DISTRIBUTION SHEET

To	From	Page 1 of 1
DISTRIBUTION	DC LARSEN	Date 8/30/94
Project Title/Work Order		EDT No. 608552
DACS UPGRADE ACCEPTANCE TEST PROCEDURE, WHC-SD-WM-ATP-082, REV 0		ECN No. N/A

Name	MSIN	Text With All Attach.	Text Only	Attach./ Appendix Only	EDT/ECN Only
Central Files (2)	L8-04	X			
GT BEAR	R1-51	X			
JL DEICHMAN	H4-19				X
GL DUNFORD	R1-51				X
LE EFFERDING	H0-33				X
JM GRAY	S7-54	X			
CE HANSON	H5-09				X
R JOHNSON	H5-09	X			
GD JOHNSON	R2-78				X
NW KIRCH	R2-11				X
JJ KLOS	T4-07	X			
LS KROGSRUD	R3-08	X			
JW LENTSCH	S7-15				X
ML MCELROY	S1-57	X			
DR NUNAMAKER	T4-07	X			
E PANISKO	P8-34				X
MA PAYNE	S7-14				X
RW REED	R1-51				X
SH RIFAEY	S6-12				X
MH SHANNON	H4-61				X
RG SOBOCINSKI	H5-09	X			
TRUIT	L6-37	X			
BAUER	L6-37				X
OSTI(2)	L8-07	X			

JA4 SEP 28 1994

ENGINEERING DATA TRANSMITTAL

1. EDT 608552

2. To: (Receiving Organization)	3. From: (Originating Organization)	4. Related EDT No.:
DISTRIBUTION	TEST ENGINEERING	N/A
5. Proj./Prog./Dept./Div.:	6. Cog. Engr.:	7. Purchase Order No.:
HMT	DC LARSEN	N/A
8. Originator Remarks: Procedure will perform acceptance testing for new computers and software after installation in the DACS trailer.		9. Equip./Component No.: N/A
		10. System/Bldg./Facility: N/A
11. Receiver Remarks: N/A		12. Major Assm. Dwg. No.: N/A
		13. Permit/Permit Application No.: N/A
		14. Required Response Date: N/A

15. DATA TRANSMITTED

(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	(F) Impact Level	(G) Reason for Transmittal	(H) Originator Disposition	(I) Receiver Disposition
1	WHC-SD-WM-ATP-082		0	DACS UPGRADE ACCEPTANCE TEST PROCEDURE	SQ	2	1	

16. KEY

Impact Level (F)	Reason for Transmittal (G)	Disposition (H) & (I)
1, 2, 3, or 4 (see MRP 5.43)	1. Approval 4. Review 2. Release 5. Post-Review 3. Information 6. Dist. (Receipt Acknow. Required)	1. Approved 4. Reviewed no/comment 2. Approved w/comment 5. Reviewed w/comment 3. Disapproved w/comment 6. Receipt acknowledged

17. SIGNATURE/DISTRIBUTION (See Impact Level for required signatures)

(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(J) Name	(K) Signature	(L) Date	(M) MSIN	(G) Reason	(H) Disp.
1	1	Cog.Eng. DC LARSEN	D C Larsen	8/30/94		PEER REVIEW	M F Erhart	9/12/94			
1	1	Cog. Mgr. RW REED	R.W. Reed for	9/29/94							
1	1	QA	M. L. McElroy	9-14-94	S1-57						
1	1	Safety	L.S. Krogsrud	9/27/94	R3-08						
		Env.									
		OPERATIONS									

18.	19.	20.	21. DOE APPROVAL (if required) Ltr. No.
Signature of EDT Originator / Date	N/A Authorized Representative for Receiving Organization / Date	Cognizant/Project Engineer's Manager / Date	[] Approved [] Approved w/comments [] Disapproved w/comments

BD-7400-172-2 (07/91) GEF097

APPENDIX B

Unreviewed Safety Question Forms

Figure B-1. Unreviewed Safety Question - Changes Screening Form. (1 Sheet)

REFERENCE ITEM # WHC-SD-WM-ATP-082 REV. 0
TITLE DACS UPGRADE ACCEPTANCE TEST PROCEDURE

Does the referenced item:

A. Make PROPOSED CHANGES to the facility or procedures which differ from conditions described in the AUTHORIZATION BASIS documentation?

N/A___ NO X Yes/Maybe____

Basis: The referenced item tests facility modifications described WHC-SD-WM-WP-284 Work Plan For Upgrade of SY-101 Hydrogen Mitigation Test Project Data Acquisition Control System (DACS-1). These modifications are designed to be transparent to the operability of the DACS system. The reference item makes no changes to the facility or procedures.

B. Make PROPOSED CHANGES that represent conditions that have not been analyzed in the AUTHORIZATION BASIS?

N/A___ NO X Yes/Maybe____

Basis: The tests to be conducted are on modifications described in WHC-SD-WM-WP-284 Work Plan For Upgrade of SY-101 Hydrogen Mitigation Test Project Data Acquisition Control System (DACS-1). The ATP testing does not make changes that represent conditions described in the Authorization basis; Safety Assessment for Proposed Operation to Mitigate Episodic Gas Releases in Tank 242-SY-101 (LAUR-92-3196 rev.11).

C. Describe tests or experiments which differ from those described in the AUTHORIZATION BASIS documentation?

N/A___ NO X Yes/Maybe____

Basis:The tests to be conducted are on modifications described in WHC-SD-WM-WP-284 Work Plan For Upgrade of SY-101 Hydrogen Mitigation Test Project Data Acquisition Control System (DACS-1). The ATP testing does describe tests that differ from those described in the Authorization basis; Safety Assessment for Proposed Operation to Mitigate Episodic Gas Releases in Tank 242-SY-101 (LAUR-92-3196 rev.11). Additionally, all electrical tests will be performed by certified electricians who are required to follow National Electrical Codes and any additional WHC electrical controls.

D. Is a change in a TSR, OSR, or compliance plan to OSR involved?
N/A___ NO X Yes/Maybe____
Basis: The tests to be conducted do not violate any conditions covered in the Authorization basis; Safety Assessment for Proposed Operation to Mitigate Episodic Gas Releases in Tank 242-SY-101 (LAUR-92-3196 rev.11).

USQE #1 M. F. ERHART (Print Name) — M F Erhart (Signature) — 9/12/94 (Date)

USQE #2 D. C. LARSEN (Print Name) — D C Larsen (Signature) — Sept 12 1994 (Date)

RELEASE AUTHORIZATION

Document Number:	WHC-SD-WM-ATP-082, REV 0
Document Title:	DACS UPGRADE ACCEPTANCE TEST PROCEDURE
Release Date:	September 28, 1994

* * * * * * * * * * * * * *

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 Broz
(Signature)

September 28, 1994
(Date)

JKE 9/28/94

SUPPORTING DOCUMENT

1. Total Pages 102

2. Title	3. Number	4. Rev No.
DACS UPGRADE ACCEPTANCE TEST PROCEDURE	WHC-SD-WM-ATP-082	0

5. Key Words

DATA ACQUISITION AND CONTROL(DACS), 101-SY, UPGRADE

APPROVED FOR PUBLIC RELEASE

KMB 9/28/94

6. Author

Name: AC ZUEHLKE

Signature

Organization/Charge Code 7CH30/N2B31

7. Abstract

This procedure will test the upgraded computers and software after installation in the DACS trailer.

8. PURPOSE AND USE OF DOCUMENT - This document was prepared for use within the U.S. Department of Energy and its contractors. It is to be used only to perform, direct, or integrate work under U.S. Department of Energy contracts. This document is not approved for public release until reviewed.

PATENT STATUS - This document copy, since it is transmitted in advance of patent clearance, is made available in confidence solely for use in performance of work under contracts with the U.S. Department of Energy. This document is not to be published nor its contents otherwise disseminated or used for purposes other than specified above before patent approval for such release or use has been secured, upon request, from the Patent Counsel, U.S. Department of Energy Field Office, Richland, WA.

DISCLAIMER - This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, nor any of their contractors, subcontractors or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or any third party's use or the results of such use of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

10. RELEASE STAMP

OFFICIAL RELEASE BY WHC
DATE SEP 28 1994
STA 4

9. Impact Level SQ

DACS UPGRADE ACCEPTANCE TEST PROCEDURE

WHC-SD-WM-ATP-082
REVISION 0

SEPTEMBER 1994

DACS UPGRADE ACCEPTANCE TEST PROCEDURE

TABLE OF CONTENTS

1.0 PURPOSE/SCOPE 4

2.0 REFERENCES 5

3.0 RESPONSIBILITIES 6

4.0 DESCRIPTION OF THE SYSTEM 7

5.0 TEST CONDITIONS AND EQUIPMENT REQUIRED 8

6.0 ACCEPTANCE TEST 12

6.1 Check of Manual Mixer Pump Rotation (Station #5 as Master Station) 12
6.2 "STOP DIR MOTOR" Functional Check (Station #5 as Master Station) 19
6.3 Normal Directional Drive Motor Run (Station #5 as Master Station) 21
6.4 "HI LIMIT" Check (Station #5 as Master Station) 24
6.5 Start Inhibited-Adj Set Point Interlock Check (@ "HI LIMIT"; Station #5 as Master Station) 27
6.6 Reverse Direction Drive and "LO LIMIT" Check (Station #5 as Master Station) 30
6.7 Start Inhibited-Adj Set Point" Interlock Check (@ "LO LIMIT"; Station #5 as Master Station) 33
6.8 Check of Manual Mixer Pump Rotation (Station #7 as Master Station) 37
6.9 Check of Manual Mixer Pump Rotation (Station #7 as Motor Control Station) 42
6.10 Check of Pump Bump Operation (Station #5 as Master Station) . . 46
6.11 Checks of Phase B Tests #13.0 through #18.0 (Station #5 as Master Station) 51
6.12 Check of PUMPRUN Screen (Station #5 as Master Station) 69
6.13 Check of Pump Bump Operation (Station #7 as Master Station) . . 80
6.14 Checks of Phase B Tests #13.0 through #18.0 (Station #7 as Master Station) 85
6.15 Check of PUMPRUN Screen (Station #7 as Master Station) 101
6.16 Check of Pump Bump Operation (Station #7 as Motor Control Station) 112
6.17 Checks of Phase B Tests (Station #7 as Motor Control Station) . 115
6.18 Check of PUMPRUN Screen (Station #7 as Motor Control Station) . 124
6.19 Check of "Pump Discharge Minus Baseline" Alarm and Abort Levels 135
6.20 Loss of Programmable Logic Controller Alarm Check 138
6.21 Checks of Programmable Logic Controller (PLC) Inputs 140

6.22 Checks of MIT 17C Thermocouple, Gas Chromatograph, FTIR, and RGA5 Inputs 147
6.23 Checks of Gas Analysis Equipment Readouts 150
6.24 Field Instrumentation End-To-End Checks 155
6.25 Drop 13 I/O Health Status Check 164

7.0 ATTACHMENTS 167

Attachment 1: Exception List 168
Attachment 2: Tables and Data Sheets 169

Table 1: Development System Module Setups 169
Table 2: PLC Inputs and Input Groups 170
Table 3: PLC Direct Inputs 192

Attachment 3: Measurement and Test Equipment Record Sheet 200
Attachment 4: Final Procedure Acceptance Sheet 201

1.0 PURPOSE/SCOPE

The readiness of the Data Acquisition and Control System (DACS) to provide monitoring and control of the mixer pump, directional drive system, and the instrumentation associated with the SY-101 tank and support systems, and the proper functioning of the DACS with new Model 984-785 Programmable Logic Controllers (PLCs), new MODBUS PLUS version 2.01 software for the PLCs, and version 3.72 of the GENESIS software will be systematically evaluated by performance of this procedure.

The portion of this procedure dealing with sensor inputs to the new PLCs and the MODBUS PLUS software will be tested off-line on a development system located in the 306E building at Hanford, Washington, or on an identical development system at Los Alamos, New Mexico. Complete testing of each sensor from the field to the Genesis workstations is not necessary, since the hardware configuration up to the connections to the PLCs will not be disturbed. Once the new PLCs and the MODBUS PLUS software have been tested on the development system, and have been installed in the DACS trailer, however, a complete check of at least one sensor per Input/Output (I/O) cabinet from sensor to Genesis screen, including any associated alarms and/or aborts, will be performed to provide a reasonable assurance that none of the DACS computer station readouts for the sensors or field hardware have been affected by any of the changes.

The portion of this procedure dealing with the latest version of the Genesis software will be tested both on the development system, with the new PLCs and the MODBUS PLUS software, and at the Genesis workstations in the DACS trailer. Testing in the DACS trailer will concentrate on mixer pump and directional drive system control with Stations #7 and #8 each on-line as the pump control station and with Stations #5 and #7 each on-line as the master control station. During this testing, the mixer pump and/or the directional drive motors will be electrically disconnected and DANGER tagged at the local disconnect switches near the mixer pump, such that testing can be conducted without actual mixer pump operation.

Any new or changed Control Screens which provide operator interface with the system during operations will be verified to be adequate for correct control and monitoring of the mixer pump, directional drive system, and/or 101-SY tank instrumentation.

2.0 REFERENCES

2.1 LAUR-92-3196, "Safety Assessment for Proposed Pump Operation to Mitigate Episodic Gas Releases in Tank 241-SY-101"

2.2 WHC-CM-1-6, WHC Radiological Control Manual

2.3 WHC-CM-4-3, Industrial Safety Manual, Vols 1-3

2.4 WHC-CM-4-15, Radiation Work Requirements and Permits Manual, Vol 2

2.5 WHC-CM-4-40, Industrial Hygiene Manual

2.6 WHC-CM-6-1, Standard Engineering Practices, EP-5.8, "Engineering Document Contents"

2.7 WHC-CM-6-1, Appendix M, "Acceptance Test Procedures and Reports"

2.8 WHC-IP-0263-TF, Westinghouse Hanford Company Building Emergency Plan, Appendix G, "S-Farm Complex"

2.9 WHC-IP-0842, Waste Tank Project Administration, Section 5.9.1, "Lockout/Tagout"

2.10 WHC-IP-0842, Waste Tank Project Administration, Section 15.3

2.11 WHC-SD-WM-ATP-046, "SY-101 Mitigation Testing Acceptance Test Procedure", Rev 0

2.12 WHC-SD-WM-ATP-058, "SY-101 Post Pump-Installation Acceptance Test Procedure", Rev 1

2.13 WHC-SD-WM-ATP-061, "MIT Acceptance Test Procedure", Rev 0

2.14 WHC-SD-WM-ATP-062, "Phase B Mitigation Testing Software Acceptance Test Procedure", Rev 0

2.15 WHC-SD-WM-HSP-002, Tank Farm Health and Safety Plan

2.16 WHC-SD-WM-MA-014, "Mitigation Test Management"

2.17 WHC-SD-WM-TP-140, "Test Plan for Tank 101-SY Mitigation-By-Mixing Test"

3.0 RESPONSIBILITIES

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

- Test Manager: The individual assigned direct responsibility for the performance, preparation, 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 Engineer, Test Director, or Technician assigned to direct/verify testing activities outside of the DACS trailer.
- Development System Personnel: Personnel, familiar with the operation of the development system equipment, assigned to assist with this test procedure.
- Gas Monitoring Systems Personnel: Personnel, familiar with the operation of the Gas Monitoring Systems equipment, assigned to assist with this test procedure.

Only personnel designated by the Mitigation Testing Program Test Manager are allowed to direct testing per this procedure, and perform operating and control functions using the DACS computer system.

One engineer acting as either a Test Engineer or as a Test Director is required to be present in the DACS trailer 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.

At least one Test Engineer or Test Director is required to perform testing using the development system.

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 H_2 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. If abnormal conditions are detected, then, in certain situations, the DACS automatically generates alarms and causes the system to abort pump operations.

The portions of the system to be tested include:

- New PLCs, PLC software, and new Genesis software
- All field input signals to the PLCs (simulated, using a development system)
- Selected field inputs from each I/O cabinet to the DACS computer stations
- All pump motor and directional drive system functions
- Any new or changed Genesis screens

5.0 TEST CONDITIONS AND EQUIPMENT REQUIRED

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

- WHC-CM-1-6, WHC Radiological Control Manual
- WHC-CM-4-3, Industrial Safety Manual, Vols 1-3
- WHC-CM-4-15, Radiation Work Requirements and Permits Manual, Vol 2
- 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 several occasions when leads are lifted and landed at various terminals. Some of these leads will be energized. Hand and eye protection shall be worn, and insulated tools shall be used, when working on energized circuits (< 50 Vac). The instrument leads must be energized to correctly simulate a sensor input signal, through the instrumentation circuitry, 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 101-SY 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 101-SY testing activities may be resumed after permission to do so is received from the responsible West Area Shift Manager (WASM) and Test Manager.

5.5 Prior to initiation of testing at the DACS trailer or in the SY tank farm, and at the start of each Tank Farms Operations shift during testing, the West Area Shift Manager shall be briefed on the scope of testing to be conducted during the shift. The briefing shall include a request to verify that the mixer pump motor local disconnect switch, DS-101-25, and the rotation motor local disconnect switch, DS-101-26, are locked and tagged OFF, if required to support testing activities. Additionally, a discussion of work in the tank farm that could affect testing shall also be held between the West Area Shift Manager and the acting Test Director in charge of the test to be conducted.

5.5.1 If mixer pump operation is necessary during testing activities, then testing shall be suspended by the acting Test Director. After test suspension, the acting Test Director shall notify the West Area Shift Manager that preparations for mixer pump operations may commence. This will include a verification that DS-101-25 and/or DS-101-26 may be closed, as required.

5.5.2 If testing is to continue following mixer pump operation, the acting Test Director shall wait for notification from the West Area Shift Manager that, if required, DS-101-25 and/or DS-101-26 have been placed in OFF and locked and tagged, before resumption of testing activities.

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

5.6.1 Prior to commencing testing at the development facility, the new PLCs and MODBUS PLUS software have been verified to be installed and ready for testing.

Verified by:_____/_____
(Test Director) Date

5.6.2 Prior to commencing testing at the DACS trailer, the new PLCs and MODBUS PLUS software have been verified to be installed and ready for testing.

Verified by:_____/_____
(Test Director) Date

5.6.3 Prior to commencing testing at the DACS trailer, the new Genesis software has been verified to be installed and ready for testing.

Verified by:_____/_____
(Test Director) Date

5.6.4 For each test section performed at the DACS trailer, as determined by the West Area Shift Manager, a pre-job safety meeting, including a review of any applicable JHA, shall be conducted in accordance with a Pre-Job Safety Meeting Form, per WHC-IP-0842, Waste Tank Project Administration, Section 15.3.

5.6.5 The DACS computers at Stations #5, #6, #7, and #8 shall be verified to be available to support testing activities, prior to the start of each day or shift of testing.

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

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

5.7.2 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)

5.7.3 For testing at the DACS trailer and the SY tank farm, radios (2 minimum) or other means of communications, for communicating between personnel in the DACS trailer and field personnel

5.7.4 Calibrated multimeter, capable of measuring circuit resistance, and voltages to 480 Vac

5.7.5 Omega CL-24, Thermocouple Calibrator, capable of generating a 0.397 to 3.819 mV DC (50 °F to 200 °F) signal, required for providing input signals for thermocouple sensor channels to be tested

5.7.6 Signal generator capable of 4 - 20 mA and 0.0 - 25 Vdc

5.7.7 Stopwatch, with commercial accuracy (no calibration required)

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.

6.0 ACCEPTANCE TEST

WARNING

When testing is being conducted using the DACS computers and pump control software at Station #7 or #8, mixer pump motor local disconnect switch DS-101-25 must remain locked and tagged in OFF (OPEN) to prevent actual mixer pump operation.

NOTES: Sections 6.1 through 6.7 may be performed as a group at any time, at the discretion of the Test Director. Sections 6.8 and 6.9 should be performed in conjunction with the performance of these sections, to minimize the overall impact of testing on the SY tank farm.

Sections 6.10, 6.11, and 6.12 may be performed as a group at any time, at the discretion of the Test Director.

Sections 6.13, 6.14, and 6.15 may be performed as a group at any time, at the discretion of the Test Director.

Sections 6.16, 6.17 and 6.18 may be performed as a group at any time, at the discretion of the Test Director.

6.1 Check of Manual Mixer Pump Rotation (Station #5 as Master Station)

6.1.1 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.

6.1.1.1 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 Exit the operating programs at Stations #5 and #8, access the "C" prompt, and load the latest version of the Genesis operating strategy.

6.1.3 Ensure that Station #5 is the master station and that Station #8 is the motor control station.

6.1.3.1 Verify that no nuisance alarms are present after Stations #5 and #8 are on-line.

6.1.4 At Station #8, access the MAINMENU screen.

6.1.5 Select the "Manual Nozzle Positioning" block and click the left mouse button.

6.1.6 Verify that the DDISPLAY screen is brought up at Station #8.

6.1.7 Select the "Main Test" block and click the left mouse button.

6.1.8 Verify that the MAINMENU screen is brought up at Station #8.

6.1.9 Select the "Pump Bump" block and click the left mouse button.

6.1.10 Verify that the BUMPPUMP screen is brought up at Station #8.

6.1.11 Select the "Main Menu" block and click the left mouse button.

6.1.12 Verify that the MAINMENU screen is brought up at Station #8.

6.1.13 Select the "Phase B Tests" block and click the left mouse button.

6.1.14 Verify that the PBTESTS screen is brought up at Station #8.

6.1.15 Select the "Main Menu" block and click the left mouse button.

6.1.16 Verify that the MAINMENU screen is brought up at Station #8.

6.1.17 Select the "Pump Operation" block and click the left mouse button.

6.1.18 Verify that the PUMPRUN screen is brought up at Station #8.

6.1.19 Select the "MAIN" block and click the left mouse button.

6.1.20 Verify that the MAINMENU screen is brought up at Station #8.

6.1.21 Conduct a prejob safety meeting and review any applicable JHA with all affected personnel, prior to performing any further testing per this procedure section.

NOTE: During the performance of the following steps, no operation of the mixer pump motor will occur, however, the mixer pump will be oriented to various angles by the directional drive system.

6.1.22 Request the West Area Shift Manager (WASM) to ensure mixer pump motor local disconnect switch DS-101-25 is DANGER Tagged OPEN/OFF and directional drive motor local disconnect switch DS-101-26 is CLOSED, to allow rotational drive system operation.

6.1.23 When the WASM reports that local disconnect switch DS-101-25 is verified to be DANGER Tagged OPEN/OFF, and local disconnect DS-101-26 is CLOSED, then record the WASM's name, and the time that the disconnect switches were reported in position, in the DACS logbook.

6.1.24 Request WASM to remove DANGER Tags from circuit breakers VSD-101-1 and VSD-101-2.

6.1.25 If necessary to allow directional drive motor operation, 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 #1.

6.1.26 At Station #5, access the "CSMAIN" screen.

6.1.27 Ensure that the E Stop circuitry is reset.

6.1.28 Request WASM to close circuit breakers VSD-101-1 and VSD-101-2.

6.1.29 At Station #7, access the "PUMP" screen.

6.1.30 At Station #8, access the "DDISPLAY" screen.

)TE: This procedure was written assuming that the mixer pump is oriented to an angle less than 100°. If the mixer pump is not oriented to an angle less than 100°, then, with the permission of the Test Manager, appropriate steps of the normal operating procedure may be performed to orient the mixer pump to an angle less than 100°.

6.1.31 Ensure that the displayed value in the "MEASURED POSITION" field is less than "100".

6.1.32 Select the "SET POINT POSITION" field and enter a value of "135".

6.1.33 Select the "SET POINT ACCEL" field and enter a value of "100".

6.1.34 Select the "SET POINT DECEL" field and enter a value of "100".

6.1.35 Select the "SET POINT SPEED" field and enter a value of "300".

6.1.36 Select the "HIGH POSITION LIMIT" field and enter a value of "170".

6.1.37 Select the "LOW POSITION LIMIT" field and enter a value of "-5".

6.1.38 Select the "POSITION HI DEADBAND" field and enter a value of "5".

6.1.39 Select the "POSITION LO DEADBAND" field and enter a value of "5".

6.1.40 Verify that the GREEN "DRIVE READY" light is lighted.

6.1.41 Select the "ENABLE/DISABLE MOVE" state field and toggle the field until "ENABLE MOVE" appears.

6.1.42 Press the "ENTER" key.

6.1.43 Verify that the indications for the following fields are within the values stated in Table 1.

Table 1

FIELD/INDICATOR	EXPECTED READING/INDICATION
GREEN "RUNNING" Light	Lighted
GREEN "FORWARD" Light	Lighted
GREEN "AT SPEED" Light	Lighted
MEASURED POSITION	Increasing Value, ⟨ 135
MEASURED SPEED	300 (290 - 310)

6.1.44 Press the left-hand E Stop pushbutton.

6.1.45 Verify that the indications for the following fields are within the values stated in Table 2.

Table 2

FIELD/INDICATOR	EXPECTED READING/INDICATION
GREEN "RUNNING" Light	Not Lighted
GREEN "FORWARD" Light	Lighted
GREEN "AT SPEED" Light	Not Lighted
GREEN "STOPPED" Light	Lighted
RED "DRIVE FAULT" Light	Lighted
MEASURED SPEED	0

6.1.46 Verify that the VSD has stopped, by observing the "SERIAL LINK LOST" display on both VSD keypads.

6.1.47 Ensure that the E Stop circuitry is reset.

6.1.48 Request WASM to close circuit breakers VSD-101-1 and VSD-101-2.

6.1.49 If necessary, repeat Steps 6.1.32 through 6.1.39.

6.1.50 Verify that the "DRIVE READY" light is lighted.

6.1.51 Select the "ENABLE/DISABLE MOVE" state field, toggle the field until "ENABLE MOVE" appears, and press the "ENTER" key.

6.1.52 Verify that the indications for the following fields are within the values stated in Table 3.

Table 3

FIELD/INDICATOR	EXPECTED READING/INDICATION
GREEN "RUNNING" Light	Lighted
GREEN "FORWARD" Light	Lighted
GREEN "AT SPEED" Light	Lighted
MEASURED POSITION	Increasing Value, ⟨ 135
MEASURED SPEED	300 (290 - 310)

6.1.53 Press the right-hand E Stop pushbutton.

6.1.54 Verify that the VSD has stopped, by observing the "SERIAL LINK LOST" display on both VSD keypads.

6.1.55 Verify that the indications for the following fields are within the values stated in Table 4.

Table 4

FIELD/INDICATOR	EXPECTED READING/INDICATION
GREEN "RUNNING" Light	Not Lighted
GREEN "FORWARD" Light	Lighted
GREEN "AT SPEED" Light	Not Lighted
GREEN "STOPPED" Light	Lighted
RED "DRIVE FAULT" Light	Lighted
MEASURED SPEED	0

6.1.56 Ensure that the E Stop circuitry is reset.

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: _____

6.2 "STOP DIR MOTOR" Functional Check (Station #5 as Master Station)

6.2.1 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, Exception List.

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.

NOTE: If Section 6.2 is performed after completion of Section 6.1, with no change of personnel, then Step 6.2.2 does not have to be performed.

6.2.2 Conduct a prejob safety meeting and review any applicable JHA with all affected personnel, prior to performing any testing per this procedure section.

6.2.3 Repeat Steps 6.1.32 through 6.1.39, if necessary.

6.2.4 Request WASM to close circuit breakers VSD-101-1 and VSD-101-2.

6.2.5 Verify that the "DRIVE READY" light is lighted.

6.2.6 Select the "ENABLE/DISABLE MOVE" state field and toggle the field until "ENABLE MOVE" appears.

6.2.7 Press the "ENTER" key.

6.2.8 Verify that the indications for the following fields are within the values stated in Table 5.

Table 5

FIELD/INDICATOR	EXPECTED READING/INDICATION
GREEN "RUNNING" Light	Lighted
GREEN "FORWARD" Light	Lighted
GREEN "AT SPEED" Light	Lighted
MEASURED POSITION	Increasing Value, ⟨ 135
MEASURED SPEED	300 (290 - 310)

6.2.9 Select the "STOP DIR MOTOR" block and press the "ENTER" key.

6.2.10 Verify that the indications for the following fields are within the values stated in Table 6.

Table 6

FIELD/INDICATOR	EXPECTED READING/INDICATION
GREEN "RUNNING" Light	Not Lighted
GREEN "FORWARD" Light	Lighted
GREEN "AT SPEED" Light	Not Lighted
GREEN "POSITION IN DEADBAND" Light	Not Lighted
GREEN "STOPPED" Light	Lighted
MEASURED POSITION	Steady Value, ⟨ 135
MEASURED SPEED	0

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: _____

6.3 Normal Directional Drive Motor Run (Station #5 as Master Station)

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.

NOTE: If Section 6.3 is performed after completion of Section 6.2, with no change of personnel, then Step 6.3.2 does not have to be performed.

6.3.2 Conduct a prejob safety meeting and review any applicable JHA with all affected personnel, prior to performing any testing per this procedure section.

6.3.3 Repeat Steps 6.1.32 through 6.1.39, if necessary.

6.3.4 Select the "SET POINT POSITION" field and enter a value of "150".

6.3.5 Select the "SET POINT SPEED" field and enter a value of "500".

6.3.6 Verify that the GREEN "DRIVE READY" light is lighted.

6.3.7 Select the "ENABLE/DISABLE MOVE" state field, toggle the field until "ENABLE MOVE" appears, and press the "ENTER" key.

6.3.8 Verify that the analog "Nozzle Position (deg)" SetP" position indicator is positioned at "150", that both the "SetP" and "Meas" indicators are colored WHITE, and that the "Meas" indicator is moving to the right toward "150".

6.3.9 Verify that the indications for the following fields are within the values stated in Table 7.

Table 7

FIELD/INDICATOR	EXPECTED READING/INDICATION
GREEN "RUNNING" Light	Lighted
GREEN "FORWARD" Light	Lighted
GREEN "AT SPEED" Light	Lighted
MEASURED POSITION	Increasing Value, ⟨ 150
MEASURED SPEED	500 (490 - 510)

NOTE: Steps 6.3.10 through 6.3.14 verify that the computer program will not allow simultaneous operation of the directional drive and pump motors.

6.3.10 Access the BUMPPUMP screen.

6.3.11 Input the following parameters for a pump bump:

- SET TIME: 2 min
- ACCELERATION: 100
- DECELERATION: 176
- MAX SPEED: 1000
- SET POINT SPEED: 1000

6.3.12 Select the "ENABLE" button and press the ENTER key.

6.3.13 Verify that, after a time delay, the GREEN "PLC BUMP ENABLED" light does NOT illuminate.

6.3.14 Access the DDISPLAY screen and verify that mixer pump rotational test is still in progress.

6.3.15 When the MEASURED POSITION field displays a value of 140, then select the "SET POINT SPEED" field and enter a value of "300".

6.3.16 When the directional drive indication shows that rotation has stopped, verify that the indications for the following fields are within the values stated in Table 8.

Table 8

FIELD/INDICATOR	EXPECTED READING/INDICATION
GREEN "RUNNING" Light	Not Lighted
GREEN "FORWARD" Light	Lighted
GREEN "AT SPEED" Light	Not Lighted
GREEN "STOPPED" Light	Lighted
MEASURED POSITION	150 (145 - 155)
MEASURED SPEED	0
GREEN "POSITION IN DEADBAND" Light	Lighted

6.3.17 Verify that the analog "Nozzle Position (deg)" "Meas" and SetP" position indicators have both turned GREEN and are both indicating approximately "150".

6.3.18 Select the "SET POINT POSITION" field and enter a value 2 higher than the value displayed for MEASURED POSITION.

6.3.19 Select the "ENABLE/DISABLE MOVE" state field, toggle the field until "ENABLE MOVE" appears, and press the "ENTER" key.

6.3.20 Verify that, after a time delay, a YELLOW "?" is displayed in the lower portion of the screen.

6.3.21 Move the curser over the "?" and click the left mouse button.

6.3.22 Verify that the "POSITION PUMP PROBLEM" screen is displayed and that the "PUMP POSITION WITHIN DESIRED RANGE" message is displayed in RED letters.

6.3.23 Position the curser over the "Reset Status" block and click the left mouse button.

6.3.24 Place the curser over the "Directional Motor" block and click the left mouse button.

6.3.25 Verify that the DDISPLAY screen is displayed.

6.3.26 Verify that the "?" is no longer displayed in the lower portion of the DDISPLAY screen.

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: _____

6.4 "HI LIMIT" Check (Station #5 as Master Station)

6.4.1 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.

6.4.1.1 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.

NOTE: If Section 6.4 is performed after completion of Section 6.3, with no change of personnel, then Step 6.4.2 does not have to be performed.

6.4.2 Conduct a prejob safety meeting and review any applicable JHA with all affected personnel, prior to performing any testing per this procedure section.

6.4.3 Select the "SET POINT POSITION" field and enter a value of "180".

6.4.4 Select the "ENABLE/DISABLE MOVE" state field, toggle the field until "ENABLE MOVE" appears, and press the "ENTER" key.

6.4.5 Verify that the indications for the following fields are within the values stated in Table 9.

Table 9

FIELD/INDICATOR	EXPECTED READING/INDICATION
GREEN "RUNNING" Light	Lighted
GREEN "FORWARD" Light	Lighted
GREEN "AT SPEED" Light	Lighted
MEASURED POSITION	Increasing Value, ⟩ 145
MEASURED SPEED	300 (290 - 310)

6.4.5.1 Verify that the values displayed at Station #7 for the following parameters are approximately the same as the values for the same parameters displayed at Station #8:

- Directional Drive Position (ZIMPE112)
- Directional Drive RPM (23211)
- Directional Drive AMPS (23210)
- Directional Drive VOLTS (23208)

6.4.6 When the directional drive indication shows that rotation has stopped, verify that the indications for the following fields are within the values stated in Table 10.

Table 10

FIELD/INDICATOR	EXPECTED READING/INDICATION
GREEN "RUNNING" Light	Not Lighted
GREEN "FORWARD" Light	Lighted
GREEN "AT SPEED" Light	Not Lighted
GREEN "STOPPED" Light	Lighted
MEASURED POSITION	170 (170 - 175)
MEASURED SPEED	0
RED "HI LIMIT" Warning	Lighted
RED "START INHIBITED-ADJ SET POINT" Warning	Lighted
RED "HALM POSITION POSITION FROM PLC" Alarm	Active on ALARM/EVENT SUMMARY screen at Station #8
Audible Alarm Horn at Station #8	Sounding

6.4.7 Acknowledge the alarm at Station #8 to silence the audible horn.

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: _____

6.5 Start Inhibited-Adj Set Point Interlock Check (@ "HI LIMIT"; Station #5 as Master Station)

6.5.1 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.

6.5.1.1 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 all discrepancies noted during testing.

NOTE: If Section 6.5 is performed after completion of Section 6.4, with no change of personnel, then Step 6.5.2 does not have to be performed.

6.5.2 Conduct a prejob safety meeting and review any applicable JHA with all affected personnel, prior to performing any testing per this procedure section.

6.5.3 Select the "ENABLE/DISABLE MOVE" state field, toggle the field until "ENABLE MOVE" appears, and press the "ENTER" key.

6.5.4 Verify that the RED "HI LIMIT" and "START INHIBITED-ADJ SET POINT" warning messages are lighted, and that the directional drive motor does NOT start.

6.5.5 Verify that, after a time delay, a YELLOW "?" is displayed in the lower portion of the screen.

6.5.6 Move the curser over the "?" and click the left mouse button.

6.5.7 Verify that the "POSITION PUMP PROBLEM" screen is displayed and that the "PUMP POSITION BEYOND HIGH LIMIT" message is displayed in RED letters.

6.5.8 Position the curser over the "Reset Status" block and click the left mouse button.

6.5.9 Place the curser over the "Directional Motor" block and click the left mouse button.

6.5.10 Verify that the DDISPLAY screen is displayed.

6.5.11 Verify that the "?" is no longer displayed in the lower portion of the DDISPLAY screen.

6.5.12 Select the "SET POINT POSITION" field and enter a value of "160".

6.5.13 Select the "ENABLE/DISABLE MOVE" state field, toggle the field until "ENABLE MOVE" appears, and press the "ENTER" key.

6.5.14 Verify that the indications for the following fields are within the values stated in Table 11.

Table 11

FIELD/INDICATOR	EXPECTED READING/INDICATION
GREEN "RUNNING" Light	Lighted
GREEN "FORWARD" Light	Not Lighted
GREEN "REVERSE" Light	Lighted
GREEN "AT SPEED" Light	Lighted
MEASURED POSITION	Decreasing Value, < 170
MEASURED SPEED	300 (290 - 310)
RED "HI LIMIT" Warning	Not Lighted
RED "START INHIBITED-ADJ SET POINT" Warning	Not Lighted

6.5.15 When the directional drive indication shows that rotation has stopped, verify that the indications for the following fields are within the values stated in Table 12.

Table 12

FIELD/INDICATOR	EXPECTED READING/INDICATION
GREEN "RUNNING" Light	Not Lighted
GREEN "FORWARD" Light	Not Lighted
GREEN "REVERSE" Light	Lighted
GREEN "AT SPEED" Light	Not Lighted
GREEN "STOPPED" Light	Lighted
MEASURED POSITION	160 (155 - 165)
MEASURED SPEED	0
GREEN "POSITION IN DEADBAND" Light	Lighted
RED "HALM POSITION POSITION FROM PLC" Alarm	Not active on ALARM/EVENT SUMMARY screen at Station #8

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: _____

6.6 Reverse Direction Drive and "LO LIMIT" Check (Station #5 as Master Station)

6.6.1 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.

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

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

NOTE: If Section 6.6 is performed after completion of Section 6.5, with no change of personnel, then Step 6.6.2 does not have to be performed.

6.6.2 Conduct a prejob safety meeting and review any applicable JHA with all affected personnel, prior to performing any testing per this procedure section.

6.6.3 Select the "SET POINT POSITION" field and enter a value of "15".

6.6.4 Select the "SET POINT ACCEL" field and enter a value of "100".

6.6.5 Select the "SET POINT DECEL" field and enter a value of "100".

6.6.6 Select the "SET POINT SPEED" field and enter a value of "500".

6.6.7 Select the "LOW POSITION LIMIT" field and enter a value of "25".

6.6.8 Select the "POSITION HI DEADBAND" field and enter a value of "5".

6.6.9 Select the "POSITION LO DEADBAND" field and enter a value of "5".

6.6.10 Select the "ENABLE/DISABLE MOVE" state field, toggle the field until "ENABLE MOVE" appears, and press the "ENTER" key.

6.6.11 Verify that the indications for the following fields are within the values stated in Table 13.

Table 13

FIELD/INDICATOR	EXPECTED READING/INDICATION
GREEN "RUNNING" Light	Lighted
GREEN "FORWARD" Light	Not Lighted
GREEN "REVERSE" Light	Lighted
GREEN "AT SPEED" Light	Lighted
MEASURED POSITION	Decreasing Value, ⟨ 160
MEASURED SPEED	500 (490 - 510)

6.6.12 When the MEASURED POSITION field displays a value of 35, then select the "SET POINT SPEED" field and enter a value of "300".

6.6.13 When the directional drive indication shows that rotation has stopped, verify that the indications for the following fields are within the values stated in Table 14.

Table 14

FIELD/INDICATOR	EXPECTED READING/INDICATION
GREEN "RUNNING" Light	Not Lighted
GREEN "FORWARD" Light	Not Lighted
GREEN "REVERSE" Light	Lighted
GREEN "AT SPEED" Light	Not Lighted
GREEN "STOPPED" Light	Lighted
MEASURED POSITION	25 (25 - 20)
MEASURED SPEED	0
RED "LO LIMIT" Warning	Lighted
RED "START INHIBITED-ADJ SET POINT" Warning	Lighted
RED "LALM POSITION POSITION FROM PLC" Alarm	Active on ALARM/EVENT SUMMARY screen at Station #8
Audible Alarm Horn at Station #8	Sounding

6.6.14 Acknowledge the alarm at Station #8 to silence the audible horn.

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: _____

6.7 Start Inhibited-Adj Set Point" Interlock Check (@ "LO LIMIT"; Station #5 as Master Station)

6.7.1 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.

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

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

NOTE: If Section 6.7 is performed after completion of Section 6.6, with no change of personnel, then Step 6.7.2 does not have to be performed.

6.7.2 Conduct a prejob safety meeting and review any applicable JHA with all affected personnel, prior to performing any testing per this procedure section.

6.7.3 Select the "ENABLE/DISABLE MOVE" state field, toggle the field until "ENABLE MOVE" appears and press the "ENTER" key.

6.7.4 Verify that the RED "LO LIMIT" and "START INHIBITED-ADJ SET POINT" warning messages are lighted, and that the directional drive motor does not start.

6.7.5 Verify that, after a time delay, a YELLOW "?" is displayed in the lower portion of the screen.

6.7.6 Move the curser over the "?" and click the left mouse button.

6.7.7 Verify that the "POSITION PUMP PROBLEM" screen is displayed and that the "PUMP POSITION BEYOND LOW LIMIT" message is displayed in RED letters.

6.7.8 Position the curser over the "Reset Status" block and click the left mouse button.

6.7.9 Place the curser over the "Directional Motor" block and click the left mouse button.

6.7.10 Verify that the DDISPLAY screen is displayed.

6.7.11 Verify that the "?" is no longer displayed in the lower portion of the DDISPLAY screen.

6.7.12 Select the "SET POINT POSITION" field and enter a value of "35".

6.7.13 Select the "ENABLE/DISABLE MOVE" state field, toggle the field until "ENABLE MOVE" appears and press the "ENTER" key.

6.7.14 Verify that the indications for the following fields are within the values stated in Table 15.

Table 15

FIELD/INDICATOR	EXPECTED READING/INDICATION
GREEN "RUNNING" Light	Lighted
GREEN "FORWARD" Light	Lighted
GREEN "REVERSE" Light	Not Lighted
GREEN "AT SPEED" Light	Lighted
MEASURED POSITION	Increasing Value, $\rangle$ 25
MEASURED SPEED	300 (290 - 310)
RED "LO LIMIT" Warning	Not Lighted
RED "START INHIBITED-ADJ SET POINT" Warning	Not Lighted

6.7.15 When the directional drive indication shows that rotation has stopped, verify that the indications for the following fields are within the values stated in Table 16.

Table 16

FIELD/INDICATOR	EXPECTED READING/INDICATION
GREEN "RUNNING" Light	Not Lighted
GREEN "FORWARD" Light	Lighted
GREEN "REVERSE" Light	Not Lighted
GREEN "AT SPEED" Light	Not Lighted
GREEN "STOPPED" Light	Lighted
MEASURED POSITION	35 (30 - 40)
MEASURED SPEED	0
GREEN "POSITION IN DEADBAND" Light	Lighted
RED "LALM POSITION POSITION FROM PLC" Alarm	Not active on the ALARM/EVENT SUMMARY screen at Station #8

6.7.16 Select the "SET POINT POSITION" field and enter a value of "5".

6.7.17 Select the "LOW POSITION LIMIT" field and enter a value of "-5".

6.7.18 Select the "ENABLE/DISABLE MOVE" state field, toggle the field until "ENABLE MOVE" appears, and press the "ENTER" key.

6.7.19 Verify that the drive energizes and that the mixer pump is being rotated toward "5".

6.7.20 When the directional drive indication shows that rotation has stopped, verify that the indications for the following fields are within the values stated in Table 17.

Table 17

FIELD/INDICATOR	EXPECTED READING/INDICATION
GREEN "RUNNING" Light	Not Lighted
GREEN "FORWARD" Light	Not Lighted
GREEN "REVERSE" Light	Lighted
GREEN "AT SPEED" Light	Not Lighted
GREEN "STOPPED" Light	Lighted
MEASURED POSITION	5 (0 to 10)
MEASURED SPEED	0
GREEN "POSITION IN DEADBAND" Light	Lighted

6.7.21 Verify that the analog "Nozzle Position (deg)" "Meas" and SetP" position indicators have both turned GREEN and are both indicating approximately "5".

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: _____

6.8 Check of Manual Mixer Pump Rotation (Station #7 as Master Station)

NOTE: Section 6.8 should be performed in conjunction with the performance of Sections 6.1 through 6.7 and 6.9.

6.8.1 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.

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

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

6.8.2 Shift the master station from Station #5 to Station #7.

6.8.3 At Station #6, access the PUMPALRM screen.

6.8.4 At Station #7, access the PUMP screen.

6.8.5 At Station #8, access the MAINMENU screen.

6.8.6 Select the "Manual Nozzle Positioning" block and click the left mouse button.

6.8.7 Verify that the DDISPLAY screen is brought up at Station #8.

6.8.8 Select the "Main Test" block and click the left mouse button.

6.8.9 Verify that the MAINMENU screen is brought up at Station #8.

6.8.10 Select the "Pump Bump" block and click the left mouse button.

6.8.11 Verify that the BUMPPUMP screen is brought up at Station #8.

6.8.12 Select the "Main Menu" block and click the left mouse button.

6.8.13 Verify that the MAINMENU screen is brought up at Station #8.

6.8.14 Select the "Phase B Tests" block and click the left mouse button.

6.8.15 Verify that the PBTESTS screen is brought up at Station #8.

6.8.16 Select the "Main Menu" block and click the left mouse button.

6.8.17 Verify that the MAINMENU screen is brought up at Station #8.

6.8.18 Select the "Pump Operation" block and click the left mouse button.

6.8.19 Verify that the PUMPRUN screen is brought up at Station #8.

6.8.20 Select the "MAIN" block and click the left mouse button.

6.8.21 Verify that the MAINMENU screen is brought up at Station #8.

NOTE: If Section 6.8 is performed immediately after the performance of Section 6.7, with no change of personnel, then Steps 6.8.22 through 39 do NOT need to be performed.

6.8.22 Conduct a prejob safety meeting and review any applicable JHA with all affected personnel, prior to performing any testing per this procedure section.

WARNING

When testing is being conducted using the DACS computers and pump control software at Station #7 or #8, mixer pump motor local disconnect switch DS-101-25 must remain locked and tagged in OFF (OPEN) to prevent actual mixer pump operation.

NOTE: During the performance of the following steps, no operation of the mixer pump motor will occur, however, the mixer pump will be oriented to various angles by the directional drive system.

6.8.23 Request the West Area Shift Manager (WASM) to ensure mixer pump motor local disconnect switch DS-101-25 is DANGER Tagged OPEN/OFF and directional drive motor local disconnect switch DS-101-26 is CLOSED, to allow rotational drive system operation.

6.8.24 When the WASM reports that local disconnect switch DS-101-25 is verified to be DANGER Tagged OPEN/OFF, and local disconnect DS-101-26 is CLOSED, then record the WASM's name, and the time that the disconnect switches were reported in position, in the DACS logbook.

6.8.25 Request WASM to remove DANGER Tags from circuit breakers VSD-101-1 and VSD-101-2.

6.8.26 If necessary to allow directional drive motor operation, 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 #1.

6.8.27 Ensure that the E Stop circuitry is reset.

6.8.28 Request WASM to close circuit breakers VSD-101-1 and VSD-101-2.

6.8.29 Select the "SET POINT POSITION" field and enter a value of "70".

6.8.30 Select the "SET POINT ACCEL" field and enter a value of "100".

6.8.31 Select the "SET POINT DECEL" field and enter a value of "100".

6.8.32 Select the "SET POINT SPEED" field and enter a value of "500".

6.8.33 Select the "HIGH POSITION LIMIT" field and enter a value of "170".

6.8.34 Select the "LOW POSITION LIMIT" field and enter a value of "-5".

6.8.35 Select the "POSITION HI DEADBAND" field and enter a value of "5".

6.8.36 Select the "POSITION LO DEADBAND" field and enter a value of "5".

6.8.37 Verify that the GREEN "DRIVE READY" light is lighted.

6.8.38 Select the "ENABLE/DISABLE MOVE" state field, toggle the field until "ENABLE MOVE" appears, and press the "ENTER" key.

6.8.39 Verify that the analog "Nozzle Position (deg)" SetP" position indicator is positioned at "70", that both the "SetP" and "Meas" indicators are colored WHITE, and that the "Meas" indicator is moving to the right toward "70".

6.8.40 Verify that the indications for the following fields are within the values stated in Table 18.

Table 18

FIELD/INDICATOR	EXPECTED READING/INDICATION
GREEN "RUNNING" Light	Lighted
GREEN "FORWARD" Light	Lighted
GREEN "AT SPEED" Light	Lighted
MEASURED POSITION	Increasing Value, ⟨ 70
MEASURED SPEED	500 (490 - 510)

6.8.41 When the MEASURED POSITION field displays a value of 60, then select the "SET POINT SPEED" field and enter a value of "300".

6.8.42 When the directional drive indication shows that rotation has stopped, verify that the indications for the following fields are within the values stated in Table 19.

Table 19

FIELD/INDICATOR	EXPECTED READING/INDICATION
GREEN "RUNNING" Light	Not Lighted
GREEN "FORWARD" Light	Lighted
GREEN "AT SPEED" Light	Not Lighted
GREEN "STOPPED" Light	Lighted
MEASURED POSITION	70 (65 - 75)
MEASURED SPEED	0
GREEN "POSITION IN DEADBAND" Light	Lighted

6.8.43 Verify that the analog "Nozzle Position (deg)" "Meas" and SetP" position indicators have both turned GREEN and are both indicating approximately "70".

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: _____

6.9 Check of Manual Mixer Pump Rotation (Station #7 as Motor Control Station)

NOTE:	Section 6.9 should be performed in conjunction with the performance of Sections 6.1 through 6.7 and 6.8.

6.9.1 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.

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

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

6.9.2 Ensure that Station #5 is the Master Station.

6.9.3 Shift the motor control station from Station #8 to Station #7.

6.9.4 At Station #5 access the PUMPALRM screen.

6.9.5 At Station #6 access the PUMP screen.

6.9.6 At Station #7 access the MAINMENU screen.

6.9.7 Select the "Manual Nozzle Positioning" block and click the left mouse button.

6.9.8 Verify that the DDISPLAY screen is brought up at Station #7.

6.9.9 Select the "Main Test" block and click the left mouse button.

6.9.10 Verify that the MAINMENU screen is brought up at Station #7.

6.9.11 Select the "Pump Bump" block and click the left mouse button.

6.9.12 Verify that the BUMPPUMP screen is brought up at Station #7.

6.9.13 Select the "Main Menu" block and click the left mouse button.

6.9.14 Verify that the MAINMENU screen is brought up at Station #7.

6.9.15 Select the "Phase B Tests" block and click the left mouse button.

6.9.16 Verify that the PBTESTS screen is brought up at Station #7.

6.9.17 Select the "Main Menu" block and click the left mouse button.

6.9.18 Verify that the MAINMENU screen is brought up at Station #7.

NOTE: If Section 6.9 is performed immediately following the performance of Section 6.8, with no change of personnel, then Steps 6.9.19 through 6.9.23 do NOT need to be performed.

6.9.19 Conduct a prejob safety meeting and review any applicable JHA with all affected personnel, prior to performing any testing per this procedure section.

WARNING

When testing is being conducted using the DACS computers and pump control software at Station #7 or #8, mixer pump motor local disconnect switch DS-101-25 must remain locked and tagged in OFF (OPEN) to prevent actual mixer pump operation.

NOTE: During the performance of the following steps, no operation of the mixer pump motor will occur, however, the mixer pump will be oriented to various angles by the directional drive system.

6.9.20 Request the West Area Shift Manager (WASM) to ensure mixer pump motor local disconnect switch DS-101-25 is DANGER Tagged OPEN/OFF and directional drive motor local disconnect switch DS-101-26 is CLOSED, to allow rotational drive system operation.

6.9.21 When the WASM reports that local disconnect switch DS-101-25 is verified to be DANGER Tagged OPEN/OFF, and local disconnect DS-101-26 is CLOSED, then record the WASM's name, and the time that the disconnect switches were reported in position in the DACS logbook.

6.9.22 Request WASM to remove DANGER Tags from circuit breakers VSD-101-1 and VSD-101-2.

6.9.23 If necessary to allow directional drive motor operation, 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 #1.

6.9.24 Ensure that the E Stop circuitry is reset.

6.9.25 Request WASM to close circuit breakers VSD-101-1 and VSD-101-2.

6.9.26 Select the "SET POINT POSITION" field and enter a value of "25".

6.9.27 Select the "SET POINT ACCEL" field and enter a value of "100".

6.9.28 Select the "SET POINT DECEL" field and enter a value of "100".

6.9.29 Select the "SET POINT SPEED" field and enter a value of "500".

6.9.30 Select the "HIGH POSITION LIMIT" field and enter a value of "170".

6.9.31 Select the "LOW POSITION LIMIT" field and enter a value of "-5".

6.9.32 Select the "POSITION HI DEADBAND" field and enter a value of "5".

6.9.33 Select the "POSITION LO DEADBAND" field and enter a value of "5".

6.9.34 Verify that the GREEN "DRIVE READY" light is lighted.

6.9.35 Select the "ENABLE/DISABLE MOVE" state field, toggle the field until "ENABLE MOVE" appears, and press the "ENTER" key.

6.9.36 Verify that the analog "Nozzle Position (deg)" SetP" position indicator is positioned at "25", that both the "SetP" and "Meas" indicators are colored WHITE, and that the "Meas" indicator is moving to the left toward "25".

6.9.37 Verify that the indications for the following fields are within the values stated in Table 20.

Table 20

FIELD/INDICATOR	EXPECTED READING/INDICATION
GREEN "RUNNING" Light	Lighted
GREEN "REVERSE" Light	Lighted
GREEN "AT SPEED" Light	Lighted
MEASURED POSITION	Decreasing Value, ⟨ 70
MEASURED SPEED	500 (490 - 510)

6.9.38 When the MEASURED POSITION field displays a value of "35", then select the "SET POINT SPEED" field and enter a value of "300".

6.9.39 When the directional drive indication shows that rotation has stopped, verify that the indications for the following fields are within the values stated in Table 21.

Table 21

FIELD/INDICATOR	EXPECTED READING/INDICATION
GREEN "RUNNING" Light	Not Lighted
GREEN "REVERSE" Light	Lighted
GREEN "AT SPEED" Light	Not Lighted
GREEN "STOPPED" Light	Lighted
MEASURED POSITION	25 (30 - 20)
MEASURED SPEED	0
GREEN "POSITION IN DEADBAND" Light	Lighted

6.9.40 Verify that the analog "Nozzle Position (deg)" "Meas" and SetP" position indicators have both turned GREEN and are both indicating approximately "25".

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: _____

6.10 Check of Pump Bump Operation (Station #5 as Master Station)

NOTE: Sections 6.10, 6.11, and 6.12 should be performed as a group.

6.10.1 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.

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

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

6.10.2 Ensure that Station #5 is on-line as the Master Station and Station #8 is on-line as the Motor Control Station.

6.10.3 Request the West Area Shift Manager (WASM) to ensure local disconnect switches DS-101-25 and DS-101-26 are DANGER Tagged OPEN/OFF.

6.10.4 When the WASM reports that local disconnect switches DS-101-25 and DS-101-26 have been verified to be DANGER Tagged OPEN/OFF, then record the WASM's name, and the time that the disconnect switches were reported DANGER Tagged OFF in the DACS logbook.

6.10.5 Request WASM to remove DANGER Tags from circuit breakers VSD-101-1 and VSD-101-2.

6.10.6 If necessary to allow resetting of the E Stop circuitry, 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 #1.

6.10.7 At Station #6, access the CSMAIN screen.

6.10.8 At Station #7, access the PUMPALRM screen.

6.10.9 Ensure that the E Stop circuitry is reset.

6.10.10 Request WASM to close circuit breakers VSD-101-1 and VSD-101-2.

6.10.11 At Station #8, access the BUMPPUMP screen.

6.10.12 Input the following parameters at Station #8:

- SET TIME: 2 min
- ACCELERATION: 100
- DECELERATION: 176
- MAX SPEED: 1000
- SET POINT SPEED: 1000

6.10.13 Select the "ENABLE" button and press the ENTER key.

6.10.14 When the "PLC BUMP ENABLED" circle illuminates GREEN, then verify that the "PUMP DATA ARCHIVE RATE" displayed at Station #7 changes from "SLOW (5 MIN)" to "FAST (1 SEC)" and start a stopwatch.

6.10.15 After the Station #8 PLC Alarm/Abort display updates, then verify the following:

- The analog "PUMP SPEED" ("SP") bar graph is colored WHITE and indicates approximately "1000" RPM
- SPD ALARM indicates approximately "1010"
- SPD ABORT indicates approximately "1020"
- CUR ALM indicates approximately "205"
- CUR ABT indicates approximately "210"
- DISPR ALM indicates approximately "86.7"
- DISPR ABT indicates approximately "100"

NOTE: The elapsed time recorded in Step 6.10.16 should be approximately 60 seconds.

6.10.16 When the "PLC BUMP ENABLED" circle is no longer illuminated, then stop the stopwatch, and record the elapsed time: _____ seconds.

6.10.17 Select the "ENABLE" button and press the ENTER key.

6.10.18 When the "PLC BUMP ENABLED" circle illuminates GREEN, then select the "BUMP" button and press the ENTER key.

6.10.19 After the Station #8 display shows that the VSD is up to speed, then verify the following:

- "MEASURED SPEED" indicates approximately "1000" RPM
- The analog "PUMP SPEED" ("SP") bar graph is colored GREEN and indicates approximately "1000" RPM
- The analog "PUMP SPEED" ("MEA") bar graph is colored GREEN and indicates approximately "1000" RPM
- The "FORWARD", "AT SPEED", "DRIVE READY", and "RUNNING" circles are illuminated GREEN
- The "REVERSE", "STOPPED", and "DRIVE FAULT" circles are NOT illuminated
- The "REV ENBL" circle is illuminated RED.
- The "ELAPSED TIME" counter is counting up from "0" to "2 min".
- The GREEN "STOP TEST" button has changed to a YELLOW "STOP ENABLE" button.

6.10.20 At Station #5, access the "PUMP" screen, and verify that the displayed values for the following mixer pump motor parameters are approximately equal to the displayed values for those same parameters at Station #8:

- Mixer Pump Motor RPM (23205)
- Mixer Pump Motor AMPS (23204)
- Mixer Pump Motor VOLTS (23202)

6.10.21 When the "ELAPSED TIME" counter reaches "1 min 30 sec", then verify that the "BMP30SEC" alarm sounds at Station #8.

6.10.22 When the "ELAPSED TIME" counter reaches "2 min", then verify that the E Stops are tripped and the VSD stops.

6.10.23 Ensure that the E Stop circuitry is reset.

6.10.24 Request WASM to close circuit breakers VSD-101-1 and VSD-101-2.

6.10.25 Input the following parameters at Station #8:

- SET TIME: 5 min
- ACCELERATION: 100
- DECELERATION: 176
- MAX SPEED: 1000
- SET POINT SPEED: 1000

6.10.26 Select the "ENABLE" button and press the ENTER key.

6.10.27 When the "PLC BUMP ENABLED" circle illuminates GREEN, then select the "BUMP" button and press the ENTER key.

)TE: Whenever the STOP TEST button is colored GREEN (during the starting sequence of a mixer pump test), the test may be terminated by selecting the "STOP TEST" button and clicking the left mouse button. After a mixer pump test has been started, the "STOP TEST" button will change to a YELLOW "STOP ENABLE" button. If the "STOP ENABLE" button is selected and the left mouse button clicked, then the "STOP ENABLE" button will change to a flashing YELLOW "STOP TEST" button. The flashing "STOP TEST" button must be selected and the left mouse button clicked within approximately 5 seconds to terminate a mixer pump test. If the flashing "STOP TEST" button is NOT selected wthin approximately 5 seconds, then the flashing "STOP TEST" button will change back to a steady YELLOW "STOP ENABLE" button.

6.10.28 After the Station #8 display shows that the VSD is up to speed, then:

6.10.28.1 Select the YELLOW "STOP ENABLE" button and click the left mouse button.

6.10.28.2 After approximately 2 seconds, verify that the YELLOW "STOP ENABLE" button changes to a flashing YELLOW "STOP TEST" button.

6.10.28.3 After approximately 5 seconds, verify that the flashing YELLOW "STOP TEST" button changes to a steady YELLOW "STOP ENABLE" button.

6.10.28.4 Select the YELLOW "STOP ENABLE" button and click the left mouse button.

6.10.28.5 When the YELLOW "STOP TEST" button begins to flash, then select the YELLOW "STOP TEST" button and click the left mouse button.

6.10.29 After the Station #8 display updates to show that the VSD is stopped, then verify the following:

- "MEASURED SPEED" indicates "0" RPM
- The analog "PUMP SPEED" ("SP") bar graph is colored WHITE and indicates approximately "1000" RPM
- The analog "PUMP SPEED" ("MEA") bar graph is NOT present (indicates "0" RPM)
- The E Stops have NOT tripped

)TE: Satisfactory performance of Steps 6.10.30 through 6.10.32 proves the ability to perform extended pump runs with the pump bump software.

6.10.30 Input the following parameters at Station #8:

- SET TIME: 10 hr 12 min 27 sec
- ACCELERATION: 100
- DECELERATION: 176
- MAX SPEED: 400
- SET POINT SPEED: 400

6.10.31 Select the "ENABLE" button and press the ENTER key.

6.10.32 Verify that the "PLC BUMP ENABLED" circle illuminates GREEN.

6.10.33 At Station #8, select the "STOP PUMP" button and click the left mouse key.

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

Test Engineer _____ Date: _____

6.11 Checks of Phase B Tests #13.0 through #18.0 (Station #5 as Master Station)

NOTE: Section 6.11 should be performed in conjunction with Sections 6.10 and 6.12.

6.11.1 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.

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

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

NOTE: If Section 6.11 is performed immediately following the performance of Section 6.10, then Steps 6.11.2 through 6.11.7 do NOT need to be performed.

6.11.2 Request the West Area Shift Manager (WASM) to ensure mixer pump motor local disconnect switch DS-101-25 and directional drive motor local disconnect switch DS-101-26 are DANGER Tagged OPEN/OFF.

6.11.3 When the WASM reports that local disconnect switches DS-101-25 and DS-101-26 have been verified to be DANGER Tagged OPEN/OFF, then record the WASM's name, and the time that the disconnect switches were reported in the required positions in the DACS logbook.

6.11.4 Request WASM to remove DANGER Tags from circuit breakers VSD-101-1 and VSD-101-2.

6.11.5 If necessary to allow resetting of the E Stop circuitry, 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 #1.

6.11.6 Ensure that the E Stop circuitry is reset.

6.11.7 Request WASM to close circuit breakers VSD-101-1 and VSD-101-2.

6.11.8 At Station #8, access the PBTESTS screen.

6.11.9 Select the "Test" field in the "Choose Test" block, enter "4.0", and press the ENTER key.

6.11.10 Verify that the "TEST NOT IN FILE" message is displayed in the "Choose Test" block in YELLOW letters.

6.11.11 Select either the "up" or "down" arrow in the "Choose Test" block and click the left mouse button until "13.0" is displayed.

6.11.12 Verify that the "TEST NOT IN FILE" message is NOT displayed in the "Choose Test" block.

6.11.13 Select the "SET VALUES" button, press the "ENTER" key, and verify that the displayed values for the following parameters are approximately the values listed:

- POSITION SET POINT: 35.0
- MAX DUR PER ANGLE: 0:30: 0
- SPD SET POINT: 750
- ACCELERATION (Pump Motor): 6 RPM/S
- DECELERATION (Pump Motor): 360 RPM/S
- MAX SPEED: 750
- ACCEL (Dir Drive Motor): 100 RPM/S
- DECEL (Dir Drive Motor): 100 RPM/S
- SETP SPD (Dir Drive Motor): 100 RPM

6.11.13.1 In the "Test Duration" block, the displayed values in the "Elapsed" fields for "MAX TEST DURATION" and "MAX DUR PER ANGLE" are "0"s.

6.11.14 Perform the following to verify proper alarm and abort settings:

6.11.14.1 Verify that the alarm and abort values displayed at Station #7 for pump speed are "760" and "770" respectively.

6.11.14.2 Verify that the displayed values for "SPD ALARM" and "SPD ABORT", in the "PLC Alarm/Abort" block at Station #8 are "760" and "770" respectively.

6.11.14.3 Verify that the alarm and abort values displayed at Station #7 for pump discharge pressure are "47.2" and "55.1" respectively.

6.11.14.4 Verify that the displayed values for "DISPR ALM" and "DISPR ABT", in the "PLC Cur/DisPr Alarm/Abort" block at Station #8 are "47.2" and "55.1" respectively.

6.11.14.5 Verify that the alarm and abort values displayed at Station #7 for pump motor current are "205" and "210" respectively.

6.11.14.6 Verify that the displayed values for "CUR ALM" and "CUR ABT", in the "PLC Cur/DisPr Alarm/Abort" block at Station #8, are "205" and "210" respectively.

6.11.15 Select the "POSITION PUMP" button, press the "ENTER" key, and verify the following:

6.11.15.1 The YELLOW "RUNNING" indicator in the "Nozzle Position (deg)" block is illuminated.

6.11.15.2 The visible portions of the analog "Meas" and "SetP" indicators in the "Nozzle Position (deg)" block are colored WHITE.

6.11.15.3 The analog "SetP" indicator has moved to indicate "35".

6.11.15.4 The value displayed in the digital indication field to the right of the analog "SetP" display is "35".

6.11.15.5 The value displayed in the "MEAS SPD" field is approximately "100".

6.11.16 At Station #8, press the "F2" key, and perform the following:

6.11.16.1 Enter DACS Tag # "POSITION" and place the tag in Manual.

6.11.16.2 Enter "35" in the "AIN" block.

6.11.17 Verify the following:

6.11.17.1 In the "Pump Orientation" block, the "MEASURED POSITION" field indicates "35".

6.11.17.2 The value displayed in the digital indication field to the right of the analog "Meas" display is "35".

6.11.17.3 In the "Nozzle Position (deg)" block, the analog "Meas" indicator has moved to "35" and is aligned with the analog "SetP" indicator.

6.11.17.4 The colors of the visible portions of both analog "SetP" and "Meas" indicators have changed from WHITE to GREEN.

6.11.17.5 The YELLOW "RUNNING" indicator in the "Nozzle Position (deg)" block is no longer illuminated.

6.11.17.6 The WHITE "STOPPED" indicator in the "Nozzle Position (deg)" block is illuminated.

NOTE: If the selected test is not started within 60 seconds after the test is enabled (when the "START TEST" button turns GREEN), then the "START TEST" and "STOP TEST" buttons will be illuminated GRAY, and the test will no longer be enabled.

6.11.18 Select the "ENABLE TEST" button, press the "ENTER" key, start a stopwatch, and verify the following:

6.11.18.1 The display fields for the following parameters are illuminated GREEN:

- "MEASURED POSITION"
- "SPD SET POINT"
- "ACCELERATION"
- "DECELERATION"
- "MAX SPEED"
- "SPD ALARM"
- "SPD ABORT"

6.11.18.2 The "START TEST" button has illuminated GREEN.

6.11.18.3 The "STOP TEST" button has illuminated GREEN.

6.11.19 When the "START TEST" button is no longer illuminated GREEN, then stop the stopwatch and record the elapsed time: _____ secs.

6.11.19.1 Reset the stopwatch.

6.11.20 Select the "ENABLE TEST" button and press the "ENTER" key.

NOTE: Test #13.0 will be performed with all timers running for full elapsed time measurements. Tests #14.0 - #18.0 will be performed with timers being manually controlled for shorter test time durations.

6.11.21 When the "START TEST" button has illuminated GREEN, then select the "START TEST" button, press the "ENTER" key, and start a stopwatch.

6.11.22 Verify the following:

6.11.22.1 The VSD for the mixer pump motor is running.

6.11.22.2 The "ENABLE STOP" button is illuminated YELLOW.

6.11.22.3 The YELLOW "RUNNING" indicator in the "Pump Speed (RPM)" block is illuminated.

6.11.22.4 The visible portions of the analog "Meas" and "SetP" indicators in the "Pump Speed (RPM)" block are colored WHITE.

6.11.22.5 The analog "SetP" indicator has moved to indicate "750".

6.11.22.6 The value displayed in the digital indication field to the right of the analog "SetP" display in the "Pump Speed (RPM)" block is "750".

6.11.23 When the mixer pump motor VSD is running at 750 RPM, then verify the following:

6.11.23.1 The value displayed in the digital indication field to the right of the analog "Meas" display is "750".

6.11.23.2 In the "Pump Speed (RPM)" block, the analog "Meas" indicator has moved to indicate "750".

6.11.23.3 The colors of the visible portions of both analog "SetP" and "Meas" indicators in the "Pump Speed (RPM)" block have changed from WHITE to GREEN.

6.11.23.4 The fields for "MOTOR AMPS", "MOTOR VOLTS", and "LINE VOLTS" in the "Pump Speed (RPM)" block are indicating positive values.

6.11.23.5 The "Elapsed" timers in the "Test Duration" block for "MAX TEST DURATION" and "MAX DUR PER ANGLE" are counting.

6.11.24 After the displayed values for mixer pump motor current are updated:

6.11.24.1 Verify that the alarm and abort values displayed at Station #7 for pump motor current are "127.9" and "149.2" respectively.

6.11.24.2 Verify that the displayed values for "CUR ALM" and "CUR ABT", in the "PLC Cur/DisPr Alarm/Abort" block at Station #8, are "127.9" and "149.2" respectively.

)TE: Steps 6.11.25 through 6.11.42 verify that the computer program will NOT allow simultaneous operation of the directional drive and pump motors.

6.11.25 At Station #8, access the DDISPLAY screen.

6.11.26 Select the "SET POINT POSITION" field and enter a value of "70".

6.11.27 Select the "SET POINT ACCEL" field and enter a value of "100".

6.11.28 Select the "SET POINT DECEL" field and enter a value of "100".

6.11.29 Select the "SET POINT SPEED" field and enter a value of "500".

6.11.30 Select the "HIGH POSITION LIMIT" field and enter a value of "170".

6.11.31 Select the "LOW POSITION LIMIT" field and enter a value of "-5".

6.11.32 Select the "POSITION HI DEADBAND" field and enter a value of "5".

6.11.33 Select the "POSITION LO DEADBAND" field and enter a value of "5".

6.11.34 Select the "ENABLE/DISABLE MOVE" state field, toggle the field until "ENABLE MOVE" appears, and press the "ENTER" key.

6.11.35 Verify that, after a time delay, a YELLOW "?" is displayed in the lower portion of the screen.

6.11.36 Move the curser over the "?" and click the left mouse button.

6.11.37 Verify that the "POSITION PUMP PROBLEM" screen is displayed and that the "PUMP MOTOR NOT STOPPED"and "PUMP MOTOR RUNNING" messages are displayed in RED letters.

6.11.38 Position the curser over the "Reset Status" block and click the left mouse button.

6.11.39 Place the curser over the "Directional Motor" block and click the left mouse button.

6.11.40 Verify that the DDISPLAY screen is displayed.

6.11.41 Verify that the "?" is no longer displayed in the lower portion of the DDISPLAY screen.

6.11.42 Access the PBTESTS screen and verify that Test 13.0 is still in progress.

6.11.43 Monitor Stations #5, #6, #7, and #8 during VSD operation for proper system performance.

6.11.43.1 If any unusual performance parameters are noted, then record a description of the condition in Attachment 1, Exception List.

NOTE: An alarm will be annunciated at Station #8 approximately 30 seconds before the end of each completed test.

6.11.44 When the "PB30SEC" alarm is received at Station #8, then record the elapsed time on the stopwatch: _____ .

6.11.45 When the simulated pump run is completed, then stop the stopwatch.

6.11.45.1 Record the elapsed time on the stopwatch: _____ (min/sec).

6.11.45.2 Reset the stopwatch.

6.11.46 Verify the following:

- An E Stop trip has been actuated.
- The mixer pump motor VSD has stopped.
- The "START TEST" and "STOP TEST" buttons have turned GRAY.
- The indicated values for "MOTOR AMPS", "MOTOR VOLTS", and "LINE VOLTS" are all "0".
- The "RUNNING" indicators in the "Nozzle Position (deg)" and Pump Speed (RPM) blocks are dark.

6.11.47 Ensure that the E Stop circuitry is reset.

6.11.48 Ensure that VSD-101-1, directional drive motor power supply circuit breaker and VSD-101-2, mixer pump motor power supply circuit breaker, are closed (or "ON").

6.11.49 Select either the "up" or "down" arrow in the "Choose Test" block and click the left mouse button until "14.0" is displayed.

6.11.50 Verify that the "TEST NOT IN FILE" message is NOT displayed in the "Choose Test" block.

6.11.51 Select the "SET VALUES" button, press the "ENTER" key, and verify that the displayed values for the following parameters are approximately the values listed:

- POSITION SET POINT: 65
- MAX DUR PER ANGLE: 0:30: 0
- SPD SET POINT: 750
- ACCELERATION (Pump Motor): 6 RPM/S
- DECELERATION (Pump Motor): 360 RPM/S
- MAX SPEED: 750
- ACCEL (Dir Drive Motor): 100 RPM/S
- DECEL (Dir Drive Motor): 100 RPM/S
- SETP SPD (Dir Drive Motor): 100 RPM

6.11.52 Select the "POSITION PUMP" button, press the "ENTER" key, and verify that the YELLOW "RUNNING" indicator is illuminated.

6.11.53 At Station #8, press the "F2" key, and perform the following:

6.11.53.1 Enter DACS tag # "POSITION" and ensure that the tag is in Manual.

6.11.53.2 Enter "65" in the "AIN" block.

6.11.54 Verify the following:

6.11.54.1 The colors of the visible portions of both analog "SetP" and "Meas" indicators have changed from WHITE to GREEN, and are indicating approximately "65".

6.11.54.2 The WHITE "STOPPED" indicator in the "Nozzle Position (deg)" block is illuminated.

6.11.55 Select the "ENABLE TEST" button and press the "ENTER" key.

6.11.56 When the "START TEST" button illuminates GREEN, then select the "START TEST" button, press the "ENTER" key, and verify that the YELLOW "RUNNING" indicator in the "Pump Speed (RPM)" block is illuminated.

6.11.57 When the mixer pump motor VSD is running at 750 RPM, then verify the following:

6.11.57.1 The colors of the visible portions of both analog "SetP" and "Meas" indicators in the "Pump Speed (RPM)" block have changed from WHITE to GREEN.

6.11.57.2 The fields for "MOTOR AMPS", "MOTOR VOLTS", and "LINE VOLTS" in the "Pump Speed (RPM)" block are indicating positive values.

6.11.57.3 The "Elapsed" timers in the "Test Duration" block for "MAX TEST DURATION" and "MAX DUR PER ANGLE" are counting.

6.11.58 Monitor Stations #5, #6, #7, and #8 during VSD operation for proper system performance.

6.11.58.1 If any unusual performance parameters are noted, then record a description of the condition in Attachment 1, Exception List.

NOTE: Successful completion of Steps 6.11.59 through 6.11.60 will verify that the Station #8 timer will shut down the mixer pump independent of the PLC test timer.

6.11.59 When the "Elapsed" timer indicates 0: 2: 0, then perform the following at Station #8:

6.11.59.1 Press the F2 key.

6.11.59.2 Enter DACS Tag #PBRAMP in the "TAG" block in the lower portion of the screen.

6.11.59.3 Press the TAB key to access the "LLIM" block.

6.11.59.4 Enter a value of "1740" in the "LLIM" block, and press the "ENTER" key.

6.11.59.5 After a time delay, verify that the "PB30SEC" alarm is annunciated at Station #8.

6.11.60 When the value in the "MAX DUR PER ANGLE" block reaches "0:30: 00", then verify the following:

- An E Stop trip has NOT actuated.
- The mixer pump motor VSD has stopped.
- The "START TEST" and "STOP TEST" buttons have turned GRAY.
- The indicated values for "MOTOR AMPS" and "MOTOR VOLTS" are "0".
- The "RUNNING" indicators in the "Nozzle Position (deg)" and Pump Speed (RPM) blocks are dark.

6.11.61 Enter a value of "0" in the "LLIM" block for DACS Tag #PBRAMP, and press the "ENTER" key.

6.11.62 Select either the "up" or "down" arrow in the "Choose Test" block and click the left mouse button until "15.0" is displayed.

6.11.63 Verify that the "TEST NOT IN FILE" message is NOT displayed in the "Choose Test" block.

6.11.64 Select the "SET VALUES" button, press the "ENTER" key, and verify that the displayed values for the following parameters are approximately the values listed:

- POSITION SET POINT: 95
- MAX DUR PER ANGLE: 0:30: 0
- SPD SET POINT: 750
- ACCELERATION (Pump Motor): 6 RPM/S
- DECELERATION (Pump Motor): 360 RPM/S
- MAX SPEED: 750
- ACCEL (Dir Drive Motor): 100 RPM/S
- DECEL (Dir Drive Motor): 100 RPM/S
- SETP SPD (Dir Drive Motor): 100 RPM

6.11.65 Select the "POSITION PUMP" button, press the "ENTER" key, and verify that the YELLOW "RUNNING" indicator is illuminated.

6.11.66 At Station #8, press the "F2" key, and perform the following:

6.11.66.1 Enter DACS tag # POSITION and ensure that the tag is in Manual.

6.11.66.2 Enter "95" in the "AIN" block.

6.11.67 Verify the following:

6.11.67.1 The colors of the visible portions of both analog "SetP" and "Meas" indicators have changed from WHITE to GREEN.

6.11.67.2 The WHITE "STOPPED" indicator in the "Nozzle Position (deg)" block is illuminated.

NOTE: If the selected test is not started within 60 seconds after the test is enabled (when the "START TEST" button turns GREEN), then the "START TEST" and "STOP TEST" buttons will be illuminated GRAY, and the test will no longer be enabled.

6.11.68 Select the "ENABLE TEST" button and press the "ENTER" key.

6.11.69 When the "START TEST" button illuminates GREEN, then select the "START TEST" button, press the "ENTER" key, and verify that the YELLOW "RUNNING" indicator in the "Pump Speed (RPM)" block is illuminated.

6.11.70 When the mixer pump motor VSD is running at 750 RPM, then verify the following:

6.11.70.1 The colors of the visible portions of both analog "SetP" and "Meas" indicators in the "Pump Speed (RPM)" block have changed from WHITE to GREEN.

6.11.70.2 The fields for "MOTOR AMPS", "MOTOR VOLTS", and "LINE VOLTS" in the "Pump Speed (RPM)" block are indicating positive values.

6.11.70.3 The "Elapsed" timers in the "Test Duration" block for "MAX TEST DURATION" and "MAX DUR PER ANGLE" are counting.

6.11.71 Monitor Stations #5, #6, #7, and #8 during VSD operation for proper system performance.

6.11.71.1 If any unusual performance parameters are noted, then record a description of the condition in Attachment 1, Exception List.

)TE: Successful completion of Steps 6.11.72 through 6.11.73 will verify that the PLC timer will shut down the mixer pump independent of the Station #8 test timer.

6.11.72 When the "Elapsed" timer indicates 0: 2: 0, then perform the following at Station #8:

6.11.72.1 Press the F2 key.

6.11.72.2 Enter DACS Tag #PBDNTM and place the tag in "Manual".

6.11.72.3 Verify that the value for OUT is "0".

6.11.72.4 Press the F2 key.

6.11.72.5 Enter DACS Tag #PBCALSEC.

6.11.72.6 Press the "Page Down" key and then place the tag in "Manual".

6.11.72.7 Enter a value of "210" in the "AIN" block for "out1", and press the "ENTER" key.

6.11.73 When the PLC causes the test to terminate, then verify the following:

- An E Stop trip has been actuated.
- The mixer pump motor VSD has stopped.
- The "START TEST" and "STOP TEST" buttons have turned GRAY.
- The indicated values for "MOTOR AMPS", "MOTOR VOLTS", and "LINE VOLTS" are all "0".
- The "RUNNING" indicators in the "Nozzle Position (deg)" and Pump Speed (RPM) blocks are dark.

6.11.74 Perform the following at Station #8:

6.11.74.1 Press the F2 key, if necesary.

6.11.74.2 Enter DACS Tag #PBCALSEC and place the tag in "Auto".

6.11.74.3 Enter DACS Tag #PBDNTM and place the tag in "Auto".

6.11.75 Ensure that the E Stop circuitry is reset.

6.11.76 Ensure that VSD-101-1, directional drive motor power supply circuit breaker and VSD-101-2, mixer pump motor power supply circuit breaker, are closed (or "ON").

6.11.77 Select either the "up" or "down" arrow in the "Choose Test" block and click the left mouse button until "16.0" is displayed.

6.11.78 Verify that the "TEST NOT IN FILE" message is NOT displayed in the "Choose Test" block.

6.11.79 Select the "SET VALUES" button, press the "ENTER" key, and verify that the displayed values for the following parameters are approximately the values listed:

- POSITION SET POINT: 125
- MAX DUR PER ANGLE: 0:30: 0
- SPD SET POINT: 750
- ACCELERATION (Pump Motor): 6 RPM/S
- DECELERATION (Pump Motor): 360 RPM/S
- MAX SPEED: 750
- ACCEL (Dir Drive Motor): 100 RPM/S
- DECEL (Dir Drive Motor): 100 RPM/S
- SETP SPD (Dir Drive Motor): 100 RPM

6.11.80 Select the "POSITION PUMP" button, press the "ENTER" key, and verify that the YELLOW "RUNNING" indicator is illuminated.

6.11.81 At Station #8, press the "F2" key, and perform the following:

6.11.81.1 Enter DACS Tag # "POSITION" and ensure that the tag is in Manual.

6.11.81.2 Enter "125" in the "AIN" block.

6.11.82 Verify the following:

6.11.82.1 The colors of the visible portions of both analog "SetP" and "Meas" indicators have changed from WHITE to GREEN.

6.11.82.2 The WHITE "STOPPED" indicator in the "Nozzle Position (deg)" block is illuminated.

6.11.83 Select the "ENABLE TEST" button and press the "ENTER" key.

6.11.84 When the "START TEST" button illuminates GREEN, then select the "START TEST" button, press the "ENTER" key, and verify that the YELLOW "RUNNING" indicator in the "Pump Speed (RPM)" block is illuminated.

6.11.85 When the mixer pump motor VSD is running at 750 RPM, then verify the following:

6.11.85.1 The colors of the visible portions of both analog "SetP" and "Meas" indicators in the "Pump Speed (RPM)" block have changed from WHITE to GREEN.

6.11.85.2 The fields for "MOTOR AMPS", "MOTOR VOLTS", and "LINE VOLTS" in the "Pump Speed (RPM)" block are indicating positive values.

6.11.85.3 The "Elapsed" timers in the "Test Duration" block for "MAX TEST DURATION" and "MAX DUR PER ANGLE" are counting.

6.11.86 Monitor Stations #5, #6, #7, and #8 during VSD operation for proper system performance.

6.11.86.1 If any unusual performance parameters are noted, then record a description of the condition in Attachment 1, Exception List.

6.11.87 When the "Elapsed" timer indicates 0: 2: 0, then:

6.11.87.1 Select the "ENABLE STOP" button and click the left mouse button.

6.11.87.2 Select the flashing YELLOW "STOP TEST" button and click the left mouse button.

6.11.88 Verify the following:

- An E Stop trip has NOT actuated.
- The mixer pump motor VSD has stopped.
- The "START TEST" and "STOP TEST" buttons have turned GRAY.
- The indicated values for "MOTOR AMPS" and "MOTOR VOLTS" are "0".
- The "RUNNING" indicators in the "Nozzle Position (deg)" and Pump Speed (RPM) blocks are dark.

6.11.89 Select either the "up" or "down" arrow in the "Choose Test" block and click the left mouse button until "17.0" is displayed.

6.11.90 Verify that the "TEST NOT IN FILE" message is NOT displayed in the "Choose Test" block.

6.11.91 Select the "SET VALUES" button, press the "ENTER" key, and verify that the displayed values for the following parameters are approximately the values listed:

- POSITION SET POINT: 155
- MAX DUR PER ANGLE: 0:30: 0
- SPD SET POINT: 750
- ACCELERATION (Pump Motor): 6 RPM/S
- DECELERATION (Pump Motor): 360 RPM/S
- MAX SPEED: 750
- ACCEL (Dir Drive Motor): 100 RPM/S
- DECEL (Dir Drive Motor): 100 RPM/S
- SETP SPD (Dir Drive Motor): 100 RPM

6.11.92 Select the "POSITION PUMP" button, press the "ENTER" key, and verify that the YELLOW "RUNNING" indicator is illuminated.

6.11.93 At Station #8, press the "F2" key, and perform the following:

6.11.93.1 Enter DACS Tag # "POSITION" and ensure that the tag is in Manual.

6.11.93.2 Enter "155" in the "AIN" block.

6.11.94 Verify the following:

6.11.94.1 The colors of the visible portions of both analog "SetP" and "Meas" indicators have changed from WHITE to GREEN.

6.11.94.2 The WHITE "STOPPED" indicator in the "Nozzle Position (deg)" block is illuminated.

6.11.95 Select the "ENABLE TEST" button and press the "ENTER" key.

6.11.96 When the "START TEST" button illuminates GREEN, then select the "START TEST" button, press the "ENTER" key, and verify that the YELLOW "RUNNING" indicator in the "Pump Speed (RPM)" block is illuminated.

6.11.97 When the mixer pump motor VSD is running at 750 RPM, then verify the following:

6.11.97.1 The colors of the visible portions of both analog "SetP" and "Meas" indicators in the "Pump Speed (RPM)" block have changed from WHITE to GREEN.

6.11.97.2 The fields for "MOTOR AMPS", "MOTOR VOLTS", and "LINE VOLTS" in the "Pump Speed (RPM)" block are indicating positive values.

6.11.97.3 The "Elapsed" timers in the "Test Duration" block for "MAX TEST DURATION" and "MAX DUR PER ANGLE" are counting.

6.11.98 Monitor Stations #5, #6, #7, and #8 during VSD operation for proper system performance.

6.11.98.1 If any unusual performance parameters are noted, then record a description of the condition in Attachment 1, Exception List.

6.11.99 When the "Elapsed" timer indicates 0: 2: 0, then perform the following at Station #8:

6.11.99.1 Press the F2 key and enter DACS Tag #PBRAMP.

6.11.99.2 Press the TAB key to access the "LLIM" block, enter a value of "1740" in the "LLIM" block, and press the "ENTER" key.

6.11.99.3 After a time delay, verify that the "PB30SEC" alarm is annunciated at Station #8.

6.11.100 When the value in the "MAX DUR PER ANGLE" block reaches "0:30:00", then verify the following:

- An E Stop trip has NOT actuated.
- The mixer pump motor VSD has stopped.
- The "START TEST" and "STOP TEST" buttons have turned GRAY.
- The indicated values for "MOTOR AMPS" and "MOTOR VOLTS" are "0".
- The "RUNNING" indicators in the "Nozzle Position (deg)" and Pump Speed (RPM) blocks are dark.

6.11.101 Press the TAB key to access the "LLIM" block, enter a value of "0", and press the "ENTER" key.

6.11.102 Select either the "up" or "down" arrow in the "Choose Test" block and click the left mouse button until "18.0" is displayed.

6.11.103 Verify that the "TEST NOT IN FILE" message is NOT displayed in the "Choose Test" block.

6.11.104 Select the "SET VALUES" button, press the "ENTER" key, and verify that the displayed values for the following parameters are approximately the values listed:

- POSITION SET POINT: 185
- MAX DUR PER ANGLE: 0:30: 0
- SPD SET POINT: 750
- ACCELERATION (Pump Motor): 6 RPM/S
- DECELERATION (Pump Motor): 360 RPM/S
- MAX SPEED: 750
- ACCEL (Dir Drive Motor): 100 RPM/S
- DECEL (Dir Drive Motor): 100 RPM/S
- SETP SPD (Dir Drive Motor): 100 RPM

6.11.105 Select the "POSITION PUMP" button, press the "ENTER" key, and verify that the YELLOW "RUNNING" indicator is illuminated.

6.11.106 At Station #8, press the "F2" key, and perform the following:

6.11.106.1 Enter DACS Tag # "POSITION" and ensure that the tag is in Manual.

6.11.106.2 Enter "185" in the "AIN" block.

6.11.107 Verify the following:

6.11.107.1 The colors of the visible portions of both analog "SetP" and "Meas" indicators have changed from WHITE to GREEN.

6.11.107.2 The WHITE "STOPPED" indicator in the "Nozzle Position (deg)" block is illuminated.

6.11.108 Select the "ENABLE TEST" button and press the "ENTER" key.

6.11.109 When the "START TEST" button illuminates GREEN, then select the "START TEST" button, press the "ENTER" key, and verify that the YELLOW "RUNNING" indicator in the "Pump Speed (RPM)" block is illuminated.

6.11.110 When the mixer pump motor VSD is running at 750 RPM, then verify the following:

6.11.110.1 The colors of the visible portions of both analog "SetP" and "Meas" indicators in the "Pump Speed (RPM)" block have changed from WHITE to GREEN.

6.11.110.2 The fields for "MOTOR AMPS", "MOTOR VOLTS", and "LINE VOLTS" in the "Pump Speed (RPM)" block are indicating positive values.

6.11.110.3 The "Elapsed" timers in the "Test Duration" block for "MAX TEST DURATION" and "MAX DUR PER ANGLE" are counting.

6.11.111 Monitor Stations #5, #6, #7, and #8 during VSD operation for proper system performance.

6.11.111.1 If any unusual performance parameters are noted, then record a description of the condition in Attachment 1, Exception List.

6.11.112 When the "Elapsed" timer indicates 0: 2: 0, then perform the following at Station #8:

6.11.112.1 Press the F2 key and enter DACS Tag #PBRAMP.

6.11.112.2 Press the TAB key to access the "LLIM" block, enter a value of "1740", and press the "ENTER" key.

6.11.112.3 After a time delay, verify that the "PB30SEC" alarm is annunciated at Station #8.

6.11.113 When the value in the "MAX DUR PER ANGLE" block reaches "0:30:00", then verify the following:

- An E Stop trip has NOT actuated.
- The mixer pump motor VSD has stopped.
- The "START TEST" and "STOP TEST" buttons have turned GRAY.
- The indicated values for "MOTOR AMPS" and "MOTOR VOLTS" are "0".
- The "RUNNING" indicators in the "Nozzle Position (deg)" and Pump Speed (RPM) blocks are dark.

6.11.114 Press the TAB key to access the "LLIM" block for DACS Tag #PBRAMP, enter a value of "0", and press the "ENTER" key.

6.11.115 Press the F2 key and enter DACS Tag # "POSITION".

6.11.116 Place the tag in Auto.

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: _____

6.12 Check of PUMPRUN Screen (Station #5 as Master Station)

NOTE: Section 6.12 should be performed in conjunction with Sections 6.10 and 6.11.

6.12.1 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.

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

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

NOTE: If Section 6.12 is performed immediately following the performance of Section 6.11, then Steps 6.12.2 through 6.12.7 do NOT need to be performed.

6.12.2 Request the West Area Shift Manager (WASM) to ensure mixer pump motor local disconnect switch DS-101-25 and directional drive motor local disconnect switch DS-101-26 are DANGER Tagged OPEN/OFF.

6.12.3 When the WASM reports that local disconnect switches DS-101-25 and DS-101-26 have been verified to be DANGER Tagged OPEN/OFF, then record the WASM's name, and the time that the disconnect switches were reported in the required positions in the DACS logbook.

6.12.4 Request WASM to remove DANGER Tags from circuit breakers VSD-101-1 and VSD-101-2.

6.12.5 If necessary to allow resetting of the E Stop circuitry, 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 #1.

6.12.6 Ensure that the E Stop circuitry is reset.

6.12.7 Request WASM to close circuit breakers VSD-101-1 and VSD-101-2.

6.12.8 At Station #8, access the PUMPRUN screen.

6.12.9 Select the "Test" field and enter "1.0".

6.12.10 Select the GREEN "SET VALUES" button and click the left mouse button.

6.12.11 Refer to Table PR and verify that the parameters displayed for Test 1.0 are the same as the parameters listed for Test 1.0 in Table PR.

6.12.12 Select the "STOP TEST" button and click the left mouse button.

6.12.13 Repeat Steps 6.12.9 through 6.12.12 for Tests 2.0 through 30.0, then goto Step 6.12.14.

TABLE PR

TEST #	TIME (H/M/S)	SPEED (RPM)	ANGLE (DEG)	ACCEL (RPM/S)	DECEL (RPM/S)	RESET	TITLE
1.0	5 MIN	1000	28	100	176	YES	BUMP AT 28 DEG
2.0	5 MIN	1000	65	100	176	YES	BUMP AT 65 DEG
3.0	5 MIN	1000	97	100	176	YES	BUMP AT 97 DEG
4.0	5 MIN	1000	125	100	176	YES	BUMP AT 125 DEG
5.0	5 MIN	1000	155	100	176	YES	BUMP AT 155 DEG
6.0	5 MIN	1000	185	100	176	YES	BUMP AT 185 DEG
7.0	1 HR	750	28	100	176	YES	1 HR RUN AT 28 DEG
8.0	1 HR	750	65	100	176	YES	1 HR RUN AT 65 DEG
9.0	1 HR	750	97	100	176	YES	1 HR RUN AT 97 DEG
10.0	1 HR	750	125	100	176	YES	1 HR RUN AT 125 DEG
11.0	1 HR	750	155	100	176	YES	1 HR RUN AT 155 DEG
12.0	1 HR	750	185	100	176	YES	1 HR RUN AT 185 DEG
.3.0	30 MIN	750	35	6	360	YES	PHASE B AT 35 DEG

TEST #	TIME (H/M/S)	SPEED (RPM)	ANGLE (DEG)	ACCEL (RPM/S)	DECEL (RPM/S)	RESET	TITLE
14.0	30 MIN	750	65	6	360	NO	PHASE B AT 65 DEG
15.0	30 MIN	750	95	6	360	NO	PHASE B AT 95 DEG
16.0	30 MIN	750	125	6	360	NO	PHASE B AT 125 DEG
17.0	30 MIN	750	155	6	360	NO	PHASE B AT 155 DEG
18.0	30 MIN	750	185	6	360	NO	PHASE B AT 185 DEG
19.0	25 MIN	1000	28	100	176	YES	25 MIN EXCAV, 28 DEG
20.0	25 MIN	1000	65	100	176	YES	25 MIN EXCAV, 65 DEG
21.0	25 MIN	1000	97	100	176	YES	25 MIN EXCAV, 97 DEG
22.0	25 MIN	1000	125	100	176	YES	25 MIN EXCAV, 125 DEG
23.0	25 MIN	1000	155	100	176	YES	25 MIN EXCAV, 155 DEG
24.0	25 MIN	1000	185	100	176	YES	25 MIN EXCAV, 185 DEG
25.0	40 MIN	920	28	100	176	YES	40 MIN EXCAV, 28 DEG
26.0	40 MIN	920	65	100	176	YES	40 MIN EXCAV, 65 DEG
27.0	40 MIN	920	97	100	176	YES	40 MIN EXCAV, 97 DEG
28.0	40 MIN	920	125	100	176	YES	40 MIN EXCAV, 125 DEG
29.0	40 MIN	920	155	100	176	YES	40 MIN EXCAV, 155 DEG
30.0	40 MIN	920	185	100	176	YES	40 MIN EXCAV, 185 DEG

6.12.14 Select the "Test" field and enter "13.0".

6.12.15 Select the GREEN "SET VALUES" button and click the left mouse button.

6.12.16 Verify that the displayed values for the following parameters are approximately the values listed:

- Test: 13.0
- Angle: 35
- Speed: 750
- Hrs: 0
- Mins: 30
- Secs: 0
- Accel: 6
- Decel: 360
- Reset: YES
- PHASE B AT 35 DEG

6.12.17 Verify that the "Test in file." message is displayed and that the "Test setup changed." message is NOT displayed.

6.12.18 Verify that the "SELECTED TEST:" field indicates "13.0" and "PHASE B AT 35 DEG".

6.12.19 Verify the following under the POSITION MOTOR heading:

- If the indicated mixer pump position angle is any angle other than 35 (33 to 37), then the value in the "Angle" field is displayed in YELLOW letters, and the "POSITION PUMP" button is GREEN.
- If the indicated mixer pump position angle is 35 (33 to 37), then the value in the "Angle" field is displayed in GREEN letters, and the "POSITION PUMP" button is GRAY.
- The value displayed in the "Speed" field is "0.0".
- The WHITE "STOPPED" indicator is illuminated and the YELLOW "RUNNING" indicator is NOT illuminated.

6.12.20 Verify the following under the ELAPSED TIME heading:

- The displayed value for "Current" is 0: 0: 0.
- The displayed value for "Total" is 0: 0: 0.
- If the "POSITION PUMP" button is GREEN, then the "ENABLE TEST" button is GRAY.
- If the "POSITION PUMP" button is GRAY, then the "ENABLE TEST" button is GREEN.

6.12.21 Verify the following under the PUMP MOTOR heading:

- The displayed value for "Speed" is 0.0 and is colored GREEN.
- The WHITE "STOPPED" indicator is illuminated and the YELLOW "RUNNING" indicator is NOT illuminated.
- The "START TEST" button is GRAY.
- The "STOP TEST" button is GREEN.

6.12.22 If the "POSITION PUMP" button is GRAY and the "ENABLE TEST" button is GREEN, then goto Step 6.12.27.

6.12.23 If the "POSITION PUMP" button is GREEN, then select the "POSITION PUMP" button, click the left mouse button, and verify the following under the POSITION MOTOR heading:

- The YELLOW "RUNNING" indicator is illuminated and the WHITE "STOPPED" indicator is NOT illuminated.
- The indicated value in the "Speed" field is approximately "100".

6.12.24 At Station #8, press the "F2" key, and perform the following:

6.12.24.1 Enter DACS Tag # "POSITION" and place the tag is in Manual.

6.12.24.2 Enter "35" in the "AIN" block.

6.12.25 Verify the following under the POSITION MOTOR heading:

- The value in the "Angle" field is "35" and is displayed in GREEN letters.
- The displayed value for "Speed" is 0.0.
- The WHITE "STOPPED" indicator is illuminated and the YELLOW "RUNNING" indicator is NOT illuminated.
- The "POSITION PUMP" button is GRAY.

6.12.26 Verify that the "ENABLE TEST" button is GREEN.

6.12.27 Select the "ENABLE TEST" button and click the left mouse button.

OTE: If the test is not started within 60 seconds after the test is enabled (when the "START TEST" button turns GREEN), then the "START TEST" button will be illuminated GRAY, and the test will no longer be enabled.

6.12.28 When the "START TEST" button turns GREEN and the "ENABLE TEST" button turns GRAY, then start a stopwatch.

6.12.29 When the "START TEST" button is no longer illuminated GREEN, then stop the stopwatch and record the elapsed time: _____ secs.

6.12.30 Verify that the "ENABLE TEST" button is illuminated GREEN and the "START TEST" button is illuminated GRAY.

6.12.31 Reset the stopwatch.

6.12.32 Select the "ENABLE TEST" button and press the "ENTER" key.

6.12.33 When the "START TEST" button turns GREEN and the "ENABLE TEST" button turns GRAY, then select the "START TEST" button and click the left mouse button.

6.12.34 Verify the following under the PUMP MOTOR heading:

- The indicated value in the "Speed" field is increasing.
- The YELLOW "RUNNING" indicator is illuminated and the WHITE "STOPPED" indicator is NOT illuminated.
- The "START TEST" button has turned GRAY.

6.12.35 Verify that both timers under the "ELAPSED TIME" heading are counting.

6.12.36 Verify that the YELLOW "ENABLE STOP" button is illuminated.

6.12.37 Select the "ENABLE STOP" button and click the left mouse button.

6.12.38 Select the flashing YELLOW "STOP TEST" button and click the left mouse button.

6.12.39 Verify the following:

- The WHITE "STOPPED" indicator is illuminated and the YELLOW "RUNNING" indicator is NOT illuminated.
- The displayed value for "Speed" is 0.0.
- The "STOP TEST" button has turned GRAY.
- The "SET VALUES" button has turned GREEN.
- Both timers under the "ELAPSED TIME" heading are displaying positive values.

6.12.40 Select the GREEN "SET VALUES" button and click the left mouse button.

6.12.41 Select the GREEN "ENABLE TEST" button and press the "ENTER" key.

6.12.42 Select the GREEN "START TEST" button, click the left mouse button, and start a stopwatch.

6.12.43 Monitor pump parameters at Stations #5, #6, #7, and #8 for consistent, expected values during the 30-minute simulated pump run.

)TE: An alarm will be annunciated at Station #8 approximately 30 seconds before the end of the test.

6.12.44 When the "PB30SEC" alarm is received at Station #8, then record the elapsed time on the stopwatch: _____ .

6.12.45 When the timers under the "ELAPSED TIME" heading indicate 0:30: 0, then stop the stopwatch.

6.12.45.1 Record the elapsed time on the stopwatch: _____.

6.12.45.2 Reset the stopwatch.

6.12.46 Verify the following:

- The WHITE "STOPPED" indicator is illuminated and the YELLOW "RUNNING" indicator is NOT illuminated.
- The displayed value for "Speed" is 0.0.
- The "STOP TEST" button has turned GRAY.
- The "SET VALUES" button has turned GREEN.
- The "Current" timer under the "ELAPSED TIME" heading is displaying 0: 0: 0.
- The "Total" timer under the "ELAPSED TIME" heading is displaying 0:30: 0.

6.12.47 Select the "Test" field and enter "1.0".

6.12.48 Input/verify the following parameters at Station #8:

- Angle: 50
- Speed: 1000
- Hrs: 0
- Mins: 5
- Secs: 0
- Accel: 100
- Decel: 176
- Reset: YES
- BUMP AT 28 DEG

6.12.49 Verify that the "Test in file." and "Test setup changed." messages are displayed.

6.12.50 Select the GREEN "SET VALUES" button and click the left mouse button.

6.12.51 Verify that the "SELECTED TEST:" field is displaying "MANUAL" in YELLOW letters.

6.12.52 Select the "POSITION PUMP" button, click the left mouse button, and verify the following under the POSITION MOTOR heading:

- The YELLOW "RUNNING" indicator is illuminated and the WHITE "STOPPED" indicator is NOT illuminated.
- The indicated value in the "Speed" field is approximately "100".

6.12.53 At Station #8, press the "F2" key, and perform the following:

6.12.53.1 Enter DACS Tag # "POSITION" and ensure that the tag is in Manual.

6.12.53.2 Enter "50" in the "AIN" block.

6.12.54 Select the GREEN "ENABLE TEST" button and press the "ENTER" key.

6.12.55 Select the GREEN "START TEST" button and click the left mouse button.

6.12.56 Verify the following under the PUMP MOTOR heading:

- The indicated value in the "Speed" field is increasing.
- The YELLOW "RUNNING" indicator is illuminated and the WHITE "STOPPED" indicator is NOT illuminated.
- The "START TEST" button has turned GRAY.

6.12.57 Verify that both timers under the "ELAPSED TIME" heading are counting.

6.12.58 Verify that the YELLOW "ENABLE STOP" button is illuminated.

6.12.59 Select the "ENABLE STOP" button and click the left mouse button.

6.12.60 Select the flashing YELLOW "STOP TEST" button and click the left mouse button.

6.12.61 Verify the following:

- The WHITE "STOPPED" indicator is illuminated and the YELLOW "RUNNING" indicator is NOT illuminated.
- The displayed value for "Speed" is 0.0.
- The "STOP TEST" button has turned GRAY.
- The "SET VALUES" button has turned GREEN.
- Both timers under the "ELAPSED TIME" heading are displaying positive values.

6.12.62 At Station #8, access the TESTSET screen.

6.12.63 Input the following values for the parameters listed:

- Test Number: 31.0
- Angle (deg): 100
- Speed (RPM): 1000
- Duration: 0: 5: 0
- Accel (RPM/S): 100
- Decel (RPM/S): 300
- Elapsed Time Reset: YES
- ATP TEST SETUP

6.12.64 Select the "Save Test" button and click the left mouse button.

6.12.65 Access the PUMPRUN screen at Station #8.

6.12.66 Select the "Test" field and enter "31.0".

6.12.67 Verify that the displayed values for the following parameters are approximately the values listed:

- Angle: 100
- Speed: 1000
- Hrs: 0
- Mins: 5
- Secs: 0
- Accel: 100
- Decel: 300
- Reset: YES
- ATP TEST SETUP

6.12.68 Verify that the "Test in file." message is displayed and that the "Test setup changed." message is NOT displayed.

6.12.69 Select the GREEN "SET VALUES" button and click the left mouse button.

6.12.70 Verify that the "SELECTED TEST:" field indicates "31.0" and "ATP TEST SETUP".

6.12.71 Select the "POSITION PUMP" button, click the left mouse button, and verify the following under the POSITION MOTOR heading:

- The YELLOW "RUNNING" indicator is illuminated and the WHITE "STOPPED" indicator is NOT illuminated.
- The indicated value in the "Speed" field is approximately "100".

6.12.72 At Station #8, press the "F2" key, and perform the following:

6.12.72.1 Enter DACS Tag # "POSITION" and ensure that the tag is in Manual.

6.12.72.2 Enter "100" in the "AIN" block.

6.12.73 Select the GREEN "ENABLE TEST" button and press the "ENTER" key.

6.12.74 Select the GREEN "START TEST" button and click the left mouse button.

6.12.75 Verify the following under the PUMP MOTOR heading:

- The indicated value in the "Speed" field is increasing.
- The YELLOW "RUNNING" indicator is illuminated and the WHITE "STOPPED" indicator is NOT illuminated.
- The "START TEST" button has turned GRAY.

6.12.76 Verify that both timers under the "ELAPSED TIME" heading are counting.

6.12.77 Verify that the YELLOW "ENABLE STOP" button is illuminated.

6.12.78 Select the YELLOW "ENABLE STOP" button and click the left mouse button.

6.12.79 Select the flashing YELLOW "STOP TEST" button and click the left mouse button.

6.12.80 Verify the following:

- The WHITE "STOPPED" indicator is illuminated and the YELLOW "RUNNING" indicator is NOT illuminated.
- The displayed value for "Speed" is 0.0.
- The "STOP TEST" button has turned GRAY.
- The "SET VALUES" button has turned GREEN.
- Both timers under the "ELAPSED TIME" heading are displaying positive values.

6.12.81 At Station #8, access the TESTSET screen.

6.12.82 Select the "Test Number" field and enter "31.0".

6.12.83 Select the "Delete Test" button and click the left mouse button.

6.12.84 Access the PUMPRUN screen at Station #8.

6.12.85 Select the "Test" field and enter "31.0".

6.12.86 Verify that the "Test NOT in file." message is displayed.

6.12.87 Press the F2 key and enter DACS tag # "POSITION".

6.12.88 Place the tag in Auto.

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

Test Engineer _____ Date: _____

6.13 Check of Pump Bump Operation (Station #7 as Master Station)

NOTE: Sections 6.13, 6.14, and 6.15 should be performed as a group.

6.13.1 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.

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

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

NOTE: If Section 6.13 is performed immediately following the performance of Section 6.12, then Steps 6.13.2 through 6.13.5 do NOT need to be performed.

6.13.2 Request the West Area Shift Manager (WASM) to ensure local disconnect switches DS-101-25 and DS-101-26 are DANGER Tagged OPEN/OFF.

6.13.3 When the WASM reports that local disconnect switches DS-101-25 and DS-101-26 have been verified to be DANGER Tagged OPEN/OFF, then record the WASM's name, and the time that the disconnect switches were reported DANGER Tagged OFF in the DACS logbook.

6.13.4 Request WASM to remove DANGER Tags from circuit breakers VSD-101-1 and VSD-101-2.

6.13.5 If necessary to allow resetting of the E Stop circuitry, 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 #1.

6.13.6 Shift the master station from Station #5 to Station #7.

6.13.7 At Station #6, access the PUMPALRM screen.

6.13.8 At Station #7, access the PUMP screen.

6.13.9 At Station #8, access the BUMPPUMP screen.

6.13.10 Ensure that the E Stop circuitry is reset.

6.13.11 Request WASM to close circuit breakers VSD-101-1 and VSD-101-2.

6.13.12 Input the following parameters at Station #8:

- SET TIME: 2 min
- ACCELERATION: 100
- DECELERATION: 176
- MAX SPEED: 1000
- SET POINT SPEED: 1000

6.13.13 Select the "ENABLE" button and press the ENTER key.

6.13.14 After the Station #8 PLC Alarm/Abort display updates, then verify the following:

- The analog "PUMP SPEED" ("SP") bar graph is colored WHITE and indicates approximately "1000" RPM
- SPD ALARM indicates approximately "1010"
- SPD ABORT indicates approximately "1020"
- CUR ALM indicates approximately "205"
- CUR ABT indicates approximately "210"
- DISPR ALM indicates approximately "86.7"
- DISPR ABT indicates approximately "100"

6.13.15 When the "PLC BUMP ENABLED" circle illuminates GREEN, then select the "BUMP" button and press the ENTER key.

6.13.16 Verify that the "PUMP DATA ARCHIVE RATE" displayed at Station #6 changes from "SLOW (5 MIN)" to "FAST (1 SEC)".

6.13.17 After the Station #8 display shows that the VSD is up to speed, then verify the following:

- "MEASURED SPEED" indicates approximately "1000" RPM
- The analog "PUMP SPEED" ("SP") bar graph is colored GREEN and indicates approximately "1000" RPM
- The analog "PUMP SPEED" ("MEA") bar graph is colored GREEN and indicates approximately "1000" RPM
- The "FORWARD", "AT SPEED", "DRIVE READY", and "RUNNING" circles are illuminated GREEN
- The "REV ENBL" circle is illuminated RED
- The "REVERSE", "STOPPED", and "DRIVE FAULT" circles are NOT illuminated
- The "ELAPSED TIME" counter is counting up from "0" to "2 min"

6.13.18 When the "ELAPSED TIME" counter reaches "1 min 30 sec", then verify that the "BMP30SEC" alarm sounds.

6.13.19 When the "ELAPSED TIME" counter reaches "2 min", then verify that the E Stops are tripped and the VSD stops.

6.13.20 Ensure that the E Stop circuitry is reset.

6.13.21 Request WASM to close circuit breakers VSD-101-1 and VSD-101-2.

6.13.22 Input the following parameters at Station #8:

- SET TIME: 5 min
- ACCELERATION: 100
- DECELERATION: 176
- MAX SPEED: 1000
- SET POINT SPEED: 1000

6.13.23 Select the "ENABLE" button and press the ENTER key.

6.13.24 When the "PLC BUMP ENABLED" circle illuminates GREEN, then select the "BUMP" button and press the ENTER key.

6.13.25 After the Station #8 display shows that the VSD is up to speed, then:

6.13.25.1 Select the YELLOW "ENABLE STOP" button and click the left mouse button.

6.13.25.2 Select the flashing YELLOW "STOP PUMP" button and click the left mouse button.

6.13.26 After the Station #8 display updates to show that the VSD is stopped, then verify the following:

- "MEASURED SPEED" indicates "0" RPM
- The analog "PUMP SPEED" ("SP") bar graph is colored WHITE and indicates approximately "1000" RPM
- The analog "PUMP SPEED" ("MEA") bar graph is NOT present (indicates "0" RPM)
- The E Stops have NOT tripped

)TE: Satisfactory performance of Steps 6.13.27 through 6.13.29 proves the ability to perform extended pump runs with the pump bump software.

6.13.27 Input the following parameters at Station #8:

- SET TIME: 10 hr 12 min 27 sec
- ACCELERATION: 100
- DECELERATION: 176
- MAX SPEED: 400
- SET POINT SPEED: 400

6.13.28 Select the "ENABLE" button and press the ENTER key.

6.13.29 Verify that the "PLC BUMP ENABLED" circle illuminates GREEN.

NOTE: The SET TIME fields on the BUMPPUMP screen will not accept inputs greater than "18" in the "hr" block or "60" in the "sec" or "min" blocks. If numbers greater than "18" or "60" are entered, then the input value will be changed automatically to "0" and a "TEST START PROBLEM" "?" will be displayed.

6.13.30 When the "PLC BUMP ENABLED" circle is no longer illuminated, then enter the following parameters at Station #8:

- SET TIME: 60 sec
- ACCELERATION: 176
- DECELERATION: 100
- MAX SPEED: 1000
- SET POINT SPEED: 1000

6.13.31 Select the "ENABLE" button and press the ENTER key.

6.13.32 When the "PLC BUMP ENABLED" circle illuminates GREEN, then select the "BUMP" button and press the ENTER key.

6.13.33 Verify that, after a time delay, a YELLOW "?" is displayed in the lower portion of the screen.

6.13.34 Move the curser over the "?" and click the left mouse button.

6.13.35 Verify that the "TEST START PROBLEM" screen is displayed and that the "DESIRED TEST TIME TOO LOW" message is displayed in RED letters.

6.13.36 Position the curser over the "Reset Status" block and click the left mouse button.

6.13.37 Place the curser over the "Pump Bump" block and click the left mouse button.

6.13.38 Verify that the BUMPPUMP screen is displayed.

6.13.39 Verify that the "?" is no longer displayed in the lower portion of the BUMPPUMP screen.

6.13.40 Verify that the "PLC BUMP ENABLED" circle is illuminated.

6.13.41 At Station #8, select the "ENABLE STOP" button and click the left mouse key.

6.13.42 Select the flashing YELLOW "STOP TEST" button and click the left mouse button.

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

Test Engineer _____ Date: _____

6.14 Checks of Phase B Tests #13.0 through #18.0 (Station #7 as Master Station)

NOTE: Section 6.14 should be performed in conjunction with the performance of Sections 6.13 and 6.15.

6.14.1 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.

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

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

NOTE: If Section 6.13 is performed immediately following the performance of Section 6.12, then Steps 6.14.2 through ? do NOT need to be performed.

6.14.2 Request the West Area Shift Manager (WASM) to ensure local disconnect switches DS-101-25 and DS-101-26 are DANGER Tagged OPEN/OFF.

6.14.3 When the WASM reports that local disconnect switches DS-101-25 and DS-101-26 have been verified to be DANGER Tagged OPEN/OFF, then record the WASM's name, and the time that the disconnect switches were reported DANGER Tagged OFF in the DACS logbook.

6.14.4 Request WASM to remove DANGER Tags from circuit breakers VSD-101-1 and VSD-101-2.

6.14.5 If necessary to allow resetting of the E Stop circuitry, 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 #1.

6.14.6 Ensure that the E Stop circuitry is reset.

6.14.7 At Station #6, access the PUMPALRM screen.

6.14.8 Request WASM to close circuit breakers VSD-101-1 and VSD-101-2.

6.14.9 At Station #8, access the PBTESTS screen.

6.14.10 Select either the "up" or "down" arrow in the "Choose Test" block and click the left mouse button until "13.0" is displayed.

6.14.11 Select the "SET VALUES" button, press the "ENTER" key, and verify that the displayed values for the following parameters are approximately the values listed:

- POSITION SET POINT: 35
- MAX DUR PER ANGLE: 0:30: 0
- SPD SET POINT: 750
- ACCELERATION (Pump Motor): 6 RPM/S
- DECELERATION (Pump Motor): 360 RPM/S
- MAX SPEED: 750
- ACCEL (Dir Drive Motor): 100 RPM/S
- DECEL (Dir Drive Motor): 100 RPM/S
- SETP SPD (Dir Drive Motor): 100 RPM

6.14.11.1 In the "Test Duration" block, the displayed values in the "Elapsed" fields for "MAX TEST DURATION" and "MAX DUR PER ANGLE" are "0"s.

6.14.12 Perform the following to verify proper alarm and abort settings:

6.14.12.1 Verify that the alarm and abort values displayed at Station #6 for pump speed are "760" and "770" respectively.

6.14.12.2 Verify that the displayed values for "SPD ALARM" and "SPD ABORT", in the "PLC Alarm/Abort" block at Station #8 are "760" and "770" respectively.

6.14.12.3 Verify that the alarm and abort values displayed at Station #6 for pump discharge pressure are "47.2" and "55.1" respectively.

6.14.12.4 Verify that the displayed values for "DISPR ALM" and "DISPR ABT", in the "PLC Cur/DisPr Alarm/Abort" block at Station #8 are "47.2" and "55.1" respectively.

6.14.12.5 Verify that the alarm and abort values displayed at Station #6 for pump motor current are "205" and "210" respectively.

6.14.12.6 Verify that the displayed values for "CUR ALM" and "CUR ABT", in the "PLC Cur/DisPr Alarm/Abort" block at Station #8, are "205" and "210" respectively.

6.14.13 Select the "POSITION PUMP" button, press the "ENTER" key, and verify the following:

6.14.13.1 The YELLOW "RUNNING" indicator in the "Nozzle Position (deg)" block is illuminated.

6.14.13.2 The visible portions of the analog "Meas" and "SetP" indicators in the "Nozzle Position (deg)" block are colored WHITE.

6.14.13.3 The analog "SetP" indicator has moved to indicate "35".

6.14.13.4 The value displayed in the digital indication field to the right of the analog "SetP" display is "35".

6.14.13.5 The value displayed in the "MEAS SPD" field is "100".

6.14.14 At Station #8, press the "F2" key, and perform the following:

6.14.14.1 Enter DACS Tag # "POSITION" and ensure that the tag is in Manual.

6.14.14.2 Enter "35" in the "AIN" block.

6.14.15 Verify the following:

6.14.15.1 In the "Pump Orientation" block, the "MEASURED POSITION" field indicates "35".

6.14.15.2 The value displayed in the digital indication field to the right of the analog "Meas" display is "35".

6.14.15.3 In the "Nozzle Position (deg)" block, the analog "Meas" indicator has moved to "35" and is aligned with the analog "SetP" indicator.

6.14.15.4 The colors of the visible portions of both analog "SetP" and "Meas" indicators have changed from WHITE to GREEN.

6.14.15.5 The YELLOW "RUNNING" indicator in the "Nozzle Position (deg)" block is no longer illuminated.

6.14.15.6 The WHITE "STOPPED" indicator in the "Nozzle Position (deg)" block is illuminated.

)TE: If the selected test is not started within 60 seconds after the test is enabled (when the "START TEST" button turns GREEN), then the "START TEST" and "STOP TEST" buttons will be illuminated GRAY, and the test will no longer be enabled.

6.14.16 Select the "ENABLE TEST" button, press the "ENTER" key, and verify the following:

6.14.16.1 The display fields for the following parameters are illuminated GREEN:

- "MEASURED POSITION"
- "SPD SET POINT"
- "ACCELERATION"
- "DECELERATION"
- "MAX SPEED"
- "SPD ALARM"
- "SPD ABORT"

6.14.16.2 The "STOP TEST" button has illuminated GREEN.

6.14.17 Select the "START TEST" button and press the "ENTER" key.

6.14.18 Verify the following:

6.14.18.1 The VSD for the mixer pump motor is running.

6.14.18.2 The "ENABLE STOP" button is illuminated YELLOW.

6.14.18.3 The YELLOW "RUNNING" indicator in the "Pump Speed (RPM)" block is illuminated.

6.14.18.4 The visible portions of the analog "Meas" and "SetP" indicators in the "Pump Speed (RPM)" block are colored WHITE.

6.14.18.5 The analog "SetP" indicator has moved to indicate "750".

6.14.18.6 The value displayed in the digital indication field to the right of the analog "SetP" display in the "Pump Speed (RPM)" block is "750".

6.14.19 When the mixer pump motor VSD is running at 750 RPM, then verify the following:

6.14.19.1 The value displayed in the digital indication field to the right of the analog "Meas" display is "750".

6.14.19.2 In the "Pump Speed (RPM)" block, the analog "Meas" indicator has moved to indicate "750".

6.14.19.3 The colors of the visible portions of both analog "SetP" and "Meas" indicators in the "Pump Speed (RPM)" block have changed from WHITE to GREEN.

6.14.19.4 The fields for "MOTOR AMPS", "MOTOR VOLTS", and "LINE VOLTS" in the "Pump Speed (RPM)" block are indicating positive values.

6.14.19.5 The "Elapsed" timers in the "Test Duration" block for "MAX TEST DURATION" and "MAX DUR PER ANGLE" are counting.

6.14.20 After the displayed values for mixer pump motor current are updated:

6.14.20.1 Verify that the alarm and abort values displayed at Station #6 for pump motor current are "127.9" and "149.2" respectively.

6.14.20.2 Verify that the displayed values for "CUR ALM" and "CUR ABT", in the "PLC Cur/DisPr Alarm/Abort" block at Station #8, are "127.9" and "149.2" respectively.

6.14.21 Monitor Stations #6, #7, and #8 during VSD operation for proper system performance.

6.14.21.1 If any unusual performance parameters are noted, then record a description of the condition in Attachment 1, Exception List.

TE: Successful completion of Steps 6.14.22 through 6.14.23 will verify that the PLC timer will shut down the mixer pump independent of the Station #8 test timer.

6.14.22 When the "Elapsed" timer indicates 0: 2: 0, then perform the following at Station #8:

6.14.22.1 Press the F2 key.

6.14.22.2 Enter DACS Tag #PBDNTM and place the tag in Manual.

6.14.22.3 Verify that "out" is "0".

6.14.22.4 Press the F2 key.

6.14.22.5 Enter DACS Tag #PBCALSEC.

6.14.22.6 Press the "Page Down" key and then place the tag in "Manual".

6.14.22.7 Enter a value of "210" in the "AIN" block for "out1", and press the "ENTER" key.

6.14.23 When the PLC causes the test to terminate, then verify the following:

- An E Stop trip has been actuated.
- The mixer pump motor VSD has stopped.
- The "START TEST" and "STOP TEST" buttons have turned GRAY.
- The indicated values for "MOTOR AMPS", "MOTOR VOLTS", and "LINE VOLTS" are all "0".
- The "RUNNING" indicators in the "Nozzle Position (deg)" and Pump Speed (RPM) blocks are dark.

6.14.24 Ensure that the E Stop circuitry is reset.

6.14.25 Ensure that VSD-101-1, directional drive motor power supply circuit breaker and VSD-101-2, mixer pump motor power supply circuit breaker, are closed (or "ON").

6.14.26 Select either the "up" or "down" arrow in the "Choose Test" block and click the left mouse button until "14.0" is displayed.

6.14.27 Verify that the "TEST NOT IN FILE" message is NOT displayed in the "Choose Test" block.

6.14.28 Select the "SET VALUES" button, press the "ENTER" key, and verify that the displayed values for the following parameters are approximately the values listed:

- POSITION SET POINT: 65
- MAX DUR PER ANGLE: 0:30: 0
- SPD SET POINT: 750
- ACCELERATION (Pump Motor): 6 RPM/S
- DECELERATION (Pump Motor): 360 RPM/S
- MAX SPEED: 750
- ACCEL (Dir Drive Motor): 100 RPM/S
- DECEL (Dir Drive Motor): 100 RPM/S
- SETP SPD (Dir Drive Motor): 100 RPM

6.14.29 Select the "POSITION PUMP" button, press the "ENTER" key, and verify that the YELLOW "RUNNING" indicator is illuminated.

6.14.30 At Station #8, press the "F2" key, and perform the following:

6.14.30.1 Enter DACS Tag # "POSITION" and ensure that the tag is in Manual.

6.14.30.2 Enter "65" in the "AIN" block.

6.14.31 Verify the following:

6.14.31.1 The colors of the visible portions of both analog "SetP" and "Meas" indicators have changed from WHITE to GREEN.

6.14.31.2 The WHITE "STOPPED" indicator in the "Nozzle Position (deg)" block is illuminated.

6.14.32 Select the "ENABLE TEST" button and press the "ENTER" key.

6.14.33 When the "START TEST" button illuminates GREEN, then select the "START TEST" button, press the "ENTER" key, and verify that the YELLOW "RUNNING" indicator in the "Pump Speed (RPM)" block is illuminated.

6.14.34 When the mixer pump motor VSD is running at 750 RPM, then verify the following:

6.14.34.1 The colors of the visible portions of both analog "SetP" and "Meas" indicators in the "Pump Speed (RPM)" block have changed from WHITE to GREEN.

6.14.34.2 The fields for "MOTOR AMPS", "MOTOR VOLTS", and "LINE VOLTS" in the "Pump Speed (RPM)" block are indicating positive values.

6.14.34.3 The "Elapsed" timers in the "Test Duration" block for "MAX TEST DURATION" and "MAX DUR PER ANGLE" are counting.

6.14.35 Monitor Stations #6, #7, and #8 during VSD operation for proper system performance.

6.14.35.1 If any unusual performance parameters are noted, then record a description of the condition in Attachment 1, Exception List.

NOTE: Successful completion of Steps 6.14.36 through 6.14.37 will verify that the Station #8 timer will shut down the mixer pump independent of the PLC test timer.

6.14.36 When the "Elapsed" timer indicates 0: 2: 0, then perform the following at Station #8:

6.14.36.1 Press the F2 key.

6.14.36.2 Enter DACS Tag #PBRAMP in the "TAG" block in the lower portion of the screen.

6.14.36.3 Press the TAB key to access the "LLIM" block.

6.14.36.4 Enter a value of "1740" in the "LLIM" block, and press the "ENTER" key.

6.14.36.5 After a time delay, verify that the "PB30SEC" alarm is annunciated at Station #8.

6.14.37 When the value in the "MAX DUR PER ANGLE" block reaches "0:30: 00", then verify the following:

- An E Stop trip has NOT actuated.
- The mixer pump motor VSD has stopped.
- The "START TEST" and "STOP TEST" buttons have turned GRAY.
- The indicated values for "MOTOR AMPS" and "MOTOR VOLTS" are "0".
- The "RUNNING" indicators in the "Nozzle Position (deg)" and Pump Speed (RPM) blocks are dark.

6.14.38 Enter a value of "0" in the "LLIM" block for DACS Tag #PBRAMP, and press the "ENTER" key.

6.14.39 Select either the "up" or "down" arrow in the "Choose Test" block and click the left mouse button until "15.0" is displayed.

6.14.40 Verify that the "TEST NOT IN FILE" message is NOT displayed in the "Choose Test" block.

6.14.41 Select the "SET VALUES" button, press the "ENTER" key, and verify that the displayed values for the following parameters are approximately the values listed:

- POSITION SET POINT: 95
- MAX DUR PER ANGLE: 0:30: 0
- SPD SET POINT: 750
- ACCELERATION (Pump Motor): 6 RPM/S
- DECELERATION (Pump Motor): 360 RPM/S
- MAX SPEED: 750
- ACCEL (Dir Drive Motor): 100 RPM/S
- DECEL (Dir Drive Motor): 100 RPM/S
- SETP SPD (Dir Drive Motor): 100 RPM

6.14.42 Select the "POSITION PUMP" button, press the "ENTER" key, and verify that the YELLOW "RUNNING" indicator is illuminated.

6.14.43 At Station #8, press the "F2" key, and perform the following:

6.14.43.1 Enter DACS Tag # "POSITION" and ensure that the tag is in Manual.

6.14.43.2 Enter "95" in the "AIN" block.

6.14.44 Verify the following:

6.14.44.1 The colors of the visible portions of both analog "SetP" and "Meas" indicators have changed from WHITE to GREEN.

6.14.44.2 The WHITE "STOPPED" indicator in the "Nozzle Position (deg)" block is illuminated.

6.14.45 Select the "ENABLE TEST" button and press the "ENTER" key.

6.14.46 When the "START TEST" button illuminates GREEN, then select the "START TEST" button, press the "ENTER" key, and verify that the YELLOW "RUNNING" indicator in the "Pump Speed (RPM)" block is illuminated.

6.14.47 When the mixer pump motor VSD is running at 750 RPM, then verify the following:

6.14.47.1 The colors of the visible portions of both analog "SetP" and "Meas" indicators in the "Pump Speed (RPM)" block have changed from WHITE to GREEN.

6.14.47.2 The fields for "MOTOR AMPS", "MOTOR VOLTS", and "LINE VOLTS" in the "Pump Speed (RPM)" block are indicating positive values.

6.14.47.3 The "Elapsed" timers in the "Test Duration" block for "MAX TEST DURATION" and "MAX DUR PER ANGLE" are counting.

6.14.48 Monitor Stations #6, #7, and #8 during VSD operation for proper system performance.

6.14.48.1 If any unusual performance parameters are noted, then record a description of the condition in Attachment 1, Exception List.

6.14.49 When the "Elapsed" timer indicates 0: 2: 0, then:

6.14.49.1 Select the "ENABLE STOP" button and click the left mouse button.

6.14.49.2 Select the flashing YELLOW "STOP TEST" button and click the left mouse button.

6.14.50 Verify the following:

- An E Stop trip has NOT actuated.
- The mixer pump motor VSD has stopped.
- The "START TEST" and "STOP TEST" buttons have turned GRAY.
- The indicated values for "MOTOR AMPS" and "MOTOR VOLTS" are "0".
- The "RUNNING" indicators in the "Nozzle Position (deg)" and Pump Speed (RPM) blocks are dark.

6.14.51 Select either the "up" or "down" arrow in the "Choose Test" block and click the left mouse button until "16.0" is displayed.

6.14.52 Verify that the "TEST NOT IN FILE" message is NOT displayed in the "Choose Test" block.

6.14.53 Select the "SET VALUES" button, press the "ENTER" key, and verify that the displayed values for the following parameters are approximately the values listed:

- POSITION SET POINT: 125
- MAX DUR PER ANGLE: 0:30: 0
- SPD SET POINT: 750
- ACCELERATION (Pump Motor): 6 RPM/S
- DECELERATION (Pump Motor): 360 RPM/S
- MAX SPEED: 750
- ACCEL (Dir Drive Motor): 100 RPM/S
- DECEL (Dir Drive Motor): 100 RPM/S
- SETP SPD (Dir Drive Motor): 100 RPM

6.14.54 Select the "POSITION PUMP" button, press the "ENTER" key, and verify that the YELLOW "RUNNING" indicator is illuminated.

6.14.55 At Station #8, press the "F2" key, and perform the following:

6.14.55.1 Enter DACS Tag # "POSITION" and ensure that the tag is in Manual.

6.14.55.2 Enter "125" in the "AIN" block.

6.14.56 Verify the following:

6.14.56.1 The colors of the visible portions of both analog "SetP" and "Meas" indicators have changed from WHITE to GREEN.

6.14.56.2 The WHITE "STOPPED" indicator in the "Nozzle Position (deg)" block is illuminated.

6.14.57 Select the "ENABLE TEST" button and press the "ENTER" key.

6.14.58 When the "START TEST" button illuminates GREEN, then select the "START TEST" button, press the "ENTER" key, and verify that the YELLOW "RUNNING" indicator in the "Pump Speed (RPM)" block is illuminated.

6.14.59 When the mixer pump motor VSD is running at 750 RPM, then verify the following:

6.14.59.1 The colors of the visible portions of both analog "SetP" and "Meas" indicators in the "Pump Speed (RPM)" block have changed from WHITE to GREEN.

6.14.59.2 The fields for "MOTOR AMPS", "MOTOR VOLTS", and "LINE VOLTS" in the "Pump Speed (RPM)" block are indicating positive values.

6.14.59.3 The "Elapsed" timers in the "Test Duration" block for "MAX TEST DURATION" and "MAX DUR PER ANGLE" are counting.

6.14.60 Monitor Stations #6, #7, and #8 during VSD operation for proper system performance.

6.14.60.1 If any unusual performance parameters are noted, then record a description of the condition in Attachment 1, Exception List.

6.14.61 When the "Elapsed" timer indicates 0: 2: 0, then perform the following at Station #8:

6.14.61.1 Press the F2 key and enter DACS Tag #PBRAMP.

6.14.61.2 Press the TAB key to access the "LLIM" block, enter a value of "1740" in the "LLIM" block, and press the "ENTER" key.

6.14.61.3 After a time delay, verify that the "PB30SEC" alarm is annunciated at Station #8.

6.14.62 When the value in the "MAX DUR PER ANGLE" block reaches "0:30:00", then verify the following:

- An E Stop trip has NOT actuated.
- The mixer pump motor VSD has stopped.
- The "START TEST" and "STOP TEST" buttons have turned GRAY.
- The indicated values for "MOTOR AMPS" and "MOTOR VOLTS" are "0".
- The "RUNNING" indicators in the "Nozzle Position (deg)" and Pump Speed (RPM) blocks are dark.

6.14.63 Press the TAB key to access the "LLIM" block, enter a value of "0", and press the "ENTER" key.

6.14.64 Select either the "up" or "down" arrow in the "Choose Test" block and click the left mouse button until "17.0" is displayed.

6.14.65 Verify that the "TEST NOT IN FILE" message is NOT displayed in the "Choose Test" block.

6.14.66 Select the "SET VALUES" button, press the "ENTER" key, and verify that the displayed values for the following parameters are approximately the values listed:

- POSITION SET POINT: 155
- MAX DUR PER ANGLE: 0:30: 0
- SPD SET POINT: 750
- ACCELERATION (Pump Motor): 6 RPM/S
- DECELERATION (Pump Motor): 360 RPM/S
- MAX SPEED: 750
- ACCEL (Dir Drive Motor): 100 RPM/S
- DECEL (Dir Drive Motor): 100 RPM/S
- SETP SPD (Dir Drive Motor): 100 RPM

6.14.67 Select the "POSITION PUMP" button, press the "ENTER" key, and verify that the YELLOW "RUNNING" indicator is illuminated.

6.14.68 At Station #8, press the "F2" key, and perform the following:

6.14.68.1 Enter DACS Tag # "POSITION" and ensure that the tag is in Manual.

6.14.68.2 Enter "155" in the "AIN" block.

6.14.69 Verify the following:

6.14.69.1 The colors of the visible portions of both analog "SetP" and "Meas" indicators have changed from WHITE to GREEN.

6.14.69.2 The WHITE "STOPPED" indicator in the "Nozzle Position (deg)" block is illuminated.

6.14.70 Select the "ENABLE TEST" button and press the "ENTER" key.

6.14.71 When the "START TEST" button illuminates GREEN, then select the "START TEST" button, press the "ENTER" key, and verify that the YELLOW "RUNNING" indicator in the "Pump Speed (RPM)" block is illuminated.

6.14.72 When the mixer pump motor VSD is running at 750 RPM, then verify the following:

6.14.72.1 The colors of the visible portions of both analog "SetP" and "Meas" indicators in the "Pump Speed (RPM)" block have changed from WHITE to GREEN.

6.14.72.2 The fields for "MOTOR AMPS", "MOTOR VOLTS", and "LINE VOLTS" in the "Pump Speed (RPM)" block are indicating positive values.

6.14.72.3 The "Elapsed" timers in the "Test Duration" block for "MAX TEST DURATION" and "MAX DUR PER ANGLE" are counting.

6.14.73 Monitor Stations #6, #7, and #8 during VSD operation for proper system performance.

6.14.73.1 If any unusual performance parameters are noted, then record a description of the condition in Attachment 1, Exception List.

6.14.74 When the "Elapsed" timer indicates 0: 2: 0, then perform the following at Station #8:

6.14.74.1 Press the F2 key and enter DACS Tag #PBRAMP.

6.14.74.2 Press the TAB key to access the "LLIM" block, enter a value of "1740" in the "LLIM" block, and press the "ENTER" key.

6.14.74.3 After a time delay, verify that the "PB30SEC" alarm is annunciated at Station #8.

6.14.75 When the value in the "MAX DUR PER ANGLE" block reaches "0:30:00", then verify the following:

- An E Stop trip has NOT actuated.
- The mixer pump motor VSD has stopped.
- The "START TEST" and "STOP TEST" buttons have turned GRAY.
- The indicated values for "MOTOR AMPS" and "MOTOR VOLTS" are "0".
- The "RUNNING" indicators in the "Nozzle Position (deg)" and Pump Speed (RPM) blocks are dark.

6.14.76 Press the TAB key to access the "LLIM" block, enter a value of "0", and press the "ENTER" key.

6.14.77 Select either the "up" or "down" arrow in the "Choose Test" block and click the left mouse button until "18.0" is displayed.

6.14.78 Verify that the "TEST NOT IN FILE" message is NOT displayed in the "Choose Test" block.

6.14.79 Select the "SET VALUES" button, press the "ENTER" key, and verify that the displayed values for the following parameters are approximately the values listed:

- POSITION SET POINT: 185
- MAX DUR PER ANGLE: 0:30: 0
- SPD SET POINT: 750
- ACCELERATION (Pump Motor): 6 RPM/S
- DECELERATION (Pump Motor): 360 RPM/S
- MAX SPEED: 750
- ACCEL (Dir Drive Motor): 100 RPM/S
- DECEL (Dir Drive Motor): 100 RPM/S
- SETP SPD (Dir Drive Motor): 100 RPM

6.14.80 Select the "POSITION PUMP" button, press the "ENTER" key, and verify that the YELLOW "RUNNING" indicator is illuminated.

6.14.81 At Station #8, press the "F2" key, and perform the following:

6.14.81.1 Enter DACS Tag # "POSITION" and ensure that the tag is in Manual.

6.14.81.2 Enter "185" in the "AIN" block.

6.14.82 Verify the following:

6.14.82.1 The colors of the visible portions of both analog "SetP" and "Meas" indicators have changed from WHITE to GREEN.

6.14.82.2 The WHITE "STOPPED" indicator in the "Nozzle Position (deg)" block is illuminated.

6.14.83 Select the "ENABLE TEST" button and press the "ENTER" key.

6.14.84 When the "START TEST" button illuminates GREEN, then select the "START TEST" button, press the "ENTER" key, and verify that the YELLOW "RUNNING" indicator in the "Pump Speed (RPM)" block is illuminated.

6.14.85 When the mixer pump motor VSD is running at 750 RPM, then verify the following:

6.14.85.1 The colors of the visible portions of both analog "SetP" and "Meas" indicators in the "Pump Speed (RPM)" block have changed from WHITE to GREEN.

6.14.85.2 The fields for "MOTOR AMPS", "MOTOR VOLTS", and "LINE VOLTS" in the "Pump Speed (RPM)" block are indicating positive values.

6.14.85.3 The "Elapsed" timers in the "Test Duration" block for "MAX TEST DURATION" and "MAX DUR PER ANGLE" are counting.

6.14.86 Monitor Stations #6, #7, and #8 during VSD operation for proper system performance.

6.14.86.1 If any unusual performance parameters are noted, then record a description of the condition in Attachment 1, Exception List.

6.14.87 When the "Elapsed" timer indicates 0: 2: 0, then perform the following at Station #8:

6.14.87.1 Press the F2 key and enter DACS Tag #PBRAMP.

6.14.87.2 Press the TAB key to access the "LLIM" block, enter a value of "1740", and press the "ENTER" key.

6.14.87.3 After a time delay, verify that the "PB30SEC" alarm is annunciated at Station #8.

6.14.88 When the value in the "MAX DUR PR ANGLE" block reaches "0:30:00", then verify the following:

- An E Stop trip has NOT actuated.
- The mixer pump motor VSD has stopped.
- The "START TEST" and "STOP TEST" buttons have turned GRAY.
- The indicated values for "MOTOR AMPS" and "MOTOR VOLTS" are "0".
- The "RUNNING" indicators in the "Nozzle Position (deg)" and Pump Speed (RPM) blocks are dark.

6.14.89 Press the TAB key to access the "LLIM" block for DACS Tag #PBRAMP, enter a value of "0", and press the "ENTER" key.

6.14.90 Press the F2 key and enter DACS tag # "POSITION".

6.14.91 Place the tag in Auto.

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: _____

6.15 Check of PUMPRUN Screen (Station #7 as Master Station)

NOTE: Section 6.15 should be performed in conjunction with Sections 6.13 and 6.14.

6.15.1 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.

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

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

NOTE: If Section 6.15 is performed immediately following the performance of Section 6.14, then Steps 6.15.2 through 6.15.7 do NOT need to be performed.

6.15.2 Request the West Area Shift Manager (WASM) to ensure mixer pump motor local disconnect switch DS-101-25 and directional drive motor local disconnect switch DS-101-26 are DANGER Tagged OPEN/OFF.

6.15.3 When the WASM reports that local disconnect switches DS-101-25 and DS-101-26 have been verified to be DANGER Tagged OPEN/OFF, then record the WASM's name, and the time that the disconnect switches were reported in the required positions in the DACS logbook.

6.15.4 Request WASM to remove DANGER Tags from circuit breakers VSD-101-1 and VSD-101-2.

6.15.5 If necessary to allow resetting of the E Stop circuitry, 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 #1.

6.15.6 Ensure that the E Stop circuitry is reset.

6.15.7 Request WASM to close circuit breakers VSD-101-1 and VSD-101-2.

6.15.8 At Station #8, access the PUMPRUN screen.

6.15.9 Select the "Test" field and enter "1.0".

6.15.10 Select the GREEN "SET VALUES" button and click the left mouse button.

6.15.11 Refer to Table PR and verify that the parameters displayed for Test 1.0 are the same as the parameters listed for Test 1.0 in Table PR.

6.15.12 Select the "STOP TEST" button and click the left mouse button.

6.15.13 Repeat Steps 6.15.9 through 6.15.12 for Tests 2.0 through 30.0, then goto Step 6.15.14.

TABLE PR

TEST #	TIME (H/M/S)	SPEED (RPM)	ANGLE (DEG)	ACCEL (RPM/S)	DECEL (RPM/S)	RESET	TITLE
1.0	5 MIN	1000	28	100	176	YES	BUMP AT 28 DEG
2.0	5 MIN	1000	65	100	176	YES	BUMP AT 65 DEG
3.0	5 MIN	1000	97	100	176	YES	BUMP AT 97 DEG
4.0	5 MIN	1000	125	100	176	YES	BUMP AT 125 DEG
5.0	5 MIN	1000	155	100	176	YES	BUMP AT 155 DEG
6.0	5 MIN	1000	185	100	176	YES	BUMP AT 185 DEG
7.0	1 HR	750	28	100	176	YES	1 HR RUN AT 28 DEG
8.0	1 HR	750	65	100	176	YES	1 HR RUN AT 65 DEG
9.0	1 HR	750	97	100	176	YES	1 HR RUN AT 97 DEG
10.0	1 HR	750	125	100	176	YES	1 HR RUN AT 125 DEG
11.0	1 HR	750	155	100	176	YES	1 HR RUN AT 155 DEG
12.0	1 HR	750	185	100	176	YES	1 HR RUN AT 185 DEG
13.0	30 MIN	750	35	6	360	YES	PHASE B AT 35 DEG

TEST #	TIME (H/M/S)	SPEED (RPM)	ANGLE (DEG)	ACCEL (RPM/S)	DECEL (RPM/S)	RESET	TITLE
14.0	30 MIN	750	65	6	360	NO	PHASE B AT 65 DEG
15.0	30 MIN	750	95	6	360	NO	PHASE B AT 95 DEG
16.0	30 MIN	750	125	6	360	NO	PHASE B AT 125 DEG
17.0	30 MIN	750	155	6	360	NO	PHASE B AT 155 DEG
18.0	30 MIN	750	185	6	360	NO	PHASE B AT 185 DEG
19.0	25 MIN	1000	28	100	176	YES	25 MIN EXCAV, 28 DEG
20.0	25 MIN	1000	65	100	176	YES	25 MIN EXCAV, 65 DEG
21.0	25 MIN	1000	97	100	176	YES	25 MIN EXCAV, 97 DEG
22.0	25 MIN	1000	125	100	176	YES	25 MIN EXCAV, 125 DEG
23.0	25 MIN	1000	155	100	176	YES	25 MIN EXCAV, 155 DEG
24.0	25 MIN	1000	185	100	176	YES	25 MIN EXCAV, 185 DEG
25.0	40 MIN	920	28	100	176	YES	40 MIN EXCAV, 28 DEG
26.0	40 MIN	920	65	100	176	YES	40 MIN EXCAV, 65 DEG
27.0	40 MIN	920	97	100	176	YES	40 MIN EXCAV, 97 DEG
28.0	40 MIN	920	125	100	176	YES	40 MIN EXCAV, 125 DEG
29.0	40 MIN	920	155	100	176	YES	40 MIN EXCAV, 155 DEG
30.0	40 MIN	920	185	100	176	YES	40 MIN EXCAV, 185 DEG

6.15.14 Select the "Test" field and enter "13.0".

6.15.15 Select the GREEN "SET VALUES" button and click the left mouse button.

6.15.16 Verify that the displayed values for the following parameters are approximately the values listed:

- Test: 13.0
- Angle: 35
- Speed: 750
- Hrs: 0
- Mins: 30
- Secs: 0
- Accel: 6
- Decel: 360
- Reset: NO
- PHASE B AT 35 DEG

6.15.17 Verify that the "Test in file." message is displayed and that the "Test setup changed." message is NOT displayed.

6.15.18 Verify that the "SELECTED TEST:" field indicates "31.0" and "PHASE B AT 35 DEG".

6.15.19 Verify the following under the POSITION MOTOR heading:

- If the indicated mixer pump position angle is any angle other than 35 (33 to 37), then the value in the "Angle" field is displayed in YELLOW letters, and the "POSITION PUMP" button is GREEN.
- If the indicated mixer pump position angle is 35 (33 to 37), then the value in the "Angle" field is displayed in GREEN letters, and the "POSITION PUMP" button is GRAY.
- The value displayed in the "Speed" field is "0.0".
- The WHITE "STOPPED" indicator is illuminated and the YELLOW "RUNNING" indicator is NOT illuminated.

6.15.20 Verify the following under the ELAPSED TIME heading:

- The displayed value for "Current" is 0: 0: 0.
- The displayed value for "Total" is 0: 0: 0.
- If the "POSITION PUMP" button is GREEN, then the "ENABLE TEST" button is GRAY.
- If the "POSITION PUMP" button is GRAY, then the "ENABLE TEST" button is GREEN.

6.15.21 Verify the following under the PUMP MOTOR heading:

- The displayed value for "Speed" is 0.0 and is colored GREEN.
- The WHITE "STOPPED" indicator is illuminated and the YELLOW "RUNNING" indicator is NOT illuminated.
- The "START TEST" and "STOP TEST" buttons are GRAY.

6.15.22 If the "POSITION PUMP" button is GRAY and the "ENABLE TEST" button is GREEN, then goto Step 6.15.27.

6.15.23 If the "POSITION PUMP" button is GREEN, then select the "POSITION PUMP" button, click the left mouse button, and verify the following under the POSITION MOTOR heading:

- The YELLOW "RUNNING" indicator is illuminated and the WHITE "STOPPED" indicator is NOT illuminated.
- The indicated value in the "Speed" field is approximately "100".

6.15.24 At Station #8, press the "F2" key, and perform the following:

6.15.24.1 Enter DACS Tag # "POSITION" and place the tag is in Manual.

6.15.24.2 Enter "35" in the "AIN" block.

6.15.25 Verify the following under the POSITION MOTOR heading:

- The value in the "Angle" field is "35" and is displayed in GREEN letters.
- The displayed value for "Speed" is 0.0.
- The WHITE "STOPPED" indicator is illuminated and the YELLOW "RUNNING" indicator is NOT illuminated.
- The "POSITION PUMP" button is GRAY.

6.15.26 Verify that the "ENABLE TEST" button is GREEN.

6.15.27 Select the "ENABLE TEST" button and click the left mouse button.

NOTE: If the test is not started within 60 seconds after the test is enabled (when the "START TEST" button turns GREEN), then the "START TEST" button will be illuminated GRAY, and the test will no longer be enabled.

6.15.28 When the "START TEST" button turns GREEN and the "ENABLE TEST" button turns GRAY, then start a stopwatch.

6.15.29 When the "START TEST" button is no longer illuminated GREEN, then stop the stopwatch and record the elapsed time: _____ secs.

6.15.29.1 Reset the stopwatch.

6.15.30 Verify that the "ENABLE TEST" button is illuminated GREEN and the "START TEST" button is illuminated GRAY.

6.15.31 Select the "ENABLE TEST" button and press the "ENTER" key.

6.15.32 When the "START TEST" button turns GREEN and the "ENABLE TEST" button turns GRAY, then select the "START TEST" button and click the left mouse button.

6.15.33 Verify the following under the PUMP MOTOR heading:

- The indicated value in the "Speed" field is increasing.
- The YELLOW "RUNNING" indicator is illuminated and the WHITE "STOPPED" indicator is NOT illuminated.
- The "START TEST" button has turned GRAY.

6.15.34 Verify that both timers under the "ELAPSED TIME" heading are counting.

6.15.35 Verify that the "ENABLE STOP" button is illuminated YELLOW.

6.15.36 Select the "ENABLE STOP" button and click the left mouse button.

6.15.37 Select the flashing YELLOW "STOP TEST" button and click the left mouse button.

6.15.38 Verify the following:

- The WHITE "STOPPED" indicator is illuminated and the YELLOW "RUNNING" indicator is NOT illuminated.
- The displayed value for "Speed" is 0.0.
- The "STOP TEST" button has turned GRAY.
- The "SET VALUES" button has turned GREEN.
- Both timers under the "ELAPSED TIME" heading are displaying positive values.

6.15.39 Select the GREEN "SET VALUES" button and click the left mouse button.

6.15.40 Select the GREEN "ENABLE TEST" button and press the "ENTER" key.

6.15.41 Select the GREEN "START TEST" button, click the left mouse button, and start a stopwatch.

6.15.42 Monitor pump parameters at Stations #6, #7, and #8 for consistent, expected values during the 30-minute simulated pump run.

NOTE: An alarm will be annunciated at Station #8 approximately 30 seconds before the end of the test.

6.15.43 When the "PB30SEC" alarm is received at Station #8, then record the elapsed time on the stopwatch: _____ .

6.15.44 When the timers under the "ELAPSED TIME" heading indicate 0:30: 0, then stop the stopwatch.

6.15.44.1 Record the elapsed time on the stopwatch: _____

6.15.44.2 Reset the stopwatch.

6.15.45 Verify the following:

- The WHITE "STOPPED" indicator is illuminated and the YELLOW "RUNNING" indicator is NOT illuminated.
- The displayed value for "Speed" is 0.0.
- The "STOP TEST" button has turned GRAY.
- The "SET VALUES" button has turned GREEN.
- The "Current" timer under the "ELAPSED TIME" heading is displaying 0: 0: 0.
- The "Total" timer under the "ELAPSED TIME" heading is displaying 0:30: 0.

6.15.46 Select the "Test" field and enter "1.0".

6.15.47 Input/verify the following parameters at Station #8:

- Angle: 50
- Speed: 1000
- Hrs: 0
- Mins: 5
- Secs: 0
- Accel: 100
- Decel: 176
- Reset: YES
- BUMP AT 28 DEG

6.15.48 Verify that the "Test in file." and "Test setup changed." messages are displayed.

6.15.49 Select the GREEN "SET VALUES" button and click the left mouse button.

6.15.50 Verify that the "SELECTED TEST:" field is displaying "MANUAL" in YELLOW letters.

6.15.51 Select the "POSITION PUMP" button, click the left mouse button, and verify the following under the POSITION MOTOR heading:

- The YELLOW "RUNNING" indicator is illuminated and the WHITE "STOPPED" indicator is NOT illuminated.
- The indicated value in the "Speed" field is approximately "100".

6.15.52 At Station #8, press the "F2" key, and perform the following:

6.15.52.1 Enter DACS Tag # "POSITION" and ensure that the tag is in Manual.

6.15.52.2 Enter "50" in the "AIN" block.

6.15.53 Select the GREEN "ENABLE TEST" button and press the "ENTER" key.

6.15.54 Select the GREEN "START TEST" button and click the left mouse button.

6.15.55 Verify the following under the PUMP MOTOR heading:

- The indicated value in the "Speed" field is increasing.
- The YELLOW "RUNNING" indicator is illuminated and the WHITE "STOPPED" indicator is NOT illuminated.
- The "START TEST" button has turned GRAY.

6.15.56 Verify that both timers under the "ELAPSED TIME" heading are counting.

6.15.57 Verify that the YELLOW "ENABLE STOP" button is illuminated.

6.15.58 Select the "ENABLE STOP" button and click the left mouse button.

6.15.59 Select the flashing YELLOW "STOP TEST" button and click the left mouse button.

6.15.60 Verify the following:

- The WHITE "STOPPED" indicator is illuminated and the YELLOW "RUNNING" indicator is NOT illuminated.
- The displayed value for "Speed" is 0.0.
- The "STOP TEST" button has turned GRAY.
- The "SET VALUES" button has turned GREEN.
- Both timers under the "ELAPSED TIME" heading are displaying positive values.

6.15.61 At Station #8, access the TESTSET screen.

6.15.62 Input the following values for the parameters listed:

- Test Number: 31.0
- Angle (deg): 100
- Speed (RPM): 1000
- Duration: 0: 5: 0
- Accel (RPM/S): 100
- Decel (RPM/S): 300
- Elapsed Time Reset: YES
- ATP TEST SETUP

6.15.63 Select the "Save Test" button and click the left mouse button.

6.15.64 Access the PUMPRUN screen at Station #8.

6.15.65 Select the "Test" field and enter "31.0" if necessary.

6.15.66 Verify that the displayed values for the following parameters are approximately the values listed:

- Angle: 100
- Speed: 1000
- Hrs: 0
- Mins: 5
- Secs: 0
- Accel: 100
- Decel: 300
- Reset: YES
- ATP TEST SETUP

6.15.67 Verify that the "Test in file." message is displayed and that the "Test setup changed." message is NOT displayed.

6.15.68 Select the GREEN "SET VALUES" button and click the left mouse button.

6.15.69 Verify that the "SELECTED TEST:" field indicates "31.0" and "ATP TEST SETUP".

6.15.70 Select the "POSITION PUMP" button, click the left mouse button, and verify the following under the POSITION MOTOR heading:

- The YELLOW "RUNNING" indicator is illuminated and the WHITE "STOPPED" indicator is NOT illuminated.
- The indicated value in the "Speed" field is approximately "100".

6.15.71 At Station #8, press the "F2" key, and perform the following:

6.15.71.1 Enter DACS Tag # "POSITION" and ensure that the tag is in Manual.

6.15.71.2 Enter "100" in the "AIN" block.

6.15.72 Select the GREEN "ENABLE TEST" button and press the "ENTER" key.

6.15.73 Select the GREEN "START TEST" button and click the left mouse button.

6.15.74 Verify the following under the PUMP MOTOR heading:

- The indicated value in the "Speed" field is increasing.
- The YELLOW "RUNNING" indicator is illuminated and the WHITE "STOPPED" indicator is NOT illuminated.
- The "START TEST" button has turned GRAY.

6.15.75 Verify that both timers under the "ELAPSED TIME" heading are counting.

6.15.76 Verify that the YELLOW "ENABLE STOP" button is illuminated.

6.15.77 Select the "ENABLE STOP" button and click the left mouse button.

6.15.78 Select the flashing YELLOW "STOP TEST" button and click the left mouse button.

6.15.79 Verify the following:

- The WHITE "STOPPED" indicator is illuminated and the YELLOW "RUNNING" indicator is NOT illuminated.
- The displayed value for "Speed" is 0.0.
- The "STOP TEST" button has turned GRAY.
- The "SET VALUES" button has turned GREEN.
- Both timers under the "ELAPSED TIME" heading are displaying positive values.

6.15.80 At Station #8, access the TESTSET screen.

6.15.81 Select the "Test Number" field and enter "31.0".

6.15.82 Select the "Delete Test" button and click the left mouse button.

6.15.83 Access the PUMPRUN screen at Station #8.

6.15.84 Select the "Test" field and enter "31.0".

6.15.85 Verify that the "Test NOT in file." message is displayed.

6.15.86 Press the F2 key and enter DACS tag # "POSITION".

6.15.87 Place the tag in Auto.

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

Test Engineer _____ Date: _____

6.16 Check of Pump Bump Operation (Station #7 as Motor Control Station)

NOTE: Sections 6.16, 6.17, and 6.18 should be performed as a group.

6.16.1 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.

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

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

NOTE: If Section 6.16 is performed immediately following the performance of Section 6.15, then Steps 6.16.2 through 6.16.5 do NOT need to be performed.

6.16.2 Request the West Area Shift Manager (WASM) to ensure local disconnect switches DS-101-25 and DS-101-26 are DANGER Tagged OPEN/OFF.

6.16.3 When the WASM reports that local disconnect switches DS-101-25 and DS-101-26 have been verified to be DANGER Tagged OPEN/OFF, then record the WASM's name, and the time that the disconnect switches were reported DANGER Tagged OFF in the DACS logbook.

6.16.4 Request WASM to remove DANGER Tags from circuit breakers VSD-101-1 and VSD-101-2.

6.16.5 If necessary to allow resetting of the E Stop circuitry, 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 #1.

6.16.6 Ensure that Station #5 is the Master Station.

6.16.7 Shift the motor control station from Station #8 to Station #7.

6.16.8 Ensure that the E Stop circuitry is reset.

6.16.9 Request WASM to close circuit breakers VSD-101-1 and VSD-101-2.

6.16.10 At Station #5 access the PUMPALRM screen.

6.16.11 At Station #6 access the PUMP screen.

6.16.12 At Station #7, access the BUMPPUMP screen.

6.16.13 Input the following parameters at Station #7:

- SET TIME: 2 min
- ACCELERATION: 100
- DECELERATION: 176
- MAX SPEED: 1000
- SET POINT SPEED: 1000

6.16.14 Select the "ENABLE" button and press the ENTER key.

6.16.15 After the Station #7 PLC Alarm/Abort display updates, then verify the following:

- The analog "PUMP SPEED" ("SP") bar graph is colored WHITE and indicates approximately "1000" RPM
- SPD ALARM indicates approximately "1010"
- SPD ABORT indicates approximately "1020"
- CUR ALM indicates approximately "205"
- CUR ABT indicates approximately "210"
- DISPR ALM indicates approximately "86.7"
- DISPR ABT indicates approximately "100"

6.16.16 When the "PLC BUMP ENABLED" circle illuminates GREEN, then select the "BUMP" button and press the ENTER key.

6.16.17 Verify that the "PUMP DATA ARCHIVE RATE" displayed at Station #5 changes from "SLOW (5 MIN)" to "FAST (1 SEC)".

6.16.18 After the Station #7 display shows that the VSD is up to speed, then verify the following:

- "MEASURED SPEED" indicates approximately "1000" RPM
- The analog "PUMP SPEED" ("SP") bar graph is colored GREEN and indicates approximately "1000" RPM
- The analog "PUMP SPEED" ("MEA") bar graph is colored GREEN and indicates approximately "1000" RPM
- The "FORWARD", "AT SPEED", "DRIVE READY", and "RUNNING" circles are illuminated GREEN
- The "REV ENBL" circle is illuminated RED
- The "REVERSE", "STOPPED", and "DRIVE FAULT" circles are NOT illuminated
- The "ELAPSED TIME" counter is counting up from "0" to "2 min"

6.16.19 When the "ELAPSED TIME" counter reaches "1 min 30 sec", then verify that the "BMP30SEC" alarm sounds.

6.16.20 When the "ELAPSED TIME" counter reaches "2 min", then verify that the E Stops are tripped and the VSD stops.

6.16.21 Ensure that the E Stop circuitry is reset.

6.16.22 Request WASM to close circuit breakers VSD-101-1 and VSD-101-2.

6.16.23 Input the following parameters at Station #7:

- SET TIME: 5 min
- ACCELERATION: 100
- DECELERATION: 176
- MAX SPEED: 1000
- SET POINT SPEED: 1000

6.16.24 Select the "ENABLE" button and press the ENTER key.

6.16.25 When the "PLC BUMP ENABLED" circle illuminates GREEN, then select the "BUMP" button and press the ENTER key.

6.16.26 After the Station #7 display shows that the VSD is up to speed, then:

6.16.26.1 Select the YELLOW "ENABLE STOP" button and click the left mouse button.

6.16.26.2 Select the flashing YELLOW "STOP TEST" button and click the left mouse button.

6.16.27 After the Station #7 display updates to show that the VSD is stopped, then verify the following:

- "MEASURED SPEED" indicates "0" RPM
- The analog "PUMP SPEED" ("SP") bar graph is colored WHITE and indicates approximately "1000" RPM
- The analog "PUMP SPEED" ("MEA") bar graph is NOT present (indicates "0" RPM)
- The E Stops have NOT tripped

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

Test Engineer _____ Date: _____

6.17 Checks of Phase B Tests (Station #7 as Motor Control Station)

NOTE: Sections 6.17 should be performed in conjunction with the performance of Sections 6.16 and 6.18.

6.17.1 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.

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

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

NOTE: If Section 6.17 is performed immediately following the performance of Section 6.16, then Steps 6.17.2 through 6.17.7 do NOT need to be performed.

6.17.2 Request the West Area Shift Manager (WASM) to ensure local disconnect switches DS-101-25 and DS-101-26 are DANGER Tagged OPEN/OFF.

6.17.3 When the WASM reports that local disconnect switches DS-101-25 and DS-101-26 have been verified to be DANGER Tagged OPEN/OFF, then record the WASM's name, and the time that the disconnect switches were reported DANGER Tagged OFF in the DACS logbook.

6.17.4 Request WASM to remove DANGER Tags from circuit breakers VSD-101-1 and VSD-101-2.

6.17.5 If necessary to allow resetting of the E Stop circuitry, 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 #1.

6.17.6 Ensure that the E Stop circuitry is reset.

6.17.7 Request WASM to close circuit breakers VSD-101-1 and VSD-101-2.

6.17.8 At Station #5, access the PUMPALRM screen.

6.17.9 Select either the "up" or "down" arrow in the "Choose Test" block and click the left mouse button until "13.0" is displayed.

6.17.10 Verify that the "TEST NOT IN FILE" message is NOT displayed in the "Choose Test" block.

6.17.11 Select the "SET VALUES" button, press the "ENTER" key, and verify that the displayed values for the following parameters are approximately the values listed:

- POSITION SET POINT: 35
- MAX DUR PER ANGLE: 0:30: 0
- SPD SET POINT: 750
- ACCELERATION (Pump Motor): 6 RPM/S
- DECELERATION (Pump Motor): 360 RPM/S
- MAX SPEED: 750
- ACCEL (Dir Drive Motor): 100 RPM/S
- DECEL (Dir Drive Motor): 100 RPM/S
- SETP SPD (Dir Drive Motor): 100 RPM

6.17.12 Select the "POSITION PUMP" button, press the "ENTER" key, and verify that the YELLOW "RUNNING" indicator is illuminated.

6.17.13 At Station #7, press the "F2" key, and perform the following:

6.17.13.1 Enter DACS Tag # "POSITION" and ensure that the tag is in Manual.

6.17.13.2 Enter "35" in the "AIN" block.

6.17.14 Verify the following:

6.17.14.1 The colors of the visible portions of both analog "SetP" and "Meas" indicators have changed from WHITE to GREEN.

6.17.14.2 The WHITE "STOPPED" indicator in the "Nozzle Position (deg)" block is illuminated.

6.17.15 Select the "ENABLE TEST" button, press the "ENTER" key, and verify the following:

6.17.15.1 The display fields for the following parameters are illuminated GREEN:

- "MEASURED POSITION"
- "SPD SET POINT"
- "ACCELERATION"
- "DECELERATION"
- "MAX SPEED"
- "SPD ALARM"
- "SPD ABORT"

6.17.15.2 The "STOP TEST" button has illuminated GREEN.

6.17.16 Select the "START TEST" button and press the "ENTER" key.

6.17.17 Verify that the YELLOW "RUNNING" indicator in the "Pump Speed (RPM)" block is illuminated.

6.17.18 When the mixer pump motor VSD is running at 750 RPM, then verify the following:

6.17.18.1 The colors of the visible portions of both analog "SetP" and "Meas" indicators in the "Pump Speed (RPM)" block have changed from WHITE to GREEN.

6.17.18.2 The fields for "MOTOR AMPS", "MOTOR VOLTS", and "LINE VOLTS" in the "Pump Speed (RPM)" block are indicating positive values.

6.17.18.3 The "Elapsed" timers in the "Test Duration" block for "MAX TEST DURATION" and "MAX DUR PER ANGLE" are counting.

6.17.19 Monitor Stations #5, #6, and #7 during VSD operation for proper system performance.

6.17.19.1 If any unusual performance parameters are noted, then record a description of the condition in Attachment 1, Exception List.

TE: Successful completion of Steps 6.17.20 through 6.17.21 will verify that the Station #7 timer will shut down the mixer pump independent of the PLC test timer.

6.17.20 When the "Elapsed" timer indicates 0: 2: 0, then perform the following at Station #7:

6.17.20.1 Press the F2 key.

6.17.20.2 Enter DACS Tag #PBRAMP in the "TAG" block in the lower portion of the screen.

6.17.20.3 Press the TAB key to access the "LLIM" block.

6.17.20.4 Enter a value of "1740" in the "LLIM" block, and press the "ENTER" key.

6.17.20.5 After a time delay, verify that the "PB30SEC" alarm is annunciated at Station #7.

6.17.21 When the value in the "MAX DUR PER ANGLE" block reaches "0:30: 00", then verify the following:

- An E Stop trip has NOT actuated.
- The mixer pump motor VSD has stopped.
- The "START TEST" and "STOP TEST" buttons have turned GRAY.
- The indicated values for "MOTOR AMPS" and "MOTOR VOLTS" are "0".
- The "RUNNING" indicators in the "Nozzle Position (deg)" and Pump Speed (RPM) blocks are dark.

6.17.22 Enter a value of "0" in the "LLIM" block for DACS Tag #PBRAMP, and press the "ENTER" key.

6.17.23 Select either the "up" or "down" arrow in the "Choose Test" block and click the left mouse button until "15.0" is displayed.

6.17.24 Verify that the "TEST NOT IN FILE" message is NOT displayed in the "Choose Test" block.

6.17.25 Select the "SET VALUES" button, press the "ENTER" key, and verify that the displayed values for the following parameters are approximately the values listed:

- POSITION SET POINT: 95
- MAX DUR PER ANGLE: 30
- SPD SET POINT: 750
- ACCELERATION (Pump Motor): 6 RPM/S
- DECELERATION (Pump Motor): 360 RPM/S
- MAX SPEED: 750
- ACCEL (Dir Drive Motor): 100 RPM/S
- DECEL (Dir Drive Motor): 100 RPM/S
- SETP SPD (Dir Drive Motor): 100 RPM

6.17.26 Select the "POSITION PUMP" button, press the "ENTER" key, and verify that the YELLOW "RUNNING" indicator is illuminated.

6.17.27 At Station #7, press the "F2" key, and perform the following:

6.17.27.1 Enter DACS Tag # "POSITION" and ensure that the tag is in Manual.

6.17.27.2 Enter "95" in the "AIN" block.

6.17.28 Verify the following:

6.17.28.1 The colors of the visible portions of both analog "SetP" and "Meas" indicators have changed from WHITE to GREEN.

6.17.28.2 The WHITE "STOPPED" indicator in the "Nozzle Position (deg)" block is illuminated.

6.17.29 Select the "ENABLE TEST" button and press the "ENTER" key.

6.17.30 When the "START TEST" button illuminates GREEN, then select the "START TEST" button, press the "ENTER" key, and verify that the YELLOW "RUNNING" indicator in the "Pump Speed (RPM)" block is illuminated.

6.17.31 When the mixer pump motor VSD is running at 750 RPM, then verify the following:

6.17.31.1 The colors of the visible portions of both analog "SetP" and "Meas" indicators in the "Pump Speed (RPM)" block have changed from WHITE to GREEN.

6.17.31.2 The fields for "MOTOR AMPS", "MOTOR VOLTS", and "LINE VOLTS" in the "Pump Speed (RPM)" block are indicating positive values.

6.17.32 The "Elapsed" timers in the "Test Duration" block for "MAX TEST DURATION" and "MAX DUR PER ANGLE" are counting.

6.17.33 Monitor Stations #5, #6, and #7 during VSD operation for proper system performance.

6.17.33.1 If any unusual performance parameters are noted, then record a description of the condition in Attachment 1, Exception List.

NOTE: Successful completion of Steps 6.17.34 through 6.17.35 will verify that the PLC timer will shut down the mixer pump independent of the Station #7 test timer.

6.17.34 When the "Elapsed" timer indicates 0: 2: 0, then perform the following at Station #7:

6.17.34.1 Press the F2 key.

6.17.34.2 Enter DACS Tag #PBDNTM and place the tag in "Manual".

6.17.34.3 Verify that the value for "out" is "0".

6.17.34.4 Press the F2 key.

6.17.34.5 Enter DACS Tag #PBCALSEC.

6.17.34.6 Press the "Page Down" key and then place the tag in "Manual".

6.17.34.7 Enter a value of "210" in the "AIN" block for "out1", and press the "ENTER" key.

6.17.35 When the PLC causes the test to terminate, then verify the following:

- An E Stop trip has been actuated.
- The mixer pump motor VSD has stopped.
- The "START TEST" and "STOP TEST" buttons have turned GRAY.
- The indicated values for "MOTOR AMPS", "MOTOR VOLTS", and "LINE VOLTS" are all "0".
- The "RUNNING" indicators in the "Nozzle Position (deg)" and Pump Speed (RPM) blocks are dark.

6.17.36 Perform the following at Station #7:

6.17.36.1 Press the F2 key.

6.17.36.2 Enter DACS Tag #PBDNTM and place the tag in "Auto".

6.17.36.3 Press the F2 key.

6.17.36.4 Enter DACS Tag #PBCALSEC and place the tag in "Auto".

6.17.37 Ensure that the E Stop circuitry is reset.

6.17.38 Ensure that VSD-101-1, directional drive motor power supply circuit breaker and VSD-101-2, mixer pump motor power supply circuit breaker, are closed (or "ON").

6.17.39 Select either the "up" or "down" arrow in the "Choose Test" block and click the left mouse button until "18.0" is displayed.

6.17.40 Verify that the "TEST NOT IN FILE" message is NOT displayed in the "Choose Test" block.

6.17.41 Select the "SET VALUES" button, press the "ENTER" key, and verify that the displayed values for the following parameters are approximately the values listed:

- POSITION SET POINT: 185
- MAX DUR PER ANGLE: 0:30: 0
- SPD SET POINT: 750
- ACCELERATION (Pump Motor): 6 RPM/S
- DECELERATION (Pump Motor): 360 RPM/S
- MAX SPEED: 750
- ACCEL (Dir Drive Motor): 100 RPM/S
- DECEL (Dir Drive Motor): 100 RPM/S
- SETP SPD (Dir Drive Motor): 100 RPM

6.17.42 Select the "POSITION PUMP" button, press the "ENTER" key, and verify that the YELLOW "RUNNING" indicator is illuminated.

6.17.43 At Station #7, press the "F2" key, and perform the following:

6.17.43.1 Enter DACS Tag # "POSITION" and ensure that the tag is in Manual.

6.17.43.2 Enter "185" in the "AIN" block.

6.17.44 Verify the following:

6.17.44.1 The colors of the visible portions of both analog "SetP" and "Meas" indicators have changed from WHITE to GREEN.

6.17.44.2 The WHITE "STOPPED" indicator in the "Nozzle Position (deg)" block is illuminated.

6.17.45 Select the "ENABLE TEST" button and press the "ENTER" key.

6.17.46 When the "START TEST" button illuminates GREEN, then select the "START TEST" button, press the "ENTER" key, and verify that the YELLOW "RUNNING" indicator in the "Pump Speed (RPM)" block is illuminated.

6.17.47 When the mixer pump motor VSD is running at 750 RPM, then verify the following:

6.17.47.1 The colors of the visible portions of both analog "SetP" and "Meas" indicators in the "Pump Speed (RPM)" block have changed from WHITE to GREEN.

6.17.47.2 The fields for "MOTOR AMPS", "MOTOR VOLTS", and "LINE VOLTS" in the "Pump Speed (RPM)" block are indicating positive values.

6.17.47.3 The "Elapsed" timers in the "Test Duration" block for "MAX TEST DURATION" and "MAX DUR PER ANGLE" are counting.

6.17.48 Monitor Stations #5, #6, and #7 during VSD operation for proper system performance.

6.17.48.1 If any unusual performance parameters are noted, then record a description of the condition in Attachment 1, Exception List.

6.17.49 When the "Elapsed" timer indicates 0: 2: 0, then perform the following at Station #7:

6.17.49.1 Press the F2 key and enter DACS Tag #PBRAMP.

6.17.49.2 Press the TAB key to access the "LLIM" block, enter a value of "1740", and press the "ENTER" key.

6.17.49.3 After a time delay, verify that the "PB30SEC" alarm is annunciated at Station #7.

6.17.50 When the value in the "MAX DUR PER ANGLE" block reaches "0:30:00", then verify the following:

- An E Stop trip has NOT actuated.
- The mixer pump motor VSD has stopped.
- The "START TEST" and "STOP TEST" buttons have turned GRAY.
- The indicated values for "MOTOR AMPS" and "MOTOR VOLTS" are "0".
- The "RUNNING" indicators in the "Nozzle Position (deg)" and Pump Speed (RPM) blocks are dark.

6.17.51 Press the TAB key to access the "LLIM" block for DACS Tag #PBRAMP, enter a value of "0", and press the "ENTER" key.

6.17.52 Press the F2 key and enter DACS tag # "POSITION".

6.17.53 Place the tag in Auto.

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: _____

6.18 Check of PUMPRUN Screen (Station #7 as Motor Control Station)

NOTE: Section 6.18 should be performed in conjunction with the performance of Sections 6.16 and 6.17.

6.18.1 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.

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

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

NOTE: If Section 6.18 is performed immediately following the performance of Section 6.17, then Steps 6.18.2 through 6.18.7 do NOT need to be performed.

6.18.2 Request the West Area Shift Manager (WASM) to ensure mixer pump motor local disconnect switch DS-101-25 and directional drive motor local disconnect switch DS-101-26 are DANGER Tagged OPEN/OFF.

6.18.3 When the WASM reports that local disconnect switches DS-101-25 and DS-101-26 have been verified to be DANGER Tagged OPEN/OFF, then record the WASM's name, and the time that the disconnect switches were reported in the required positions in the DACS logbook.

6.18.4 Request WASM to remove DANGER Tags from circuit breakers VSD-101-1 and VSD-101-2.

6.18.5 If necessary to allow resetting of the E Stop circuitry, 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 #1.

6.18.6 Ensure that the E Stop circuitry is reset.

6.18.7 Request WASM to close circuit breakers VSD-101-1 and VSD-101-2.

6.18.8 At Station #7, access the PUMPRUN screen.

6.18.9 Select the "Test" field and enter "1.0".

6.18.10 Select the GREEN "SET VALUES" button and click the left mouse button.

6.18.11 Refer to Table PR and verify that the parameters displayed for Test 1.0 are the same as the parameters listed for Test 1.0 in Table PR.

6.18.12 Select the "STOP TEST" button and click the left mouse button.

6.18.13 Repeat Steps 6.18.9 through 6.18.12 for Tests 2.0 through 30.0, then goto Step 6.18.14.

TABLE PR

TEST #	TIME (H/M/S)	SPEED (RPM)	ANGLE (DEG)	ACCEL (RPM/S)	DECEL (RPM/S)	RESET	TITLE
1.0	5 MIN	1000	28	100	176	YES	BUMP AT 28 DEG
2.0	5 MIN	1000	65	100	176	YES	BUMP AT 65 DEG
3.0	5 MIN	1000	97	100	176	YES	BUMP AT 97 DEG
4.0	5 MIN	1000	125	100	176	YES	BUMP AT 125 DEG
5.0	5 MIN	1000	155	100	176	YES	BUMP AT 155 DEG
6.0	5 MIN	1000	185	100	176	YES	BUMP AT 185 DEG
7.0	1 HR	750	28	100	176	YES	1 HR RUN AT 28 DEG
8.0	1 HR	750	65	100	176	YES	1 HR RUN AT 65 DEG
9.0	1 HR	750	97	100	176	YES	1 HR RUN AT 97 DEG
10.0	1 HR	750	125	100	176	YES	1 HR RUN AT 125 DEG
11.0	1 HR	750	155	100	176	YES	1 HR RUN AT 155 DEG
12.0	1 HR	750	185	100	176	YES	1 HR RUN AT 185 DEG
13.0	30 MIN	750	35	6	360	YES	PHASE B AT 35 DEG
14.0	30 MIN	750	65	6	360	NO	PHASE B AT 65 DEG
15.0	30 MIN	750	95	6	360	NO	PHASE B AT 95 DEG
16.0	30 MIN	750	125	6	360	NO	PHASE B AT 125 DEG
17.0	30 MIN	750	155	6	360	NO	PHASE B AT 155 DEG
18.0	30 MIN	750	185	6	360	NO	PHASE B AT 185 DEG
19.0	25 MIN	1000	28	100	176	YES	25 MIN EXCAV, 28 DEG
20.0	25 MIN	1000	65	100	176	YES	25 MIN EXCAV, 65 DEG
21.0	25 MIN	1000	97	100	176	YES	25 MIN EXCAV, 97 DEG

TEST #	TIME (H/M/S)	SPEED (RPM)	ANGLE (DEG)	ACCEL (RPM/S)	DECEL (RPM/S)	RESET	TITLE
22.0	25 MIN	1000	125	100	176	YES	25 MIN EXCAV, 125 DEG
23.0	25 MIN	1000	155	100	176	YES	25 MIN EXCAV, 155 DEG
24.0	25 MIN	1000	185	100	176	YES	25 MIN EXCAV, 185 DEG
25.0	40 MIN	920	28	100	176	YES	40 MIN EXCAV, 28 DEG
26.0	40 MIN	920	65	100	176	YES	40 MIN EXCAV, 65 DEG
27.0	40 MIN	920	97	100	176	YES	40 MIN EXCAV, 97 DEG
28.0	40 MIN	920	125	100	176	YES	40 MIN EXCAV, 125 DEG
29.0	40 MIN	920	155	100	176	YES	40 MIN EXCAV, 155 DEG
30.0	40 MIN	920	185	100	176	YES	40 MIN EXCAV, 185 DEG

6.18.14 Select the "Test" field and enter "13.0".

6.18.15 Select the GREEN "SET VALUES" button and click the left mouse button.

6.18.16 Verify that the displayed values for the following parameters are approximately the values listed:

- Test: 13.0
- Angle: 35
- Speed: 750
- Hrs: 0
- Mins: 30
- Secs: 0
- Accel: 6
- Decel: 360
- Reset: NO
- PHASE B AT 35 DEG

6.18.17 Verify that the "Test in file." message is displayed and that the "Test setup changed." message is NOT displayed.

6.18.18 Verify that the "SELECTED TEST:" field indicates "13.0" and "PHASE B AT 35 DEG".

6.18.19 Verify the following under the POSITION MOTOR heading:

- If the indicated mixer pump position angle is any angle other than 35 (33 to 37), then the value in the "Angle" field is displayed in YELLOW letters, and the "POSITION PUMP" button is GREEN.
- If the indicated mixer pump position angle is 35 (33 to 37), then the value in the "Angle" field is displayed in GREEN letters, and the "POSITION PUMP" button is GRAY.
- The value displayed in the "Speed" field is "0.0".
- The WHITE "STOPPED" indicator is illuminated and the YELLOW "RUNNING" indicator is NOT illuminated.

6.18.20 Verify the following under the ELAPSED TIME heading:

- The displayed value for "Current" is 0: 0: 0.
- The displayed value for "Total" is 0: 0: 0.
- If the "POSITION PUMP" button is GREEN, then the "ENABLE TEST" button is GRAY.
- If the "POSITION PUMP" button is GRAY, then the "ENABLE TEST" button is GREEN.

6.18.21 Verify the following under the PUMP MOTOR heading:

- The displayed value for "Speed" is 0.0 and is colored GREEN.
- The WHITE "STOPPED" indicator is illuminated and the YELLOW "RUNNING" indicator is NOT illuminated.
- The "START TEST" and "STOP TEST" buttons are GRAY.

6.18.22 If the "POSITION PUMP" button is GRAY and the "ENABLE TEST" button is GREEN, then goto Step 6.18.27.

6.18.23 If the "POSITION PUMP" button is GREEN, then select the "POSITION PUMP" button, click the left mouse button, and verify the following under the POSITION MOTOR heading:

- The YELLOW "RUNNING" indicator is illuminated and the WHITE "STOPPED" indicator is NOT illuminated.
- The indicated value in the "Speed" field is approximately "100".

6.18.24 At Station #7, press the "F2" key, and perform the following:

6.18.24.1 Enter DACS Tag # "POSITION" and ensure that the tag is in Manual.

6.18.24.2 Enter "35" in the "AIN" block.

6.18.25 Verify the following under the POSITION MOTOR heading:

- The value in the "Angle" field is "35" and is displayed in GREEN letters.
- The displayed value for "Speed" is 0.0.
- The WHITE "STOPPED" indicator is illuminated and the YELLOW "RUNNING" indicator is NOT illuminated.
- The "POSITION PUMP" button is GRAY.

6.18.26 Verify that the "ENABLE TEST" button is GREEN.

6.18.27 Select the "ENABLE TEST" button and click the left mouse button.

TE: If the test is not started within 60 seconds after the test is enabled (when the "START TEST" button turns GREEN), then the "START TEST" button will be illuminated GRAY, and the test will no longer be enabled.

6.18.28 When the "START TEST" button turns GREEN and the "ENABLE TEST" button turns GRAY, then start a stopwatch.

6.18.29 When the "START TEST" button is no longer illuminated GREEN, then stop the stopwatch and record the elapsed time: _____ secs.

6.18.29.1 Reset the stopwatch.

6.18.30 Verify that the "ENABLE TEST" button is illuminated GREEN and the "START TEST" button is illuminated GRAY.

6.18.31 Select the "ENABLE TEST" button and press the "ENTER" key.

6.18.32 When the "START TEST" button turns GREEN and the "ENABLE TEST" button turns GRAY, then select the "START TEST" button and click the left mouse button.

6.18.33 Verify the following under the PUMP MOTOR heading:

- The indicated value in the "Speed" field is increasing.
- The YELLOW "RUNNING" indicator is illuminated and the WHITE "STOPPED" indicator is NOT illuminated.
- The "START TEST" button has turned GRAY.

6.18.34 Verify that both timers under the "ELAPSED TIME" heading are counting.

6.18.35 Verify that the YELLOW "ENABLE STOP" button is illuminated.

6.18.36 Select the "ENABLE STOP" button and click the left mouse button.

6.18.37 Select the flashing YELLOW "STOP TEST" button and click the left mouse button.

6.18.38 Verify the following:

- The WHITE "STOPPED" indicator is illuminated and the YELLOW "RUNNING" indicator is NOT illuminated.
- The displayed value for "Speed" is 0.0.
- The "STOP TEST" button has turned GRAY.
- The "SET VALUES" button has turned GREEN.
- Both timers under the "ELAPSED TIME" heading are displaying positive values.

6.18.39 Select the GREEN "SET VALUES" button and click the left mouse button.

6.18.40 Select the GREEN "ENABLE TEST" button and press the "ENTER" key.

6.18.41 Select the GREEN "START TEST" button, click the left mouse button, and start a stopwatch.

6.18.42 Monitor pump parameters at Stations #5, #6, and #7 for consistent, expected values during the 30-minute simulated pump run.

NOTE: An alarm will be annunciated at Station #7 approximately 30 seconds before the end of the test.

6.18.43 When the "PB30SEC" alarm is received at Station #7, then record the elapsed time on the stopwatch: _____ .

6.18.44 When the timers under the "ELAPSED TIME" heading indicate 0:30: 0, then stop the stopwatch.

6.18.44.1 Record the elapsed time on the stopwatch: _____.

6.18.44.2 Reset the stopwatch.

6.18.45 Verify the following:

- The WHITE "STOPPED" indicator is illuminated and the YELLOW "RUNNING" indicator is NOT illuminated.
- The displayed value for "Speed" is 0.0.
- The "STOP TEST" button has turned GRAY.
- The "SET VALUES" button has turned GREEN.
- The "Current" timer under the "ELAPSED TIME" heading is displaying 0: 0: 0.
- The "Total" timer under the "ELAPSED TIME" heading is displaying 0:30: 0.

6.18.46 Select the "Test" field and enter "1.0".

6.18.47 Input/verify the following parameters at Station #7:

- Angle: 50
- Speed: 900
- Hrs: 0
- Mins: 5
- Secs: 0
- Accel: 100
- Decel: 176
- Reset: YES
- BUMP AT 28 DEG

6.18.48 Verify that the "Test in file." and "Test setup changed." messages are displayed.

6.18.49 Select the GREEN "SET VALUES" button and click the left mouse button.

6.18.50 Verify that the "SELECTED TEST:" field is displaying "MANUAL" in YELLOW letters.

6.18.51 Select the "POSITION PUMP" button, click the left mouse button, and verify the following under the POSITION MOTOR heading:

- The YELLOW "RUNNING" indicator is illuminated and the WHITE "STOPPED" indicator is NOT illuminated.
- The indicated value in the "Speed" field is approximately "100".

6.18.52 At Station #7, press the "F2" key, and perform the following:

6.18.52.1 Enter DACS Tag # "POSITION" and ensure that the tag is in Manual.

6.18.52.2 Enter "50" in the "AIN" block.

6.18.53 Select the GREEN "ENABLE TEST" button and press the "ENTER" key.

6.18.54 Select the GREEN "START TEST" button and click the left mouse button.

6.18.55 Verify the following under the PUMP MOTOR heading:

- The indicated value in the "Speed" field is increasing.
- The YELLOW "RUNNING" indicator is illuminated and the WHITE "STOPPED" indicator is NOT illuminated.
- The "START TEST" button has turned GRAY.

6.18.56 Verify that both timers under the "ELAPSED TIME" heading are counting.

6.18.57 Verify that the YELLOW "ENABLE STOP" button is illuminated.

6.18.58 Select the "ENABLE STOP" button and click the left mouse button.

6.18.59 Select the flashing YELLOW "STOP TEST" button and click the left mouse button.

6.18.60 Verify the following:

- The WHITE "STOPPED" indicator is illuminated and the YELLOW "RUNNING" indicator is NOT illuminated.
- The displayed value for "Speed" is 0.0.
- The "STOP TEST" button has turned GRAY.
- The "SET VALUES" button has turned GREEN.
- Both timers under the "ELAPSED TIME" heading are displaying positive values.

6.18.61 At Station #7, access the TESTSET screen.

6.18.62 Input the following values for the parameters listed:

- Test Number: 31.0
- Angle (deg): 100
- Speed (RPM): 1000
- Duration: 0: 5: 0
- Accel (RPM/S): 100
- Decel (RPM/S): 300
- Elapsed Time Reset: YES
- ATP TEST SETUP

6.18.63 Select the "Save Test" button and click the left mouse button.

6.18.64 Access the PUMPRUN screen at Station #7.

6.18.65 Select the "Test" field and enter "31.0" if necessary.

6.18.66 Verify that the displayed values for the following parameters are approximately the values listed:

- Angle: 100
- Speed: 1000
- Hrs: 0
- Mins: 5
- Secs: 0
- Accel: 100
- Decel: 300
- Reset: YES
- ATP TEST SETUP

6.18.67 Verify that the "Test in file." message is displayed and that the "Test setup changed." message is NOT displayed.

6.18.68 Select the GREEN "SET VALUES" button and click the left mouse button.

6.18.69 Verify that the "SELECTED TEST:" field indicates "31.0" and "ATP TEST SETUP".

6.18.70 Select the "POSITION PUMP" button, click the left mouse button, and verify the following under the POSITION MOTOR heading:

- The YELLOW "RUNNING" indicator is illuminated and the WHITE "STOPPED" indicator is NOT illuminated.
- The indicated value in the "Speed" field is approximately "100".

6.18.71 At Station #7, press the "F2" key, and perform the following:

6.18.71.1 Enter DACS Tag # "POSITION" and ensure that the tag is in Manual.

6.18.71.2 Enter "100" in the "AIN" block.

6.18.72 Select the GREEN "ENABLE TEST" button and press the "ENTER" key.

6.18.73 Select the GREEN "START TEST" button and click the left mouse button.

6.18.74 Verify the following under the PUMP MOTOR heading:

- The indicated value in the "Speed" field is increasing.
- The YELLOW "RUNNING" indicator is illuminated and the WHITE "STOPPED" indicator is NOT illuminated.
- The "START TEST" button has turned GRAY.

6.18.75 Verify that both timers under the "ELAPSED TIME" heading are counting.

6.18.76 Verify that the YELLOW "ENABLE STOP" button is illuminated.

6.18.77 Select the "ENABLE STOP" button and click the left mouse button.

6.18.78 Select the flashing YELLOW "STOP TEST" button and click the left mouse button.

6.18.79 Verify the following:

- The WHITE "STOPPED" indicator is illuminated and the YELLOW "RUNNING" indicator is NOT illuminated.
- The displayed value for "Speed" is 0.0.
- The "STOP TEST" button has turned GRAY.
- The "SET VALUES" button has turned GREEN.
- Both timers under the "ELAPSED TIME" heading are displaying positive values.

6.18.80 At Station #7, access the TESTSET screen.

6.18.81 Select the "Test Number" field and enter "31.0".

6.18.82 Select the "Delete Test" button and click the left mouse button.

6.18.83 Access the PUMPRUN screen at Station #7.

6.18.84 Select the "Test" field and enter "31.0".

6.18.85 Verify that the "Test NOT in file." message is displayed.

6.18.86 Press the F2 key and enter DACS tag # "POSITION".

6.18.87 Place the tag in Auto.

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

Test Engineer _____ Date: _____

6.19 Check of "Pump Discharge Minus Baseline" Alarm and Abort Levels

NOTE: Section 6.19 shall be performed at the DACS Development Center.

6.19.1 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.

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

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

6.19.2 Ensure that Station #5 is the master station and that Station #8 is the motor control station.

6.19.3 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 the PLC monitor.

6.19.4 At Station #5, access the "ALARM/EVENT SUMMARY" screen.

6.19.5 At Station #7, access the "PUMPALRM" screen.

6.19.6 At Station #7, press the F2 key and enter "PIR12A01".

6.19.7 At Station #8, access the "PUMPRUN" screen.

6.19.8 Select the "Test" field and enter "13.0".

6.19.9 Select the GREEN "SET VALUES" button and click the left mouse button.

6.19.10 At Station #8, press the "F2" key, and perform the following:

6.19.10.1 Enter DACS Tag # "POSITION" and ensure that the tag is in Manual.

6.19.10.2 Enter "35" in the "AIN" block.

6.19.11 Ensure that PLC Module Group A is "traffic copped" into the Development System PLC.

6.19.12 Ensure that Module Group A is displayed at the PLC monitor.

6.19.13 Adjust the potentiometer at address "4.2.6.3" until the display on the PLC monitor for PIR12A01 indicates approximately "60".

6.19.14 Select the "ENABLE TEST" button and press the "ENTER" key.

NOTE: The displayed Alarm and Abort values for pump discharge pressure should be equal to 47.2 PSID and 55.1 PSID respectively, ± 1 PSID.

6.19.15 Verify that the displayed pump discharge pressure alarm limit, as read at Station #7 is approximately 47.2 PSID.

6.19.16 Verify that the displayed pump discharge pressure abort limit, as read at Station #7 is approximately 55.1 PSID.

6.19.17 At Station #8, select the "START TEST" button, click the left mouse button, and verify that the motor simulator is running.

6.19.18 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.

6.19.19 Verify that no alarm or abort indications are present for DACS Tag # PCR12A01, on the "PUMPALRM" screen at Station #7.

6.19.20 At the PLC monitor, ensure that the abort coil for mixer pump discharge pressure is enabled.

NOTE: The alarm and abort should occur when the PLC monitor display shows a value of approximately "1348" and "1563", for PIR12A01, respectively.

6.19.21 Adjust the "4.2.6.3" potentiometer until:

- The indicated alarm limit value in the "Alarm Limit" Column turns RED at Station #7.
- "PCR12A01" in the "TAG" Column turns RED at Station #7.
- The wording in the "DESCRIPTION" Column turns RED at Station #7.
- "PSID" in the "UNITS" Column turns RED at Station #7.
- An alarm is annunciated on the "ALARM/EVENT SUMMARY" screen, at Station #5.

6.19.22 Record the value displayed in the "Current Value" column for PCR12A01 on the "PUMPALRM" screen: _____.

6.19.23 If the value at which the alarm actuated was uncertain, then:

6.19.23.1 Adjust the "4.2.6.3" potentiometer to decrease the signal below the alarm point.

6.19.23.2 Repeat Steps 6.19.21 through 6.19.23.1 until the correct alarm actuation value is determined, and goto Step 6.19.24.

6.19.24 Adjust the "4.2.6.3" potentiometer to slowly increase the signal until an abort is actuated.

6.19.25 Record the value displayed in the "Current Value" column for PCR12A01 on the "PUMPALRM" screen: _____.

6.19.26 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 approximately "60", as read on the PLC monitor.

6.19.27 Ensure that the abort coil is reset.

6.19.28 Select the GREEN "SET VALUES" button and click the left mouse button.

6.19.29 Select the "ENABLE TEST" button and press the "ENTER" key.

6.19.30 Select the "START TEST" button and click the left mouse button.

6.19.31 Repeat Steps 6.19.24 through 6.19.30 as necessary to actuate the abort, until the setpoint is determined, then goto Step 6.19.32.

6.19.32 Adjust the "4.2.6.3" potentiometer until the PLC monitor displays a value of approximately "100" for DACS Tag #PIR12A01.

6.19.33 At Station #8, 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.

Test Engineer: _____ Date: _____

6.20 Loss of Programmable Logic Controller Alarm Check

NOTE:	Testing per this section may be performed at any time, at the discretion of the Test Director, and shall be performed at the DACS trailer.

6.20.1 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.

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

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

6.20.2 At the instrument racks in the back of the DACS trailer, ensure that the AC PWR switches for both 984, Model 785E Programmable Logic Controllers (PLCs) are ON and that both DC PWR switches are OFF.

6.20.3 Ensure that the latest version of the MODBUS PLUS software has been down-loaded to both PLCs.

6.20.4 Exit the operating program at Station #5, access a "C" prompt, and load the latest version of the Genesis software.

6.20.5 Access the ALARM/EVENT SUMMARY screen at Station #5, and acknowledge all alarms.

6.20.6 Ensure that the S911 HOT STANDBY PROCESSOR status lights indicate that one PLC is the "PRIMARY" PLC and the other PLC is in "STANDBY".

6.20.7 Turn off the AC power to the PLC in STANDBY and verify that the "PLCOK 1 - PLCOK; 0 - PLC PROBLEM" alarm is received at Station #5.

6.20.7.1 Acknowledge the alarm at Station #5.

6.20.8 Turn on the AC power to the PLC that was in STANDBY and verify that the "PLCOK 1 - PLCOK; 0 - PLC PROBLEM" alarm has cleared.

6.20.9 Turn off the AC power to the PRIMARY PLC and verify that the "PLCOK 1 - PLCOK; 0 - PLC PROBLEM" alarm is received at Station #5.

6.20.9.1 Acknowledge the alarm at Station #5.

6.20.10 Verify that the PLC that was in STANDBY is now the PRIMARY PLC.

6.20.11 Turn on the AC power to the PLC that was the PRIMARY PLC and verify that the "PLCOK 1 - PLCOK; 0 - PLC PROBLEM" alarm has cleared.

6.20.12 Verify that the PLC that was originally the PRIMARY PLC is now in STANDBY.

6.20.13 Turn off the AC power to both PLCs and verify that the "PLCCOMFA" alarm is received at Station #5.

6.20.14 Restore AC power to only one PLC, reload the PLC program, and verify that the "PLCCOMFA" alarm has cleared at Station #5.

6.20.15 Exit the operating program at Station #5, access a "C" prompt, and load the latest version of the Genesis software.

6.20.16 Access the ALARM/EVENT SUMMARY screen at Station #5, and acknowledge all alarms.

6.20.17 Down-load the latest version of the MODBUS PLUS software to the operating PLC, and turn the controller OFF at the prompt.

6.20.18 After approximately a 10-second time delay, verify that the "PLCCOMFA" alarm is received at Station #5.

6.20.19 Restore AC power to both PLCs and verify:

- The "PLCCOMFA" alarm has cleared at Station #5.
- One PLC is the PRIMARY PLC.
- One PLC is in STANDBY.

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: _____

6.21 Checks of Programmable Logic Controller (PLC) Inputs

NOTE: Testing per this section will be conducted using a development system.

6.21.1 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.

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

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

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

6.21.3 Refer to Table 2, "PLC Inputs and Input Groups" of Appendix 2 for the DACS tag #s, development system module address, and PLC address code for testing of sensors per this procedure section.

NOTES: Development system personnel will 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.

6.21.4 Locate the portion of Table 2 for Module Group A.

6.21.5 Request development system personnel to configure the "field" input modules for Module Group A.

6.21.6 Request development system personnel to access the appropriate PLC Modsoft screen for testing Module Group A.

6.21.7 Reboot Station #5 to reset the abort limits.

6.21.8 Request development system personnel to disable abort coils as required to deenergize PLC coil #22.

6.21.9 At Station #5, for sensors that provide alarm and abort functions, display the proper control screen (CS) for checking current values, alarm values, and abort values for each sensor by first displaying the CSMAIN screen and then selecting the "To Screen" block, associated with the line describing the appropriate sensor type.

6.21.10 Refer to the "DACS Tag" Column of the Table 2 data sheet and locate the tag number of the first sensor to be tested in Module Group A.

6.21.11 Refer to the "DEV SYSTEM LOCATION" Column of the data sheets, to direct development system personnel in locating the correct module for the sensor to be tested.

6.21.12 If the sensor does NOT provide alarm and/or abort signals, then press the F2 key at Station #5 and type the tag number for the sensor being tested.

6.21.13 If the sensor being tested provides an analog signal, then goto Step 6.21.21.

6.21.14 If the sensor being tested provides a digital input, then:

6.21.14.1 Request development system personnel to apply the required input/test signal to cause a change of state ("ON" to "OFF" or "OFF" to "ON") as indicated at Station #5.

6.21.14.2 Record that the sensor change of state occurred by entering "YES" in the "D:" block of the "HIGH END READING" column of the respective data sheet.

6.21.15 If the sensor being tested does NOT provide an alarm and/or abort indication, then goto Step 6.21.22.

6.21.16 If the sensor being tested provides an alarm and/or abort indication, then:

6.21.16.1 Ensure that the abort coil associated with the sensor being tested is enabled, prior to testing the abort function

6.21.16.2 Initial the "AL:" block and/or the "AB:" block in the "ALARM/ABORT VALUES (DACS) column of the respective data sheet, if the alarm and/or abort signal was indicated when the displayed sensor value changed state.

6.21.16.3 Verify that the alarm and/or abort is displayed on the "ALARM/EVENT SUMMARY" screen, at Station #5.

6.21.16.4 Verify that some or all of the DACS tag number, description, and current value indications for the sensor being tested are being displayed in RED on any other associated screens.

NOTE: There is no E Stop circuit installed in the development system. 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 system, 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.

6.21.16.5 If an abort was actuated, then verify that PLC coil #22 is energized.

6.21.17 Request development system personnel to remove the applied input/test signal.

6.21.18 If an alarm and/or abort indication was actuated when the sensor was tested, then verify that the alarm and/or abort condition has cleared.

6.21.19 Reset the abort coil at Station #5.

6.21.19.1 Ensure that PLC coil #22 is de-energized.

6.21.20 If testing was completed satisfactorily, then initial the "TEST ENGINEER INITIALS" block for the sensor that was tested and goto Step 6.21.25.

6.21.21 If the sensor being tested provides an analog input, then:

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" will correspond to a reading at the low end of the sensor range, as read at Station #5. A displayed Modsoft value of "2048" will correspond to a reading at the middle of the sensor range as read at Station #5. A displayed Modsoft value of "4095" will correspond to a reading at the high end of the sensor range as read at Station #5. Values in parenthesis "(XXXX)" in the "AL:" and "AB:" blocks on the data sheets are approximate Modsoft values for the alarm and abort setpoints for the associated sensors.

6.21.21.1 Request development system personnel to apply an input/test signal of "0" as read on the PLC Modsoft display for the sensor being tested.

6.21.21.2 Record the corresponding value displayed at Station #5, in the "D:" block in the "LOW END READING" Column, on the respective data sheet.

6.21.21.3 Request development system personnel to apply an input/test signal of "2048" as read on the PLC Modsoft display for the sensor being tested.

6.21.21.4 Record the corresponding value displayed at Station #5, in the "D:" block in the "MID RANGE READING" Column, on the respective data sheet.

6.21.21.5 Request development system personnel to apply an input/test signal of "4095" as read on the PLC Modsoft display for the sensor being tested.

6.21.21.6 Record the corresponding value displayed at Station #5, in the "D:" block in the "HIGH END READING" Column, on the respective data sheet.

6.21.22 If the sensor being tested does NOT provide alarm and/or abort signals, then request development system personnel to adjust the applied input/test signal to provide a normal, on-scale reading at Station #5.

6.21.23 If testing was completed satisfactorily, then initial the "TEST ENGINEER INITIALS" block for the sensor that was tested and goto Step 6.21.25.

6.21.24 If the sensor being tested provides alarm and/or abort signals, then:

6.21.24.1 Request the development system personnel to vary the applied input/test signal as required to clear any active alarm and/or abort conditions.

6.21.24.2 Ensure that the abort coil(s) for the sensor being tested is(are) enabled.

TE: There is no E Stop circuit installed in the development system. 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 system, 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.

6.21.24.3 Ensure that all alarms and/or aborts associated with the sensor being tested are clear at Station #5, and that PLC coil #22 is deenergized.

6.21.24.4 Request development system personnel to slowly adjust the applied input/test signal to actuate the alarm(s) and/or abort(s), using the values in parenthesis in the "AL:" and "AB:" blocks on the data sheets, as a guide.

)TES: Some sensors provide HI and LO alarms and/or aborts. During testing of these sensors, ALL associated alarms and/or aborts shall be tested. Readings for LOW alarms and aborts are to be recorded in the "LO AL:" and "LO AB:" blocks respectively. Readings for HIGH alarms and aborts are to be recorded in the "HI AL:" and "HI AB:" blocks respectively.

When an alarm and/or abort is actuated, the alarm and/or abort should be displayed on the "ALARM/EVENT SUMMARY" screen, and all other screens displaying the current value of the sensor should be displaying all or part of the sensor DACS tag #, description, and current value in RED.

6.21.24.5 When an alarm is actuated, then:

6.21.24.5.1 Record the corresponding value displayed at Station #5, in the "AL:", "LO AL:", or "HI AL:" block of the "ALARM/ABORT VALUES (DACS)" column on the respective data sheet.

6.21.24.5.2 Verify that the alarm is displayed on the "ALARM/EVENT SUMMARY" screen, at Station #5.

6.21.24.5.3 Verify that all or part of the DACS tag #, description, and current value indications for the sensor being tested are being displayed in RED on any other associated screens.

6.21.24.6 When an abort is actuated, then record the corresponding value displayed at Station #5, in the "AB:", "LO AB:", or "HI AB:" block of the "ALARM/ABORT VALUES (DACS)" column on the respective data sheet.

6.21.24.6.1 Verify that the abort is displayed on the "ALARM/EVENT SUMMARY" screen, at Station #5.

6.21.24.6.2 Verify that all or part of the DACS tag #, description, and current value indications for the sensor being tested are being displayed in RED on any other associated screens.

6.21.24.6.3 Verify that PLC coil #22 is energized.

6.21.24.7 Repeat Steps 6.21.24 through 6.21.24.6.3 until all alarm and/or abort values have been determined as accurately as possible, then goto Step 6.21.24.8.

6.21.24.8 Request development system personnel to adjust the applied input/test signal to provide a normal, on-scale reading at Station #5.

6.21.24.9 Ensure that all alarms and/or aborts associated with the sensor being tested are clear at Station #5.

6.21.24.10 Ensure that all abort coils associated with the sensor being tested are disabled, if required, and that PLC coil #22 is deenergized.

6.21.24.11 If testing was completed satisfactorily, then initial the "TEST ENGINEER INITIALS" block for the sensor that was tested and goto Step 6.21.25.

6.21.25 Repeat Steps 6.21.8 through 6.21.24.11 as required, for all remaining sensors in Module Group A, as listed in Table 2, then goto Step 6.21.26.

6.21.26 Repeat Steps 6.21.4 through 6.21.24.11 as required, for all remaining Module Groups, as listed in Table 2, then goto the next test section to be performed.

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: _____

6.22 Checks of MIT 17C Thermocouple, Gas Chromatograph, FTIR, and RGA5 Inputs

NOTE: Testing per this section will be conducted using a development system.

6.22.1 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.

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

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

6.22.2 At the computer that is running the Modsoft program, disable and set to "0" the following coils:

- #107
- #165
- #374
- #440
- #449
- #458
- #469
- #478
- #487

6.22.3 Refer to Table 3, "PLC Direct Inputs" of Appendix 2 for the DACS tag #s and PLC address code for testing of sensors per this procedure section.

NOTES: Development system personnel will apply and remove all input/test signals.

Testing of PLC inputs may be performed in any order, at the discretion of the Test Director.

6.22.4 Reboot Station #5.

6.22.5 Refer to the "DACS Tag" Column of the Table 3 data sheet and locate the tag number of the first sensor to be tested.

6.22.6 Press the F2 key at Station #5 and type the tag number for the sensor being tested or access any screen that displays the current value reading for that sensor.

6.22.7 Refer to the "MODICON" Column of the data sheets, to direct development system personnel in locating the correct PLC address for the sensor to be tested.

6.22.8 If the sensor being tested provides a digital input, then:

6.22.8.1 Request development system personnel to input a "1" or "0" to cause a change of state ("ON" to "OFF" or "OFF" to "ON") as indicated at Station #5.

6.22.8.2 Record that the sensor change of state occurred by entering "YES" in the "D:" block of the "HIGH END READING" column of the respective data sheet.

6.22.8.3 Request development system personnel to return the digital input to the pre-test setting ("OFF" to "ON" or "ON" to "OFF"), and goto Step 6.22.10.

6.22.9 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 at Station #5, while the test values are typed in at the PLC utilizing the Modsoft program. The value typed in at the PLC should be equal to the value displayed at Station #5.

6.22.9.1 Request development system personnel to type in the value indicated in the "F:" block in the "LOW END READING" Column on the respective data sheet for the sensor being tested.

6.22.9.2 Record the corresponding value displayed at Station #5, in the "D:" block in the "LOW END READING" Column, on the respective data sheet.

6.22.9.3 Request development system personnel to type in the value indicated in the "F:" block in the "MID RANGE READING" Column on the respective data sheet for the sensor being tested.

6.22.9.4 Record the corresponding value displayed at Station #5, in the "D:" block in the "MID RANGE READING" Column, on the respective data sheet.

6.22.9.5 Request development system personnel to type in the value indicated in the "F:" block in the "HIGH END READING" Column on the respective data sheet for the sensor being tested.

6.22.9.6 Record the corresponding value displayed at Station #5, in the "D:" block in the "HIGH END READING" Column, on the respective data sheet.

6.22.9.7 If DACS tag #GC1-H2 is being tested, then request development system personnel to type in a value of "15".

6.22.9.7.1 Verify that the low hydrogen alarm is received at Station #5, and record the alarm level reading in the "AL:" block on the respective data sheet.

6.22.9.8 Request development system personnel to type in an input/test value corresponding to a normal, on-scale value.

6.22.10 If testing was completed satisfactorily, then initial the "TEST ENGINEER INITIALS" block for the sensor that was tested and goto Step 6.22.11.

6.22.11 Repeat Steps 6.22.5 through 6.22.10 until all sensors in Table 3 have been tested, then goto the next test section to be performed.

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: _____

6.23 Checks of Gas Analysis Equipment Readouts

NOTE: Testing per this section may be performed at any time, at the discretion of the Test Director, and shall be performed at the DACS trailer.

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

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

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

NOTE: Testing per this section will require close coordination of the Test Director and Gas Monitoring Systems personnel.

6.23.2 Request Gas Monitoring Systems personnel to monitor the Gas Analysis Systems computer in Rack 10/CB A-5, in the rear of the DACS trailer, or Station #2 in the DACS trailer Control Area, for incoming data.

6.23.3 At Station #5, access the GASSUM screen.

6.23.4 Request Gas Monitoring Systems Personnel to call out what the GC-1 H_2 reading at Station #5 should be at the next update, based on the indications displayed at the Gas Analysis computer.

6.23.4.1 Record the reading called out in Step 6.23.4:

(1) _____ (2) _____ (3) _____

6.23.5 When the GC-1 H_2 reading at Station #5 updates, record the displayed value:

(1) _____ (2) _____ (3) _____

6.23.6 Verify that the readings recorded in Steps 6.23.4.1 and 6.23.5 are the same.

6.23.7 Repeat Steps 6.23.4 through 6.23.6 two additional times, then goto Step 6.23.8.

6.23.8 Request Gas Monitoring Systems Personnel to manually adjust the next GC-1 H_2 input to Station #5 to 15 ppm.

6.23.9 When the GC-1 H_2 reading at Station #5 updates, then verify that the displayed value is 15 ppm and that a low hydrogen concentration alarm has been received on the MANABRT and ALARM/EVENT SUMMARY screens.

6.23.10 Request Gas Monitoring Systems Personnel to manually adjust the next GC-1 H_2 input to Station #5 to 0 ppm.

6.23.11 When the GC-1 H_2 reading at Station #5 updates, then verify that the displayed value is 0 ppm and that either a GC1-INST or GC1-ZVAL alarm or both has (have) been received on the ALARM/EVENT SUMMARY screen.

6.23.12 Request Gas Monitoring Systems Personnel to manually adjust the next GC-1 H_2 input to Station #5 to a value greater than 15 ppm.

6.23.13 When the GC-1 H_2 reading at Station #5 updates, then verify that the displayed value is is greater than 15 ppm and that no GC-1 alarms are active on the MANABRT and ALARM/EVENT SUMMARY screens.

6.23.14 Request Gas Monitoring Systems Personnel to manually stop the GC-1 H_2 input to Station #5.

6.23.15 When Gas Monitoring Systems Personnel state that the GC-1 H_2 input to Station #5 has been stopped, then start a stopwatch.

6.23.16 When the GC-1 H_2 alarm is received at Station #5, then stop the stopwatch and record the elapsed time: _____.

6.23.16.1 Verify that the time recorded in Step 6.23.16 is approximately 8 minutes (7 mins 30 secs to 9 mins).

6.23.17 Request Gas Monitoring Systems Personnel to return the GC-1 H_2 input to Station #5 to normal.

6.23.18 Request Gas Monitoring Systems Personnel to call out what the GC-2 H_2 reading at Station #5 should be at the next update, based on the indications displayed at the Gas Analysis computer.

6.23.18.1 Record the reading called out in Step 6.23.18:

(1) _____ (2) _____ (3) _____

6.23.19 When the GC-2 H_2 reading at Station #5 updates, record the displayed value:

(1) _____ (2) _____ (3) _____

6.23.20 Verify that the readings recorded in Steps 6.23.18.1 and 6.23.19 are the same.

6.23.21 Repeat Steps 6.23.18 through 6.23.20 two additional times, then goto Step 6.23.22.

6.23.22 Request Gas Monitoring Systems Personnel to call out what the GC-3 reading at Station #5 should be at the next update, based on the indications displayed at the Gas Analysis computer.

6.23.22.1 Record the reading called out in Step 6.23.22:

(1) _____ (2) _____ (3) _____

6.23.23 When the GC-3 reading at Station #5 updates, record the displayed value:

(1) _____ (2) _____ (3) _____

6.23.24 Verify that the readings recorded in Steps 6.23.22.1 and 6.23.23 are the same.

6.23.25 Repeat Steps 6.23.22 through 6.23.24 two additional times, then goto Step 6.23.26.

6.23.26 Request Gas Monitoring Systems Personnel to call out what the FTIR NH_3 reading at Station #5 should be at the next update, based on the indications displayed at the Gas Analysis computer.

6.23.26.1 Record the reading called out in Step 6.23.26:

(1) _____ (2) _____ (3) _____

6.23.27 When the FTIR NH_3 reading at Station #5 updates, record the displayed value:

(1) _____ (2) _____ (3) _____

6.23.28 Verify that the readings recorded in Steps 6.23.26.1 and 6.23.27 are the same.

6.23.29 Repeat Steps 6.23.26 through 6.23.28 two additional times, then goto Step 6.23.30.

6.23.30 Request Gas Monitoring Systems Personnel to manually adjust the next FTIR NH_3 input to Station #5 to 3000 ppm.

6.23.31 When the FTIR NH_3 reading at Station #5 updates, then verify that the displayed value is 3000 ppm and that a FTIR NH3 CONCENTRATION alarm has been received on the ALARM/EVENT SUMMARY screen.

6.23.32 Request Gas Monitoring Systems Personnel to return the FTIR NH_3 input to Station #5 to normal.

6.23.33 Request Gas Monitoring Systems Personnel to call out what the FTIR NO_2 reading at Station #5 should be at the next update, based on the indications displayed at the Gas Analysis computer.

6.23.33.1 Record the reading called out in Step 6.23.33:

(1) _____ (2) _____ (3) _____

6.23.34 When the FTIR NO_2 reading at Station #5 updates, record the displayed value:

(1) _____ (2) _____ (3) _____

6.23.35 Verify that the readings recorded in Steps 6.23.33.1 and 6.23.34 are the same.

6.23.36 Repeat Steps 6.23.33 through 6.23.35 two additional times, then goto Step 6.23.37.

6.23.37 Request Gas Monitoring Systems Personnel to call out what the B & K (PHOTO) NH_3 reading at Station #5 should be at the next update, based on the indications displayed at the Gas Analysis computer.

6.23.37.1 Record the reading called out in Step 6.23.37:

(1) _____ (2) _____ (3) _____

6.23.38 When the B & K (PHOTO) NH_3 reading at Station #5 updates, record the displayed value:

(1) _____ (2) _____ (3) _____

6.23.39 Verify that the readings recorded in Steps 6.23.37.1 and 6.23.38 are the same.

6.23.40 Repeat Steps 6.23.37 through 6.23.39 two additional times, then goto Step 6.23.41.

6.23.41 Request Gas Monitoring Systems Personnel to manually adjust the next B & K (PHOTO) NH_3 input to Station #5 to 1000 ppm.

6.23.42 When the B & K (PHOTO) NH_3 reading at Station #5 updates, then verify that the displayed value is 1000 ppm and that a STACK NH3 CONCENTRATION alarm has been received on the ALARM/EVENT SUMMARY screen.

6.23.43 Request Gas Monitoring Systems Personnel to manually stop the B & K (PHOTO) NH_3 input to Station #5.

6.23.44 When Gas Monitoring Systems Personnel state that the B & K (PHOTO) NH_3 input to Station #5 has been stopped, then start a stopwatch.

6.23.45 When the B & K (PHOTO) NH_3 alarm is received at Station #5, then stop the stopwatch and record the elapsed time: _____.

6.23.45.1 Verify that the time recorded in Step 6.23.45 is approximately 8 minutes (7 mins 30 secs to 9 mins).

6.23.46 At Station #5, verify that a NH3-INST alarm has been received on the ALARM/EVENT SUMMARY screen.

6.23.47 Request Gas Monitoring Systems Personnel to return the B & K (PHOTO) NH_3 input to Station #5 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: _____

6.24 Field Instrumentation End-To-End Checks

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 the DACS upgrades.

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

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

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

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.

6.24.2 At Station #5, display the "ALARM/EVENT SUMMARY" screen.

6.24.3 At Station #6, display the "CSMAIN" screen.

6.24.4 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 #1.

6.24.5 Ensure that the E Stop circuitry is reset.

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 instrumentation 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.

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

6.24.7 If testing in this section requires more than one shift to complete, then perform Steps 6.24.40 and 6.24.41 at the end of each shift.

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

6.24.8 Refer to the "CSMAIN" screen, (Station #6) for alarm and abort values, for instruments to be checked for proper alarm and abort functions.

NOTE: Sensors that do NOT provide alarm and abort signals have "N/A" in the "AL:" and "AB:" blocks in the "ALARM/ABORT VALUES (DACS)" Column, on the Data Sheets.

6.24.9 At Station #7, for sensors that provide alarm and abort functions, display the proper screen for checking current values, alarm values, and abort values for each sensor by first displaying the "CSMAIN" screen and then selecting the "To Screen" block, after the line describing the appropriate sensor type.

)TE: 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.

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

6.24.11 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

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

6.24.12 Direct field personnel to access the proper instrument cabinet and terminal board, and locate the associated signal lead(s) for the sensor to be tested.

6.24.13 If the sensor provides alarm and abort signals, then 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.

6.24.14 If the sensor does not provide alarm and abort signals, then:

6.24.14.1 At Station #7, press the F2 key and enter the DACS tag number for the sensor being tested.

6.24.14.2 Record the readout value displayed in the "AIN" block, in the "B:" block in the "DACS READING" Column, on the appropriate Data Sheet.

6.24.15 Direct field personnel to lift the lead(s) from the terminal board if necessary and connect the signal source or install a jumper.

6.24.16 Direct field personnel to set the output of the signal source to the value listed in the "F:" block in the "LOW END READING" Column, on the respective Data Sheet.

6.24.17 Observe the "Current Value" or "AIN" value displayed at Station #7 for the instrument being tested, and record the reading in the "D:" block of the "LOW END READING" Column.

6.24.18 Direct field personnel to slowly increase the output of the signal source to the value listed in the "F:" block in the "MID RANGE READING" Column of the respective Data Sheet.

6.24.19 Observe the "Current Value" or "AIN" value displayed at Station #7 for the instrument being tested, and record the reading in the "D:" block in the "MID RANGE READING" Column of the respective Data Sheet.

6.24.20 Direct field personnel to slowly increase the output of the signal source toward the value listed in the "F:" block in the "HIGH END READING" Column of the respective Data Sheet.

6.24.21 Observe the "Current Value" or "AIN" value displayed at Station #7 for the instrument being tested, and record the reading in the "D:" block in the "HIGH END READING" Column of the respective Data Sheet.

6.24.22 If the sensor being tested does not provide an alarm and/or abort signal, then goto Step 6.24.33.

NOTES: Performance of Steps 6.24.23 through 6.24.32 will require careful coordination between DACS trailer personnel and field personnel to accurately establish alarm and abort values for those sensor inputs which have alarm and abort functions.

Alarm and abort setpoints are listed in parenthesis in the "AL:" and "AB:" blocks on the data sheets.

6.24.23 If the sensor being tested provides an alarm and/or abort signal, direct field personnel to adjust the output of the signal source below/above the expected alarm point and then slowly increase/decrease the output of the signal source until the alarm is actuated.

6.24.24 Note the indicated value in the "Current Value" display at Station #7 when the alarm actuates, record the alarm value in the "AL:" block in the "ALARM/ABORT VALUES (DACS)" Column of the appropriate Data Sheet, and verify the following:

- The alarm is shown in RED on the Alarm/Event Summary screen at Station #5.
- The "Description" and "Alarm Limit" Column displays on the screen at Station #6 have turned RED for the associated group of sensors to which the sensor being tested belongs.
- The "TAG", "DESCRIPTION", "Alarm Limit", and "Units" Column displays on the screen at Station #7 have turned RED for the sensor being tested.

6.24.25 Acknowledge the alarm and verify the following:

- The alarm is shown in YELLOW on the Alarm/Event Summary screen at Station #5.
- The "Description" and "Alarm Limit" Column displays on the screen at Station #6 remain RED for the associated group of sensors to which the sensor being tested belongs.
- The "TAG", "DESCRIPTION", "Alarm Limit", and "Units" Column displays on the screen at Station #7 remain RED for the sensor being tested.

6.24.26 If the indicated value at which the alarm occurred is uncertain, repeat Steps 6.24.23 through 6.24.25 until the correct alarm actuation value is determined, and then goto Step 6.24.27.

6.24.27 Ensure that the abort coil(s) for the sensor being tested is (are) enabled.

6.24.28 Ensure that all alarms and/or aborts associated with the sensor being tested are clear at Station #5.

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

6.24.30 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 "ALARM/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 in RED on the Alarm/Event Summary screen.
- At Station #6, the Columns that were RED have remained RED, and the "Abort Limit" Column has turned RED for the associated group of sensors to which the sensor being tested belongs.
- At Station #7, the Columns that were RED have remained RED and the "Abort Limit" Column has turned RED for the sensor being tested.
- 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.

6.24.31 Place the E Stop Alarm Silence toggle switch in the "Alarm Silence" position.

6.24.32 If the indicated value at which the abort occurred is uncertain, then reduce/increase the output of the signal source to a value less/greater than the expected abort value, perform Steps 6.24.35.2 and 6.24.35.3, and repeat Steps 6.24.29 through 6.24.31 until the correct abort actuation value is determined, then goto Step 6.24.33.

6.24.33 Direct field personnel to reduce the input signal and disconnect the signal source, or remove the installed jumper.

6.24.34 Reconnect the sensor lead(s) to the proper terminal(s), if necessary.

6.24.35 If an abort signal was actuated, then:

6.24.35.1 If necessary, at Station #1, disable the abort coil for the sensor that was last tested.

6.24.35.2 Ensure that the E Stop circuitry is reset.

6.24.35.3 Place the Alarm Silence toggle switch in the "Normal" position.

6.24.36 If an alarm and abort were actuated, then verify that the following automatic actions occurred when the alarm and abort cleared:

- At Station #5, the alarm indication has disappeared from the "Alarm/Event Summary" screen.
- All column displays on the screen at Station #6 have turned WHITE for the associated group of sensors to which the sensor being tested belongs.
- All column displays on the screen at Station #7 have turned WHITE for the sensor being tested.

6.24.37 Record the post-test sensor readout from the "Current Value" or "AIN" 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.

6.24.38 Compare the pre-test (B:) and post-test (A:) readings taken in Step 6.24.13 or Step 6.24.14.2, and 6.24.37.

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

6.24.39 Repeat Steps 6.24.9 through 6.24.38.1 to complete testing for sensors that provide alarm and abort signals, and Steps 6.24.10 through 6.24.38.1 for sensors that do NOT provide alarm and abort signals, then goto Step 6.24.40.

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

6.24.41 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: _____

Table F: Instruments to be Field Checked

DACS TAG	DESCRIPTION	SCALE/ RANGE	SIGNAL	INPUT SIGNAL CONNECTN POINTS	DACS READING	LOW END READING	MID RANGE READING	ALARM/ ABORT VALUES (DACS)	HIGH END READING	INITIALS
TIPN0202	MIXER PUMP DISCH NOZZLE #1 TEMP-1	32-212 °F	100 - 140 Ω	MIX PMP JBX-1 TB1, TERM 20 & 21	B:	F: 110 Ω	F: 120 Ω	AL: (130)	F: 130 Ω	
					A:	D:	D:	AB: (135)	D:	
PIR17B04	MIT TANK DOME PRESSURE RISER 17B	-5 TO +20 INWG	1-5 Vdc	* GMS-1 TB2, PULL FU-4, TB2 +9&-10	B:	F: 1.1 Vdc	F: 3.0 Vdc	AL: (-1.5)	F: 4.9 Vdc	
					A:	D:	D:	AB: (-1.0)	D:	
NITKSY06	0-10% H2 VENT HDR. SHMS #2	0-10% H2	4-20 mA	GMS2, JB1, TB2-11, LEAD TB2-10	B:	F: 5.0 mA	F: 12.0 mA	AL: (0.56)	F: 19.0 mA	
					A:	D:	D:	AB: (0.75)	D:	
ARMALM	HMT ALERT GAMMA RADIATION	ON/OFF	24 Vdc	Eberline Instr. TB4, Jumper Term 4 & 6	B: N/A	F: N/A	F: N/A	AL: (ON)	F: 1 OR 0	
					A: N/A	D: N/A	D: N/A	AB: N/A	D:	

Table F: Instruments to be Field Checked

DACS TAG	DESCRIPTION	SCALE/ RANGE	SIGNAL	INPUT SIGNAL CONNECTN POINTS	DACS READING	LOW END READING	MID RANGE READING	ALARM/ ABORT VALUES (DACS)	HIGH END READING	INITIALS
XIR12AN1	PUMP CASING VIBRATION	0 - 5 G's	± 10 Vdc	HMT PMP JBX-1, TB1, 36 & 37	B:	F: -9.9 Vdc	F: 0.0 Vdc	AL: N/A	F: +9.9 Vdc	
					A:	D:	D:	AB: N/A	D:	
FTE50002	VENT HEADER FLOW-HIGH RANGE	0 - 4000 CFM	.6-3 Vdc	I/O #8, SLOT 8, MOD 2, TERM 13 & 14	B:	F: .65 Vdc	F: 1.8 Vdc	LO AL: (425)	F: 2.9 Vdc	
								HI AL: (675)		
					A:	D:	D:	LO AB: (400)	D:	
								HI AB: (700)		

6.25 Drop 13 I/O Health Status Check

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

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

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

6.25.2 At Station #5, access the "ALARM/EVENT SUMMARY" screen.

6.25.3 At Station #6, access the "I/O HEALTH STATUS" screen.

6.25.4 Verify that the indicated status for the following is "OK", in GREEN letters:

- DROP 2, RACK 1, SLOTS 4, 5, 6
- DROP 2, RACK 2, SLOTS 3, 4
- DROP 4, RACK 1, SLOTS 4, 5, 6, 7
- DROP 4, RACK 2, SLOTS 4, 5, 6
- DROP 6, RACK 1, SLOTS 4, 5, 6, 7
- DROP 8, RACK 1, SLOTS 4, 5, 6, 7
- DROP 8, RACK 2, SLOTS 3, 4, 5
- DROP 9, RACK 1, SLOTS 4, 5, 6, 7
- DROP 13, RACK 1, SLOTS 4, 5, 6, 7, 8
- DROP 14, RACK 1, SLOTS 4, 5, 6
- DROP 14, RACK 2, SLOTS 3, 4, 5, 6, 7
- DROP 15, RACK 1, SLOTS 4, 5, 6, 7
- DROP 16, RACK 1, SLOTS 4, 5, 6, 7, 8

6.25.5 Refer to Table IP for information related to the modules to be tested in Drop 13.

6.25.6 For each instrument listed in Table IP:

6.25.6.1 Direct field personnel to:

6.25.6.1.1 Locate the rack for the module to be tested.

6.25.6.1.2 Locate the module to be tested.

6.25.6.1.3 Turn off power for the rack.

6.25.6.1.4 Remove the module to be tested from the rack.

6.25.6.1.5 Restore power to the rack.

6.25.6.2 Verify that the alarm associated with the module that was removed from the rack, as listed in the "ALARM" column of Table IP, is received at Station #5.

6.25.6.3 Acknowledge the alarm at Station #5.

6.25.6.4 Verify, after a time delay, that the indicated status at Station #6 for the module being tested, changes from "OK" in GREEN letters to "BAD" in RED letters, and initial the "OK TO BAD" column in Table IP.

6.25.6.5 Direct field personnel to:

6.25.6.5.1 Turn off power to the rack.

6.25.6.5.2 Reinstall the module being tested into the rack, and remove the next module to be tested from the rack.

6.25.6.5.3 Restore power to the rack.

6.25.6.6 Verify, after a time delay, that the indicated status at Station #6, for the module that was replaced, changes from "BAD" in RED letters to "OK" in GREEN letters, and initial the "BAD TO OK" column in Table IP.

6.25.6.7 Verify that the alarm at Station #5, for the module that was replaced, is clear.

6.25.6.8 Enter "YES" or "NO" in the "Test Sat ?" column.

6.25.6.8.1 If a "NO" was entered in the "Test Sat ?" column, then list the discrepancy on Attachment 1.

6.25.6.9 Repeat Steps 6.25.6.1 through 6.25.6.8.1 until testing for all modules in Drop 13 is complete.

.ble IP

MODULE	ALARM	"OK" TO "BAD"	"BAD" TO "OK"	Test Sat ? (YES/NO)
DROP 13, RACK 1, SLOT 4	J11C12 D013 DROP 13 RACK 1 I/O HEALTH			
DROP 13, RACK 1, SLOT 5	J11C12 D012 DROP 13 RACK 1 I/O HEALTH			
DROP 13, RACK 1, SLOT 6	J11C12 D011 DROP 13 RACK 1 I/O HEALTH			
DROP 13, RACK 1, SLOT 7	J11C12 D010 DROP 13 RACK 1 I/O HEALTH			
DROP 13, RACK 1, SLOT 8	J11C12 D09 DROP 13 RACK 1 I/O HEALTH			

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: _____

9 ATTACHMENTS

Attachment 1, Exception List

Attachment 2, Tables and Data Sheets

Table 1: Development System Module Setups
Table 2: PLC Inputs and Input Groups
Table 3: PLC Direct Inputs

Attachment 3, Measurement and Test Equipment Record Sheet

Attachment 4, Final Procedure Acceptance Sheet

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

Attachment 1: Exception List

Table 1: Development System 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

Table 2: PLC Inputs and Input Groups

DACS TAG	DESCRIPTION	SCALE / RANGE	DEV SYSTEM LOCATION	MODICON	LOW END READING	MID RANGE READING	ABORT COIL NUMBER	ALARM/ ABORT VALUES (DACS)	HIGH END READING	TEST ENGINEER INITIALS
MODULE GROUP A										
MIP00001	MOISTURE IN PUMP MOTOR OIL 1	ON/OFF	2.1.7.1	100001	F:N/A D: N/A	F: N/A D: N/A	100001	AL: N/A AB:	F: N/A D:	
ZIMPE143	MIX PUMP POS. LIMIT SWITCH CW	ON/OFF	2.1.7.3	100003	F: N/A D: N/A	F: N/A D: N/A	N/A	AL: N/A AB:	F: N/A D:	
ZIMPE144	MIX PUMP POS. LIMIT SWITCH CCW	ON/OFF	2.1.7.4	100004	F: N/A D: N/A	F: N/A D: N/A	N/A	AL: N/A AB:	F: N/A D:	
FSLMSY18	FTIR LOW FLOW SWITCH	LOW FLOW, 0.3 GPM	2.1.6.5	100037	F: N/A D: N/A	F: N/A D: N/A	N/A	AL: N/A AB: N/A	F: N/A D:	
TASLMSY2	SAMPLE TRACE HEAT ALARM LOW	65 °F	2.1.6.6	100038	F: N/A D: N/A	F: N/A D: N/A	N/A	AL: N/A AB: N/A	F: N/A D:	
PITMSY19	FTIR PURGE/ AIR BRG. PRESSURE	ON/OFF	2.1.6.7	100039	F: N/A D: N/A	F: N/A D: N/A	N/A	AL: N/A AB: N/A	F: N/A D:	
ARMALM	HMT ALERT GAMMA RADIATION	ON/OFF	4.1.5.11	100075	F: N/A D: N/A	F: N/A D: N/A	N/A	AL: AB: N/A	F: N/A D:	
ARMABORT	HMT HIGH GAMMA RADIATION	ON/OFF	4.1.5.13	100077	F: N/A D: N/A	F: N/A D: N/A	N/A	AL: AB: N/A	F: N/A D:	

Table 2: PLC Inputs and Input Groups

DACS TAG	DESCRIPTION	SCALE / RANGE	DEV SYSTEM LOCATION	MODICON	LOW END READING	MID RANGE READING	ABORT COIL NUMBER	ALARM/ ABORT VALUES (DACS)	HIGH END READING	TEST ENGINEER INITIALS
ARMFAIL	ARM INSTRUMENT FAILURE	ON/OFF	4.1.5.12	100076	F: N/A	F: N/A	N/A	AL:	F: N/A	
					D: N/A	D: N/A		AB: N/A	D:	
TIPN0202	MIX PUMP DIS. NOZ. 1 TEMP 1	32-212°F	4.2.6.5	300021	F: 0	F: 2048	303	AL: (2230)	F: 4095	
					D:	D:		AB: (2344)	D:	
TIPNO101	MIX PUMP DIS. NOZ. 2 TEMP 1	32-212°F	4.1.4.1	300001	F: 0	F: 2048	300	AL: (2230)	F: 4095	
					D:	D:		AB: (2344)	D:	
TIPN0201	MIX PUMP DIS. NOZ. 1 TEMP 2	32-212°F	4.1.6.8	300016	F: 0	F: 2048	302	AL: (2230)	F: 4095	
					D:	D:		AB: (2344)	D:	
TIPNO102	MIX PUMP DIS. NOZ. 2 TEMP 2	32-212°F	4.1.6.1	300009	F: 0	F: 2048	301	AL: (2230)	F: 4095	
					D:	D:		AB: (2344)	D:	
TIR12A01	MIXER PUMP MOTOR OIL TEMP #1	32-383°F	4.1.4.6	300006	F: 0	F: 2048	306	AL: (1844)	F: 4095	
					D:	D:		AB: (2252)	D:	

Table 2: PLC Inputs and Input Groups

DACS TAG	DESCRIPTION	SCALE / RANGE	DEV SYSTEM LOCATION	MODICON	LOW END READING	MID RANGE READING	ABORT COIL NUMBER	ALARM/ ABORT VALUES (DACS)	HIGH END READING	TEST ENGINEER INITIALS
TIR12A02	MIXER PUMP MOTOR OIL TEMP 2	32-383°F	4.1.6.6	300014	F: 0	F: 2048	307	AL: (1844)	F: 4095	
					D:	D:		AB: (2252)	D:	
PIR12A01	MIXER PUMP PRESSURE	0-150 PSIG	4.2.6.3	300019	F: 0	F: 2048	304	AL: N/A	F: 4095	
					D:	D:		AB: N/A	D:	
FIPN0202	MIX PUMP DIS. NOZ. 1 FLOW 1	0-1500 GPM	4.2.6.4	300020	F: 0	F: 2048	N/A	AL: N/A	F: 4095	
					D:	D:		AB: N/A	D:	
FIPN0101	MIX PUMP DIS. NOZ. 2 FLOW 1	0-1500 GPM	4.1.4.2	300002	F: 0	F: 2048	N/A	AL: N/A	F: 4095	
					D:	D:		AB: N/A	D:	
FIPN0201	MIX PUMP DIS. NOZ. 1 FLOW 2	0-1500 GPM	4.1.4.8	300008	F: 0	F: 2048	N/A	AL: N/A	F: 4095	
					D:	D:		AB: N/A	D:	
FIPN0102	MIX PUMP DIS. NOZ. 2 FLOW 2	0-1500 GPM	4.1.6.2	300010	F: 0	F: 2048	N/A	AL: N/A	F: 4095	
					D:	D:		AB: N/A	D:	
PIPNO201	MIX PUMP DIS. NOZ. 1 PRESS 1	0-150 PSIG	4.1.4.7	300007	F: 0	F: 2048	N/A	AL: N/A	F: 4095	
					D:	D:		AB: N/A	D:	
PIPN0101	MIX PUMP DIS. NOZ. 2 PRESS 1	0-150 PSIG	4.1.4.3	300003	F: 0	F: 2048	N/A	AL: N/A	F: 4095	
					D:	D:		AB: N/A	D:	
PIPN0202	MIX PUMP DIS. NOZ. 1 PRESS 2	0-150 PSIG	4.1.6.7	300015	F: 0	F: 2048	N/A	AL: N/A	F: 4095	
					D:	D:		AB: N/A	D:	

Table 2: PLC Inputs and Input Groups

DACS TAG	DESCRIPTION	SCALE / RANGE	DEV SYSTEM LOCATION	MODICON	LOW END READING	MID RANGE READING	ABORT COIL NUMBER	ALARM/ ABORT VALUES (DACS)	HIGH END READING	TEST ENGINEER INITIALS
PIPN0102	MIX PUMP DIS. NOZ. 2 PRESS 2	0-150 PSIG	4.1.6.3	300011	F: 0 D:	F: 2048 D:	N/A	AL: N/A AB: N/A	F: 4095 D:	
PITN0111	MIX PUMP NOZ. 2 TAP PRESS.	-10 - +90 PSIG	4.2.6.6	300022	F: 0 D:	F: 2048 D:	N/A	AL: N/A AB: N/A	F: 4095 D:	
PITN0110	MIX PUMP NOZ. 1 TAP PRESS.	-10 - +90 PSIG	4.2.6.7	300023	F: 0 D:	F: 2048 D:	N/A	AL: N/A AB: N/A	F: 4095 D:	
ZIMPE142	MIXER PUMP COLUMN GAS PRESSURE	0 - 25 PSIG	4.2.6.1	300017	F: 0 D:	F: 2048 D:	341	AL: (1474) AB: (1147)	F: 4095 D:	
PIO10001	CAMERA ENCL. PURGE PRESSURE	0 - 30" WG	4.2.7.1	300025	F: 0 D:	F: 2048 D:	N/A	AL: N/A AB: N/A	F: 4095 D:	
PIO20002	NITROGEN SUPPLY	0 - 3000 PSIG	4.2.7.2	300026	F: 0 D:	F: 2048 D:	N/A	AL: N/A AB: N/A	F: 4095 D:	
MODULE GROUP B										
UPSOT1	UPS OVER TEMP CLOSURE	ON/OFF	2.1.6.7	100103	F: N/A D: N/A	F: N/A D: N/A	N/A	AL: AB: N/A	F: N/A D:	
UPSLV1	UPS LOW VOLTAGE	ON/OFF	2.1.6.8	100104	F: N/A D: N/A	F: N/A D: N/A	N/A	AL: AB: N/A	F: N/A D:	

Attachment 2, Tables and Data Sheets

Table 2: PLC Inputs and Input Groups

DACS TAG	DESCRIPTION	SCALE / RANGE	DEV SYSTEM LOCATION	MODICON	LOW END READING	MID RANGE READING	ABORT COIL NUMBER	ALARM/ ABORT VALUES (DACS)	HIGH END READING	TEST ENGINEER INITIALS
UPSBY1	UPS SYSTEM ON BYPASS ALARM	ON/OFF	2.1.6.9	100105	F: N/A D: N/A	F: N/A D: N/A	N/A	AL: AB: N/A	F: N/A D:	
UPSFA1	UPS OUTPUT FAIL ALARM	ON/OFF	2.1.6.10	10106	F: N/A D: N/A	F: N/A D: N/A	N/A	AL: AB: N/A	F: N/A D:	
PWY01001	CAMERA POWER ON	24 Vdc CLOSE	2.1.6.11	100107	F: N/A D: N/A	F: N/A D: N/A	N/A	AL: N/A AB: N/A	F: N/A D:	
PXO10001	LOSS OF CAMERA PURGE	24 Vdc OPEN	2.1.6.12	101008	F: N/A D: N/A	F: N/A D: N/A	N/A	AL: N/A AB: N/A	F: N/A D:	
UPSPI1	UPS AC POWER INPUT	ON/OFF	2.1.6.14	100110	F: N/A D: N/A	F: N/A D: N/A	N/A	AL: AB: N/A	F: N/A D:	
PMPINRUN	PUMP MOTOR RUNNING INDICATOR	ON/OFF	2.1.6.15	100111	F: N/A D: N/A	F: N/A D: N/A	N/A	AL: N/A AB: N/A	F: N/A D:	
FICABORT	FIC TANK LEVEL ALARM	ON/OFF	2.1.7.2	100162	F: N/A D: N/A	F: N/A D: N/A	N/A	AL: AB: N/A	F: N/A D:	
WHF17B1L	STR GAUGE 17B-1 HI FREQ ALRM	ON/OFF	4.1.5.1	100193	F: N/A D: N/A	F: N/A D: N/A	N/A	AL: AB: N/A	F: N/A D:	
WHF17B2L	STR GAUGE 17B-2 HI FREQ ALRM	ON/OFF	4.1.5.17	100209	F: N/A D: N/A	F: N/A D: N/A	N/A	AL: AB: N/A	F: N/A D:	

Table 2: PLC Inputs and Input Groups

DACS TAG	DESCRIPTION	SCALE / RANGE	DEV SYSTEM LOCATION	MODICON	LOW END READING	MID RANGE READING	ABORT COIL NUMBER	ALARM/ ABORT VALUES (DACS)	HIGH END READING	TEST ENGINEER INITIALS
WHF17B1B	STR GAUGE 17B-1 HI FREQ ABORT	ON/OFF	4.1.5.2	100194	F: N/A D: N/A	F: N/A D: N/A	100194	AL: N/A AB:	F: N/A D:	
WHF17B2B	STR GAUGE 17B-2 HI FREQ ABORT	ON/OFF	4.1.5.18	100210	F: N/A D: N/A	F: N/A D: N/A	100210	AL: N/A AB:	F: N/A D:	
WHF17C1L	STR GAUGE 17C-1 HI FREQ ALRM	ON/OFF	4.1.5.3	100195	F: N/A D: N/A	F: N/A D: N/A	N/A	AL: AB: N/A	F: N/A D:	
WHF17C2L	STR GAUGE 17C-2 HI FREQ ALRM	ON/OFF	4.1.5.19	100211	F: N/A D: N/A	F: N/A D: N/A	N/A	AL: AB: N/A	F: N/A D:	
WHF17C1B	STR GAUGE 17C-1 HI FREQ ABORT	ON/OFF	4.1.5.4	100196	F: N/A D: N/A	F: N/A D: N/A	100196	AL: N/A AB:	F: N/A D:	
WHF17C2B	STR GAUGE 17C-2 HI FREQ ABORT	ON/OFF	4.1.5.20	100212	F: N/A D: N/A	F: N/A D: N/A	100212	AL: N/A AB:	F: N/A D:	
WHF1B1L	STR GAUGE 1B-1 HI FREQ ALRM	ON/OFF	4.1.5.6	100198	F: N/A D: N/A	F: N/A D: N/A	N/A	AL: AB: N/A	F: N/A D:	
WHF1B2L	STR GAUGE 1B-2 HI FREQ ALRM	ON/OFF	4.1.5.22	100214	F: N/A D: N/A	F: N/A D: N/A	N/A	AL: AB: N/A	F: N/A D:	
WHF1B3L	STR GAUGE 1B-3 HI FREQ ALRM	ON/OFF	4.1.5.8	100200	F: N/A D: N/A	F: N/A D: N/A	N/A	AL: AB: N/A	F: N/A D:	

Table 2: PLC Inputs and Input Groups

DACS TAG	DESCRIPTION	SCALE / RANGE	DEV SYSTEM LOCATION	MODICON	LOW END READING	MID RANGE READING	ABORT COIL NUMBER	ALARM/ ABORT VALUES (DACS)	HIGH END READING	TEST ENGINEER INITIALS
WHF1B1B	STR GAUGE 1B-1 HI FREQ ABORT	ON/OFF	4.1.5.7	100199	F: N/A	F: N/A	100199	AL: N/A	F: N/A	
					D: N/A	D: N/A		AB:	D:	
WHF1B2B	STR GAUGE 1B-2 HI FREQ ABORT	ON/OFF	4.1.5.23	100215	F: N/A	F: N/A	100215	AL: N/A	F: N/A	
					D: N/A	D: N/A		AB:	D:	
WHF1B3B	STR GAUGE 1B-3 HI FREQ ABORT	ON/OFF	4.1.5.24	100216	F: N/A	F: N/A	100216	AL: N/A	F: N/A	
					D: N/A	D: N/A		AB:	D:	
TT10001	VENT HEADER TEMPERATURE	30-140°F	4.1.4.1	300033	F: 0	F: 2048	N/A	AL: N/A	F: 4095	
					D:	D:		AB: N/A	D:	
NIR17B01	WHTKR MON/HI H2	0 - 1%	4.1.4.2	300034	F: 0	F: 2048	259	AL: (2293)	F: 4095	
					D:	D:		AB: (3071)	D:	
PIR17B04	MIT TANK DOME PRESSURE	-5 TO +20 INWG	4.1.4.6	300038	F: 0	F: 2048	311	AL: (573)	F: 4095	
					D:	D:		AB: (655)	D:	
MT10001	VENT HEADER RELATIVE HUMIDITY	0 - 100 %	4.1.4.5	300037	F: 0	F: 2048	N/A	AL: N/A	F: 4095	
					D:	D:		AB: N/A	D:	
PDITMSY6	GC-1 DIFF. PRESSURE	0 - 250 IN WG	4.1.6.4	300044	F: 0	F: 2048	N/A	AL: N/A	F: 4095	
					D:	D:		AB: N/A	D:	

Table 2: PLC Inputs and Input Groups

DACS TAG	DESCRIPTION	SCALE / RANGE	DEV SYSTEM LOCATION	MODICON	LOW END READING	MID RANGE READING	ABORT COIL NUMBER	ALARM/ ABORT VALUES (DACS)	HIGH END READING	TEST ENGINEER INITIALS
PITMSY13	GC-3 SAMPLE PRESSURE	0-30 PSIA	4.1.6.5	300045	F: 0 D:	F: 2048 D:	N/A	AL: N/A AB: N/A	F: 4095 D:	
TITMSY15	FTIR SAMPLE GAS TEMP	32-150°F	4.1.6.6	300046	F: 0 D:	F: 2048 D:	N/A	AL: N/A AB: N/A	F: 4095 D:	
PITMSY16	FTIR SAMPLE PRESSURE	0-30 PSIA	4.1.6.7	300047	F: 0 D:	F: 2048 D:	N/A	AL: N/A AB: N/A	F: 4095 D:	
NITKSY06	EXH. HDR WTKR MON/HI H2	0-10% H2	4.2.6.3	300051	F: 0 D:	F: 2048 D:	257	AL: (229) AB: (307)	F: 4095 D:	
FITMSY17	FTIR SAMPLE GAS FLOW	0-10 INWG	4.2.6.4	300052	F: 0 D:	F: 2048 D:	N/A	AL: N/A AB: N/A	F: 4095 D:	
PDITMSY9	GC-2 DIFF. PRESSURE	0 - 250 IN WG	4.2.6.5	300053	F: 0 D:	F: 2048 D:	N/A	AL: N/A AB: N/A	F: 4095 D:	
PITMSY07	GC-1 SAMPLE PRESSURE	0-30 PSIA	4.2.6.6	300054	F: 0 D:	F: 2048 D:	N/A	AL: N/A AB: N/A	F: 4095 D:	
TICMSY18	FTIR COOLING WATER TEMP	32-150°F	4.2.6.7	300055	F: 0 D:	F: 2048 D:	N/A	AL: N/A AB: N/A	F: 4095 D:	
TITMSY25	GMS II BUILDING TEMP	32-150°F	4.2.6.8	300056	F: 0 D:	F: 2048 D:	N/A	AL: N/A AB: N/A	F: 4095 D:	

Table 2: PLC Inputs and Input Groups

DACS TAG	DESCRIPTION	SCALE / RANGE	DEV SYSTEM LOCATION	MODICON	LOW END READING	MID RANGE READING	ABORT COIL NUMBER	ALARM/ ABORT VALUES (DACS)	HIGH END READING	TEST ENGINEER INITIALS
NITJSYO6	0-10% H2 RISER 16A SHMS 1	0-10% H2	4.2.7.2	300058	F: 0	F: 2048	258	AL: (229)	F: 4095	
					D:	D:		AB: (307)	D:	
PITMSY12	GC-3 DIFF. PRESSURE	0 - 250 INWG	4.2.7.4	300060	F: 0	F: 2048	N/A	AL: N/A	F: 4095	
					D:	D:		AB: N/A	D:	
PITMSY04	SAMPLING INLET PRESSURE	0 - 30 PSIA	4.2.7.5	300061	F: 0	F: 2048	N/A	AL: N/A	F: 4095	
					D:	D:		AB: N/A	D:	
PITMSY10	GC-2 SAMPLE PRESSURE	0 - 30 PSIA	4.2.7.6	300062	F: 0	F: 2048	N/A	AL: N/A	F: 4095	
					D:	D:		AB: N/A	D:	
MODULE GROUP C										
ARMGEXP	USED TO CALCULATE ARMGAMMA	0 - 5 VOLTS	4.1.4.5	300069	F: 0	F: 2048	N/A	AL: N/A	F: 4095	
					D:	D:		AB: N/A	D:	
NIR05A01	MIX PUMP WTKR MON HI H2	1 - 10%	4.2.7.7	300111	F: 0	F: 2048	260	AL: (229)	F: 4095	
					D:	D:		AB: (307)	D:	

Table 2: PLC Inputs and Input Groups

DACS TAG	DESCRIPTION	SCALE / RANGE	DEV SYSTEM LOCATION	MODICON	LOW END READING	MID RANGE READING	ABORT COIL NUMBER	ALARM/ ABORT VALUES (DACS)	HIGH END READING	TEST ENGINEER INITIALS
MODULE GROUP D										
TIVDTCAB	VDTT INST. CABINET TEMP	50 - 120 °F	4.1.4.4	300124	F: 0 D:	F: 2048 D:	N/A	AL: N/A AB: N/A	F: 4095 D:	
TII04CAB	I/O #4 CABINET TEMP	50 - 120 °F	4.1.4.5	300125	F: 0 D:	F: 2048 D:	N/A	AL: N/A AB: N/A	F: 4095 D:	
TRT1	TRAILER TEMP REAR RACK 1	-32 - +212 °F	4.1.6.1	300161	F: 0 D:	F: 2048 D:	N/A	AL: N/A AB: N/A	F: 4095 D:	
TRT2	TRAILER TEMP REAR RACK 4	-32 - +212 °F	4.2.6.1	300169	F: 0 D:	F: 2048 D:	N/A	AL: N/A AB: N/A	F: 4095 D:	
TRT3	TRAILER TEMP REAR RACK 6	-32 - +212 °F	4.1.6.2	300162	F: 0 D:	F: 2048 D:	N/A	AL: N/A AB: N/A	F: 4095 D:	
TRT4	TRAILER TEMP REAR RACK 8	-32 - +212 °F	4.2.6.2	300170	F: 0 D:	F: 2048 D:	N/A	AL: N/A AB: N/A	F: 4095 D:	
TRT5	TRAILER TEMP FRONT RACK 1	-32 - +212 °F	4.1.6.3	300163	F: 0 D:	F: 2048 D:	N/A	AL: N/A AB: N/A	F: 4095 D:	
TRT6	TRAILER TEMP FRONT RACK 3	-32 - +212 °F	4.2.6.3	300171	F: 0 D:	F: 2048 D:	N/A	AL: N/A AB: N/A	F: 4095 D:	
TRT7	TRAILER TEMP FRONT RACK 5	-32 - +212 °F	4.1.6.4	300164	F: 0 D:	F: 2048 D:	N/A	AL: N/A AB: N/A	F: 4095 D:	

Table 2: PLC Inputs and Input Groups

DACS TAG	DESCRIPTION	SCALE / RANGE	DEV SYSTEM LOCATION	MODICON	LOW END READING	MID RANGE READING	ABORT COIL NUMBER	ALARM/ ABORT VALUES (DACS)	HIGH END READING	TEST ENGINEER INITIALS
TRT8	TRAILER TEMP FRONT RACK 6	-32 - +212 °F	4.2.6.4	300172	F: 0 D:	F: 2048 D:	N/A	AL: N/A AB: N/A	F: 4095 D:	
TRT9	TRAILER TEMP FRONT RACK 8	-32 - +212 °F	4.1.6.5	300165	F: 0 D:	F: 2048 D:	N/A	AL: N/A AB: N/A	F: 4095 D:	
TRT10	TRAILER TEMP AMBIENT	-32 - +212 °F	4.1.6.6	300166	F: 0 D:	F: 2048 D:	N/A	AL: N/A AB: N/A	F: 4095 D:	
UPST1	UPS TEMPERATURE	-32 - +212 °F	4.1.6.7	300167	F: 0 D:	F: 2048 D:	N/A	AL: N/A AB: N/A	F: 4095 D:	
WST1	DACS-1 WEATHER STATION TEMP	-57.53 - 301.7 °F	4.1.6.8	300168	F: 0 D:	F: 2048 D:	N/A	AL: N/A AB: N/A	F: 4095 D:	
WSWSPD	WEATHER STATION WIND SPEED	0 - 72.473 MPH	4.2.6.5	300173	F: 0 D:	F: 2048 D:	N/A	AL: N/A AB: N/A	F: 4095 D:	
TRT11	TRAILER TEMP REAR RACK 9	-32 - +212 °F	4.2.6.7	300175	F: 0 D:	F: 2048 D:	N/A	AL: N/A AB: N/A	F: 4095 D:	
TRA1A	DACS-1 TRAILER CURRENT PHASE A	0 - 100 AMPS	4.2.7.1	300177	F: 0 D:	F: 2048 D:	N/A	AL: N/A AB: N/A	F: 4095 D:	

Table 2: PLC Inputs and Input Groups

DACS TAG	DESCRIPTION	SCALE / RANGE	DEV SYSTEM LOCATION	MODICON	LOW END READING	MID RANGE READING	ABORT COIL NUMBER	ALARM/ ABORT VALUES (DACS)	HIGH END READING	TEST ENGINEER INITIALS
TRA1B	DACS-1 TRAILER CURRENT PHASE B	0 - 100 AMPS	4.2.7.2	300178	F: 0	F: 2048	N/A	AL: N/A	F: 4095	
					D:	D:		AB: N/A	D:	
TRA1C	DACS-1 TRAILER CURRENT PHASE C	0 - 100 AMPS	4.2.7.3	300179	F: 0	F: 2048	N/A	AL: N/A	F: 4095	
					D:	D:		AB: N/A	D:	
TRV1	DACS-1 TRAILER VOLTAGE	0 - 130 VOLTS	4.2.7.4	300180	F: 0	F: 2048	N/A	AL: N/A	F: 4095	
					D:	D:		AB: N/A	D:	
WSH1	DACS-1 WEATHER ST. HUMIDITY	0 - 360%	4.2.7.5	300181	F: 0	F: 2048	N/A	AL: N/A	F: 4095	
					D:	D:		AB: N/A	D:	
WSWDIR	WEATHER STATION WIND DIRECTION	0 - 360 DEG	4.2.7.6	300182	F: 0	F: 2048	N/A	AL: N/A	F: 4095	
					D:	D:		AB: N/A	D:	
WSP1	DACS-1 W.S. BAROMETRIC PRESS.	11.60 - 15.37 PSIA	4.2.7.7	300183	F: 0	F: 2048	N/A	AL: N/A	F: 4095	
					D:	D:		AB: N/A	D:	
MODULE GROUP E										
TIR17B22	TANK TEMP RISER 17B, LVL 402"	12.5 - 325 °F	4.1.4.1	300185	F: 0	F: 2048	299	AL: (1540)	F: 4095	
					D:	D:		AB: (1605)	D:	

Table 2: PLC Inputs and Input Groups

DACS TAG	DESCRIPTION	SCALE / RANGE	DEV SYSTEM LOCATION	MODICON	LOW END READING	MID RANGE READING	ABORT COIL NUMBER	ALARM/ ABORT VALUES (DACS)	HIGH END READING	TEST ENGINEER INITIALS
LIR13A01	TANK LVL RISER 13A RADAR GAUGE	397 - 438 IN	4.1.4.2	300186	F: 0	F: 2048	N/A	AL: N/A	F: 4095	
					D:	D:		AB: N/A	D:	
TIR17B01	TANK TEMP RISER 17B, LVL 4"	12.5 - 325 °F	4.1.6.2	300194	F: 0	F: 2048	278	AL: (1540)	F: 4095	
					D:	D:		AB: (1605)	D:	
TIR17B02	TANK TEMP RISER 17B, LVL 16"	12.5 - 325 °F	4.1.4.3	300187	F: 0	F: 2048	279	AL: (1540)	F: 4095	
					D:	D:		AB: (1605)	D:	
TIR17B03	TANK TEMP RISER 17B, LVL 28"	12.5 - 325 °F	4.1.6.3	300195	F: 0	F: 2048	280	AL: (1540)	F: 4095	
					D:	D:		AB: (1605)	D:	
TIR17B04	TANK TEMP RISER 17B, LVL 52"	12.5 - 325 °F	4.1.4.4	300188	F: 0	F: 2048	281	AL: (1540)	F: 4095	
					D:	D:		AB: (1605)	D:	
TIR17B05	TANK TEMP RISER 17B, LVL 76"	12.5 - 325 °F	4.1.6.4	300196	F: 0	F: 2048	282	AL: (1540)	F: 4095	
					D:	D:		AB: (1605)	D:	

Table 2: PLC Inputs and Input Groups

DACS TAG	DESCRIPTION	SCALE / RANGE	DEV SYSTEM LOCATION	MODICON	LOW END READING	MID RANGE READING	ABORT COIL NUMBER	ALARM/ ABORT VALUES (DACS)	HIGH END READING	TEST ENGINEER INITIALS
TIR17B06	TANK TEMP RISER 17B, LVL 100"	12.5 - 325 °F	4.1.4.5	300189	F: 0	F: 2048	283	AL: (1540)	F: 4095	
					D:	D:		AB: (1605)	D:	
TIR17B07	TANK TEMP RISER 17B, LVL 112"	12.5 - 325 °F	4.1.6.5	300197	F: 0	F: 2048	284	AL: (1540)	F: 4095	
					D:	D:		AB: (1605)	D:	
TIR17B08	TANK TEMP RISER 17B, LVL 124"	12.5 - 325 °F	4.1.4.6	300190	F: 0	F: 2048	285	AL: (1540)	F: 4095	
					D:	D:		AB: (1605)	D:	
TIR17B09	TANK TEMP RISER 17B, LVL 148"	12.5 - 325 °F	4.1.6.6	300198	F: 0	F: 2048	286	AL: (1540)	F: 4095	
					D:	D:		AB: (1605)	D:	
TIR17B10	TANK TEMP RISER 17B, LVL 172"	12.5 - 325 °F	4.1.4.7	300191	F: 0	F: 2048	287	AL: (1540)	F: 4095	
					D:	D:		AB: (1605)	D:	
TIR17B11	TANK TEMP RISER 17B, LVL 196"	12.5 - 325 °F	4.1.6.7	300199	F: 0	F: 2048	288	AL: (1540)	F: 4095	
					D:	D:		AB: (1605)	D:	

Attachment 2, Tables and Data Sheets

Table 2: PLC Inputs and Input Groups

DACS TAG	DESCRIPTION	SCALE / RANGE	DEV SYSTEM LOCATION	MODICON	LOW END READING	MID RANGE READING	ABORT COIL NUMBER	ALARM/ ABORT VALUES (DACS)	HIGH END READING	TEST ENGINEER INITIALS
TIR17B12	TANK TEMP RISER 17B, LVL 208"	12.5 - 325 °F	4.1.4.8	300192	F: 0	F: 2048	289	AL: (1540)	F: 4095	
					D:	D:		AB: (1605)	D:	
TIR17B13	TANK TEMP RISER 17B, LVL 220"	12.5 - 325 °F	4.1.6.8	300200	F: 0	F: 2048	290	AL: (1540)	F: 4095	
					D:	D:		AB: (1605)	D:	
TIR17B14	TANK TEMP RISER 17B, LVL 232"	12.5 - 325 °F	4.2.6.1	300201	F: 0	F: 2048	291	AL: (1540)	F: 4095	
					D:	D:		AB: (1605)	D:	
TIR17B15	TANK TEMP RISER 17B, LVL 244"	12.5 - 325 °F	4.2.7.1	300209	F: 0	F: 2048	292	AL: (1540)	F: 4095	
					D:	D:		AB: (1605)	D:	
TIR17B16	TANK TEMP RISER 17B, LVL 268"	12.5 - 325 °F	4.2.6.2	300202	F: 0	F: 2048	293	AL: (1540)	F: 4095	
					D:	D:		AB: (1605)	D:	
TIR17B17	TANK TEMP RISER 17B, LVL 292"	12.5 - 325 °F	4.2.7.2	300210	F: 0	F: 2048	294	AL: (1540)	F: 4095	
					D:	D:		AB: (1605)	D:	

Table 2: PLC Inputs and Input Groups

DACS TAG	DESCRIPTION	SCALE / RANGE	DEV SYSTEM LOCATION	MODICON	LOW END READING	MID RANGE READING	ABORT COIL NUMBER	ALARM/ ABORT VALUES (DACS)	HIGH END READING	TEST ENGINEER INITIALS
TIR17B18	TANK TEMP RISER 17B, LVL 326"	12.5 - 325 °F	4.2.6.3	300203	F: 0	F: 2048	295	AL: (1540)	F: 4095	
					D:	D:		AB: (1605)	D:	
TIR17B19	TANK TEMP RISER 17B, LVL 340"	12.5 - 325 °F	4.2.7.3	300211	F: 0	F: 2048	296	AL: (1540)	F: 4095	
					D:	D:		AB: (1605)	D:	
TIR17B20	TANK TEMP RISER 17B, LVL 364"	12.5 - 325 °F	4.2.7.4	300212	F: 0	F: 2048	297	AL: (1540)	F: 4095	
					D:	D:		AB: (1605)	D:	
TIR17B21	TANK TEMP RISER 17B, LVL 392"	12.5 - 325 °F	4.2.6.4	300204	F: 0	F: 2048	298	AL: (1540)	F: 4095	
					D:	D:		AB: (1605)	D:	
NITHDR01	HEAD. HYDROGEN CONC. PRESS.	0 - 10%	4.2.6.5	300205	F: 0	F: 2048	N/A	AL: N/A	F: 4095	
					D:	D:		AB: N/A	D:	
FTE50003	SY TANK FARM EXHAUST FLOW	0 - 1274 CFM	4.2.6.6	300206	F:0	F: 2048	N/A	AL: N/A	F: 4095	
					D:	D:		AB: N/A	D:	

Attachment 2, Tables and Data Sheets

Table 2: PLC Inputs and Input Groups

DACS TAG	DESCRIPTION	SCALE / RANGE	DEV SYSTEM LOCATION	MODICON	LOW END READING	MID RANGE READING	ABORT COIL NUMBER	ALARM/ ABORT VALUES (DACS)	HIGH END READING	TEST ENGINEER INITIALS
FTE50001	VENT HEADER FLOW LOW RANGE	0 - 1275 CFM	4.2.6.7	300207	F: 0	F: 2048	308 342	LO AL: (1365) HI AL: (2168)	F: 4095	
					D:	D:		LO AB: (1285) HI AB: (2248)	D:	
PIR11B01	TANK DOME PRESSURE RISER 11B	-4 to 6 INWG	4.2.6.8	300208	F: 0	F: 2048	310	AL: (1024)	F: 4095	
					D:	D:		AB: (1229)	D:	
MODULE GROUP F										
FTE50002	VENT HEADER FLOW HIGH RANGE	-1000 to +7333 CFM	4.1.4.5	300237	F: 0	F: 2048	343 309	LO AL: (700) HI AL: (823)	F: 4095	
					D:	D:		LO AB: (688) HI AB: (835)	D:	
ZIMPE112	MIXER PUMP OSCILLATOR POSITION		4.1.6.1	300281	F: 0	F: 2048	N/A	AL: N/A	F: 4095	
					D:	D:		AB: N/A	D:	

Table 2: PLC Inputs and Input Groups

DACS TAG	DESCRIPTION	SCALE / RANGE	DEV SYSTEM LOCATION	MODICON	LOW END READING	MID RANGE READING	ABORT COIL NUMBER	ALARM/ ABORT VALUES (DACS)	HIGH END READING	TEST ENGINEER INITIALS
WIR17C01	STRAIN GAUGE R17C AT LEVEL 465.5"	± 684 μIN/IN	4.2.6.3	300291	F: 0	F: 2048	323 339	LO AL: (1248)	F: 4095	
								HI AL: (2847)		
					D:	D:		LO AB: (979)	D:	
								HI AB: (3116)		
WIR17B01	STRAIN GAUGE RISER 17B AT LVL 465.5"	± 684 μIN/IN	4.2.6.4	300292	F: 0	F: 2048	332 318	LO AL: (1248)	F: 4095	
								HI AL: (2847)		
					D:	D:		LO AB: (979)	D:	
								HI AB: (3116)		
WIR12A01	PUMP SUPPORT COLUMN STRAIN #1	± 684 μIN/IN	4.2.6.5	300293	F: 0	F: 2048	313 256	LO AL: (1612)	F: 4095	
								HI AL: (2483)		
					D:	D:		LO AB: (1467)	D:	
								HI AB: (2628)		

Table 2: PLC Inputs and Input Groups

DACS TAG	DESCRIPTION	SCALE / RANGE	DEV SYSTEM LOCATION	MODICON	LOW END READING	MID RANGE READING	ABORT COIL NUMBER	ALARM/ ABORT VALUES (DACS)	HIGH END READING	TEST ENGINEER INITIALS
WIR12A03	PUMP SUPPORT COLUMN STRAIN #3	± 684 μIN/IN	4.2.6.6	300294	F: 0	F: 2048	315 263	LO AL: (1612) HI AL: (2483)	F: 4095	
					D:	D:		LO AB: (1467) HI AB: (2628)	D:	
XIR12AN2	PUMP CASING VIBRATION	-5 to 5 G'S	4.2.6.7	300295	F: 0	F: 2048	N/A	AL: N/A	F: 4095	
					D:	D:		AB: N/A	D:	
WIR17C02	STRAIN GAUGE R17C AT LEVEL 465.5"	± 684 μIN/IN	4.2.6.8	300296	F: 0	F: 2048	340 324	LO AL: (1248) HI AL: (2847)	F: 4095	
					D:	D:		LO AB: (979) HI AB: (3116)	D:	

Table 2: PLC Inputs and Input Groups

DACS TAG	DESCRIPTION	SCALE / RANGE	DEV SYSTEM LOCATION	MODICON	LOW END READING	MID RANGE READING	ABORT COIL NUMBER	ALARM/ ABORT VALUES (DACS)	HIGH END READING	TEST ENGINEER INITIALS
WIR1BA01	STRAIN GAUGE RISER 1B AT LVL 530"	± 684 μIN/IN	4.2.7.2	300298	F: 0	F: 2048	334 320	LO AL: (1099) HI AL: (2996)	F: 4095	
					D:	D:		LO AB: (413) HI AB: (3682)	D:	
WIR1BA03	STRAIN GAUGE 1B, LVL 530"	± 684 μIN/IN	4.2.7.3	300299	F: 0	F: 2048	336 321	LO AL: (1099) HI AL: (2996)	F: 4095	
					D:	D:		LO AB: (413) HI AB: 3682)	D:	
WIR17B02	STRAIN GAUGE RISER 17B AT LVL 465.5"	± 684 μIN/IN	4.2.7.4	300300	F: 0	F: 2048	319 333	LO AL: (1248) HI AL: (2847)	F: 4095	
					D:	D:		LO AB: (979) HI AB: (3116)	D:	

Table 2: PLC Inputs and Input Groups

DACS TAG	DESCRIPTION	SCALE / RANGE	DEV SYSTEM LOCATION	MODICON	LOW END READING	MID RANGE READING	ABORT COIL NUMBER	ALARM/ ABORT VALUES (DACS)	HIGH END READING	TEST ENGINEER INITIALS
WIR12A02	PUMP SUPPORT COLUMN STRAIN #2	± 684 μIN/IN	4.2.7.5	300301	F: 0	F: 2048	314 262	LO AL: (1612)	F: 4095	
								HI AL: (2483)		
					D:	D:		LO AB: (1467)	D:	
								HI AB: (2628)		
WIR12A04	PUMP SUPPORT COLUMN STRAIN #4	± 684 μIN/IN	4.2.7.6	300302	F: 0	F: 2048	331 316	LO AL: (1612)	F: 4095	
								HI AL: (2483)		
					D:	D:		LO AB: (1467)	D:	
								HI AB: (2628)		
WIR1BA02	STRAIN GAUGE 1B, LVL 530"	± 684 μIN/IN	4.2.7.7	300303	F: 0	F: 2048	335 337	LO AL: (1099)	F: 4095	
								HI AL: (2996)		
					D:	D:		LO AB: (413)	D:	
								HI AB: (3682)		

Table 2: PLC Inputs and Input Groups

DACS TAG	DESCRIPTION	SCALE / RANGE	DEV SYSTEM LOCATION	MODICON	LOW END READING	MID RANGE READING	ABORT COIL NUMBER	ALARM/ ABORT VALUES (DACS)	HIGH END READING	TEST ENGINEER INITIALS
XIR12AN1	PUMP CASING VIBRATION	-5 to 5 G'S	4.2.7.8	300304	F: 0	F: 2048	N/A	AL: N/A	F: 4095	
					D:	D:		AB: N/A	D:	

Table 3: PLC Direct Inputs

DACS TAG	DESCRIPTION	SCALE/ RANGE	MODICON	LOW END READING	MID RANGE READING	ALARM/ ABORT VALUES (DACS)	HIGH END READING	TEST ENGINEER INITIALS
TIR17C02	TANK TEMP RISER 17C, - 16"	70 - 140 °F	400003	F: 72	F: 105	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	
TIR17C05	TANK TEMP RISER 17C, - 76"	70 - 140 °F	400004	F: 72	F: 105	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	
TIR17C08	TANK TEMP RISER 17C, - 124"	70 - 140 °F	400005	F: 72	F: 105	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	
TIR17C11	TANK TEMP RISER 17C, - 196"	70 - 140 °F	400006	F: 72	F: 105	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	
TIR17C14	TANK TEMP RISER 17C, - 232"	70 - 140 °F	400007	F: 72	F: 105	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	
TIR17C17	TANK TEMP RISER 17C, - 316"	70 - 140 °F	400008	F: 72	F: 105	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	
TIR17C20	TANK TEMP RISER 17C, - 392"	70 - 140 °F	400009	F: 72	F: 105	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	
TIR17C03	TANK TEMP RISER 17C, - 28"	70 - 140 °F	400018	F: 72	F: 105	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	
TIR17C06	TANK TEMP RISER 17C, - 100"	70 - 140 °F	400019	F: 72	F: 105	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	

Attachment 2, Tables and Data Sheets

Table 3: PLC Direct Inputs

DACS TAG	DESCRIPTION	SCALE/ RANGE	MODICON	LOW END READING	MID RANGE READING	ALARM/ ABORT VALUES (DACS)	HIGH END READING	TEST ENGINEER INITIALS
TIR17C09	TANK TEMP RISER 17C, -148"	70 - 140 °F	400020	F: 72	F: 105	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	
TIR17C12	TANK TEMP RISER 17C, -208"	70 - 140 °F	400021	F: 72	F: 105	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	
TIR17C15	TANK TEMP RISER 17C, -244"	70 - 140 °F	400022	F: 72	F: 105	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	
TIR17C18	TANK TEMP RISER 17C, -340"	70 - 140 °F	400023	F: 72	F: 105	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	
TIR17C21	TANK TEMP RISER 17C, -402"	70 - 140 °F	400024	F: 72	F: 105	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	
TIR17C01	TANK TEMP RISER 17C, -4"	70 - 140 °F	400161	F: 72	F: 105	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	
TIR17C04	TANK TEMP RISER 17C, -52"	70 - 140 °F	400162	F: 72	F: 105	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	
TIR17C07	TANK TEMP RISER 17C, -112"	70 - 140 °F	400163	F: 72	F: 105	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	
TIR17C10	TANK TEMP RISER 17C, -172"	70 - 140 °F	400164	F: 72	F: 105	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	

Table 3: PLC Direct Inputs

DACS TAG	DESCRIPTION	SCALE/ RANGE	MODICON	LOW END READING	MID RANGE READING	ALARM/ ABORT VALUES (DACS)	HIGH END READING	TEST ENGINEER INITIALS
TIR17C13	TANK TEMP RISER 17C, -220"	70 - 140 °F	400165	F: 72	F: 105	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	
TIR17C16	TANK TEMP RISER 17C, -292"	70 - 140 °F	400166	F: 72	F: 105	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	
TIR17C19	TANK TEMP RISER 17C, -364"	70 - 140 °F	400167	F: 72	F: 105	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	
TIR17C22	TANK TEMP RISER 17C, -427"	70 - 140 °F	400168	F: 72	F: 105	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	
TBSTC01	TANK BOT & SIDE T/C #1	-148 to +2192 °F	400259	F: 82	F: 110	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	
TBSTC04	TANK BOT & SIDE T/C #4	-148 to +2192 °F	400260	F: 82	F: 110	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	
TBSTC07	TANK BOT & SIDE T/C #7	-148 to +2192 °F	400261	F: 82	F: 110	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	
TBSTC10	TANK BOT & SIDE T/C #10	-148 to +2192 °F	400262	F: 82	F: 110	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	
TBSTC13	TANK BOT & SIDE T/C #13	-148 to +2192 °F	400263	F: 82	F: 110	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	

Table 3: PLC Direct Inputs

DACS TAG	DESCRIPTION	SCALE/ RANGE	MODICON	LOW END READING	MID RANGE READING	ALARM/ ABORT VALUES (DACS)	HIGH END READING	TEST ENGINEER INITIALS
TBSTC16	TANK BOT & SIDE T/C #16	-148 to +2192 °F	400264	F: 82	F: 110	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	
TBSTC19	TANK BOT & SIDE T/C #19	-148 to +2192 °F	400265	F: 82	F: 110	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	
TBSTC22	TANK BOT & SIDE T/C #22	-148 to +2192 °F	400266	F: 82	F: 110	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	
TBSTC25	TANK BOT & SIDE T/C #25	-148 to +2192 °F	400267	F: 82	F: 110	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	
TBSTC02	TANK BOT & SIDE T/C #02	-148 to +2192 °F	400270	F: 82	F: 110	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	
TBSTC05	TANK BOT & SIDE T/C #05	-148 to +2192 °F	400271	F: 82	F: 110	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	
TBSTC08	TANK BOT & SIDE T/C #08	-148 to +2192 °F	400272	F: 82	F: 110	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	
TBSTC11	TANK BOT & SIDE T/C #11	-148 to +2192 °F	400273	F: 82	F: 110	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	
TBSTC14	TANK BOT & SIDE T/C #14	-148 to +2192 °F	400274	F: 82	F: 110	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	
TBSTC17	TANK BOT & SIDE T/C #15	-148 to +2192 °F	400275	F: 82	F: 110	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	

Attachment 2, Tables and Data Sheets

Table 3: PLC Direct Inputs

DACS TAG	DESCRIPTION	SCALE/ RANGE	MODICON	LOW END READING	MID RANGE READING	ALARM/ ABORT VALUES (DACS)	HIGH END READING	TEST ENGINEER INITIALS
TBSTC20	TANK BOT & SIDE T/C #20	-148 to +2192 °F	400276	F: 82	F: 110	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	
TBSTC23	TANK BOT & SIDE T/C #23	-148 to +2192 °F	400277	F: 82	F: 110	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	
TBSTC26	TANK BOT & SIDE T/C #26	-148 to +2192 °F	400278	F: 82	F: 110	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	
TBSTC03	TANK BOT & SIDE T/C #03	-148 to +2192 °F	400281	F: 82	F: 110	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	
TBSTC06	TANK BOT & SIDE T/C #06	-148 to +2192 °F	400282	F: 82	F: 110	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	
TBSTC09	TANK BOT & SIDE T/C #09	-148 to +2192 °F	400283	F: 82	F: 110	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	
TBSTC12	TANK BOT & SIDE T/C #12	-148 to +2192 °F	400284	F: 82	F: 110	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	
TBSTC15	TANK BOT & SIDE T/C #15	-148 to +2192 °F	400285	F: 82	F: 110	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	
TBSTC18	TANK BOT & SIDE T/C #18	-148 to +2192 °F	400286	F: 82	F: 110	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	
TBSTC21	TANK BOT & SIDE T/C #21	-148 to +2192 °F	400287	F: 82	F: 110	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	

Table 3: PLC Direct Inputs

DACS TAG	DESCRIPTION	SCALE/ RANGE	MODICON	LOW END READING	MID RANGE READING	ALARM/ ABORT VALUES (DACS)	HIGH END READING	TEST ENGINEER INITIALS
TBSTC24	TANK BOT & SIDE T/C #24	-148 to +2192 °F	400288	F: 82	F: 110	AL: N/A	F: 138	
				D:	D:	AB: N/A	D:	
GC3-TIME	GC3 TIME OF SAMPLE	0 - 65535	400633	F: 100	F: 1200	AL: N/A	F: 2330	
				D:	D:	AB: N/A	D:	
GC3-RT	GC3 HYDROGEN RETENTION TIME	0 - 65535 MIN/100	400635	F: 1	F: 5	AL: N/A	F: 10	
				D:	D:	AB: N/A	D:	
GC3-H2	GC3 HYDROGEN CONCENTRATION	0 - 65535 PPM	400636	F: 20	F: 75	AL: N/A	F: 100	
				D:	D:	AB: N/A	D:	
GC3-FILE	GC3 FILE ID	0 - 65535	400637	F: 10	F: 30	AL: N/A	F: 50	
				D:	D:	AB: N/A	D:	
FT-TIME	FTIR TIME OF SAMPLE	0 - 65535 HRS/MIN	400638	F: 100	F: 1200	AL: N/A	F: 2330	
				D:	D:	AB: N/A	D:	
FT-N2OA	FTIR N2O PEAK AREA	0 - 65535 x 100	400649	F: 10	F: 30	AL: N/A	F: 50	
				D:	D:	AB: N/A	D:	
FT-N2OC	FTIR N2O CONCENTRATION	0 - 65535 PPM	400650	F: 100	F: 300	AL: N/A	F: 500	
				D:	D:	AB: N/A	D:	

Table 3: PLC Direct Inputs

DACS TAG	DESCRIPTION	SCALE/ RANGE	MODICON	LOW END READING	MID RANGE READING	ALARM/ ABORT VALUES (DACS)	HIGH END READING	TEST ENGINEER INITIALS
FT-NH3A	FTIR NH3 PEAK AREA	0 - 65535 x 100	400651	F: 10	F: 30	AL: N/A	F: 50	
				D:	D:	AB: N/A	D:	
FT-NH3C	FTIR NH3 CONCENTRATION	0 - 9999 PPM	400652	F: 100	F: 300	AL: N/A	F: 500	
				D:	D:	AB: N/A	D:	
FT-FILE	FTIR FILE ID	0 - 65535	400653	F: 10	F: 30	AL: N/A	F: 50	
				D:	D:	AB: N/A	D:	
RG-RUN	RGA5 RUN NUMBER	0 - 65535	400612	F: 10	F: 30	AL: N/A	F: 50	
				D:	D:	AB: N/A	D:	
RG-STAT	RGA5 SAMPLE STATUS	0 - 65535	400613	F: 1	F: 2	AL: N/A	F: 3	
				D:	D:	AB: N/A	D:	
RG-TIME	RGA5 TIME OF SAMPLE	0 - 65535	400614	F: 100	F: 1200	AL: N/A	F: 2330	
				D:	D:	AB:	D:	
GC1-H2	GC1 HYDROGEN CONCENTRATION	0 - 9999.9	400615	F: 50	F: 75	AL: (15)	F: 100	
				D: (7.6)	D: (11.4)	AB: N/A	D: (15.3)	
GC1-ARHI	GC1 AREA HIGH PORTION	0 - 999999999	400616	F: 10	F: 30	AL: N/A	F: 50	
				D:	D:	AB: N/A	D:	
GC1-ARLO	GC1 AREA LOW PORTION	0 - 65535	400617	F: 100	F: 1000	AL: N/A	F: 10000	
				D:	D:	AB: N/A	D:	

Table 3: PLC Direct Inputs

DACS TAG	DESCRIPTION	SCALE/ RANGE	MODICON	LOW END READING	MID RANGE READING	ALARM/ ABORT VALUES (DACS)	HIGH END READING	TEST ENGINEER INITIALS
GC1-RT	GC1 RETENTION TIME	0 - 65535	400618	F: 1 D:	F: 5 D:	AL: N/A AB: N/A	F: 10 D:	
GC2-H2	GC2 HYDROGEN CONCENTRATION	0 - 9999.9	400619	F: 125 D: (19.1)	F: 300 D: (45.8)	AL: N/A AB: N/A	F: 500 D: (76.3)	
GC2-ARHI	GC2 AREA HIGH PORTION	0 - 999999999	400620	F: 10 D:	F: 50 D:	AL: N/A AB: N/A	F: 100 D:	
GC2-ARLO	GC2 AREA LOW PORTION	0 - 65535	400621	F: 100 D:	F: 1000 D:	AL: N/A AB: N/A	F: 10000 D:	
GC2-RT	GC2 RETENTION TIME	0 - 65535	400622	F; 130 D:	F: 550 D:	AL; N/A AB: N/A	F: 1000 D:	
PHO-MSB	PHOTO NH3 CONCENTRATION MSB	0 - 65535	400689	F: 20 D:	F: 100 D:	AL: N/A AB: N/A	F: 300 D:	
PHO-LSB	PHOTO NH3 CONCENTRATION LSB	0 - 65535	400690	F: 100 D:	F: 1000 D:	AL: N/A AB: N/A	F: 10000 D:	
PHO-TIME	PHOTO NH3 SAMPLE TIME	0 - 65535	400686	F: 100 D:	F: 1300 D:	AL: N/A AB: N/A	F: 2330 D:	

Attachment 2, Tables and Data Sheets

Measurement and Test Equipment Record Sheet					
Manufacturer	Model	Serial No.	Calibration Due Date	Calibration Tracking Code	Use Description

Attachment 3: Measurement and Test Equipment Record Sheet

mpletion of this procedure has demonstrated that:

- The mixer pump motor control and directional drive system motor control software has been tested to ensure that the software functions correctly for mixer pump operations, with Station #7 or Station #8 as the Motor Control Station and with Station #5 or Station #7 as the Master Control Station.
- All inputs to the Programmable Logic Controllers (PLCs) have been tested using a development system, and the new PLCs and MODBUS PLUS software are operating properly for use in the DACS trailer.
- End-to-end checks have been performed for selected input signals from the 101-SY instrumentation in the tank farm to the DACS computers, to ensure that installation of the new PLCs and all other changes to the DACS hardware and software are operating properly.
- New screens have been tested for proper control and display of DACS parameters.
- A record of all noted deficiencies was kept on Attachment 1, Exception List, and all recorded exceptions have been resolved and the resolutions approved.

proved by:

D. C. Larsen, Test Manager	Date
R. W. Reed, Test Engineering	Date
J. W. Lentsch, Program Manager	Date

Attachment 4: Final Procedure Acceptance Sheet