DISTRIBUTION SHEET

To DISTRIBUTION	From MF ERHART	Page 1 of 1			
		Date 05-01-95			
Project Title/Work Order OPERATOR COIL MONITORING ACCEPTANCE TEST PROCEDURE WHC-SD-WM-ATP-128 REV. 0		EDT No. 610861			
		ECN No. NA			

Name	MSIN	Text With All Attach.	Text Only	Attach./ Appendix Only	EDT/ECN Only
Central Files (2)	L8-04	X			
OSTI (2)	L8-07	X			
SC CANTRELL	L7-06				X
WG BROWN	T4-07	X			
MF ERHART (2)	R1-51	X			
GJ GAUCK	T4-07	X			
LS KROGSRUD	R3-08	X			
JJ KLOS	T4-08	X			
DW LAMASTUS	R2-84				X
JW LENTSCH	S7-15				X
ML MCELROY	S7-07	X			
DR NUNAMAKER	T4-08				X
FE PANISKO	P8-34				X
RW REED	R1-51				X
SH RIFAEY	T4-07				X
RW TRUITT	L6-37	X			
AC ZUEHLKE	T4-07				X

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UNREVIEWED SAFETY QUESTION SAFETY REVIEW FORM

(Per WHC-IP-0842, 15.9)

Page 1 of 2

REFERENCE DOCUMENT(S):

ECN No.

PCA No.

Work Pkg No.

Other (Specify) OPERATOR COIL MONITORING
ACCEPTANCE TEST PROCEDURE - WHC-SD-WM-ATP-
128, Rev. 0

TITLE: OPERATOR COIL MONITORING ACCEPTANCE TEST PROCEDURE

REFERENCES:

1. Safety Assessment for Proposed Pump Operation to Mitigate Episodic Gas Releases in Tank 241-SY-101 LAUR-92-3196 REV 14, in particular chapter 6 (level I and II Controls for Mixer Pump Operations).

Does the PROPOSED CHANGE:

- A. Represent a change to the facility as described in the AUTHORIZATION BASIS documentation?

☐ N/A ☒ No ☐ Yes/Maybe

Basis: The Safety basis, as presented in References 1, evaluated the potential hazards associated with the installation of non-obtrusive hardware and software. The testing will not change the probability of containment barrier breach or failure due to heat loading in Tank 241-SY-101, high temperatures, or material degradation due to thermal loading.

- B. Represent a change to procedures as described in the AUTHORIZATION BASIS?

☐ N/A ☒ No ☐ Yes/Maybe

Basis: The proposed activities involve the testing of software changes and Enraf signal installation and will have no affect on procedures.

- C. Represent a test or experiment not described in the AUTHORIZATION BASIS documentation?

☐ N/A ☒ No ☐ Yes/Maybe

Basis: The proposed activities involve testing of software changes and Eraf signals installation to ensure that it functions as Designed. It does not violate the Authorization basis.

- D. Does the change impact:

• Implemented OSRs or IOSRs? ☐ N/A ☒ No ☐ Yes/Maybe

• Approved IOSR Compliance Implementation Plans? ☐ N/A ☒ No ☐ Yes/Maybe

Basis: The proposed testing activity installs test equipment to test the readiness of the DACS Software. Existing OSRs IOSRs, and IOSR compliance plans are unaffected by this change.

UNREVIEWED SAFETY QUESTION SAFETY REVIEW FORM
(Continued)

Page 2 of 2

Based on the above, a Safety Evaluation ☐ DOES ☒ DOES NOT
need to be performed for this change

USQE No. 1 MF Erhart

Print Name

USQE No. 2 DC Larsen

Print Name

Signature

MF Erhart

Date

5/3/95

Signature

D.C. Larsen

Date

4 May 1995

RELEASE AUTHORIZATION

Document Number: WHC-SD-WM-ATP-128, REV 0

Document Title: OPERATOR COIL MONITORING ACCEPTANCE TEST PROCEDURE

Release Date: 5/16/95

**This document was reviewed following the
procedures described in WHC-CM-3-4 and is:**

APPROVED FOR PUBLIC RELEASE

WHC Information Release Administration Specialist:

Kara M. Broz

May 16, 1995

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SUPPORTING DOCUMENT1. Total Pages **46****2. Title****OPERATOR COIL MONITORING ACCEPTANCE TEST PROCEDURE****3. Number****WHC-SD-WM-ATP-128****4. Rev No.****0****5. Key Words****ALARMS, ABORT, DACS, COILS, RSS STATION, ENRAF, SY-101, I/O CABINET, MODICON, MODULE, GENESIS, PLC, E-STOP, MIXER PUMP, RUNTIME****6. Author****Name: MF ERHART**Signature **Organization/Charge Code 7CH30/N2B2H****7. Abstract**

This ATP will verify that all abort coil indications associated with the 101-SY mixer pump actuates and gives correct signals at the DACS Master and RSS computer stations. Additionally, several new DACS screens, which interface with the PLC, and several changed screens, which provide monitoring of the ENRAF probe will be verified for use during normal pump run evolutions by Operations personnel.

DISCLAIMER

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DATE	MAY 16 1995
<i>sto. 4</i>	

OPERATOR COIL MONITORING ACCEPTANCE TEST PROCEDURE

**WHC-SD-WM-ATP-128
REVISION 0**

APRIL 1995

OPERATOR COIL MONITORING ACCEPTANCE TEST PROCEDURE

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OPERATOR COIL MONITORING ACCEPTANCE TEST PROCEDURE

1.0 PURPOSE/SCOPE

The readiness of the Data Acquisition and Control System (DACS) to provide monitoring and control of the Programmable Logic Controller (PLC) abort coils from the Master and RSS stations will be systematically tested during performance of this procedure. It should be noted that these are not physical abort coils but software coils controlled by the software's ladder logic. The readiness of the DACS to properly interface with the ENRAF wire level gauge installed in the SY-101 storage tank will also be tested.

During this test, a verification of all abort coil indications will be conducted at the DACS Development Facility in the 306E Building by injecting an input signal for each DACS sensor that has an associated abort coil until the abort coil actuates, and then ensuring that the status of the abort coil indicated at the Master and RSS stations is correct. Each abort coil will also be tested to ensure that the "ENABLE" and "DISABLE" controls from the Master and RSS stations function correctly, and only with the use of proper passwords.

After the software to be tested is installed on the computers in the DACS trailer, a minimum of one sensor from each I/O cabinet in the SY-101 farm will be checked for proper monitoring and control of the associated abort coil from the Master and RSS stations and actual tripping of the E Stop circuitry shall be demonstrated. This is being performed to ensure proper alignment of Hardware and Software configuration.

Several new DACS screens, which provide the operator interface with the PLC, and several changed screens, that allow for Operations personnel, using Level 1 passwords, to exit the on-line Genesis program at the DACS stations, and which provide monitoring of the ENRAF probe will be verified to be adequate for use during normal pump run evolutions by Operations personnel.

The performance of this ATP will be the Verification and Validation of the DACS Genesis and Modsoft software configurations.

2.0 REFERENCES

- 2.1 ECN # 618720
- 2.2 HSR-CM, Rev. 2, Hanford Site Radiological Control Manual
- 2.3 Kaiser Engineers Hanford Construction Manual, Section CP 25, "Lock and Tag Program"
- 2.4 LAUR-92-3196, "Safety Assessment for Proposed Pump Operation to Mitigate Episodic Gas Releases in Tank 241-SY-101"

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- 2.5 WHC-CM-4-3, Industrial Safety Manual, Vols 1-3
- 2.6 WHC-CM-4-40, Industrial Hygiene Manual
- 2.7 WHC-CM-6-1, Standard Engineering Practices, EP-5.8, "Engineering Document Contents"
- 2.8 WHC-CM-6-1, Appendix M, "Acceptance Test Procedures and Reports"
- 2.9 WHC-IP-0263-TF, Westinghouse Hanford Company Building Emergency Plan, Appendix G, "S-Farm Complex"
- 2.10 WHC-IP-0842, Waste Tank Project Administration, Section 5.9.1, "Lockout/Tagout"
- 2.11 WHC-IP-0842, Waste Tank Project Administration, Section 15.3
- 2.12 WHC-SD-WM-HSP-002, Tank Farm Health and Safety Plan

3.0 RESPONSIBILITIES

The following personnel will be required for the performance of this procedure:

- Test Manager: The individual assigned direct responsibility for the preparation, performance, and adequacy of the test.
- Test Director: The engineer assigned shift responsibility for performance of the test.
- Test Engineer: The engineer assigned to assist and relieve the Test Director during the performance of the test.
- Field Engineer: A Test Director, Test Engineer, or Technician assigned to direct/verify testing activities outside of the DACS trailer.

Only personnel designated by the Plant Start-Up and Testing Manager are allowed to direct testing per this procedure, and perform operating and control functions using the DACS or DACS Development Facility computer systems.

One engineer acting as either a Test Director or as a Test Engineer is required to be present in the DACS trailer or at the DACS Development Facility computer consoles during testing. One engineer or technician acting as a Field Engineer and one or more Instrument Technicians and/or Electricians are required to inject test signals from outside of the DACS trailer.

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If, during testing, any indicated parameter, control function, or screen display is not correct or appears to be malfunctioning, then the engineer conducting this test shall make a determination as to the feasibility of continuing testing. In most cases, since actual mixer pump motor operation will not occur during this test, there will be no safety impact to continuing the test and completing corrective actions later. A record of all noted deficiencies will be kept on Attachment 1, "Exception List".

At the completion of all testing, approval of all data collected and DACS system performance shall be documented on Attachment 4, "Final Procedure Acceptance Sheet".

All changes to this procedure shall be implemented by ECN, and shall receive the approval signatures appropriate to the approval designation of the change.

4.0 DESCRIPTION OF THE SYSTEM

The DACS, which is housed in a trailer located just outside of the north fence at the SY tank farm, receives input signals from a variety of sensors located in and around the SY-101 tank. These sensors provide information such as:

- Tank vapor space and ventilation system H₂ concentration
- Tank waste temperature
- Tank pressure
- Waste density
- Operating pump parameters such as speed, flow, rotational position, discharge pressure, and internal temperature
- Strain (for major equipment)
- Waste level

The output of these sensors is conditioned and transmitted to the DACS computers where these signals are displayed, recorded, and monitored for out-of-specification conditions.

This procedure will test signals transmitted to the DACS from the ENRAF wire gauge, and verify proper indication and control of the status of the PLC abort coils from the Master and RSS stations.

5.0 TEST CONDITIONS AND EQUIPMENT REQUIRED

5.1 The provisions of the following manuals apply to all work performed under this procedure:

- HSR-CM, Rev. 2, Hanford Site Radiological Control Manual
- WHC-CM-4-3, Industrial Safety Manual, Vols 1-3
- WHC-CM-4-40, Industrial Hygiene Manual
- WHC-SD-WM-HSP-002, Tank Farm Health and Safety Plan

5.2 Lock and Tag Control

Locks and Tags shall be posted as required by WHC-IP-0842, Waste Tank Project Administration, Section 5.9.1, "Lockout/Tagout"

5.3 Jumpers and Lifted Leads

In this procedure, there are some occasions when leads will be lifted and landed at various terminals. Some of these leads will be energized. Required hand and eye protection shall be worn, and insulated tools shall be used, when working on energized circuits (< 50 Vac). Testing must be conducted with energized instrument leads to correctly simulate a sensor input signal from the sensor to the DACS computers.

5.4 Unexpected Alarms

If unexpected, non-DACS, tank farm equipment alarms or abnormal indications are received during testing at the DACS trailer or in the SY tank farm, then SY-101 testing evolutions shall be immediately suspended and actions, as prescribed in approved Tank Farms Alarm Response and Emergency Procedures, shall be taken by Tank Farms Operations personnel to place the equipment/farm in a safe, stable condition. When the reason for the unexpected condition is understood and resolved, then SY-101 testing activities may be resumed after permission to do so is received from the responsible West Area Shift Manager (WASM) and the Test Manager.

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5.5 Prior to initiation of testing, the following items shall be verified:

5.5.1 For performance of Sections 6.1, 6.2, and 6.3, all required software changes for the monitoring of the PLC abort coils at the Master and RSS stations have been loaded on the DACS Development Facility computers and the software has been released for testing.

Verified by: _____ / _____
(Test Director) Date

5.5.2 For performance of Section 6.5 the hardware has been installed for the ENRAF wire gauge and all connections have been made to the DACS.

Verified by: _____ / _____
(Test Director) Date

5.5.3 For performance of Sections 6.4 and 6.5, all required software changes for the monitoring of the PLC abort coils at the Master and RSS stations, and for monitoring of the ENRAF wire gauge have been loaded on the DACS trailer computers and the software has been released for testing.

Verified by: _____ / _____
(Test Director) Date

5.6 Prior to initiation of testing, the following equipment shall be available for use:

5.6.1 Insulated hand tools normally required for accessing equipment cabinets and terminal boards

5.6.2 For testing at the DACS trailer and SY tank farm, anti-contamination clothing and other personnel safety equipment required for access to the SY tank farm, and to perform work on energized equipment (< 50 Vac)

5.6.3 Radios (2 minimum) or other means of communications, for communicating between the DACS trailer and the SY tank farm

5.7 Calibrating source, capable of producing a 4 - 20 mA and ± 10 Vdc output signal

5.8 Attachment 3, "Measurement and Test Equipment Record Sheet", is included in Section 7.0 for recording data associated with M & TE used during the performance of this procedure.

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6.0 ACCEPTANCE TEST

6.1 Checks of Modified "WELCOME" and "MAIN TEST MENU" Screens

NOTE: Performance of the steps in this procedure section requires that no other conflicting activities are taking place in the DACS Development Facility in conjunction with the testing to be performed, and that the computers and monitors at Stations #5, #7, and #8 are available to support this test section.

- 6.1.1 If any discrepancy is noted during testing, then record a description of the condition in Attachment 1.
 - 6.1.1.1 For each discrepancy recorded, enter an identifying number in the "EXCEPTION NUMBER" Column of Attachment 1.
 - 6.1.1.2 Reproduce Attachment 1 as needed, and attach the additional pages to this procedure, to record all discrepancies noted during testing.
- 6.1.2 Perform the following at Station #5:
 - 6.1.2.1 Enter a Level 1 password.
 - 6.1.2.2 Display the "MAP" screen.
 - 6.1.2.3 Select the "WELCOME" button, click the left mouse button, and verify that the "WELCOME" screen is displayed.
 - 6.1.2.4 Select the "EXIT" button, click the left mouse button, and verify that the "TESTEXIT" screen is displayed.
 - 6.1.2.5 Select the "CANCEL" button, click the left mouse button, and verify that the "WELCOME" screen is displayed.
 - 6.1.2.6 Select the "EXIT" button, click the left mouse button, and verify that the "TESTEXIT" screen is displayed.
 - 6.1.2.7 Select the "EXIT" button and verify that the Genesis RUNTIME session is terminated and a DOS prompt is displayed.

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- 6.1.2.8 Restart the Genesis RUNTIME session.
- 6.1.2.9 Enter a Level 3 password and access the "WELCOME" screen.
- 6.1.2.10 Select the "EXIT" button, click the left mouse button, and verify that the "TESTEXIT" screen is displayed.
- 6.1.2.11 Select the "CANCEL" button, click the left mouse button, and verify that the "WELCOME" screen is displayed.
- 6.1.2.12 Select the "EXIT" button, click the left mouse button, and verify that the "TESTEXIT" screen is displayed.
- 6.1.2.13 Select the "EXIT" button and verify that the Genesis RUNTIME session is terminated and a DOS prompt is displayed.
- 6.1.2.14 Restart the Genesis RUNTIME session.
- 6.1.2.15 Enter a Level 3 password and access the "WELCOME" screen.
- 6.1.3 Perform the following at Station #7:
 - 6.1.3.1 Enter a Level 1 password.
 - 6.1.3.2 Display the "MAP" screen.
 - 6.1.3.3 Select the "WELCOME" button, click the left mouse button, and verify that the "WELCOME" screen is displayed.
 - 6.1.3.4 Select the "EXIT" button, click the left mouse button, and verify that the "TESTEXIT" screen is displayed.
 - 6.1.3.5 Select the "CANCEL" button, click the left mouse button, and verify that the "WELCOME" screen is displayed.
 - 6.1.3.6 Select the "EXIT" button, click the left mouse button, and verify that the "TESTEXIT" screen is displayed.
 - 6.1.3.7 Select the "EXIT" button, click the left mouse button, and verify that the Genesis RSS session is terminated and a DOS prompt is displayed.

OPERATOR COIL MONITORING ACCEPTANCE TEST PROCEDURE

- 6.1.3.8 Restart the Genesis RSS session.
- 6.1.3.9 Enter a Level 3 password and access the "WELCOME" screen.
- 6.1.3.10 Select the "EXIT" button, click the left mouse button, and verify that the "TESTEXIT" screen is displayed.
- 6.1.3.11 Select the "CANCEL" button, click the left mouse button, and verify that the "WELCOME" screen is displayed.
- 6.1.3.12 Select the "EXIT" button, click the left mouse button, and verify that the "TESTEXIT" screen is displayed.
- 6.1.3.13 Select the "EXIT" button, click the left mouse button, and verify that the Genesis RSS session is terminated and a DOS prompt is displayed.
- 6.1.3.14 Restart the Genesis RSS session.
- 6.1.3.15 Enter a Level 3 password and access the "WELCOME" screen.
- 6.1.4 Perform the following at Station #8:
 - 6.1.4.1 Enter a Level 1 password.
 - 6.1.4.2 Display the "MAIN TEST MENU" screen.
 - 6.1.4.3 Select the "Pump Operation" button, click the left mouse button, and verify that the "PUMPRUN" screen is displayed.
 - 6.1.4.4 Select the "EXIT" button, click the left mouse button, and verify that the "EXIT" screen is displayed.
 - 6.1.4.5 Select the "CANCEL" button, click the left mouse button, and verify that the "MAIN TEST MENU" screen is displayed.
 - 6.1.4.6 Select the "EXIT" button, click the left mouse button, and verify that the "EXIT" screen is displayed.

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- 6.1.4.7 Select the "EXIT" button, click the left mouse button, and verify that the Genesis RUNTIME session is terminated and a DOS prompt is displayed.
- 6.1.4.8 Restart the Genesis RUNTIME session and access the "MAIN TEST MENU" screen.
- 6.1.4.9 Enter a Level 3 password.
- 6.1.4.10 Select the "EXIT" button, click the left mouse button, and verify that the "EXIT" screen is displayed.
- 6.1.4.11 Select the "CANCEL" button, click the left mouse button, and verify that the "MAIN TEST MENU" screen is displayed.
- 6.1.4.12 Select the "EXIT" button, click the left mouse button, and verify that the "EXIT" screen is displayed.
- 6.1.4.13 Select the "EXIT" button, click the left mouse button, and verify that the Genesis RUNTIME session is terminated and a DOS prompt is displayed.
- 6.1.4.14 Restart the Genesis RUNTIME session and access the "MAIN TEST MENU" screen.
- 6.1.4.15 Enter a Level 3 password.

Testing as directed by this procedure section has been completed, and discrepancies, if any, have been listed on Attachment 1, Exception List.

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6.2 PLC Abort Coil Status and Indication Checks

NOTE: Performance of the steps in this procedure section requires that no other conflicting activities are taking place in the DACS Development Facility in conjunction with the testing to be performed, and that the computers and monitors at Stations #5, #7, and #8 are available to support this test section.

- 6.2.1 If any discrepancy is noted during testing, then record a description of the condition in Attachment 1.
 - 6.2.1.1 For each discrepancy recorded, enter an identifying number in the "EXCEPTION NUMBER" Column of Attachment 1.
 - 6.2.1.2 Reproduce Attachment 1 as needed, and attach the additional pages to this procedure, to record all discrepancies noted during testing.
- 6.2.2 At Station #5, display the "ABRTENAB" screen.
- 6.2.3 At Station #7, display the "ABRTNAME" screen.
- 6.2.4 At Station #8, display the "PUMPRUN" screen.

NOTES: The status ("ENABLED"/"DISABLED") of an abort coil may only be changed utilizing the "ABRTENBL" screen if a Level 3 password has been correctly entered into the Genesis program.

On the "ABRTENBL" screen, when an individual abort coil is "ENABLED", a GREEN "E" will be displayed in the column immediately to the left of the coil number for that coil.

On the "ABRTENBL" screen, when an individual abort coil is "DISABLED", a YELLOW "D" will be displayed in the column immediately to the left of the coil number for that coil.

To change the status of an individual abort coil utilizing the "ABRTENBL" screen, the operator must select the desired coil number with the mouse and click the left mouse button or press <Enter>.

- 6.2.5 Perform the following at Station #5:
 - 6.2.5.1 Enter a Level 1 password.

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- 6.2.5.2 Select 10 abort coils at random on the "ABRTENBL" screen and attempt to change the indicated status of the coils.
- 6.2.5.3 Record the abort coil numbers and the results of the attempt to change the status of the coils selected in Step 6.2.5.2, in Table A.

Table A

COIL #	Status changed? (Yes/No)

- 6.2.5.4 Enter a Level 3 password.
- 6.2.5.5 Select 10 abort coils at random on the "ABRTENBL" screen and attempt to change the indicated status of the coils.
- 6.2.5.6 Record the abort coil numbers, the as-found condition of the coils, and the results of the attempt to change the status of the coils selected in Step 6.2.5.5, in Table B.

OPERATOR COIL MONITORING ACCEPTANCE TEST PROCEDURE**Table B**

COIL #	AS-FOUND CONDITION (D/E)	STATUS CHANGED? (Yes/No)	AS-LEFT CONDITION (D/E)

6.2.5.7 Return the coils selected in Step 6.2.5.5 to the as-found status.

6.2.5.8 Record the as-left status of the coils in Table B.

NOTES: Steps for testing sensors in this section are written generically. Steps shall be repeated as necessary until required testing is complete.

Sensors shall be tested one at a time, until all have been tested.

6.2.6 Refer to Table 1, "Development Facility Module Setups" of Attachment 2, "Tables and Data Sheets", for the required configuration of input modules for each of the 6 module groups to be tested.

6.2.7 Refer to Table 2, "PLC Inputs and Input Groups" of Attachment 2 for the DACS tag numbers, development facility module addresses, and PLC address codes for testing of sensors per this procedure section.

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NOTES: If necessary, development facility personnel should be requested to configure all PLC "field" input modules for testing and apply and remove all input/test signals.

Testing of input modules within a module group may be performed in any order.

Testing of PLC input module groups may be performed in any order, at the discretion of the Test Director, but testing for each configured module group should be completed prior to configuring the "field" modules for another module group, to minimize the required amount of reconfiguration of the "field" modules.

- 6.2.8 Locate the portion of Table 2 for Module Group A.
- 6.2.9 If necessary, request development facility personnel to configure the "field" input modules for Module Group A.
- 6.2.10 If necessary, request development facility personnel to access the appropriate PLC Modsoft screen for testing Module Group A.
- 6.2.11 Reboot Station #5 to reset the abort limits.
- 6.2.12 Enter a Level 3 password.
- 6.2.13 At Station #5, disable abort coils as required to deenergize PLC coil #22.
- 6.2.14 For each coil that was disabled in Step 6.2.13, verify that a YELLOW "D" is displayed in the column immediately preceding the coil number.
- 6.2.15 For each coil that was NOT disabled in Step 6.2.13, verify that a GREEN "E" is displayed in the column immediately preceding the coil number.
- 6.2.16 Refer to the "DACS Tag" Column of a Table 2 data sheet and locate the tag number of the first sensor to be tested in Module Group A.
- 6.2.17 Refer to the "DEV FACILITY LOCATION" Column of the data sheets, to direct development facility personnel in locating the correct module for the sensor to be tested.
- 6.2.18 If the sensor being tested provides an analog input, then goto Step 6.2.20.

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- 6.2.19 If the sensor being tested provides a digital input, then:
- 6.2.19.1 Ensure that the abort coil associated with the sensor being tested is enabled, prior to testing the abort function.
 - 6.2.19.2 Apply the required input/test signal to cause a change of state ("ON" to "OFF" or "OFF" to "ON").

NOTE: When an abort coil is actuated, a RED circle is displayed in the column immediately to the right of the associated coil number on the "ABRTENBL" screen.

On the "ABRTNAME" screen, the text in the column immediately to the right of the associated coil number will be displayed in RED letters when the abort coil is actuated.

- 6.2.19.3 Verify that the proper abort indications are displayed on the "ABRTENBL" and "ABRTNAME" screens for the abort coil being tested.
- 6.2.19.4 Initial the "AB:" block in the "ABORT (DACS)" column of the respective data sheet, if the abort indications were correct when the abort was actuated.
- 6.2.19.5 Verify that the abort is displayed on the "ALARM/EVENT SUMMARY" screen, at Station #5.

NOTE: There is no E Stop circuit installed at the DACS Development Facility. Proper functioning of the PLC with respect to abort conditions will be tested by observing the state of PLC coil #22. This coil, when energized in the PLC, sends a signal to trip the E Stop circuit. During testing at the development facility, if coil #22 is observed to energize at the proper abort value, then this portion of the test shall be considered to be satisfactory. When testing is conducted for selected sensors at the DACS trailer, the actual E Stop trip function associated with this coil will be tested.

- 6.2.19.6 Verify that PLC coil #22 is energized.
- 6.2.19.7 Remove the applied input/test signal.

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- 6.2.19.8 Verify that the abort condition has cleared.
- 6.2.19.9 At Station #5, access any control screen (CS) to reset the PLC abort coil, then return to the "ABRTENAB" screen.
- 6.2.19.10 Ensure that PLC coil #22 is de-energized.
- 6.2.19.11 If testing was completed satisfactorily, then initial the "TEST ENGINEER INITIALS" block for the sensor that was tested and goto Step 6.2.21.
- 6.2.20 If the sensor being tested provides an analog input, then:

NOTE:

Analog signals will be tested by observing the values displayed for the sensor being tested in the PLC Modsoft program as the input signal is varied. A displayed Modsoft value of "0" corresponds to a reading at the low end of the sensor range, a displayed Modsoft value of "2048" corresponds to a reading near the middle of the sensor range, and a displayed Modsoft value of "4095" corresponds to a reading at the high end of the sensor range. The value or values in parenthesis "(XXXX)" in the "AB:" blocks on the data sheets are approximate Modsoft values for the abort setpoints for the associated sensors.

- 6.2.20.1 Vary the applied input/test signal as required to clear any active abort conditions.
- 6.2.20.2 Ensure that the abort coil(s) for the sensor being tested is(are) enabled at Station #5.

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NOTE: There is no E Stop circuit installed in the DACS Development Facility. Proper functioning of the PLC with respect to abort conditions will be tested by observing the state of PLC coil #22. This coil, when energized in the PLC, sends a signal to trip the E Stop circuit. During testing using the development facility, if coil #22 is observed to energize at the proper abort value, then this portion of the test shall be considered to be satisfactory. When testing is conducted for selected sensors at the DACS trailer, the actual E Stop trip function associated with this coil will be tested.

- 6.2.20.3 Ensure that all aborts associated with the sensor being tested are clear at Station #5, and that PLC coil #22 is de-energized.
- 6.2.20.4 Slowly adjust the applied input/test signal to actuate the abort(s), using the value(s) in parenthesis in the "AB:" block on the data sheet as a guide.

NOTES: Some sensors provide HI and LO aborts. During testing of these sensors, ALL associated aborts shall be tested. Readings for LOW aborts are to be recorded in the "LO AB:" blocks. Readings for HIGH aborts are to be recorded in the "HI AB:" blocks.

- 6.2.20.5 When an abort is actuated, then record the corresponding value displayed on an associated control screen, in the "AB:", "LO AB:", or "HI AB:" block of the "ABORT (DACS)" column on the respective data sheet.
- 6.2.20.6 Verify that the proper abort indications are displayed on the "ABRTENBL" and "ABRTNAME" screens for the abort coil being tested.
- 6.2.20.7 If the abort coil being tested is listed on the "ABRTCHEK" screen, then access the "ABRTCHEK" screen at Station #7, verify that the value at which the abort was actuated is approximately equal to the setpoint value listed for that coil, and initial the ABORT VALUE column of the respective data sheet.
- 6.2.20.8 Verify that the abort is displayed on the "ALARM/EVENT SUMMARY" screen, at Station #5.

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- 6.2.20.9 Verify that PLC coil #22 is energized.
- 6.2.20.10 Repeat Steps 6.2.20.3 through 6.2.20.9 until all abort values have been determined as accurately as possible, then goto Step 6.2.20.11.
- 6.2.20.11 Adjust the applied input/test signal to provide a normal, on-scale reading.
- 6.2.20.12 Ensure that all aborts associated with the sensor being tested are clear at Station #5.
- 6.2.20.13 At Station #5, access any control screen (CS) to reset the PLC abort coil, then return to the "ABRTENAB" screen.
- 6.2.20.14 If testing was completed satisfactorily, then initial the "TEST ENGINEER INITIALS" block for the sensor that was tested and goto Step 6.2.21.
- 6.2.21 Repeat Steps 6.2.13 through 6.2.20.14 as required, for all remaining sensors in Module Group A, as listed in Table 2, then goto Step 6.2.22.

NOTES: Steps 6.2.22 through 6.2.25 will verify that disabling an abort coil using the "ABRTENBL" screen will prevent an abort caused by that coil.

 The number of coils to be tested in each module group is listed in Table C.

 Coils to be tested during the performance of Steps 6.2.22 through 6.2.25 may be chosen at random by the Test Director.

- 6.2.22 Refer to Table C for the number of coils to be tested during the performance of Steps 6.2.23 through 6.2.25, for each module group.
- 6.2.23 Using the "ABRTENBL" screen, disable the abort coils of the required number of sensors in Module Group A.
- 6.2.24 Repeat Steps 6.2.13 through 6.2.19.2 for all selected digital input sensors, and Steps 6.2.13 through 6.2.17 and 6.2.20 through 6.2.20.4, increasing (decreasing) the PLC input value past the abort setpoint for all of the analog sensor inputs being tested, and verify that an abort does NOT occur.

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- 6.2.25 Record the numbers of the coils tested, the final PLC input value, and the results of the tests in Table C, and, if test results were satisfactory, then initial the associated block in the "TEST ENGINEER'S INITIALS" column, and goto Step 6.2.26.

Table C

MODULE GROUP	COIL NUMBER	FINAL PLC INPUT VALUE	ABORT ACTUATED (YES/NO)	TEST ENGINEER'S INITIALS
A				
A				
B				
B				
C				
E				
E				
E				
E				
F				
F				

- 6.2.26 Repeat Steps 6.2.8 through 6.2.25 as required, for all remaining Module Groups, as listed in Table 2, until all listed sensors have been tested.

Testing as directed by this procedure section has been completed, and discrepancies, if any, have been listed on Attachment 1, Exception List.

Test Engineer: _____ Date: _____

OPERATOR COIL MONITORING ACCEPTANCE TEST PROCEDURE

6.3 Check of "Pump Discharge Minus Baseline" Abort

NOTE: Performance of the steps in this procedure section requires that no other conflicting activities are taking place in the DACS Development Facility in conjunction with the testing to be performed, and that the computers and monitors at Stations #5, #7, and #8 are available to support this test section.

- 6.3.1 If any step in this section cannot be successfully performed or results in an abnormal condition, then record a description of the condition in Attachment 1.
 - 6.3.1.1 For each discrepancy recorded, enter an identifying number in the "EXCEPTION NUMBER" Column of Attachment 1.
 - 6.3.1.2 Reproduce Attachment 1 as needed, and attach the additional pages to this procedure, to record all discrepancies noted during testing.
- 6.3.2 Ensure that Module Group A is "traffic copped" into the development facility PLC and displayed on the PLC monitor.
- 6.3.3 Adjust the potentiometer at address "4.2.6.3" until the display on the PLC monitor for PIR12A01 indicates approximately "60".
- 6.3.4 If necessary, reboot the Station #5 computer.
- 6.3.5 Ensure that a Level 3 password has been entered into the Genesis programs at Stations #5, #7, and #8.
- 6.3.6 At Station #5, access the "ABRTENBL" screen.
- 6.3.7 If necessary to allow testing, then disable the abort coils associated with any instruments that are sending erratic signals, are out-of-service, or are inoperable, at Station #5, using the "ABRTENBL" screen.
- 6.3.8 At Station #7, access the "PUMPALRM" screen and ensure that the PLC abort coil is reset.
- 6.3.9 At Station #7, press the F2 key and enter "PIR12A01".

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6.3.10 At Station #8:

- 6.3.10.1 Access the "PUMPRUN" screen.
- 6.3.10.2 Select the "Test" field and enter "13.0".
- 6.3.10.3 Select the GREEN "SET VALUES" button and click the left mouse button.
- 6.3.10.4 Select the GREEN "POSITION PUMP" button and click the left mouse button.
- 6.3.10.5 Verify that the RED "RUNNING" indicator is illuminated and the GREEN "STOPPED" indicator for the directional drive motor is NOT illuminated.
- 6.3.10.6 Press the "F2" key, enter DACS Tag # "POSITION", and ensure that the tag is in Manual.
- 6.3.10.7 Enter "28" in the "AIN" block.
- 6.3.10.8 Verify that the GREEN "STOPPED" indicator is illuminated and the RED "RUNNING" indicator for the directional drive motor is NOT illuminated.
- 6.3.10.9 Select the "ENABLE TEST" button and click the left mouse button.

NOTE: The abort setpoint value for pump discharge pressure should be equal to 55.1 PSID $\pm$ 1 PSID.

- 6.3.11 Verify that the displayed pump discharge pressure abort limit, as read at Station #7 is approximately 55.1 PSID.
- 6.3.12 At Station #5, access the "ABRTCHEK" screen, verify that the setpoint displayed for "HPDPLIM" is approximately 55.1 PSID, and then return to the "ABRTENBL" screen.
- 6.3.13 At Station #8, select the "START TEST" button, click the left mouse button, and verify that the motor simulator is running.
- 6.3.14 Slowly adjust the "4.2.6.3" potentiometer to increase the displayed value on the PLC monitor and verify that indicated pump discharge pressure is increasing at Station #7.

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- 6.3.15 Verify that no alarm or abort indications are present for DACS Tag # PCR12A01, on the "PUMPALRM" screen at Station #7.
- 6.3.16 At Station #5, ensure that abort coil #304 is enabled.

NOTE: The abort should occur when the PLC monitor display shows a value of approximately "1563" for PIR12A01.

- 6.3.17 Adjust the "4.2.6.3" potentiometer to slowly increase the signal until an abort is actuated.
- 6.3.18 At Station #5, verify that the proper abort indications are displayed on the "ABRTENBL" and "ABRTNAME" screens.
- 6.3.19 Record the value displayed in the "Current Value" column for PCR12A01 on the "PUMPALRM" screen: _____.
- 6.3.20 If the value at which the abort actuated was uncertain, then adjust the "4.2.6.3" potentiometer to decrease the input signal to a value of approximately "60", as read on the PLC monitor.
- 6.3.21 Ensure that the PLC abort coil is reset.
- 6.3.22 At Station #8:
- 6.3.22.1 Select the GREEN "SET VALUES" button and click the left mouse button.
 - 6.3.22.2 Select the "ENABLE TEST" button and press <ENTER>.
 - 6.3.22.3 Select the "START TEST" button and click the left mouse button.
- 6.3.23 Repeat Steps 6.3.17 through 6.3.22.3 as necessary to actuate the abort, until the setpoint is determined, then goto Step 6.3.24.
- 6.3.24 Adjust the "4.2.6.3" potentiometer until the PLC monitor displays a value of approximately "100" for DACS Tag #PIR12A01.
- 6.3.25 At Station #5, verify that no abort indications are present on the "ABRTENBL" and "ABRTNAME" screens.
- 6.3.26 At Station #5, disable abort coil #304.

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- 6.3.27 Ensure that the PLC abort coil is reset.
- 6.3.28 At Station #8:
- 6.3.28.1 Select the GREEN "SET VALUES" button and click the left mouse button.
 - 6.3.28.2 Select the "ENABLE TEST" button and press <ENTER>.
 - 6.3.28.3 Select the "START TEST" button and click the left mouse button.
- 6.3.29 Verify that the RED "RUNNING" indicator is illuminated and the GREEN "STOPPED" indicator for the mixer pump motor is NOT illuminated.
- 6.3.30 Adjust the "4.2.6.3" potentiometer to slowly increase the signal until the value displayed in the "Current Value" column for PCR12A01 on the "PUMPALRM" screen indicates 75 PSID.
- 6.3.31 At Station #5, verify that the no abort indications are displayed on the "ABRTENBL" and "ABRTNAME" screens.
- 6.3.32 Adjust the "4.2.6.3" potentiometer until the PLC monitor displays a value of approximately "100" for DACS Tag #PIR12A01.
- 6.3.33 At Station #8:
- 6.3.33.1 Select the "ENABLE STOP" button and click the left mouse button.
 - 6.3.33.2 Select the flashing YELLOW "STOP TEST" button and click the left mouse button.
 - 6.3.33.3 Verify that the GREEN "STOPPED" indicator is illuminated and the RED "RUNNING" indicator for the mixer pump motor is NOT illuminated.
 - 6.3.33.4 Place DACS tag # "POSITION" in Auto.

Testing as directed by this procedure section has been completed, and discrepancies, if any, have been listed on Attachment 1, Exception List.

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6.4 Field Instrumentation End-To-End Checks

NOTE: Sections 6.4 and 6.5 should be performed together to minimize the number of required entries into the SY tank farm by field personnel.

NOTE: Only one sensor from each I/O cabinet will be end-to-end checked from the field to the DACS computer displays to confirm that no problems have been created by the installation of modified computer software.

6.4.1 If any discrepancy is noted during testing, then record a description of the condition in Attachment 1.

6.4.1.1 For each discrepancy recorded, enter an identifying number in the "EXCEPTION NUMBER" Column of Attachment 1.

6.4.1.2 Reproduce Attachment 1 as needed, and attach the additional pages to this procedure, to record all discrepancies noted during testing.

6.4.2 Enter Level 3 passwords at Stations #5, #6, and #7.

NOTE: Station #8 will NOT be used during testing per this section. Mixer pump motor and directional drive system motor power supply circuit breakers may remain danger tagged OFF for performance of this test section.

6.4.3 At Station #5, display the "ABRTENBL" screen.

6.4.4 At Station #6, display the "ABRTNAME" screen.

6.4.5 At Station #7, display the "CSMAIN" screen.

6.4.6 If necessary to allow testing of abort functions, then disable the abort coils associated with any SY-101 instruments that are sending erratic signals, are out-of-service, or are inoperable, at Station #5, using the "ABRTENBL" screen.

6.4.7 Ensure that the E Stop circuitry is reset.

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NOTES: Steps for testing instruments in this section are written generically. Steps shall be repeated as necessary until required testing is complete.

Instruments shall be tested one at a time, until all have been tested.

Since several different types of instruments send signals to the DACS, prior to starting testing for a particular instrument, test personnel shall familiarize themselves with the requirements for injecting each signal, to ensure that the proper test equipment is used and that the test signals applied are of the proper type and strength.

In general, test signals should be applied to a lifted lead, and should be verified to be applied to the cable going to the I/O Module or DACS trailer, NOT back to the sensor.

6.4.8 Establish radio communications between field personnel in the SY tank farm and the Test Engineer in the DACS trailer.

6.4.9 If testing in this section requires more than one shift to complete, then perform Steps 6.4.30 through 6.4.33.1, 6.4.35, and 6.4.36 at the end of each shift.

NOTE: The Test Engineer at the DACS console shall direct the performance of the activities in this section.

6.4.10 Refer to the "CSMAIN" or the associated control screen (Station #7) for abort values, for the instruments being checked.

NOTE: Checks in this section may be performed in any order, by selecting the sensor to be tested and following the appropriate steps to establish the necessary prerequisite conditions.

6.4.11 Refer to the "DACS Tag" Column of the Data Sheet in Table D, "Instruments to be Field Checked", at the end of this procedure section, and locate the tag number of the sensor to be tested.

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- 6.4.12 Refer to the "Input Signal Connectn Points" Column of the Data Sheets, to direct field personnel in locating the correct terminal(s) for the sensor to be tested.

WARNING

All required hand and eye protection shall be worn, and insulated tools shall be used, when working on or near energized electrical circuits (<50 Vdc).

- 6.4.13 Direct field personnel to access the proper Modicon module and terminal board, and locate the associated signal lead(s) for the sensor to be tested.
- 6.4.14 Record the readout value displayed in the "Current Value" Column of the screen at Station #7, in the "B:" block in the "DACS READING" Column, on the appropriate Data Sheet.
- 6.4.15 Direct field personnel to lift the lead(s) from the terminal board if necessary and connect the signal source.
- 6.4.16 Ensure that the abort coil(s) for the sensor being tested is (are) enabled.
- 6.4.17 Ensure that all aborts associated with the sensor being tested are clear at Station #5.

NOTES: Performance of Steps 6.4.18 and 6.4.19 will require careful coordination between DACS trailer personnel and field personnel to accurately establish the abort values for sensors being tested.

Abort setpoints are listed in parenthesis in the "AB:" blocks on the data sheets.

- 6.4.18 Direct field personnel to slowly increase/decrease the output of the signal source until an abort is actuated.

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- 6.4.19 Note the indicated value in the "Current Value" display on Station #7 when the abort is actuated, record the abort value in the "AB:" block in the "ABORT VALUES (DACS)" Column of the appropriate Data Sheet, and verify that the following automatic actions have occurred:
- At Station #5, the abort is shown on the "ABRTENBL" screen.
 - At Station #6, the abort is shown on the "ABRTNAME" screen.
 - At Station #5, the abort is shown in RED on the ALARM/EVENT SUMMARY screen.
 - The "PLC Abort Coil" button is lighted RED on the screen at Station #7.
 - The E Stop trip has actuated and the E Stop actuation alarm is sounding.
- 6.4.20 Place the E Stop Alarm Silence toggle switch in the "Alarm Silence" position.
- 6.4.21 If the indicated value at which the abort occurred is uncertain, direct field personnel to reduce/increase the output of the signal source to a value less/greater than the expected abort value, then:
- 6.4.21.1 Ensure that the E Stop circuitry is reset.
 - 6.4.21.2 Ensure that all aborts associated with the sensor being tested are clear at Station #5.
 - 6.4.21.3 Repeat Steps 6.4.18 through 6.4.20 until the correct abort actuation value is determined, then goto Step 6.4.22.
- 6.4.22 If the sensor being tested is listed on the "ABRTCHEK" screen, then verify that the value recorded in Step 6.4.19 is approximately equal to the setpoint value listed on the "ABRTCHEK" screen.
- 6.4.23 Direct field personnel to reduce/increase the output of the signal source to a value less/greater than the expected abort value.
- 6.4.24 Ensure that the E Stop circuitry is reset.
- 6.4.25 Ensure that all aborts associated with the sensor being tested are clear at Station #5.

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- 6.4.26 Verify that the following automatic actions occurred when the abort cleared:
- At Station #5, the abort indication has disappeared from the "ABRTENBL" and "ALARM/EVENT SUMMARY" screens.
 - The text display on the screen at Station #6 has turned WHITE for the sensor being tested.
 - All abort column displays on the screen at Station #7 have turned WHITE, for the sensor being tested.
- 6.4.27 Place the Alarm Silence toggle switch in the "Normal" position.
- 6.4.28 At Station #5, disable the abort coil for the sensor being tested.
- 6.4.29 Direct field personnel to slowly increase/decrease the output of the signal source above/below the output required to cause an abort actuation and verify that no abort actuation occurs.
- 6.4.30 Direct field personnel to reduce the input signal and disconnect the signal source, or remove the installed jumper.
- 6.4.31 Direct field personnel to reconnect the sensor lead(s) to the proper terminal(s), if necessary.
- 6.4.32 Record the post-test sensor readout from the "Current Value" displayed on Station #7, for the instrument that was tested, in the "A:" block in the "DACS READING" Column on the appropriate Data Sheet.
- 6.4.33 Compare the pre-test (B:) and post-test (A:) readings taken in Steps 6.4.14 and 6.4.32.
- 6.4.33.1 If the pre-test and post-test readings are not consistent, then record a description of the inconsistency in Attachment 1.
- 6.4.34 Repeat Steps 6.4.11 through 6.4.33.1 to complete testing for sensors listed in Table D, then goto Step 6.4.35.
- 6.4.35 Direct field personnel to ensure that all leads are properly restored, and that all panels and covers have been restored to normal.

OPERATOR COIL MONITORING ACCEPTANCE TEST PROCEDURE

6.4.36 Initial all Data Sheets for sensors that have been successfully tested.

Testing as directed by this procedure section has been completed, and discrepancies, if any, have been listed on Attachment 1, Exception List.

Test Engineer: _____ Date: _____

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OPERATOR COIL MONITORING ACCEPTANCE TEST PROCEDURE

Table D: Instruments to be Field Checked

DACS TAG	DESCRIPTION	SCALE/ RANGE	SIGNAL	INPUT SIGNAL CONNECTN POINTS	DACS READING	ABORT VALUES (DACS)	INITIALS
TIPN0202	MIXER PUMP DISCH NOZZLE #1 TEMP-1	32-212 °F	4-20 mA	I/O 1, D2, R1, S6, TERM 21 & 22	B:	AB: (135)	
					A:		
PIR17B04	MIT TANK DOME PRESSURE RISER 17B	-5 TO +20 INWG	1-5 Vdc	I/O 2, D4, R1, S4, TERM 25 & 26	B:	AB: (-1.0)	
					A:		
NITKSY06	0-10% H2 VENT HDR. SHMS #2	0-10% H2	4-20 mA	I/O 3, D6, R1, S5, TERM 11 & 12	B:	AB: (0.75)	
					A:		
NIR05A01	MIX PUMP WTKR MON HI H2	0 - 10%	4-20 mA	I/O 4, D9, R1, S4, Term 29 & 30	B:	AB: (0.75)	
					A:		
WIR12A01	PUMP SUPPORT COLUMN STRAIN #1	± 684 μIN/IN	± 10 Vdc	I/O 7, D14, R2, S5, TERM 21 & 22	B:	AB: (±194)	
					A:		
FTE50002	VENT HEADER FLOW-HIGH RANGE	-1000 - 7333 CFM	0-5 Vdc	I/O #8, D17, R1, S8, TERM 21 & 22	B:	LO AB: (400)	
					A:	HI AB: (700)	

OPERATOR COIL MONITORING ACCEPTANCE TEST PROCEDURE

6.5 ENRAF Wire Gauge Checks

NOTE: Sections 6.4 and 6.5 should be performed together to minimize the number of required entries into the SY tank farm by field personnel.

- 6.5.1 If any discrepancy is noted during testing, then record a description of the condition in Attachment 1.
 - 6.5.1.1 For each discrepancy recorded, enter an identifying number in the "EXCEPTION NUMBER" Column of Attachment 1.
 - 6.5.1.2 Reproduce Attachment 1 as needed, and attach the additional pages to this procedure, to record a discrepancies noted during testing.
- 6.5.2 At Station #5, display the SUMMARY screen and record the readout value displayed for "ENRAF LEVEL": _____ INCHES.
- 6.5.3 Direct field personnel to access the Modicon module in Drop 4, Rack 1, Slot 6 of I/O #2, and lift lead # WST-LIT-SY101-3-B (red) from terminal #19 and lead # WST-LIT-SY101-3-B (black) from terminal #20 on slot 6.
- 6.5.4 Direct field personnel to connect a 4 - 20 mA signal source and input a 5.0 mA test signal.

NOTE: A 5.0 mA test signal should cause an ENRAF LEVEL of approximate 378 INCHES to be displayed at Station #5.

- 6.5.5 Record the readout value displayed for "ENRAF LEVEL" at Station #5: _____.
- 6.5.6 Direct field personnel to input a 12.0 mA test signal.

OPERATOR COIL MONITORING ACCEPTANCE TEST PROCEDURE

NOTE: A 12.0 mA test signal should cause an ENRAF LEVEL of approximately 400 INCHES to be displayed at Station #5.

6.5.7 Record the readout value displayed for "ENRAF LEVEL" a Station #5: _____.

6.5.8 Direct field personnel to input a 19.0 mA test signal.

NOTE: A 19.0 mA test signal should cause an ENRAF LEVEL of approximately 422 INCHES to be displayed at Station #5.

6.5.9 Record the readout value displayed for "ENRAF LEVEL" a Station #5: _____.

NOTE: There are no alarms or aborts associated with the ENRAF wire gauge sensor readout at the DACS.

6.5.10 Direct field personnel to reduce the input signal, disconnect the signal source, and reconnect the sensor lead(s) to the proper terminal(s), if necessary.

6.5.11 Record the post-test sensor readout value displayed for "ENRAF LEVEL": _____ INCHES.

6.5.12 Compare the pre-test and post-test readings taken in Steps 6.5.2 and 6.5.11.

6.5.12.1 If the pre-test and post-test readings are not consistent, then record a description of the inconsistency in Attachment 1.

6.5.13 Direct field personnel to ensure that all leads are properly restored, and that all panels and covers have been restored to normal.

Testing as directed by this procedure section has been completed and discrepancies, if any, have been listed on Attachment 1, Exception List.

Test Engineer: _____ Date: _____

7.0 ATTACHMENTS

Attachment 1, Exception List

Attachment 2, Tables and Data Sheets

Table 1: Development Facility Module Setups

Table 2: PLC Inputs and Input Groups

Attachment 3, Measurement and Test Equipment Record Sheet

Attachment 4, Final Procedure Acceptance Sheet

OPERATOR COIL MONITORING ACCEPTANCE TEST PROCEDURE

EXCEPTION NUMBER	STEP NUMBER	EXCEPTION DESCRIPTION	EXCEPTION RESOLUTION	RESOLUTION APPROVED BY:	DATE RESOLVED

Attachment 1: EXCEPTION LIST

OPERATOR COIL MONITORING ACCEPTANCE TEST PROCEDURE

Table 1: Development Facility Module Setups

DROP	RACK	SLOT	MODULE	GROUP A	GROUP B	GROUP C	GROUP D	GROUP E	GROUP F
2	1	4	824	000017	X	X	X	X	X
2	1	5	824	X	X	X	X	X	X
2	1	6	827	100033	100097	X	X	X	X
2	1	7	829	100001	100161	X	X	X	X
4	1	4	875	300001	300033	300065	300121	300185	300233
4	1	5	827	100065	100193	X	X	X	X
4	1	6	875	300009	300041	300073	300161	300193	300281
4	1	7	885	X	X	X	X	X	X
4	2	4	883	X	X	X	X	X	X
4	2	5	883	X	X	X	X	X	X
4	2	6	875	300017	300049	300097	300169	300201	300289
4	2	7	875	300025	300057	300105	300177	300209	300297

Attachment 2, Tables and Data Sheets

OPERATOR COIL MONITORING ACCEPTANCE TEST PROCEDURE

Table 2: PLC Inputs and Input Groups

DACS TAG	DESCRIPTION	SCALE/ RANGE	DEV FACILITY LOCATION	MODICON	ABORT COIL NUMBER	ABORT (DACS)	ABORT VALUE	TEST ENGINEER INITIALS
MODULE GROUP A								
MIP00001	MOISTURE IN PUMP MOTOR OIL 1	ON/OFF	2.1.7.1	100001	255	AB:	N/A	
ZIMPE143	MIX PUMP POS. LIMIT SWITCH CW	ON/OFF	2.1.7.3	100003	184	AB:	N/A	
ZIMPE144	MIX PUMP POS. LIMIT SWITCH CCW	ON/OFF	2.1.7.4	100004	185	AB:	N/A	
TIPNO202	MIX PUMP DIS. NOZ. 1 TEMP 1	32-212°F	4.2.6.5	300021	303	AB: (2344)		
TIPNO101	MIX PUMP DIS. NOZ. 2 TEMP 1	32-212°F	4.1.4.1	300001	300	AB: (2344)		
TIPNO201	MIX PUMP DIS. NOZ. 1 TEMP 2	32-212°F	4.1.6.8	300016	302	AB: (2344)		
TIPNO102	MIX PUMP DIS. NOZ. 2 TEMP 2	32-212°F	4.1.6.1	300009	301	AB: (2344)		
TIR12A01	MIXER PUMP MOTOR OIL TEMP #1	32-383°F	4.1.4.6	300006	306	AB: (2252)		
TIR12A02	MIXER PUMP MOTOR OIL TEMP 2	32-383°F	4.1.6.6	300014	307	AB: (2252)		
ZIMPE142	MIXER PUMP COLUMN GAS PRESSURE	0 - 25 PSIG	4.2.6.1	300017	341	AB: (1147)		

Attachment 2, Tables and Data Sheets

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OPERATOR COIL MONITORING ACCEPTANCE TEST PROCEDURE

Table 2: PLC Inputs and Input Groups

DACS TAG	DESCRIPTION	SCALE/ RANGE	DEV FACILITY LOCATION	MODICON	ABORT COIL NUMBER	ABORT (DACS)	ABORT VALUE	TEST ENGINEER INITIALS
MODULE GROUP B								
WHF17B1B	STR GAUGE 17B-1 HI FREQ ABORT	ON/OFF	4.1.5.2	100194	245	AB:	N/A	
WHF17B2B	STR GAUGE 17B-2 HI FREQ ABORT	ON/OFF	4.1.5.18	100210	248	AB:	N/A	
WHF17C1B	STR GAUGE 17C-1 HI FREQ ABORT	ON/OFF	4.1.5.4	100196	246	AB:	N/A	
WHF17C2B	STR GAUGE 17C-2 HI FREQ ABORT	ON/OFF	4.1.5.20	100212	252	AB:	N/A	
WHF1B1B	STR GAUGE 1B-1 HI FREQ ABORT	ON/OFF	4.1.5.7	100199	247	AB:	N/A	
WHF1B2B	STR GAUGE 1B-2 HI FREQ ABORT	ON/OFF	4.1.5.23	100215	253	AB:	N/A	
WHF1B3B	STR GAUGE 1B-3 HI, FREQ ABORT	ON/OFF	4.1.5.24	100216	254	AB:	N/A	
NIR17B01	WHTKR MON/HI H2	0 - 1%	4.1.4.2	300034	259	AB: (3071)		
PIR17B04	MIT TANK DOME PRESSURE	-5 TO +20 INWG	4.1.4.6	300038	311	AB: (655)		
NITKSY06	EXH HDR WTKR MON/HI H2	0-10% H2	4.2.6.3	300051	257	AB: (307)		
NITJSY06	0-10% H2 RISER 16A SHMS 1	0-10% H2	4.2.7.2	300058	258	AB: (307)		

Attachment 2, Tables and Data Sheets

OPERATOR COIL MONITORING ACCEPTANCE TEST PROCEDURE

Table 2: PLC Inputs and Input Groups

DACS TAG	DESCRIPTION	SCALE/ RANGE	DEV FACILITY LOCATION	MODICON	ABORT COIL NUMBER	ABORT (DACS)	ABORT VALUE	TEST ENGINEER INITIALS
MODULE GROUP C								
NIR05A01	MIX PUMP WTKR MON HI H2	0 - 10%	4.2.7.7	300111	260	AB: (307)		
MODULE GROUP E								
TIR17B22	TANK TEMP RISER 17B, LVL 402"	12.5 - 325 °F	4.1.4.1	300185	299	AB: (1605)		
TIR17B01	TANK TEMP RISER 17B, LVL 4"	12.5 - 325 °F	4.1.6.2	300194	278	AB: (1605)		
TIR17B02	TANK TEMP RISER 17B, LVL 16"	12.5 - 325 °F	4.1.4.3	300187	279	AB: (1605)		
TIR17B03	TANK TEMP RISER 17B, LVL 28"	12.5 - 325 °F	4.1.6.3	300195	280	AB: (1605)		
TIR17B04	TANK TEMP RISER 17B, LVL 52"	12.5 - 325 °F	4.1.4.4	300188	281	AB: (1605)		
TIR17B05	TANK TEMP RISER 17B, LVL 76"	12.5 - 325 °F	4.1.6.4	300196	282	AB: (1605)		
TIR17B06	TANK TEMP RISER 17B, LVL 100"	12.5 - 325 °F	4.1.4.5	300189	283	AB: (1605)		
TIR17B07	TANK TEMP RISER 17B, LVL 112"	12.5 - 325 °F	4.1.6.5	300197	284	AB: (1605)		
TIR17B08	TANK TEMP RISER 17B, LVL 124"	12.5 - 325 °F	4.1.4.6	300190	285	AB: (1605)		

Attachment 2, Tables and Data Sheets

OPERATOR COIL MONITORING ACCEPTANCE TEST PROCEDURE

Table 2: PLC Inputs and Input Groups

DACS TAG	DESCRIPTION	SCALE/ RANGE	DEV FACILITY LOCATION	MODICON	ABORT COIL NUMBER	ABORT (DACS)	ABORT VALUE	TEST ENGINEER INITIALS
TIR17B09	TANK TEMP RISER 17B, LVL 148"	12.5 - 325 °F	4.1.6.6	300198	286	AB: (1605)		
TIR17B10	TANK TEMP RISER 17B, LVL 172"	12.5 - 325 °F	4.1.4.7	300191	287	AB: (1605)		
TIR17B11	TANK TEMP RISER 17B, LVL 196"	12.5 - 325 °F	4.1.6.7	300199	288	AB: (1605)		
TIR17B12	TANK TEMP RISER 17B, LVL 208"	12.5 - 325 °F	4.1.4.8	300192	289	AB: (1605)		
TIR17B13	TANK TEMP RISER 17B, LVL 220"	12.5 - 325 °F	4.1.6.8	300200	290	AB: (1605)		
TIR17B14	TANK TEMP RISER 17B, LVL 232"	12.5 - 325 °F	4.2.6.1	300201	291	AB: (1605)		
TIR17B15	TANK TEMP RISER 17B, LVL 244"	12.5 - 325 °F	4.2.7.1	300209	292	AB: (1605)		
TIR17B16	TANK TEMP RISER 17B, LVL 268"	12.5 - 325 °F	4.2.6.2	300202	293	AB: (1605)		
TIR17B17	TANK TEMP RISER 17B, LVL 292"	12.5 - 325 °F	4.2.7.2	300210	294	AB: (1605)		
TIR17B18	TANK TEMP RISER 17B, LVL 326"	12.5 - 325 °F	4.2.6.3	300203	295	AB: (1605)		
TIR17B19	TANK TEMP RISER 17B, LVL 340"	12.5 - 325 °F	4.2.7.3	300211	296	AB: (1605)		

Attachment 2, Tables and Data Sheets

OPERATOR COIL MONITORING ACCEPTANCE TEST PROCEDURE

Table 2: PLC Inputs and Input Groups

DACS TAG	DESCRIPTION	SCALE/ RANGE	DEV FACILITY LOCATION	MODICON	ABORT COIL NUMBER	ABORT (DACS)	ABORT VALUE	TEST ENGINEER INITIALS
TIR17B20	TANK TEMP RISER 17B, LVL 364"	12.5 - 325 °F	4.2.7.4	300212	297	AB: (1605)		
TIR17B21	TANK TEMP RISER 17B, LVL 392"	12.5 - 325 °F	4.2.6.4	300204	298	AB: (1605)		
FTE50001	VENT HEADER FLOW LOW RANGE	0 - 1275 CFM	4.2.6.7	300207	308	LO AB: (1285)		
					342	HI AB: (2248)		
PIR11B01	TANK DOME PRESSURE RISER 11B	-4 to 6 INWG	4.2.6.8	300208	310	AB: (1229)		
MODULE GROUP F								
FTE50002	VENT HEADER FLOW HIGH RANGE	-1000 to +7333 CFM	4.1.4.5	300237	343	LO AB: (688)		
					309	HI AB: (835)		
WIR17C01	STRAIN GAUGE R17C AT LEVEL 465.5"	± 684 μIN/IN	4.2.6.3	300291	323	LO AB: (979)		
					339	HI AB: (3116)		
WIR17B01	STRAIN GAUGE RISER 17B LVL 465.5"	± 684 μIN/IN	4.2.6.4	300292	332	LO AB: (979)		
					318	HI AB: (3116)		

Attachment 2, Tables and Data Sheets

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OPERATOR COIL MONITORING ACCEPTANCE TEST PROCEDURE

Table 2: PLC Inputs and Input Groups

DACS TAG	DESCRIPTION	SCALE/ RANGE	DEV FACILITY LOCATION	MODICON	ABORT COIL NUMBER	ABORT (DACS)	ABORT VALUE	TEST ENGINEER INITIALS
WIR12A01	PUMP SUPPORT COLUMN STRAIN #1	± 684 $\mu\text{IN}/\text{IN}$	4.2.6.5	300293	313	LO AB: (1467)		
					256	HI AB: (2628)		
WIR12A03	PUMP SUPPORT COLUMN STRAIN #3	± 684 $\mu\text{IN}/\text{IN}$	4.2.6.6	300294	315	LO AB: (1467)		
					263	HI AB: (2628)		
WIR17C02	STRAIN GAUGE R17C AT LEVEL 465.5"	± 684 $\mu\text{IN}/\text{IN}$	4.2.6.8	300296	340	LO AB: (979)		
					324	HI AB: (3116)		
WIR1BA01	STRAIN GAUGE RISER 1B LVL 530"	± 684 $\mu\text{IN}/\text{IN}$	4.2.7.2	300298	334	LO AB: (413)		
					320	HI AB: (3682)		
WIR1BA03	STRAIN GAUGE 1B, LVL 530"	± 684 $\mu\text{IN}/\text{IN}$	4.2.7.3	300299	336	LO AB: (413)		
					321	HI AB: (3682)		
WIR17B02	STRAIN GAUGE RISER 17B LVL 465.5"	± 684 $\mu\text{IN}/\text{IN}$	4.2.7.4	300300	319 333	LO AB: (979)		

Attachment 2, Tables and Data Sheets

OPERATOR COIL MONITORING ACCEPTANCE TEST PROCEDURE

Table 2: PLC Inputs and Input Groups

DACS TAG	DESCRIPTION	SCALE/ RANGE	DEV FACILITY LOCATION	MODICON	ABORT COIL NUMBER	ABORT (DACS)	ABORT VALUE	TEST ENGINEER INITIALS
						HI AB: (3116)		
WIR12A02	PUMP SUPPORT COLUMN STRAIN #2	± 684 $\mu\text{IN}/\text{IN}$	4.2.7.5	300301	314	LO AB: (1467)		
					262	HI AB: (2628)		
WIR12A04	PUMP SUPPORT COLUMN STRAIN #4	± 684 $\mu\text{IN}/\text{IN}$	4.2.7.6	300302	331	LO AB: (1467)		
					316	HI AB: (2628)		
WIR1BA02	STRAIN GAUGE 1B, LVL 530"	± 684 $\mu\text{IN}/\text{IN}$	4.2.7.7	300303	335	LO AB: (413)		
					337	HI AB: (3682)		

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Attachment 3: Measurement and Test Equipment Record Sheet

OPERATOR COIL MONITORING ACCEPTANCE TEST PROCEDURE

Completion of this procedure has demonstrated that:

- The Data Acquisition and Control System (DACS) provides satisfactory monitoring and control of the PLC abort coils from the Master and RSS stations.
- The new and modified DACS screens provide a satisfactory operat interface with the PLC abort coils, the ENRAF wire gauge, and allow proper exiting of the Genesis RUNTIME and RSS sessions.
- The ENRAF Wire Gauge has been tested to verify that proper indications of waste tank level are being received at the DACS.
- A record of all noted deficiencies was kept on Attachment 1, Exception List, and all recorded exceptions have been resolved and the resolutions approved.

Approved by:

D. C. Larsen, Test Manager

Date

R. W. Reed, Plant Startup and Testing

Date

J. W. Lentsch, Program Manager

Date

Attachment 4: Final Procedure Acceptance Sheet

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