD RELEASE ID: 2.	

HNF-SD-WM-DRR-062, Rev. 0
Page 2 of 6

A-7900-013-3 (05/96) GEF096

ENGINEERING CHANGE NOTICE

Page 1 of 31. ECN **639113**Proj.
ECN2. ECN Category
(mark one)

Supplemental ☐
 Direct Revision ☐
 Change ECN ☒
 Temporary ☐
 Standby ☐
 Supersede ☐
 Cancel/Void ☐

3. Originator's Name, Organization, MSIN,
and Telephone No.JD Robinson, 08E00, S7-12,
376-4777

4. USQ Required?

[X] Yes [] No

5. Date

February 5, 1997

6. Project Title/No./Work Order No.

Rotary Mode Core Sampling

7. Bldg./Sys./Fac. No.

200G/241G

8. Approval Designator

SQ

9. Document Numbers Changed by this ECN
(includes sheet no. and rev.)

See Block 13a for list

10. Related ECN No(s).

ECN-639111

11. Related PO No.

N/A

12a. Modification Work

[X] Yes (fill out Blk.
12b)[] No (NA Blks. 12b,
12c, 12d)12b. Work Package
No.

ES-97-20

12c. Modification Work Complete

Design Authority/Cog. Engineer
Signature & Date12d. Restored to Original Condi-
tion (Temp. or Standby ECN only)Design Authority/Cog. Engineer
Signature & Date

13a. Description of Change

ETN 95-0052

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

This ECN effects ECN 639111, page 5.

DELETE on item 9 the change to General Note 5

See Continuation Sheet for additional change details.

This ECN is covered by USQ TF-97-41

This ECN is against Drawg H-14-100740, Sheet 1, Rev. 0 J.D.R. 2/6/97

14a. Justification (mark one)

Criteria Change []

Design Improvement []

Environmental []

Facility Deactivation []

As-Found []

Facilitate Const []

Const. Error/Omission []

Design Error/Omission [X]

14b. Justification Details

ECN 639111 changes pressure transmitters as used on the flammable gas interlock. The
 orientation of those transmitters as shown on page 5 of ECN 639111 does not allow
 adequate mounting clearance between the pressure transmitters and cable connectors.
 This ECN will correct the clearance problem.

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

EJ Waldo S7-12 (1) KL Drury S7-12 (1)
 JD Robinson S7-12 (1) RE Raymond S7-12 (1)
 EE Salinas S7-12 (1) JA Ranschau S7-07 (1)
 ML McElroy S7-07 (1) Sta. 15 E6-12 (1)
 Sta. 1 S5-59 (1) Sta. 16 S5-00 (1)
 Sta. 2 S6-81 (1) Sta. 20 T4-00 (1)
 GP Janicek S7-12 (1)

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STA:

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RELEASE

ID:

FEB 06 1997

ENGINEERING CHANGE NOTICE

Page 2 HW-3D-WN-000-002, Rev. 0
1. ECN (use no. from pg. 1)

15. Design Verification Required [X] Yes [] No		17. Cost Impact ENGINEERING Additional [2] \$K Savings [] \$		CONSTRUCTION Additional [0] \$ Savings [] \$		18. Schedule Impact (846) Improvement [] Delay [2]	
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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	[]	Stress/Design Report	[]	Health Physics Procedure	[]
Operating Specification	[]	Interface Control Drawing	[]	Spares Multiple Unit Listing	[]
Criticality Specification	[]	Calibration Procedure	[]	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	[]	Operating Procedure	[]	Electric Circuit Schedule	[]
OM Manual	[]	Operational Safety Requirement	[]	ICRS Procedure	[]
FSAR/SAR	[]	IEFD Drawing	[]	Process Control Manual/Plan	[]
Safety Equipment List	[]	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	X

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
--------------------------	--------------------------	--------------------------

21. Approvals

Signature	Date	Signature	Date
Design Authority GP Janicek	2/6/97	Design Agent	
Cog. Eng. EJ Waldo	2/6/97	PE	
Cog. Mgr. JS Schofield	2/6/97	QA	
QA ML McElroy	2-6-97	Safety	
Safety JA Ranschau	2/6/97	Design Engineer JD Robinson	2/6/97
Environ.		Environ.	
Other		Other	
Formal Design Review Chairman GP Janicek	2/6/97		

DEPARTMENT OF ENERGY

Signature or a Control Number that tracks the Approval Signature

ADDITIONAL

ENGINEERING CHANGE NOTICE

Page 1 of 34

1. ECN 636965

Proj.
ECN

2. ECN Category (mark one) Supplemental ☐ Direct Revision ☐ Change ECN ☐ Temporary ☐ Standby ☐ Supersedeure ☒ Cancel/Void ☐	3. Originator's Name, Organization, MSIN, and Telephone No. J.L. SMALLEY, 8E800, S7-12, 2-0886	4. USQ Required? [X] Yes [] No	5. Date 1/10/97
6. Project Title/No./Work Order No. CHARACTERIZATION PROJECT/N4H3B	7. Bldg./Sys./Fac. No. 200GEN	8. Approval Designator SQ	9. Document Numbers Changed by this ECN (includes sheet no. and rev.) SEE BLOCK 13
10. Related ECN No(s). 636530	11. Related PO No. N/A		
12a. Modification Work [] Yes (fill out Bk. 12b) [X] No (NA Blks. 12b, 12c, 12d)	12b. Work Package No. N/A	12c. Modification Work Complete N/A Design Authority/Cog. Engineer Signature & Date	12d. Restored to Original Condition (Temp. or Standby ECN only) N/A Design Authority/Cog. Engineer Signature & Date
13a. Description of Change ETN-96-0003 THIS ECN SUPERCEDES ECN 636530 IN ITS ENTIRETY H-2-690134, SHEET 1, REV.0 H-2-690134, SHEET 2, REV.0 SEE ATTACHED FOR CHANGES SEE SHEET 4 OF 4 FOR CHANGES			
13b. Design Baseline Document? [X] Yes [] No			
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 DESIGN VERIFICATION PERFORMED BY <i>928 1/28/97</i> INFORMAL REVIEW PER EP4.1 THIS ECN IS BEING WRITTEN TO CHANGE THE DRILL ROD FROM CARBON STEEL TO NICKEL PLATED CARBON STEEL IN ORDER TO REDUCE THE SPARKING POTENTIAL OF THE EXTERIOR SURFACE. THIS IS A CHANGE TO SAFETY CLASS "SC" EQUIPMENT. SEE SHEET #3 FOR ADDITIONAL DETAILS. <i>928 1/28/97</i>			
15. Distribution (include name, MSIN, and no. of copies) J.L. SMALLEY S7-12 <i>sta 15</i> R.N. DALE S7-12 <i>sta 16</i> G.W. WILSON S7-12 <i>sta 20</i> T.R. FARRIS S7-12 E.E. SALINAS S7-12 G.P. JANICEK S7-12		15. Distribution (include name, MSIN, and no. of copies) EB-12 SS-00 T4-30	
		RELEASE STAMP DATE: <i>4</i> STA: <i>4</i> FEB 06 1997 ID: <i>2</i>	

HNF-SD-WM-DRR-062 Rev 0
P. ECN (use no. from pg. 1)
45-8

636965

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
SPARE PARTS LIST	T0-020-451	WHC-SD-WM-SEL-032 (note: this document is not affected by the change specified in block 13 of this ecn.)
	T0-080-518	

A-7900-013-3 (05/96) GEF096

ENGINEERING CHANGE NOTICE

Page 1 of 31. ECN **639110**Proj.
ECN

2. ECN Category (mark one) Supplemental ☐ Direct Revision ☒ Change ECN ☐ Temporary ☐ Standby ☐ Supersede ☐ Cancel/Void ☐	3. Originator's Name, Organization, MSIN, and Telephone No. JD Robinson, 08E00, S7-12, 376-4777	4. USQ Required? ☒ Yes ☐ No	5. Date February 3, 1997
	6. Project Title/No./Work Order No. Rotary Mode Core Sampling	7. Bldg./Sys./Fac. No. 241G	8. Approval Designator SQ
	9. Document Numbers Changed by this ECN (includes sheet no. and rev.) WHC-SD-WM-CSDD-020, Rev. 1	10. Related ECN No(s). 639111/168908	11. Related PO No. N/A

12a. Modification Work ☒ Yes (fill out Blk. 12b) ☐ No (NA Blks. 12b, 12c, 12d)	12b. Work Package No. ES-97-022	12c. Modification Work Description <i>2/24/97 George Janicek per telecon</i> Design Authority/Cog. Engineer Signature & Date	12d. Restored to Original Condition (Temp. or Standby ECN only) N/A
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13a. Description of Change
ETN 95-005213b. Design Baseline Document? ☒ Yes ☐ No

This Direct Revision describes software changes that will accomodate the increased (-10 inches of water to +10 inches as opposed to -10 inches to 0 on the old instruments) pressure range of the newly installed pressure transmitters. Also described are the changes required to add an alarm and alarm signal upon outside thermocouple temperature exceeding predetermined values. Note: outside temperature is hydrogen detection cell temp. *PK*

This ECN is addressed by USQ TF-97-0070 *2/10/97*

14a. Justification (mark one)

Criteria Change ☒	Design Improvement ☐	Environmental ☐	Facility Deactivation ☐
As-Found ☐	Facilitate Const ☐	Const. Error/Omission ☐	Design Error/Omission ☐

14b. Justification Details

The hydrogen detection cell as used on the flammable gas interlock is temperature sensitive; that is, outside of established temperature limits the cell's performance degrades to unacceptable levels. The hydrogen detection cell is a safety class component.

See continuation sheet page 3 for block 14b continuation.

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

EJ Waldo	S7-12 (1)	KL Drury	S7-12 (1)
JD Robinson	S7-12 (1)	RE Raymond	S7-12 (1)
EE Salinas	S7-12 (1)	JA Ranschau	S7-07 (1)
ML McElroy	S7-07 (1)	Sta. 15	E6-12 (1)
Sta. 1	S5-59 (1)	Sta. 16	S5-00 (1)
Sta. 2	S6-01 (1)	Sta. 20	T4-00 (1)
GP Janicek	S7-12 (1)		

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FEB 24 1997	
ID: <u>2</u>	

ENGINEERING CHANGE NOTICE

Page 2 of 3

639110

16. Design Verification Required ☒ Yes ☐ No	17. Cost Impact <table border="1"> <thead> <tr> <th colspan="2">ENGINEERING</th> <th colspan="2">CONSTRUCTION</th> </tr> </thead> <tbody> <tr> <td>Additional</td> <td>☒ \$5K</td> <td>Additional</td> <td>☒ \$0</td> </tr> <tr> <td>Savings</td> <td>☐ \$</td> <td>Savings</td> <td>☐ \$</td> </tr> </tbody> </table>	ENGINEERING		CONSTRUCTION		Additional	☒ \$5K	Additional	☒ \$0	Savings	☐ \$	Savings	☐ \$	18. Schedule Impact (days) Improvement ☐ Delay ☒ 14
ENGINEERING		CONSTRUCTION												
Additional	☒ \$5K	Additional	☒ \$0											
Savings	☐ \$	Savings	☐ \$											

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	☐	Stress/Design Report	☐	Health Physics Procedure	☐
Operating Specification	☐	Interface Control Drawing	☐	Spares Multiple Unit Listing	☐
Criticality Specification	☐	Calibration Procedure	☐	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	☐	Operating Procedure	☒	Electric Circuit Schedule	☐
OM Manual	☐	Operational Safety Requirement	☐	ICRS Procedure	☐
FSAR/SAR	☐	IEFD Drawing	☐	Process Control Manual/Plan	☐
Safety Equipment List	☐	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	☐	Not Applicable	☐
Environmental Permit	☐	Inventory Adjustment Request	☐		☐

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
Critical Alarm Check		
Procedure 6-ES-443		
Operating Procedure T0-080-518		

21. Approvals

Signature	Date	Signature	Date
Design Authority GP Janicek <i>[Signature]</i>	2/20/97	Design Engineer JD Robinson <i>[Signature]</i>	02/20/96
Cog. Eng. EJ Waldo <i>[Signature]</i>	2/20/97	PE	
Cog. Mgr. JS Schofield <i>[Signature]</i>	2/20/97	QA	
SA ML McElroy <i>[Signature]</i>	2-20-97	Safety	
Safety JA Ranschau <i>[Signature]</i>	2-20-97	Design Engineer JD Robinson <i>[Signature]</i>	02/20/96
Environ.		Environ.	
Formal Design Review Chairman GP Janicek <i>[Signature]</i>	2/20/97	Other	

DEPARTMENT OF ENERGY

Signature or a Control Number that tracks the Approval Signature

ADDITIONAL

ENGINEERING CHANGE NOTICE

Page 1 of 461. ECN **168908**Proj.
ECN

2. ECN Category (mark one) Supplemental ☒ Direct Revision ☐ Change ECN ☐ Temporary ☐ Standby ☐ Supersedeure ☐ Cancel/Void ☐	3. Originator's Name, Organization, MSIN, and Telephone No. G.F. Vargo, Jr., 08E00, B4-51, 376-5387	4. USQ Required? ☒ Yes ☐ No	5. Date 2/14/97
	6. Project Title/No./Work Order No. THERMOCOUPLE ON WHITTAKER CELL	7. Bldg./Sys./Fac. No. <i>2004</i>	8. Approval Designator SQ
	9. Document Numbers Changed by this ECN (includes sheet no. and rev.) See Block 13A	10. Related ECN No(s). N/A	11. Related PO No. N/A
12a. Modification Work ☒ Yes (fill out Blk. 12b) ☐ No (NA Blks. 12b, 12c, 12d)	12b. Work Package No. ES-97-95	12c. Modification Work Complete Design Authority/Cog. Engineer Signature & Date	12d. Restored to Original Condi- tion (Temp. or Standby ECN only) N/A Design Authority/Cog. Engineer Signature & Date

13a. Description of Change
USQ:TF-97-007013b. Design Baseline Document? ☒ Yes ☐ No

This ECN changes the following drawings:

H-14-100519, Sheet 1, Rev. 0; H-14-100519, Sheet 2, Rev. 0;
H-14-100519, Sheet 3, Rev. 0; H-14-100520, Sheet 1, Rev. 0;
H-14-100520, Sheet 2, Rev. 0; H-14-100520, Sheet 3, Rev. 0;
H-14-100521, Sheet 1, Rev. 0; H-14-100521, Sheet 2, Rev. 0;
H-14-100521, Sheet 3, Rev. 0; H-14-100521, Sheet 16, Rev. 0;
H-14-100531, Sheet 2, Rev. 0; H-14-100531, Sheet 3, Rev. 0;
H-14-100532, Sheet 2, Rev. 0; H-14-100524, Sheet 1, Rev. 0;
H-14-100524, Sheet 2, Rev. 0; H-14-100524, Sheet 3, Rev. 0;
H-14-100524, Sheet 4, Rev. 0; H-14-100523, Sheet 1, Rev. 0;
H-14-100523, Sheet 3, Rev. 0; H-14-100524, Sheet 9, Rev. 0;
H-14-100771, Sheet 1, Rev. 0.

(Continued on Page 3)

14a. Justification (mark one)

Criteria Change ☐	Design Improvement ☒	Environmental ☐	Facility Deactivation ☐
As-Found ☐	Facilitate Const ☐	Const. Error/Omission ☐	Design Error/Omission ☐

14b. Justification Details

The Whittaker cell temperature, as processed by the new digital thermometer with alarm relay option, will be used to shutdown core sampling operations if the temperature of the Whittaker cell is not within specified limits for RMCS operations.

The changes to the T/C configuration, from this ECN, will involve changes to the safety SSC.

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

See distribution sheet.

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DATE:

STA: 4

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2

FEB 18 1997

ENGINEERING CHANGE NOTICE				Page <u>2</u> of <u>46</u>	1. ECN (use no. from pg. 1) 168908																																																
16. Design Verification Required ☒ Yes ☐ No	17. Cost Impact <table style="width: 100%; border: none;"> <tr> <th colspan="2" style="text-align: center; border-bottom: 1px solid black;">ENGINEERING</th> <th colspan="2" style="text-align: center; border-bottom: 1px solid black;">CONSTRUCTION</th> </tr> <tr> <td style="width: 33%;">Additional</td> <td style="width: 33%;">N/A</td> <td style="width: 33%;">Additional</td> <td style="width: 33%;">N/A</td> </tr> <tr> <td>Savings</td> <td>N/A</td> <td>Savings</td> <td>N/A</td> </tr> </table>			ENGINEERING		CONSTRUCTION		Additional	N/A	Additional	N/A	Savings	N/A	Savings	N/A	18. Schedule Impact (days) <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">Improvement</td> <td style="width: 50%;">N/A</td> </tr> <tr> <td>Delay</td> <td>N/A</td> </tr> </table>	Improvement	N/A	Delay	N/A																																	
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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 WHC-SD-WM-SDD-035/Rev. 0 TO-060-347 6-ES-451 6-ES-443		Document Number/Revision WHC-SD-WM-ETP-182/Rev. 1 TO-020-451 WHC-SD-WM-SEL-032/Rev. 2		Document Number/Revision WHC-SD-WM-CSDD-020/Rev. 0 TO-080-518																																																	
21. Approvals																																																					
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