Rel. ②.

OCT 17 1996 ENGINEERING DATA TRANSMITTAL

Page 1 of 1

1. EDT № 141308

2. To: (Receiving Organization)	3. From: (Originating Organization)	4. Related EDT No.:
Interim Stabilization	Support Engineering	141307
5. Proj./Prog./Dept./Div.:	**6. Design Authority/ Design Agent/Cog. Engr.:**	**7. Purchase Order No.:**
West Tank Farm Project / Interim Stabilization	C.C. Scaief III / R.E. Larson	N/A
8. Originator Remarks:		**9. Equip./Component No.:**
This document is being routed for approval		N/A
		10. System/Bldg./Facility:
		241-A-101
11. Receiver Remarks: **11A. Design Baseline Document?** [M] Yes [ ] No		**12. Major Assm. Dwg. No.:** N/A
		13. Permit/Permit Application No.: N/A
		14. Required Response Date: 10/02/96

15. DATA TRANSMITTED

(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	(F) Approval Designator	(G) Reason for Transmittal	(H) Originator Disposition	(I) Receiver Disposition
1	WHC-SD-WM-ATR-185	All	0	Acceptance Test Report for the Safety Class Shutdown System.	SQ	1		

16. KEY

Approval Designator (F)	Reason for Transmittal (G)		Disposition (H) & (I)	
E, S, Q, D or N/A (see WHC-CM-3-5, Sec.12.7)	1. Approval	4. Review	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

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

(G) Reason	(H) Disp.	(J) Name (K) Signature (L) Date (M) MSIN	(G) Reason	(H) Disp.	(J) Name (K) Signature (L) Date (M) MSIN
1	1	Design Authority C.C. Scaief III 10/16/96 H6	1	1	M. R. Koch 10/9/96
1	1	Design Agent R. E. Larson R.E. Larson 10/2/96	1	1	ETF Design Authority D. A. Bragg 10/9/96
1	1	Cog.Eng. R. E. Larson R.E. Larson 10/2/96 T407	1	1	a.i. F. ZURCFF 10/9/96
1	1	Cog. Mgr. J.J. Badden 10/2/96 T407	1	1	Disp. Authority D. Bragg 10/10/96
1	1	QA T.J Volkman 10/2/96			
1	1	Safety L.S. Krogsrud 10/7/96			
		Env.			

18.	19.	20.	21. DOE APPROVAL (if required) Ctrl. No.
W. E. Zuroff 10/2/96	T.A. Erickson	J.J. Badden 10-17-96	[ ] Approved
Signature of EDT Originator / Date	Authorized Representative for Receiving Organization / Date	Design Authority/ Cognizant Manager / Date	[ ] Approved w/comments
			[ ] Disapproved w/comments

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

BD-7400-172-1 (07/91)

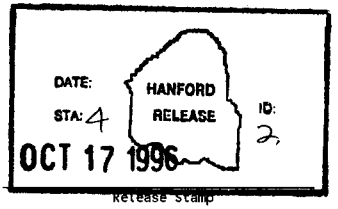
ACCEPTANCE TEST REPORT FOR THE SAFETY CLASS SHUTDOWN SYSTEM

W.F. Zuroff
Lockheed Martin Hanford Company, Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-87RL10930

EDT/ECN: 141308 UC: 2030
Org Code: 77B20 Charge Code: N1737
B&R Code: EW3120071 Total Pages: 43

Key Words: 241-A-101; Interim Stabilization; Jet Pumping; Single Shell Tanks; Safety Shutdown Circuit; Safety Class; Saltwell Pumping

Abstract: This document provides the Acceptance Test Report for the successful testing of the Safety Shutdown Circuit. The test was done in accordance with the requirements that were defined in WHC-SD-WM-SCH-003, Interim Stabilization Safety Class Trip Circuit CGI Dedication Criteria. The actual test procedure document was contained in WHC-SD-WM-ATP-185, Acceptance Test Procedure for the Safety Class Shutdown System.



Release Approval 10/17/96 Date

Release Stamp

Approved for Public Release

ACCEPTANCE TEST REPORT FOR THE SAFETY CLASS SHUTDOWN SYSTEM

1.0 PURPOSE

The purpose of this report is to document the results of the acceptance testing that was performed on the safety class shutdown system in accordance with WHC-SD-WM-ATP-185, *Acceptance Test Procedure for the Safety Class Shutdown System.* A copy of the completed test is attached to this report.

2.0 DISCUSSION

The test was performed by Westinghouse Hanford Company personnel using work package ES-96-00704, *241-A-101 Perform ATP on Safety Shutdown System.* The test commenced on 8/21/96. The test demonstrated the equipment functioned as designed and in accordance with the test procedure.

This test demonstrated the acceptance of the Safety Class (SC) Commercial Grade Items (CGI) as required by WHC-SD-WM-SCH-003, *INTERIM STABILIZATION SAFETY CLASS TRIP CIRCUIT CGI DEDICATION CRITERIA.*

The testing resulted in seven minor exceptions to the test document. All exceptions have been properly resolved and dispositioned.

The shutdown system performed very well and had an excellent time response time of less than 10 milliseconds. All components functioned as expected except the mercury switches. The switches are designed to operate in only one direction. This feature required the addition of two more switches (one for the X-plane and one for the Z-plane).

3.0 CONCLUSION

The system functioned as designed. It has been installed and is awaiting the Operational Test that will be performed in conjunction with all the equipment installed to support the saltwell pumping of Single-Shell Tank 241-A-101.

ATTACHMENT

A copy of the completed Acceptance Test Procedure is attached to this document. It includes all exceptions with the required disposition.

ACCEPTANCE TEST REPORT

FOR THE SAFETY CLASS SHUTDOWN SYSTEM

ATTACHMENT

TABLE OF CONTENTS

PAGE

1.0 PURPOSE

1.1 This ATP will test and verify the operability of the safety class shutdown system to be located at 241-A-101, in support of the A-101 saltwell jet pumping campaign.

Systems/checks that will be tested/performed include the following:

- Mercury Switches Functional Test
- Differential Pressure Relay Functional Test
- Flammable Gas Monitor Input Signal Functional Check
- Ventilation Skid Flow Input Signal Functional Check
- Contactors (PMP-1, PMP-2, HT-1 and HT-2) Functional Check and Shutdown System Time Response
- Control Cabinet (A) Switches Functional Test
- Control Cabinet (B) Switch and Indicating Lights Functional Check
- Output Signals to PICS Skid Functional Check

1.2 This ATP will NOT check the operability of the following equipment that is to be or has been tested via other test procedures;

- Portable Ventilation Flow Relay Operation
- Flammable Gas Relay Operation
- Dome Pressure Transmitter Operation
- Input Signal Cables (checked by the field installation crew)

2.0 INFORMATION

2.1 SCOPE

2.1.1 MERCURY SWITCHES FUNCTIONAL TEST

This test will verify the two mercury switches actuate when the cabinets are shaken in the X and Z planes (similar to a seismic event). A check of the switch continuity (i.e., a voltmeter across the each switch) shall be performed during the switching function. The relay actuated by the mercury switches is relay K3. This test will also verify the operation of this relay. The three input signals received from other devices will have to be simulated to allow this test to be performed.

Once the mercury switches operate the "Seismic" reset button shall be used to reset the shutdown circuitry.

2.1.2 DIFFERENTIAL PRESSURE RELAY FUNCTIONAL TEST

The pressure relay functional test shall be performed by providing a 4-20ma input signal to the isolator relay. The input signal shall be varied between 4 and 20ma. When the setpoint is reached the differential pressure relay will open causing the shutdown circuit to function. The relays actuated by this input signal are relays K1 and K2. This test will also verify the operation of these relays.

Once the differential pressure switch operates the "Panel" reset button shall be used to reset the shutdown circuitry.

2.1.3 FLAMMABLE GAS MONITOR INPUT SIGNAL FUNCTIONAL CHECK

The flammable gas monitor (FGM) input signal functional check shall be tested by installing a light switch wired across the input signal terminals. The switch shall be opened and closed to ensure the safety shutdown circuitry operates correctly. The relays actuated by this input signal are relays K1 and K2. This test will also verify the operation of these relays.

Once the FGM test switch operates the "Panel" reset button shall be used to reset the shutdown circuitry.

2.1 SCOPE (cont.)

2.1.4 VENTILATION SKID FLOW INPUT SIGNAL FUNCTIONAL CHECK

The ventilation skid flow input signal functional check shall be tested by installing a light switch wired across the input signal terminals. The switch shall be opened and closed to ensure the safety shutdown circuitry operates correctly. The relays actuated by this input signal are relays K1 and K2. This test will also verify the operation of these relays.

Once the flow test switch operates the "Panel" reset button shall be used to reset the shutdown circuitry.

2.1.5 CONTACTORS (PMP-1, PMP-2, HT-1 and HT-2) FUNCTIONAL CHECK and SHUTDOWN SYSTEM TIME RESPONSE

A check of contactors functioning properly shall be verified during the tests performed via steps 2.1.2, 2.1.3 and 2.1.4. The operation of the safety class shutdown system will be timed from the time the input signal actuates to the time the contactors drop out. The time needs to be less than or equal to one second (re-perform step 2.1.3 or 2.1.4, as required).

Once the input signal actuates the "Panel" reset button shall be used to reset the shutdown circuitry.

2.1.6 CONTROL CABINET (A) SWITCHES FUNCTIONAL TEST

A check of the Manual Shutdown/Test pushbutton must be accomplished. Simulated input signals shall be provided for the cabinet to function properly. The switch shall be pressed to initiate a shutdown.

Once the switch actuates the contactors the "Panel" reset button shall be used to reset the shutdown circuitry.

2.1.7 CONTROL CABINET (B) SWITCH and INDICATING LIGHTS FUNCTIONAL CHECK

A check of the Seismic Reset pushbutton must be accomplished. Simulated input signals shall be provided for the cabinet to function properly. The structure shall be shaken to initiate a shutdown.

Once the relay actuates the contactors the "Seismic" reset button shall be used to reset the shutdown circuitry. this portion of the system will be checked as part of the scope of Section 2.1.2.

2.1 SCOPE (cont.)

2.1.8 OUTPUT SIGNALS TO PICS SKID FUNCTIONAL CHECK

A check of the K3 relay output signal must be accomplished when the mercury switches have operated (de-energizing the K3 relay coil). A check of the motor power contactors (PMP-1 and PMP-2) auxiliary contact, for indication of the shutdown circuitry functioning, to the PICS skid is required. When a shutdown occurs verify these auxiliary contacts open.

Once the K3 relay actuates the contactors the "Seismic" reset button shall be used to reset the shutdown circuitry. Once the K1 and/or K2 relay actuates the contactors the "Panel" reset button shall be used to reset the shutdown circuitry.

The K-3 relay output signal will be checked as part of the scope of Section 2.1.1. The PMP-1 and PMP-2 auxiliary contacts will be checked as part of the scope of Section 2.1.5.

2.2 TERMS AND DEFINITIONS

2.2.1 ATP - Acceptance Test Procedure

2.2.2 ATR - Acceptance Test Report

2.2.3 DPM - Differential Pressure Monitor

2.2.4 ma - milli-ampere

2.2.5 msec - milli-second

2.2.6 JHA - Job Hazards Analysis

2.2.7 QC - Quality Control

2.2.8 SCSS - Safety Class Shutdown System

2.2.9 TFO - Tank Farm Operations

2.2.10 VAC - Voltage Alternating Current

2.3 RESPONSIBILITIES

2.3.1 The Maintenance craft personnel are responsible for:

- Providing assistance during the test.

2.3.2 Quality Control (QC) is responsible for:

- Verifying that this procedure was performed, all sections were completed and the documentation properly filled out or an exception written. Witnessing of certain procedure steps will be required.

2.3 RESPONSIBILITIES (cont.)

2.3.3 Test Director

- Provides concurrence that ATP may commence.
- Ensures the equipment found in step 4.1 of this procedure is available.
- Records equipment status and data per this procedure.
- Conducts a pre-job planning meeting.
- Conducts a Safety Class Shutdown System walkdown.
- Verifying Tank Farms Maintenance Crafts are in-place prior to commencing the ATP.
- Notifying the TFO Shift Manager of intent to start this procedure before commencing the ATP.

2.4 REFERENCES

2.4.1 The following documents were used to write or are referenced in this procedure:

- WHC-CM-1-10, SAFETY MANUAL, WKS-6, "PRE-JOB SAFETY PLANNING," WKS-8.1, "OPERATIONS LOCK AND TAG PROGRAM," WKS-15, "ELECTRICAL WORK SAFETY"
- WHC-CM-4-2 QR 11.0, QUALITY ASSURANCE MANUAL "TEST CONTROL"
- WHC-CM-6-1 EP 4.2., STANDARD ENGINEERING PRACTICE "TESTING PRACTICES"
- WHC-CM-6-1 APPX M, STANDARD ENGINEERING PRACTICES "ACCEPTANCE TEST PROCEDURES AND REPORTS".
- ECN-632817, SAFETY CLASS SHUTDOWN CIRCUIT
- WHC-SD-WM-SCH-003, INTERIM STABILIZATION SAFETY CLASS TRIP CIRCUIT CGI DEDICATION CRITERIA

2.5 SAFETY

WARNING

Energized circuits and leads are contained inside the equipment. Observe appropriate electrical precautions. Comply with WHC-CM-1-10, WKS-15, ELECTRICAL WORK SAFETY.

2.5 SAFETY (cont.)

2.5.1 The following administrative procedures control work performed in this procedure:

- Building Emergency Plan, WHC-IP-0263-TF
- Industrial Hygiene Manuals, WHC-CM-4-40 and 1-11
- Safety Manual, WHC-CM-1-10
- Tank Farm Health and Safety Plan (HASP), WHC-SD-WM-HSP-002

2.6 RADIATION AND CONTAMINATION CONTROL

2.6.1 HPT assistance is not required as the test is being performed in the assembly shop.

2.6.2 The following administrative procedures control work performed in this procedure:

- Safety Manual, WHC-CM-1-10

2.7 QUALITY ASSURANCE

2.7.1 Ensure that the check(s)/test(s) are performed per procedure. The QC Inspector shall sign and date each procedure section authenticating the validity of the data (if any) obtained and verifying that the procedure section has been performed and documented correctly.

2.8 GENERAL INFORMATION

2.8.1 Complete each procedure step in the given order, unless otherwise noted or as directed by the Test Director.

2.8.2 Editorial changes required to this ATP may be made per the red line method by the Test Director and Cognizant Engineer as long as they do not impact the equipments safety function, or performance and will not compromise or influence the test data. Any changes affecting the above stated criteria shall be made in accordance with WHC-CM-6-1, *Standard Engineering Practices*, EP-2.2 Change Control.

2.8 GENERAL INFORMATION (cont.)

2.8.3 All entries recorded in this procedure shall be made in black ink except for those noted using the redline method.

2.8.4 Any non-conformance of the equipment or unexpected results during testing shall be logged and recorded in ATP EXCEPTION LOG.

2.8.5 Do not perform any part of this procedure on faulty equipment. If faulty equipment is discovered, STOP the execution of this procedure and resolve the problem (i.e. repair equipment or write up faulty equipment as an exception and continue).

2.8.6 If the performance of this procedure is suspended for any reason, ensure the requirements of the Lock and Tag System are met before leaving the test site.

2.8.7 At the completion of daily ATP testing, ensure that the equipment is returned to a safe configuration.

2.8.8 This procedure DOES contain separate data/ verification sheets. Reference to data sheets are incorporated into the specific section.

2.8.9 The equipment has no interfaces with other equipment (other than the test equipment) for the purposes of this test.

2.8.10 A JHA form will be used in conjunction with the Prejob safety meeting form when any unusual hazards are identified. The PRE-JOB SAFETY MEETING FORM will be used with the JHA to document all attendees.

3.0 RECORDS

3.1 The completed working copy of this ATP, data sheets and all exception logs and exception records generated by this ATP, will be kept as permanent records and released in an ATR.

4.0 PREREQUISITES

4.1 The following supplies shall be available at the workplace:

- 15 Amp (min.) light switches (2)
- Calibrated 4-20ma current loop source
- Calibrated Multimeter(s)
- Shorting jumpers #12 AWG SIS or engineering approved equal, length as required
- 250 OHM resistor, 1/2 watt
- Calibrated Multi-channel event recorder (or equivalent)

4.2 The following documents are required to be at the test site, before and during the performance of this procedure:

- WHC-IP-0842, Vol II Section 4.9.1, LOCKOUT/TAGOUT
- WHC-CM-1-10, WKS-8.1, OPERATIONS LOCK & TAG PROGRAM
- WORK PACKAGE, ES-96-00589/M

4.3 The following conditions must be met before this test may commence:

4.3.1 A pre-job safety meeting has been held before performing this procedure in accordance with WHC-IP-0842, Vol V Section 4.1, PRE-JOB SAFETY MEETING FORM.

Test Director — Date: 8/21/96

EXCEPTION # 1

4.3.2 Verify the equipment is fabricated and identified per ECN 632817.

mel 8/21/96 ☑

4.3.3 Verify all equipment is prepared for the test.

Test Director — Date: 8/21/96

4.3.4 Verify test equipment is calibrated and record data on page 27.

☑

EXCEPTION #6

4.3.5 QC Inspector **SHALL VERIFY** that section 4.0 has been **COMPLETED** by **SIGNING** below.

QC Inspector Signature (SEE EXCEPTION 1 #6) — Date: 9.19.96

5.0 PROCEDURE

WARNING

Energized circuits and leads are contained inside the equipment. Observe appropriate electrical precautions. Comply with WHC-CM-1-10, WKS-15, ELECTRICAL WORK SAFETY.

5.1 MERCURY SWITCHES FUNCTIONAL TEST

5.1.1 **ENSURE** that temporary power (120 VAC) is available to the Safety Class Shutdown System via a 15 amp circuit breaker and the breaker is open.

5.1.2 **CONNECT** 250 OHM resistor between terminals TB-3-1 and TB -3-2.

5.1.3 **ENSURE** temporary jumpers are installed on the FGM, DPM, and Ventilation System inputs.

5.1.4 **CONNECT** temporary power to the SCSS and close the circuit breaker.

5.1.5 **DEPRESS** Seismic Reset Switch (PB-1).

5.1.6 **VERIFY** Power Available Indicator Light **"ON"**.

5.1.7 **DEPRESS** Panel Reset switch (PB-2). **Verify** Trip Circuit Functional Indicator Light is **"ON"**.

EXCEPTION # 2

5.1.8 **RECORD** voltage drop across Seismic Switch ~~SW-1~~ and the resistance across K3-3 (TB3-1,2).

4 mV VAC .3 OHMS

5.1.9 **TILT** cabinet 1-3 degrees in the X-plane.

5.1.10 **VERIFY** Power Available Indicator Light and the Trip Circuit Functional Indicator Light are off.

5.1 MERCURY SWITCHES FUNCTIONAL TEST (CONT.)

EXCEPTION # 2

5.1.11 **RECORD** ~~voltage drop~~ RESISTANCE across Seismic Switch ~~SW-1~~ and the resistance across K3-3.

∞ ~~VAC~~ OHMS ∞ OHMS

5.1.12 **LOWER** the cabinet to a level position.

EXCEPTION # 2

5.1.13 **REPEAT** steps 5.1.5 through 5.1.12 five (5) times and record data below.

level

11.6 m VAC	.2 OHMS	∞ ~~VAC~~ OHMS	∞ OHMS
14.9 m VAC	.2 OHMS	∞ ~~VAC~~ OHMS	∞ OHMS
11.7 m VAC	.2 OHMS	∞ ~~VAC~~ OHMS	∞ OHMS
12.3 m VAC	.2 OHMS	∞ ~~VAC~~ OHMS	∞ OHMS
14.6 m VAC	.2 OHMS	∞ ~~VAC~~ OHMS	∞ OHMS

} tilted

5.1.14 **REPEAT** steps 5.1.5 through 5.1.12 five (5) times and record data below. **TILT** cabinet 1-3 degrees in the opposite direction of the X-Plane.

EXCEPTION # 2

12.9 m VAC	.2 OHMS	∞ ~~VAC~~ OHMS	∞ OHMS
10.5 m VAC	.2 OHMS	∞ ~~VAC~~ OHMS	∞ OHMS
7.4 m VAC	.2 OHMS	∞ ~~VAC~~ OHMS	∞ OHMS
6.5 m VAC	.2 OHMS	∞ ~~VAC~~ OHMS	∞ OHMS
7.1 m VAC	.2 OHMS	∞ ~~VAC~~ OHMS	∞ OHMS

5.1.15 **DEPRESS** Seismic Reset Switch, * AND PANEL RESET MLL 8/22/96

5.1.16 **ENSURE** Power Available Light is on.

EXCEPTION # 2

5.1.17 **RECORD** the voltage drop across seismic switch ~~SW-2~~ and the resistance across K3-3.

3.8 m VAC .2 OHMS

5.1 MERCURY SWITCHES FUNCTIONAL TEST (CONT.)

5.1.18 **TILT** cabinet 1-3 degrees in the Z-Plane ☑

5.1.19 **VERIFY** Power Available Indicator Light and the Trip Circuit Function Indicator Light "**OFF**". ☑

EXCEPTION # 2

5.1.20 **RECORD** the ~~voltage drop~~ RESISTANCE across seismic switch ~~SW-2~~ and the resistance across K3-3.
~~VAC~~ ∞ OHMS ∞ OHMS ☑

5.1.21 **LOWER** the cabinet to a level position. ☑

EXCEPTION # 2

5.1.22 **REPEAT** steps 5.1.15 through 5.1.21 five (5) times and record data below.

10.9m VAC	.2 OHMS	∞ ~~VAC~~ OHMS	∞ OHMS
11.0m VAC	.2 OHMS	∞ ~~VAC~~ OHMS	∞ OHMS
8.4m VAC	.2 OHMS	∞ ~~VAC~~ OHMS	∞ OHMS
10.4m VAC	.2 OHMS	∞ ~~VAC~~ OHMS	∞ OHMS
10.9m VAC	.2 OHMS	∞ ~~VAC~~ OHMS	∞ OHMS

☑

EXCEPTION # 2

5.1.23 **REPEAT** steps 5.1.15 through 5.1.21 five (5) times and record data below. **TILT** cabinet in the opposite direction in the Z-Plane.

11.6m VAC	.3 ~~VAC~~ OHMS	∞ OHMS	∞ OHMS
8.8m VAC	.2 ~~VAC~~ OHMS	∞ OHMS	∞ OHMS
8.2m VAC	.3 ~~VAC~~ OHMS	∞ OHMS	∞ OHMS
6.0m VAC	.3 ~~VAC~~ OHMS	∞ OHMS	∞ OHMS
7.2m VAC	.2 ~~VAC~~ OHMS	∞ OHMS	∞ OHMS

☑

5.1 MERCURY SWITCHES FUNCTIONAL TEST (CONT.)

5.1.24 **OPEN** temporary power circuit breaker.

5.1.25 Test Director **SHALL VERIFY** that section 5.3 is **COMPLETE** by **SIGNING** below.

Test Director Signature — Date: 8/21/96

5.1.26 QC Inspector **SHALL VERIFY** that section 5.3 is **COMPLETE** by **SIGNING** below.

*PJ Elmendorf — QC Inspector Signature — Date: 8.21.96

*WITH EXCEPTION #2 AS NOTED.

5.2 DIFFERENTIAL PRESSURE RELAY TEST

5.2.1 **ENSURE** cabinet is de-energized.

5.2.2 **REMOVE** DPM temporary input jumper.

EXCEPTION # 3

5.2.3 **CONNECT** 4-20 ma current source to TB-3-~~4(+)~~ -1(+) and TB-3-~~5(-)~~ -2(-) in cabinet A (SALW-PNL-080H).

5.2.4 **CONNECT** 250 OHM resistor between terminals TB-3-~~1~~ -4 and TB-3-~~2~~ -5 in cabinet A. (if not already connected).

5.2.5 **CLOSE** temporary power circuit breaker.

5.2.6 **DEPRESS** Seismic Reset Switch (PB-1). **VERIFY** Power Available Light **"ON"**.

EXCEPTION #4
EXCEPTION #5

5.2.7 **RESET** DPM alarm module by ~~increasing~~ decreasing the current source until the module resets. Verify by measuring voltage drop across DPM alarm contacts.

5.2.8 **DEPRESS** Panel Reset Pushbutton (PB-2). **"VERIFY"** Trip Circuit Functional Indicating Light **"ON"**.

5.2 DIFFERENTIAL PRESSURE RELAY TEST (CONT.)

EXCEPTION # 5

5.2.9 **TRIP** DPM alarm module by ~~decreasing~~ INCREASING the current source until the module trips. ☑

5.2.10 **VERIFY** Trip Circuit Functional Indicating Light is **OFF**. ☑

5.2.11 **OPEN** temporary power circuit breaker.

EXCEPTION #3

5.2.12 **REMOVE** 4-20 ma current source from TB-3-~~4(+)~~ -1(+) and TB-3-~~5(-)~~ -2(-). ☑

5.2.13 **INSTALL** DPM temporary input jumper. ☑

5.2.14 Test Director **SHALL VERIFY** that section 5.2 is **COMPLETE** by **SIGNING** below.

[signature] 8/22/86
Test Director Signature Date

5.2.15 QC Inspector **SHALL VERIFY** that section 5.2 is **COMPLETE** by **SIGNING** below.

PJ [signature] 8·22·86
QC Inspector Signature Date

WITH EXCEPTIONS #3, 4, & 5 AS NOTED.

5.3 FLAMMABLE GAS MONITOR INPUT SIGNAL FUNCTIONAL TEST

5.3.1 **ENSURE** cabinet is de-energized. ☑

5.3.2 **REMOVE** temporary jumper from the FGM system input. ☑

5.3.3 **CONNECT** temporary light switch across input terminals of FGM system input. **CLOSE** light switch. ☑

5.3.4 **CLOSE** temporary power circuit breaker.

5.3 FLAMMABLE GAS MONITOR INPUT SIGNAL FUNCTIONAL TEST (CONT.)

5.3.5 **VERIFY** Power Available light and Trip Circuit Functional Indicator Light are "**OFF**".

5.3.6 **DEPRESS** Seismic Reset Switch (PB-1). **VERIFY** Power Available Light "**ON**".

5.3.7 **DEPRESS** Panel Reset Pushbutton (PB-2). "**VERIFY**" Trip Circuit Functional Indicating Light "**ON**".

5.3.8 **CONNECT** voltmeter across relay contact K1-1 (TB1-2,TB2-2). **MEASURE** and record voltage.

4.7 m VAC

5.3.9 **OPEN** temporary light switch. **VERIFY** Trip Circuit Functional Indicating Light is **OFF**.

5.3.10 **MEASURE** and **RECORD** voltage drop across relay contact K1-1.

119.2 VAC

5.3.11 **CLOSE** temporary light switch.

5.3.12 **DEPRESS** Panel Reset Pushbutton (PB-2). "**VERIFY**" Trip Circuit Functional Indicating Light "**ON**".

5.3.13 **CONNECT** voltmeter across relay contact K1-2 (TB1-2,TB2-3).

5.3 FLAMMABLE GAS MONITOR INPUT SIGNAL FUNCTIONAL TEST (CONT.)

5.3.14 **MEASURE** and **RECORD** voltage drop across relay contact K1-2.

~~8.6~~ 8.7m mrk 8/22/96
~~9.3m~~ VAC

5.3.15 **OPEN** temporary light switch. **VERIFY** Trip Circuit Functional Indicating Light is **OFF**.

5.3.16 **MEASURE** and **RECORD** voltage drop across relay contact K1-2.

119.2 VAC

5.3.17 **CLOSE** temporary light switch.

5.3.18 **DEPRESS** Panel Reset Pushbutton (PB-2). **"VERIFY"** Trip Circuit Functional Indicating Light **"ON"**.

5.3.19 **CONNECT** voltmeter across relay contact K2-1 (TB1-2, TB2-~~3~~ 2 Channel B).

mrk 8/22/96

5.3.20 **MEASURE** and **RECORD** voltage drop across relay contact K2-1.

~~9.1m~~ 6.3m
~~9.1mA~~ VAC

5.3.21 **OPEN** temporary light switch. **VERIFY** Trip Circuit Functional Indicating Light is **OFF**.

5.3 FLAMMABLE GAS MONITOR INPUT SIGNAL FUNCTIONAL TEST (CONT.)

5.3.22 **MEASURE** and **RECORD** voltage drop across relay contact K2-1.

119.2
+19.4 VAC MRK 8/22/96

5.3.23 **CLOSE** temporary light switch.

5.3.24 **DEPRESS** Panel Reset Pushbutton (PB-2). **"VERIFY"** Trip Circuit Functional Indicating Light **"ON"**.

5.3.25 **CONNECT** voltmeter across relay contact K2-2 (TB1-2,TB2-3 Channel B).

5.3.26 **MEASURE** and **RECORD** voltage drop across relay contact K2-2.

8.3 m VAC

5.3.27 **OPEN** temporary light switch. **VERIFY** Trip Circuit Functional Indicating Light is **OFF**.

5.3.28 **MEASURE** and **RECORD** voltage drop across relay contact K2-2.

119.3 VAC

5.3.29 **OPEN** temporary power circuit breaker.

5.3.30 **REMOVE** temporary light switch.

5.3.31 **INSTALL** the temporary FGM system input jumper.

5.3 FLAMMABLE GAS MONITOR INPUT SIGNAL FUNCTIONAL TEST (CONT.)

5.3.32 Test Director **SHALL VERIFY** that section 5.3 is **COMPLETE** by **SIGNING** below.

Test Director Signature — Date: 8/21/96

5.3.33 QC Inspector **SHALL VERIFY** that section 5.3 is **COMPLETE** by **SIGNING** below.

QC Inspector Signature — Date: 8.21.96

5.4 VENTILATION SKID FLOW INPUT SIGNAL FUNCTIONAL TEST

5.4.1 **ENSURE** cabinet is de-energized. ☑

5.4.2 **REMOVE** the temporary jumper across the Ventilation Skid Flow Input. ☑

5.4.3 **INSTALL** temporary light switch across input terminals of Ventilation system input. ☑

5.4.4 **CLOSE** the temporary power circuit breaker. ☑

5.4.5 **VERIFY** Power Available light and Trip Circuit Functional Indicator Light are **"OFF"**. ☑

5.4.6 **DEPRESS** the PB-1. **VERIFY** Power Available Light is **ON**. ☑

5.4 VENTILATION SKID FLOW INPUT SIGNAL FUNCTIONAL TEST (CONT.)

5.4.7 **DEPRESS** Panel Reset Pushbutton (PB-2). **"VERIFY"** Trip Circuit Functional Indicating Light **"ON"**.

5.4.8 **OPEN** the temporary light switch.

5.4.9 **VERIFY** Trip Circuit Functional Indicating Light is **OFF**.

5.4.10 **OPEN** the temporary power circuit breaker.

5.4.11 **REMOVE** the temporary light switch.

5.4.12 **INSTALL** temporary jumper across the Ventilation Skid Flow Input.

5.4.13 Test Director **SHALL VERIFY** that section 5.4 is **COMPLETE** by **SIGNING** below.

Test Director Signature — Date: 8/21/96

5.4.14 QC Inspector **SHALL VERIFY** that section 5.4 is **COMPLETE** by **SIGNING** below.

QC Inspector Signature — Date: 8.21.96

5.5 CONTACTORS FUNCTIONAL TEST AND SHUTDOWN SYSTEM TIME RESPONSE

5.5.1 **ENSURE** cabinet is de-energized.

5.5.2 **REMOVE** the temporary jumper across FGM input. ☑

5.5.3 **INSTALL** temporary light switch across FGM System input. ☑

EXCEPTION #6

5.5.4 **INSTALL** an event recorder with the following inputs: ☑
CH1 -- FGM Input
CH2 -- PMP-1-1
CH3 -- PMP-2-1

5.5.5 **INSTALL** ohmmeter across auxiliary contacts PMP-1-2 and PMP-2-2 (Channel A TB2-7,8). ☑

5.5.6 **CLOSE** the temporary power circuit breaker. ☑

5.5.7 **VERIFY** Power Available light and Trip Circuit Functional Indicator Light are **"OFF"**. ☑

5.5.8 **DEPRESS** Seismic Reset Switch (PB-1). **VERIFY** Power Available Light **"ON"**. ☑

5.5.9 **DEPRESS** Panel Reset Pushbutton (PB-2). **"VERIFY"** Trip Circuit Functional Indicating Light **"ON"**. ☑

5.5.10 **RESET** event recorder. ☑

5.5.11 **RECORD** resistance across auxiliary contacts PMP-1-2 and PMP-2-2. ☑

.3 OHMS

5.5.12 **OPEN** the temporary light switch. ☑

5.5 CONTACTORS FUNCTIONAL TEST AND SHUTDOWN SYSTEM TIME RESPONSE (CONT.)

5.5.13 **VERIFY** Panel Trip Functional Indicating Light is **OFF**. ☑

5.5.14 **RECORD** elapsed time from input trip to contactor operation. *(This time should be less than 1 second.)*

10 msec (record longest time response) ☑

5.5.15 **RECORD** resistance across auxiliary contacts PMP-1-2 and PMP-2-2.

∞ OHMS ☑

5.5.16 **CLOSE** the temporary light switch. ☑

5.5.17 **REPEAT** steps 5.5.8 through 5.5.16 four times and record resistance and time response below.

.3 OHMS	>10 msec	∞ OHMS
.3 OHMS	10 msec	∞ OHMS
.3 OHMS	10 msec	∞ OHMS
.3 OHMS	10 msec	∞ OHMS

☑

5.5.18 **CONNECT** ohmmeters across contactors HT1-1, HT1-2, PMP1-1, and PMP1-2. ☑

5.5.19 **CLOSE** the temporary light switch. ☑

5.5 CONTACTORS FUNCTIONAL TEST AND SHUTDOWN SYSTEM TIME RESPONSE (CONT.)

5.5.20 **DEPRESS** Panel Reset Pushbutton (PB-2). **"VERIFY"** Trip Circuit Functional Indicating Light **"ON"**.

5.5.21 **RECORD** the resistance indicated by the ohmmeters in DATA SHEET I.

5.5.22 **OPEN** the temporary light switch. **VERIFY** Trip Circuit Function Light is **OFF. RECORD** the resistance indicated by the ohmmeters DATA SHEET I. *(Ohmmeters should indicate an open circuit)*

5.5.23 **REPEAT** steps 5.5.19 through 5.5.22 twenty five (25) times.

5.5.24 **REMOVE** the ohmmeters.

5.5.25 **OPEN** temporary power circuit breaker.

5.5.26 **REMOVE** temporary light switch.

5.5.27 **INSTALL** the temporary jumper removed in step 5.5.2

5.5.28 Test Director **SHALL VERIFY** that section 5.5 is **COMPLETE** by **SIGNING** below.

Test Director Signature

8/22/96
Date

5.5 CONTACTORS FUNCTIONAL TEST AND SHUTDOWN SYSTEM TIME RESPONSE (CONT.)

5.5.29 QC Inspector **SHALL VERIFY** that section 5.5 is **COMPLETE** by **SIGNING** below.

RJ Almudel
WITH EXCEPTION #3 AS NOTED
QC Inspector Signature

9-22-94
Date

☑

5.6 CONTROL CABINET A FUNCTIONAL TEST

5.6.1 **ENSURE** temporary jumpers are installed on the system inputs. ☑

5.6.2 **CLOSE** the temporary power circuit breaker. ☑

5.6.3 **DEPRESS** Seismic Reset Switch (PB-1). **VERIFY** Power Available Light "ON". ☑

5.6.4 **DEPRESS** Panel Reset Pushbutton (PB-2). **"VERIFY"** Trip Circuit Functional Indicating Light **"ON"**. ☑

5.6.5 **DEPRESS** the manual shutdown pushbutton switch (PB-3). ☑

5.6.6 **ENSURE** and **RECORD** Trip Circuit Functional Indicator Light is off.

______ ON   X OFF ☑

5.6 CONTROL CABINET A FUNCTION TEST (CONT.)

5.6.7 **REPEAT** steps 5.6.4 through 5.6.6 ten (10) times.

ON	X OFF
ON	X OFF
ON	X OFF
ON	X OFF
ON	X OFF
ON	X OFF
ON	X OFF
ON	X OFF
ON	X OFF
ON	X OFF

☑

5.6.8 **OPEN** temporary power circuit breaker. ☑

5.6.9 **REMOVE** temporary jumpers. ☑

5.6.10 Test Director **SHALL VERIFY** that section 5.6 is **COMPLETE** by **SIGNING** below.

Test Director Signature — Date: 8/22/96

5.6.11 QC Inspector **SHALL VERIFY** that section 5.6 is **COMPLETE** by **SIGNING** below.

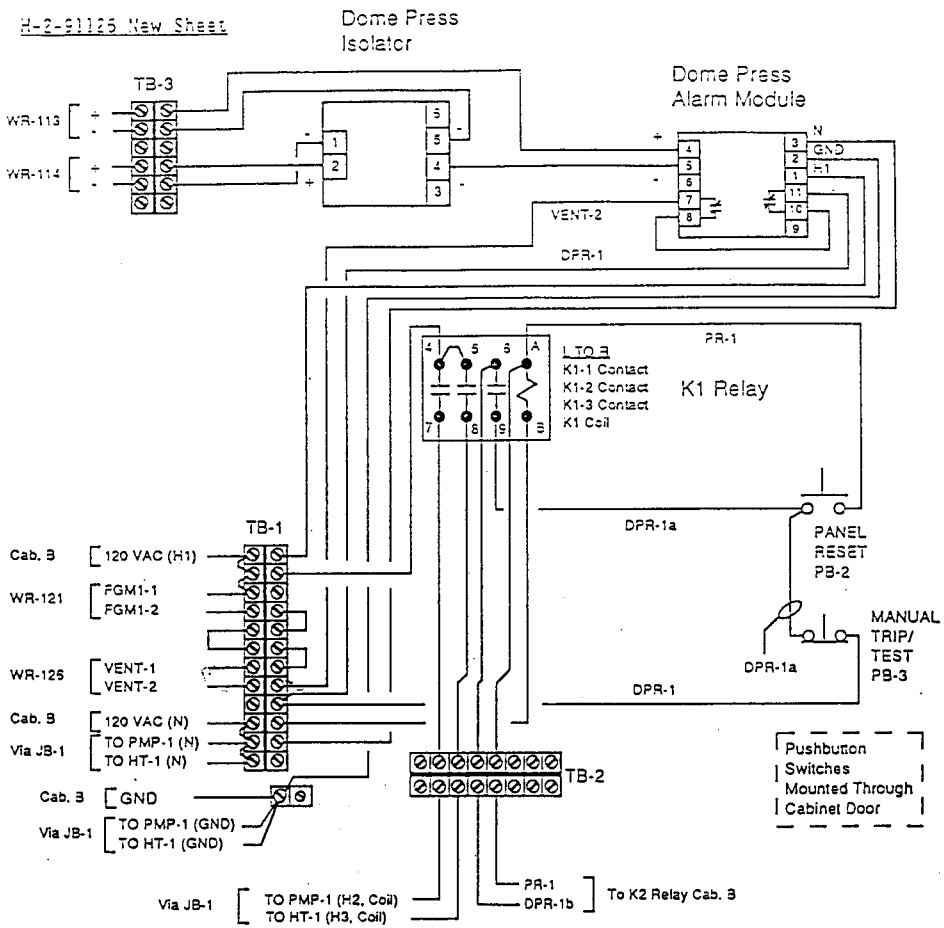
QC Inspector Signature — Date: 8.22.96

TEST EQUIPMENT CALIBRATION DATA

	INSTRUMENT NUMBER	CALIBRATION DATE	EXPIRATION DATE
MULTI-METER	681-45-~~80~~-002 CB RE 8-21-96	12/12/95 ~~681-12/2/96~~	12/12/96
TRANSMATION	681-13-20-001	10/26/95	10/26/96
MULTI-METER	681-45-08001	10/25/95	10/25/96

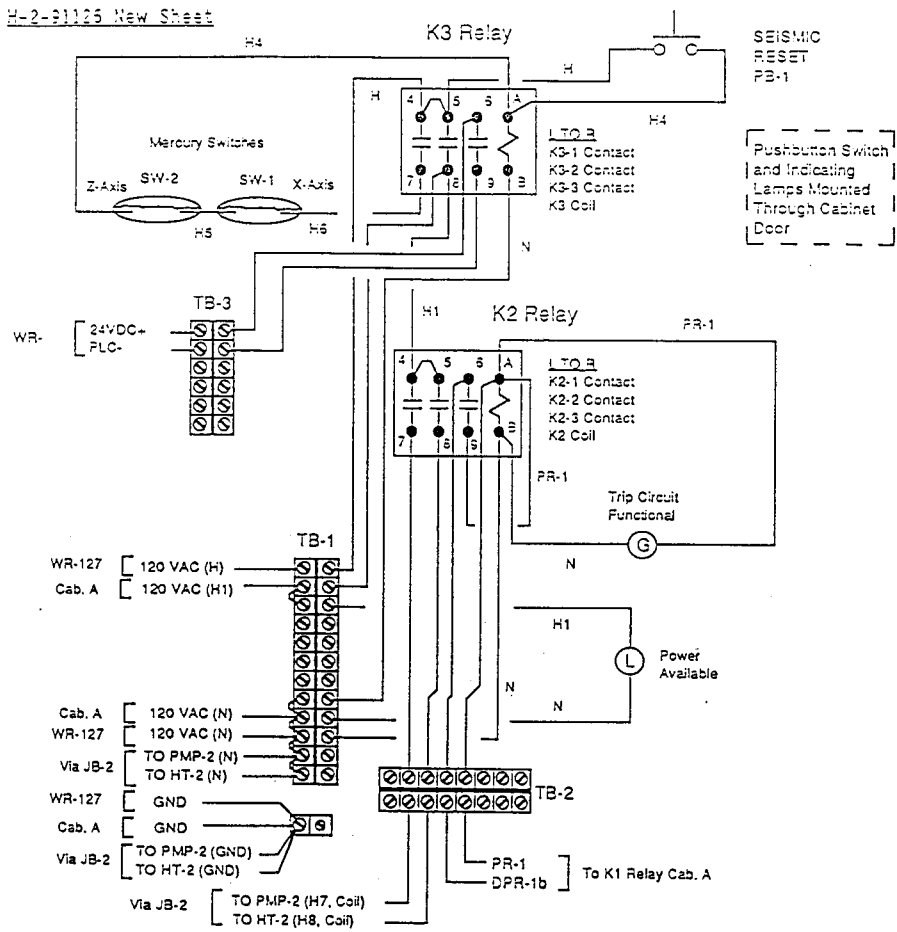
FIGURE 5.1 SAFETY CLASS CONTROL CABINET A

Exception #7



Safety Class Control Cabinet (A)
(SALW-PNL-808H)

FIGURE 5.2 SAFETY CLASS CONTROL CABINET B EXCEPTION #7



Safety Class Control Cabinet (B)
(SALW-PNL-809H)

DATA SHEET LOG

This page may be reproduced as necessary PAGE 1 of 1

DATA SHEET LOG

Sheet Log No.	Sheet Style No.	Date	Description (associated with step)
1	PER PAGE 31	8-22-96	25 TIME CONTACTOR TEST

DATA SHEET I

This page may be reproduced as necessary Page 1 of 1

These readings taken as a part of Section 5 of this ATP.

Time readings taken 11:00 Date 8/22/96

	STEP 5.5.21 (OHMS)				STEP 5.5.22 (OHMS)			
	HT1-1	HT1-2	PMP1-1	PMP1-2 (2-1)	HT1-1	HT1-2	PMP1-1	PMP2-1
1)	.4Ω	1.2Ω	.3Ω	.4Ω	∞	∞	∞	∞
2)	1.0Ω ~~∞~~	.2Ω ~~∞~~	.6Ω ~~∞~~	.2Ω ~~∞~~	∞	∞	∞	∞
3)	.5Ω	.3Ω	.3Ω	.78Ω	∞	∞	∞	∞
4)	.3Ω	.2Ω	.4Ω	.3Ω	∞	∞	∞	∞
5)	.3Ω	.2Ω	.4Ω	.6Ω	∞	∞	∞	∞
6)	2.3Ω	.2Ω	.5Ω	.4Ω	∞	∞	∞	∞
7)	.76Ω	.2Ω	.5	.3	∞	∞	∞	∞
8)	.3	.2	.6	.4	∞	∞	∞	∞
9)	.3	.2	.4	.43	∞	∞	∞	∞
10)	.3	1.3	2.1	.2	∞	∞	∞	∞
11)	.4	.2	.6	.3	∞	∞	∞	∞
12)	.4	.9	1.5	.2	∞	∞	∞	∞
13)	.4	.4	1.2	.2	∞	∞	∞	∞
14)	.6	.2	.6	.2	∞	∞	∞	∞
15)	.5	1.6	.3	.2	∞	∞	∞	∞
16)	.4	.2	3.9	.2	∞	∞	∞	∞
17)	1.7	.7	.4	.2	∞	∞	∞	∞
18)	1.0	1.2	.6	.2	∞	∞	∞	∞
19)	.9	.3	3.1	.2	∞	∞	∞	∞
20)	1.8	.3	.3	2.7	∞	∞	∞	∞
21)	1.0	.4	4.8	.4	∞	∞	∞	∞

ATP EXCEPTION LOG

This page may be reproduced as necessary PAGE 1 of 1

ATP EXCEPTION LOG		
Number	Date	Description
# 1 4.3.2	8/21/96	ECN 632817 IS IN REVISION FOR AS BUILTING
# 2	8/21/96	VOLTAGE DROP IS INAPPROPRIATE, USE RESISTANCE
# 3	8/22/96	INPUT AND OUTPUT TERMINALS OF DPM ARE REVERSED IN TEST PROCEDURE
# 4	8/22/96	ALARM MODULE ~~CIRCUIT 8 IS IN ALARM PREVENTING, TEST EXECUTION~~ IS WORKING OPPOSITE
#5	8/22/96	OF EXPECTED INCREASING SHOULD BE DECREASING
#6	8/22/96	UNCALIBRATED PLC EVENT RECORDER
#7	9/19/96	FIGURES HAVE BEEN MODIFIED

ATP EXCEPTION RECORD

This page may be reproduced as necessary.

ATP step number: 4.3.2	ATP Exception Log Number: 1

Description of Exception: EQUIPMENT IS NOT EXACTLY WIRED AND CONFIGURED PER ECN 632817.

* HINGE, SPRING AND TIPGUARD PER ~~PAGE~~ 632817 PAGE 5 WHERE NOT INSTALLED AT TIME OF TESTING.

Resolution of Exception: QC VERIFIED EQUIPMENT IS FABRICATED AND IDENTIFIED PER A REDLINED COPY OF ECN 632817. REDLINED ECN WAS PROVIDED BY COGNIZANT ENGINEER. REDLINES WILL BE INCORPORATED BY COGNIZANT ENGINEER AND RELEASED AS A REVISED ECN. CHANGE ECN 632835 ISSUED 9.17.96. PJE 9.17.96

* THIS EQUIPMENT NECESSARY FOR FIELD INSTALL, BUT NOT REQUIRED FOR TESTING.

Date of Resolution: 8/21/96	8/21/96
Test Director signature:	[signature]
Cognizant Engineer signature:	[signature] 9/19/96
Quality Assurance signature:	PJ Elmendorf 9.19.96 SEE NOTE BELOW
Tank Farm Operations signature:	[signature] 9/22/96

QC VERIFICATION PER STEP 4.3.2 WAS LIMITED TO SHOP WORK; NO FIELD WIRING YET INSTALLED. CHANGES MADE BY ECN 632835 DO NOT REPRESENT CHANGES IN CONFIGURATION THAT WOULD AFFECT ATP RESULTS (EXCEPT AS SPECIFIED IN OTHER EXCEPTIONS TO THIS TEST). THEY REPRESENT AN AS-BUILT OF THE CONFIGURATION AT THE TIME OF THE TESTING. PJ Elmendorf 9.17.96

ATP EXCEPTION RECORD

This page may be reproduced as necessary.

ATP step number: 5.1.8, 5.1.20, 5.1.22, 5.1.23 5.1.11, 5.1.13, 5.1.14, 5.1.17	ATP Exception Log Number: 2
Description of Exception: VOLTAGE DROP ACROSS SWITCH IS NOT MEANINGFUL WHEN CIRCUIT IS DEENERGIZED. ALSO, IT IS IMPRACTICAL TO MEASURE ACROSS INDIVIDUAL MERCURY SWITCHES AS 2 ARE IN THE "X" PLANE AND 2 ARE IN THE "Z" PLANE, ALL WIRED IN SERIES WITH NO TERMINAL ACCESS.	
Resolution of Exception: MEASURE RESISTANCE ACROSS ENTIRE SERIES OF MERCURY SWITCHES. VISUALLY VERIFY IF THE CORRECT (X PLANE OR Z PLANE) MERCURY SWITCH IS ACTUATED. GLASS TUBE STYLE MERCURY SWITCHES ARE EASILY VERIFIED OPEN OR CLOSED.	
Date of Resolution: 8/21/96	8/21/96
Test Director signature:	[signature]
Cognizant Engineer signature:	[signature] 9/19/96
Quality Assurance signature:	PJ Elmendorf 9.19.96
Tank Farm Operations signature:	[signature] 9/22/96

ATP EXCEPTION RECORD

This page may be reproduced as necessary.

ATP step number: 5.2.3, 5.2.4	ATP Exception Log Number: 3
Description of Exception: DPM TEST SECTION IS UNPERFORMABLE AS WRITTEN. THE INPUT TERMINALS (TB3-1,-2) ARE SPECIFIED AS OUTPUT TERMINALS IN STEP 5.2.4. OUTPUT TERMINALS (TB-3,-4,-5,-6) ARE SPECIFIED AS INPUT TERMINALS IN STEP 5.2.3.	
Resolution of Exception: Correct steps to specify correct input and output terminals and continue with procedure. STEP 5.1.2 INSTALLED RESISTOR ACROSS TB-3-1, AND TB-3-2, FOR MERCURY SWITCH FUNCTIONAL TEST. NO ADVERSE TEST RESULTS OCCURRED AS RESULT OF RESISTOR BEING INSTALLED AT THIS LOCATION DURING SECTION 5.1.	
Date of Resolution:	8/21/96
Test Director signature:	[signature]
Cognizant Engineer signature:	[signature] 9/19/96
Quality Assurance signature:	[signature] 9.19.96
Tank Farm Operations signature:	[signature] 9/22/96

ATP EXCEPTION RECORD

This page may be reproduced as necessary.

ATP step number: 5.2.7	ATP Exception Log Number: 4
Description of Exception: ALARM MODULE CLOSED ABOVE HI SETPOINT AND OPENED BELOW SETPOINT.	
Resolution of Exception: FAILSAFE DIP SWITCH SETTING REQUIRES NORMALLY OPEN CONTACTS FOR CORRECT HI LIMIT OPERATION. REWIRED ALARM CONTACTS N.O. ECN 632817 PAGE 10 WIRE ON TERMINAL 11 MOVED TO 9. WIRE ON TERMINAL 8 MOVED TO 6. ECN CORRECTION REQUIRED PAGE 10 AND PAGE 14. CHANGE ECN 632835 ISSUED 9.17.96	
Date of Resolution:	8/22/96
Test Director signature:	[signature]
Cognizant Engineer signature:	[signature] 9/19/96
Quality Assurance signature:	[signature] 9/19/96
Tank Farm Operations signature:	[signature] 9/22/96

ATP EXCEPTION RECORD

This page may be reproduced as necessary.

ATP step number: 5.2.7 5.2.9	ATP Exception Log Number: 5
Description of Exception: PROCEDURE CALLS FOR INCREASING CURRENT SOURCE UNTIL ALARM CLEARS, AND ~~INCREAS~~ DECREASING UNTIL ALARM TRIPS.	
Resolution of Exception: DPM IS A HIGH ALARM. DECREASING CURRENT SOURCE IS REQUIRED TO CLEAR MODULE, AND INCREASING TO ALARM MODULE	

Date of Resolution:	8/22/96
Test Director signature:	[signature]
Cognizant Engineer signature:	[signature] 9/19/96
Quality Assurance signature:	PJ Clemendorf 9.19.96
Tank Farm Operations signature:	[signature] 9/22/96

ATP EXCEPTION RECORD

This page may be reproduced as necessary.

ATP step number: 4.3.5	ATP Exception Log Number: 6
Description of Exception: Multi-channel event recorder equivalent was an uncalibrated PLC.	
Resolution of Exception: Response time was well under 1 second, closer to 10 ms. Visual indicator on contactors was observed to be instantaneous. Accept test results provided by uncalibrated PLC.	
Date of Resolution:	8/22/96
Test Director signature:	
Cognizant Engineer signature:	9/19/96
Quality Assurance signature:	RJ Clemendor 9.19.96
Tank Farm Operations signature:	9/22/96

ATP EXCEPTION RECORD

This page may be reproduced as necessary.

ATP step number: FIGURE 5.1 p 28, FIGURE 5.2 p 29	ATP Exception Log Number: 7
Description of Exception: FIGURES 5.1 and 5.2 do not reflect field asbuilt conditions.	
Resolution of Exception: ECN 632835 WAS WRITTEN TO CORRECT THE ORIGINAL ECN 632817. THE CHANGE ECN HAS BEEN INSERTED IN THE OTP PACKAGE ES-96-00704/I FOR REFERENCE. EQUIPMENT CHANGES DO NOT INVALIDATE TEST RESULTS. ACCEPT TEST RESULTS AS RECORDED	
Date of Resolution:	9-19-96
Test Director signature:	[signature]
Cognizant Engineer signature:	[signature] 9/19/96
Quality Assurance signature:	PS Edmundson 9.19.96
Tank Farm Operations signature:	[signature] 9/22/96

ATP ACCEPTANCE RECORD

This ATP has been completed and the results, including red-line changes, exceptions, and exception resolutions, have been reviewed for compliance with the intent of the Purpose (Section 1.0). The ATP results are accepted by the undersigned:

Cognizant Engineer	9/19/96 Date
West Tank Farm Operations	9/22/96 Date
Safety	9/23/96 Date
Quality Control	9/23/96 Date
Test Director	8/22/96 Date