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NOV 05 1999 **ENGINEERING DATA TRANSMITTAL** **S**

Page 1 of 1

1. EDT 624849

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INTERIM STABILIZATION	W. F. ZUROFF	N/A
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(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	(F) Approval Designator	(G) Reason for Transmittal	(H) Originator Disposition	(I) Receiver Disposition
1	RPP-5073	N/A	0	ACCEPTANCE TEST PROCEDURE	SQ	1	1	1
				FOR NEW PUMPING				
				INSTRUMENTATION ANDCONTROL				
				SKID "M"				

16. KEY

Approval Designator (F)	Reason for Transmittal (G)	Disposition (H) & (I)
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1	1	Design Authority W.F. ZUROFF									
1	1	Design Agent B.R. JOHNS	BR Johns	11/1/99	S7-24						
1	1	Cog. Eng. B.R. JOHNS	BR Johns	11/1/99	S7-24						
1	1	Cog. Mgr. M.R. KOCH	M R Koch	11/3/99	S7-24						
1	1	QA M.C. T.J. VOLKMAN	Michael C. Volkman	11/3/99	S7-24						
1	1	Safety F.A. ZAK	F A Zak	11/3/99							
		Env. N/A									

18.	19.	20.	21. DOE APPROVAL (if required)
BR Johns	M R Koch	W F Zuroff	Ctrl No. N/A
B.R. JOHNS	M.R. KOCH	W.F. ZUROFF	( ) Approved
Signature of EDT Originator	Authorized Representative for Receiving Organization	Design Authority/ Cognizant Manager	( ) Approved w/comments
Date 11/1/99	Date 11/3/99	Date 11/3/99	( ) Disapproved w/comments

ACCEPTANCE TEST PROCEDURE FOR NEW PUMPING AND INSTRUMENTATION CONTROL SKID "M"

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Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-96RL13200

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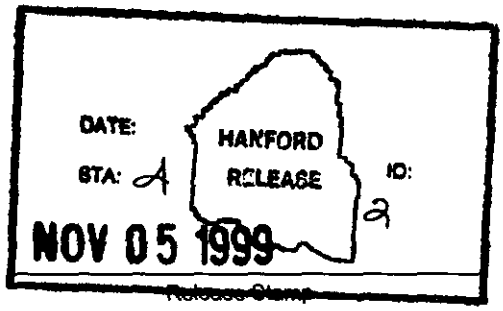
Key Words: PICS, SALT WELL, SKID, INTERIM STABILIZATION, TESTING

Abstract:
This Acceptance Test Procedure (ATP) provides for the inspection and testing of the new Pumping and Instrumentation Control (PIC) skid designed as "M". The ATP will be performed after the construction of the PIC skid in the shop.

11/5/99
Release Approval Date



Approved For Public Release

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ACCEPTANCE TEST PROCEDURE FOR NEW PUMPING AND INSTRUMENTATION CONTROL SKID "M"

1.0 PURPOSE

This Acceptance Test Procedure (ATP) verifies proper construction per the design drawings and tests for proper functioning of the Pumping and Instrumentation Control (PIC) skid "M". The Scope section lists the systems and functions to be checked. This ATP will be performed at the Site Fabrication Service's (SFS) shop upon completion of construction of the PIC skid.

2.0 INFORMATION

2.1 SCOPE

This Acceptance Test Procedure verifies and/or tests the following systems:

2.1.1 Drawing verification (Prerequisites)

2.1.2 Code inspections (Prerequisites)

2.1.3 Instrument calibrations

2.1.4 Continuity, megger and voltage checks

2.1.5 PLC Programming

2.1.6 Air system

2.1.7 Water system

2.1.8 PLC inputs and outputs

2.1.9 Heaters and air conditioner

2.1.10 Leak Detector Interlocks

2.2 TERMS AND DEFINITIONS

2.2.1 DOV - Diaphragm Operated Valve
2.2.2 GPM - Gallons Per Minute
2.2.3 IA - Instrument Air
2.2.4 LDE - Leak Detector Element
2.2.5 PRV - Pressure Relief Valve
2.2.6 SGT - Specific Gravity Transmitter
2.2.7 WFT - Weight Factor Transmitter
2.2.8 LT - Level Transmitter
2.2.9 WFIE - Weight Factor Instrument Enclosure
2.2.10 PLC - Programmable Logic Controller
2.2.11 DTAM - Data Table Access Module
2.2.12 PSPT - Pump Suction Pressure Transducer
2.2.13 PDPT - Pump Discharge Pressure Transducer
2.2.14 JFPT - Jumper Flush Pressure Transducer
2.2.15 RFPT - Recirculation Flush Pressure Transducer
2.2.16 PIC - Person In Charge

2.3 RESPONSIBILITIES

2.3.1 LMHC Quality Assurance is responsible for:

2.3.1.1 Witnessing and signing steps as identified in Acceptance Test Procedure.
2.3.1.2 Verifying that the procedure sections were performed correctly.

2.3.2 Engineering personnel are responsible for:

2.3.2.1 Identifying the equipment needed for this procedure.
2.3.2.2 Recording equipment status and data per this procedure.
2.3.2.3 Conducting pre-job system walk down.
2.3.2.4 Recording data, exceptions and other notes as required.
2.3.2.5 Providing technical support during testing.
2.3.2.6 Providing programming support during testing.
2.3.2.7 Forcing data in Programmable Logic Controller program during testing.

2.4 SAFETY

Warning: 120 VAC energized circuits and leads will be encountered during test when accessing PLC input/output terminals or the serial communication port. Observe appropriate electrical precautions as directed by HNF-PRO-088, Electrical Work Safety.

Warning: Cabinets on the PIC skid contain circuits energized with 480vac and 120vac. Comply with HNF-PRO-088, Electrical Work Safety.

2.5 QUALITY ASSURANCE

Ensure that the testing is performed per this procedure. The LMHC Quality Assurance Inspector shall sign and date each procedure section verifying the data obtained, and verifying that the procedure section has been performed correctly.

2.6 GENERAL INFORMATION

2.6.1 All data entries recorded in this procedure shall be made in black or blue ink.

2.6.2 Editorial changes required to this ATP may be made by redlining the affected section by the engineer as long as the change does not impact personnel safety or the technical aspects of this procedure. These changes shall be recorded on the ATP log sheet.

2.6.3 Unexpected results during testing shall be logged in the Acceptance Test Procedure "Exception Log" and documented on an Acceptance Test Procedure "Exception Record."

2.6.4 Technical changes to this test shall be logged as "Exceptions" and documented on the "Exception Record."

2.6.5 Do not perform any part of this procedure on faulty equipment. If faulty equipment is discovered, STOP the execution of that section of this procedure and resolve the problem OR continue with another section until the problem is repaired.

2.6.6 If the performance of this procedure is suspended for any reason, ensure the equipment is left in a safe condition per direction of the test engineer and/or PIC.

2.6.7 This procedure DOES NOT contain separate data/verification sheets. Verification of procedural steps and validity of data is recorded in this procedure next to each step as required.

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

2.6.9 A Job Hazard Analysis form shall be used in conjunction with the pre-job safety meeting form when any unusual hazards are identified. The pre-job meeting form shall be used to document all attendees.

2.6.10 An ATP log shall be used to record comments concerning ATP performance such as each day's testing activities.

2.6.11 The engineer or PIC may deviate from test steps if necessary to ensure safe equipment configuration during testing or suspension of testing. Configuration shall be noted so the equipment may be restored at resumption of testing.

2.6.12 Alarms may be acknowledged during testing at the direction of the test engineer or PIC if specific instructions are not given in the test steps.

2.6.13 Sections 4.2, 4.3, 5.6, 5.7 and 5.15 can be performed out of sequence in order to facilitate completion of this ATP.

2.6.14 Sections 5.10 through 5.13 can be performed out of order as directed by the engineer and/or PIC as necessary to facilitate ATP performance.

2.7 LIMITS AND PRECAUTIONS

NONE

3.0 RECORDS

3.1 RECORD COPY

The record copy of this procedure when completed shall be kept with the fabrication work package.

3.2 TEST RESULTS

A test report, RPP-5056 shall be issued with the final test results upon completion of this ATP.

4.0 PREREQUISITES

4.1 DRAWING VERIFICATION

A check of the constructed skid is to be compared to either the redlined drawings or the final unreleased skid drawings. Engineering and Quality Assurance shall verify the accuracy of the essential and support drawings. Engineering shall determine a resolution for all discrepancies by either correcting the drawings or changing the equipment.

The following drawings shall be walked down for verification of proper construction of the skid:

4.1.1 Wire terminations and wiring labeling on drawings H-14-103546, sheets 7 through 12 and H-14-103549, sheet 5.
4.1.2 Panel board arrangement on drawing H-14-103544.
4.1.3 Flow diagrams on drawings H-14-103546, sheet 5 and H-14-103551.

Drawing verification completed. (Final drawing release is not required to continue with this ATP.)

_____
Cognizant Engineer Signature Date

_____
Quality Assurance Inspector Signature Date

4.2 PRESSURE VESSEL INSPECTION

A pressure vessel inspection by a third party inspector is required for the air compressor, the air receiver tank and relief valves located in the air compressor cabinet and the water tank and relief valves in the water cabinet. The inspection is to verify that the equipment meets National Codes for pressure vessels. An outside-certified inspector will perform this inspection. (This inspection shall be completed prior to checking the air compressor and water systems.)

Pressure vessel inspection report received. (The ATP can continue before the report is received, but must be received prior to performing section 5.8.)

Report #_____

_____

Quality Assurance Inspector Signature Date

4.3 NATIONAL ELECTRICAL CODE (NEC) INSPECTION

4.3.1 An NEC inspection shall be performed to verify compliance to NFPA 70, latest version.

4.3.2 Areas in particular to be inspected are 480vac and 120vac wiring and grounding.

4.3.3 An NEC inspection sticker is to be placed inside the panel board door upon the NEC inspector's acceptance of the electrical portion of the skid.

The NEC inspection performed and an NEC inspection sticker placed on the panel board door. (This needs to be completed prior to the section 5.0 functional checks.)

Report #_____

_____

Quality Assurance Inspector Signature Date

4.4 SUPPLIES

The following supplies are required for this ATP:
Note: Test sections may commence prior to assembly of all the test equipment. Engineer and/or PIC are to ensure test equipment available prior to the start of each section.

4.4.1 Volt/ohm meter (VOM): Portable, 0-600vac.

Calibration No. _____ Exp. Date _____ QA _____

Calibration No. _____ Exp. Date _____ QA _____

4.4.2 Transmation current (milliamp) simulator or equivalent

Calibration No. _____ Exp. Date _____ QA _____

Calibration No. _____ Exp. Date _____ QA _____

4.4.3 Manometer (capable of a minimum of 5 inches water gauge to a maximum of 20 inches water gauge for this ATP) must have a read out of variable test pressure.

Calibration No. _____ Exp. Date _____ QA _____

Calibration No. _____ Exp. Date _____ QA _____

4.4.4 Megaohm meter, at least 500vac range.

Calibration No. _____ Exp. Date _____ QA _____

4.4.5 _____480vac, 3 phase, 30-ampere power source for PIC skid.
4.4.6 _____Selector switches (2 each) with at least one NO and one NC contact.
4.4.7 _____Proximity switches (for simulating LS-1 and LS-2), 2 each.
4.4.8 _____Leak detector probes (2 each), (Not required to be green tagged.) or 2 ON/OFF switches can be used to simulate leak detectors.
4.4.9 Heat gun to warm thermocouple probes.
4.4.10 Thermocouple or thermocouple wire for simulating jumper and pump thermocouple probes.
4.4.11 Buckets or pans for water for leak detector probe test and catching water from DIP tubes and relief valve.

4.5 PRESTART CONDITIONS

4.5.1 _____Fill the water tank at least one-third to half full of water.

4.5.2 _____Ensure the PIC skid is grounded in preparation for ATP testing.

4.5.3 Ensure the following PIC skid valves in the WFIE cabinet are OPEN prior to starting this ATP.

_____SALW-V-6035M (EQUALIZING)
_____SALW-V-6036M (EQUALIZING)

4.5.4 Ensure the following PIC skid valves are CLOSED prior to starting this ATP.

Air Compressor cabinet:

_____SALW-V-6025M
_____SALW-V-6026M
_____SALW-V-6034M
_____SALW-V-6043M
_____SALW-V-6044M
_____SALW-V-6046M
_____SALW-V-6047M
_____SALW-V-6048M
_____SALW-V-6049M

Water cabinet:

_____SALW-V-6027M
_____SALW-V-6028M
_____SALW-V-6029M
_____SALW-V-6030M
_____SALW-V-6031M
_____SALW-V-6032M
_____SALW-V-6037M

WFIE Cabinet:

_____SALW-V-6001M
_____SALW-V-6002M
_____SALW-V-6003M
_____SALW-V-6004M
_____SALW-V-6005M
_____SALW-V-6006M
_____SALW-V-6007M
_____SALW-V-6008M
_____SALW-V-6011M
_____SALW-V-6012M
_____SALW-V-6013M
_____SALW-V-6014M
_____SALW-V-6015M
_____SALW-V-6016M
_____SALW-V-6017M
_____SALW-V-6018M
_____SALW-V-6019M
_____SALW-V-6020M
_____SALW-V-6021M
_____SALW-V-6035M LOW
_____SALW-V-6035M HIGH
_____SALW-V-6036M LOW
_____SALW-V-6036M HIGH

4.5.5 Ensure the following PIC skid circuit disconnects, breakers and fuses are OPEN or OFF prior to starting this ATP.

_____SALW-DS-6002M _____SALW-DS-6003M _____SALW-DS-6004M _____SALW-DS-6005M

The following breakers are in distribution panel SALW-DP-6001M:

_____Breaker "MAIN"
_____Breaker 1
_____Breaker 3
_____Breaker 5
_____Breaker 7
_____Breaker 9
_____Breaker 11
_____Breaker 13
_____Breaker 2
_____Breaker 4
_____Breaker 6
_____Breaker 8
_____Breaker 10
_____Breaker 12
_____Breaker 14

The following fuses are inside the Instrument Enclosure:

_____Fuses FA/FB _____Fuses FC/FD
_____Fuses (Leak detector/Heat trace)

4.5.6 Check for lose electrical connections at the following locations:

_____Terminal boards in Instrument Enclosure
_____Motor starters and disconnect switches
_____Terminal board in junction box inside the WFIE cabinet
_____Terminal board in junction box for FGM outside WFIE cabinet
_____Terminal board in heat trace splice box outside WFIE cabinet
_____Distribution panel board
_____480vac power plug

4.5.7 _____Ensure desiccant and filters are installed in the air compressor dryer and the before and after filters prior to performing sections 5.8 and 5.9.

4.5.8 _____All personnel initialing and/or signing this procedure shall enter their signature and initials on the Procedure Performer Signature Sheet on the last page of this document.

4.5.9 _____ A pre-job safety meeting has been held before starting section 5.0 of this ATP.

5.0 PROCEDURE

5.1 CONTINUITY CHECKS

Continuity checks shall be performed with a calibrated VOM. Perform the checks as identified below. Readings are to be less than 1 ohm. Record ohms reading on the line(s) provided. Out of tolerance readings must be corrected and rechecked prior to going to the next section. NOTE: NEC inspection must be completed prior to proceeding.

5.1.1 480vac main power plug to line side of main disconnect switch (SALW-DS-6002M). Check all three phases and ground.

_____(RED) _____(YELLOW) _____(BLUE) _____(GND)

5.1.2 Load side of main disconnect switch (SALW-DS-6002M) to line side of transformer disconnect switch (SALW-DS-6003M). Check all three phases and ground.

_____(RED) _____(YELLOW or BLUE) _____(GND)

5.1.3 Load side of main disconnect switch (SALW-DS-6002M) to line side of jet pump motor starter (SALW-DS-6005M). Check all three phases and ground.

_____(RED) _____(YELLOW) _____(BLUE) _____(GND)

5.1.4 Load side of main disconnect switch (SALW-DS-6002M) to line side of air compressor motor starter (SALW-DS-6004M). Check all three phases and ground.

_____(RED) _____(YELLOW) _____(BLUE) _____(GND)

5.1.5 Load side of transformer disconnect switch (SALW-DS-6003M) through primary of transformer (SALW-XFMR-6001M). Check between the two-phase wires going to the transformer.

_____(continuity through transformer primary)

5.1.6 *Line side of main breaker in panel board (SALW-DP-6001M) through* secondary of transformer (SALW-XFMR-6001M). Check between the two phases and between each phase and neutral going to the transformer secondary.

_____(Phase-A to phase-C, continuity through transformer secondary)

_____(Phase-A to neutral, continuity through transformer secondary)

_____(Phase-C to neutral, continuity through transformer secondary)

5.1.7 Load side of breakers in distribution panel (SALW-DP-6001M) to terminal point identified:

_____Circuit 3 to TB10 in Instrument Enclosure
_____Circuit 5 to TB13 in Instrument Enclosure
_____Circuit 12 to Air Conditioner/Heater receptacle in Instrument Enclosure
_____Circuit 6 to safe side terminal board in Intrinsic Safe Panel
_____Circuit 1 to terminal board in FGM power junction box
_____Circuit 11 to terminal board in FGM power junction box
_____Circuit 13 to terminal board in FGM power junction box
_____Circuit 14 to terminal board in FGM power junction box
_____*Circuit 2 to terminal board in FGM heat trace splice box*
_____Circuit 10 to terminal board in FGM heat trace splice box
_____Circuit 4 to receptacle in air compressor cabinet
_____Circuit 7 to receptacles in WFIE cabinet
_____Circuit 8 to receptacle in Water cabinet
_____Circuit 9 to outside receptacle below panel board

Section 5.1 completed and all recorded readings within tolerance.

_____

Quality Assurance Inspector Signature Date

5.2 MEGGERING OF POWER WIRES

The power wires shall be checked for resistance to ground and phase to phase. A 500-volt megger shall be used for this check. Minimum acceptable readings expected are greater than 1000 megaohm or infinity. Test the circuits listed below. Record readings on the lines provided. Out of tolerance readings must be corrected and rechecked before going to the next section.

5.2.1 Each of the three phases at the pins of the power plug to ground and phase to phase. (Ensure main disconnect SALW-DS-6002M is OPEN.)

A-GND_____; B-GND_____; C-GND_____; A-B_____; A-C_____; B-C_____

5.2.2 Each of the three phases at the load side of the main disconnect switch (SALW-DS-6002M) to ground and phase to phase. (Ensure switches SALW-DS-6003M, SALW-DS-6004M and SALW-DS-6005M are OPEN.)

A-GND_____; B-GND_____; C-GND_____; A-B_____; A-C_____; B-C_____

5.2.3 Each of the two phases on the load side of the transformer disconnect switch (SALW-DS-6003M) to ground.

A-GND_____; B-GND_____;

5.2.4 Each of the three phases on the load side of the air compressor motor to ground.

A-GND_____; B-GND_____; C-GND_____

5.2.5 _____Disconnect the neutral at the distribution panel from ground.

5.2.6 Each of the two phases and neutral to ground at the distribution panel.

A-GND_____; B-GND_____; NEUTRAL-GND_____

5.2.7 _____Reconnect the ground to the neutral at the distribution panel.

5.2.8 _____Disconnect the circuit 6 wire at the safe side terminal block in the intrinsic safe panel.

5.2.9 Megger each of the 14 circuits from the wire disconnected at the load side of the breaker to ground in the distribution panel.

NOTE: Disconnect each wire from the load side of the breaker prior to performing the megger check. Reconnect after meggering.

CKT.#1 to GND_____; CKT.#2 to GND_____; CKT.#3 to GND_____; CKT.#4 to GND_____; CKT.#5 to GND_____; CKT.#6 to GND_____; CKT.#7 to GND_____; CKT.#8 to GND_____; CKT.#9 to GND_____; CKT.#10 to GND_____; CKT.#11 to GND_____; CKT.#12 to GND_____; CKT.#13 to GND_____; CKT.#14 to GND_____.

5.2.10 _____Ensure the load-side wire at each breaker is connected.

5.2.11 _____Reconnect the circuit-6-wire to the safe side terminal board at the Intrinsic safe panel.

Section 5.2 completed and all recorded readings are within tolerance.

_____

Quality Assurance Inspector Signature Date

5.3 ELECTRICAL POWER CHECKS

The voltage checks are to verify proper voltages throughout the skid at specific termination points. Voltages checked are 480vac, 3 phase; 120vac, single phase; and 24vdc. Out of tolerance readings must be corrected when found before going to the next step in this section.

5.3.1 _____Ensure that all electrical connections are completed. Wires lifted during the megger checks are to be reconnected.

5.3.2 _____Ensure all switches and breakers are open and the six fuses in the instrument cabinet are open.

5.3.3 _____Ensure that all the fuses are in the two safety switches (SALW-DS-6002M) (SALW-DS-6003M) and motor starters (SALW-DS-6004M) (SALW-DS-6005M) including the control transformers are installed.

5.3.4 _____Connect the main power plug on the skid to a three phase, 480vac power source. Source to be protected by no greater than 30 amperes over current protection.

5.3.5 _____Turn ON the power source to the skid.

5.3.6 _____ENSURE 480vac +10vac/-20vac on the line side of the main disconnect switch (SALW-DS-6002M). Record the voltage.

_____vac A-B
_____vac A-C
_____vac B-C

5.3.7 _____Close the main disconnect switch (SALW-DS-6002M).

5.3.8 _____ENSURE 480vac +10vac/-20vac on the line side of the transformer disconnect switch (SALW-DS-6003M). Record the voltage.

_____vac A-C

5.3.9 _____ENSURE 480vac +10vac/-20vac on the line side of the air compressor motor starter (SALW-DS-6003M). Record the voltage.
_____vac A-B
_____vac A-C
_____vac B-C

5.3.10 _____ENSURE 480vac +10vac/-20vac on the line side of the pump motor starter (SALW-DS-6005M). Record the voltage. _____vac A-B
_____vac A-C
_____vac B-C

5.3.11 _____Remove the dead front on the panel board (SALW-DP-6001M) for access to the main breaker for a voltage measurement.

5.3.12 _____Close the transformer disconnect switch (SALW-DS-6003M).

5.3.13 _____Check for 240vac +10/-20 at the line side of the main breaker. Record voltage. _____vac

5.3.14 _____Open the transformer disconnect switch (SALW-DS-6003M).

5.3.15 _____Replace the dead front on the panel board (SALW-DP-6001M).

5.3.16 _____Close the transformer disconnect switch (SALW-DS-6003M).

5.3.17 _____Close the 100 ampere main breaker in the panel board (SALW-DP-6001M).

5.3.18 _____Check voltages for circuits at the following locations. Record the voltage reading on the space provided.

CKT #	CHECK VOLTAGE AT	BKR OPEN VOLTAGE (NEAR 0vac)	BKR CLOSED VOLTAGE (120+/-10vac)	OPEN BKR
1	FGM J-BOX			
2	FGM HT BOX			
3	TB10, INSTR PNL			
4	RCPT, AIR COMP			
5	TB13, INSTR PNL			
6	TB, INTRINSIC PNL			
7	RCPT, WFIE			
8	RCPT, WATER CAB			
9	OUTSIDE RCPT.			
10	FGM HT BOX			
11	FGM J-BOX			
12	RCPT, INSTR PNL			
13	FGM J-BOX			
14	FGM J-BOX			

5.3.19 _____Install fuses FA, FB, FC and FD and close fuseholder.

5.3.20 _____Install fuses and close heat trace/leak detector fuseholder.

5.3.21 _____ENSURE 120vac +/-10vac at the following fuseholder load side locations.

FA_____; FB_____; FC_____; FD_____;

Heat trace fuse(wire CKT3H-B) _____;

Leak Detector fuse(wire CKT3H-A) _____

5.3.22 _____ENSURE 24vdc +/-2vdc at each 24vdc power supply.

First power supply _____; second power supply _____

5.3.23 _____Open the 100 ampere main breaker in the panel board (SALW-DP-6001M).

5.3.24 _____Open the transformer disconnect switch (SALW-DS-6003M).

5.3.25 _____Open the main disconnect switch (SALW-DS-6002M).

Voltage checks completed satisfactorily.

Quality Assurance Inspector Signature Date

5.5 SKID ELECTRICAL POWER UP

During the following sections for instrument calibration and PLC/DTAM programming, electrical power will be required to the skid. The following sequence can be used to power up and power down the skid. Record breakers closed or opened in table below. Only circuits requiring power need to be closed.

SWITCH OR BREAKER	Close	Open	Close	Open	Close	Open	Close	Open
SALW-DS-6002M								
SALW-DS-6003M								
CKT. #1								
CKT. #2								
CKT. #3								
CKT. #4								
CKT. #5								
CKT. #6								
CKT. #7								
CKT. #8								
CKT. #9								
CKT. #10								
CKT. #11								
CKT. #12								
CKT. #13								
CKT. #14								

5.6 CALIBRATIONS

Instrumentation equipment on the skid requires calibration prior to the functional testing. Lockheed Martin procedures will be used for this calibration. The table below identifies the equipment requiring calibration and the procedure for performing the calibration.

INSTRUMENT	LOCATION	PROCEDURE
SALW-PS-6004M	INSTRU. AIR CAB.	6-PCD-508
SALW-WFT-6002M	WFIE CABINET	6-PCD-361
SALW-LT-6003M	WATER CABINET	6-PCD-361
SALW-SGT-6001M	WFIE CABINET	6-PCD-361
SALW-CONV-6001M	WFIE CABINET	6-CVT-520
SALW-FQIT-6001M	INSTRUMENT CAB.	Data sheet & Vendor Man.
SALW-PI-6006M	AIR COMPRS. CABINET	6-TF-509
SALW-PI-6001M	WFIE CABINET	6-TF-509
SALW-PI-6005M	WFIE CABINET	6-TF-509
SALW-PI-6002M	WFIE CABINET	6-TF-509
SALW-PI-6003M	WFIE CABINET	6-TF-509
SALW-PI-6004M	WFIE CABINET	6-TF-509
SALW-PI-6007M	AIR COMPRS. CABINET	6-TF-509
SALW-PI-6008M	WATER CABINET	6-TF-509

Calibrations completed. Work package no. _____

_____

Engineer Signature Date

5.7 PLC/DTAM PROGRAMMING

This section is where the programs for the PLC and DTAM will be entered. Power will be required at the instrument cabinet to power up the PLC and DTAM. Power will also be required to the GFCI receptacle for power to the laptop computer. Lockheed Martin Interim Stabilization engineering will perform the programming of the PLC and DTAM. The final software programs shall be documented as required by HNF-5034. This documentation is not part of this ATP, but will be tracked by the Acceptance for Beneficial Use (ABU) document.

PLC/DTAM programmed.

_____

Engineer Signature Date

5.8 SKID ELECTRICAL AND PROCESS AIR POWER-UP

NOTE: The Third Party Pressure Vessel inspection report must be received prior to proceeding with this section. Refer to section 4.2. Ensure desiccant in the air dryer.

5.8.1 _____ **ENSURE** the skid and remote equipment are connected before proceeding with the functional testing.

5.8.2 _____ **ENERGIZE** the Pumping and Instrumentation Control Skid by **CLOSING** the following DISCONNECT SWITCHES in the order found below:

DISCONNECT SWITCH	ENERGIZED (✔)
SALW-DS-6002M	
SALW-DS-6003M	
SALW-DS-6004M	
SALW-DS-6005M	

5.8.3_____**ENERGIZE** the Pumping and Instrumentation Control Skid by **CLOSING** the following Circuit Breakers located in SALW-DP-6001M "SALW SKID DIST PNL" in the order found below:

DISCONNECT SWITCH	ENERGIZED (✔)
"MAIN"	
1, FGM AND HEATER (SPARE)	
3, HEAT TRACE & LEAK DETECTION IN INSTRUMENT ENCLOSURE	
5, INSTRUMENT CABINET	
7, WEIGHT FACTOR INSTRUMENT ENCLOSURE RECEPTACLES	
9, RECEPTACLE NEAR PNLBD	
11, FGM AND HEATER	
13, FGM SAMPLE/RETURN HEAT TRACE (SPARE)	
2, HEAT TRACE/FGM IA LINE (SPARE)	
4, AIR COMPRESSOR CABINET FAN, HEATER & RECEPTACLE (GFCI)	
6, INTRINSICALLY SAFE PANEL	
8, WATER TANK CABINET HEATER	
10, HEAT TRACE FOR DIPTUBES & FGM IA LINE	
12, INSTR CAB A/C & HTR RCPT	
14, FGM SAMPLE/RETURN HEAT TRACE	

5.8.4 _____**ACKNOWLEDGE** any initial skid alarms.

5.8.5 _____**OPEN** valve SALW-V-6034M (located in the Air COMP Cabinet).

5.8.6 _____**START** air compressor SALW-CMP-6001M "SALW SKID IA COMP" by **POSITIONING** switch on the SALW-DS-6004M to the ON position.

5.8.7 _____**ENSURE** that Air Compressor starts and builds up pressure **AND** shuts off at 86 to 94 psig, as indicated by pressure gauge SALW-PI-6006M (AIR DRYER INLET PRESS). Record shut off pressure: _____psig

_____

Engineer Signature Date

5.8.8 **CHECK** the tubing in the instrument air cabinet using a soap and water test to visually identify any air leaks. Repair as necessary. Deenergize the compressor motor and bleed off air as necessary to make repairs.

5.8.9 _____**BLEED** off air by slowly opening valve SALW-V-6043M until the compressor restarts, then close the valve and note the restart pressure.

5.8.10 _____**ENSURE** the air compressor restarts upon low pressure of 58 to 62 psig. Record pressure: _____psig

5.8.11 _____**VALVE** in air to the PIC Skid Water Tank by **SLOWLY PERFORMING** the following (Refer to H-14-103543 Sheet 1):

5.8.12 **CHECK** for air leaks as each remaining step in this section is performed. Make repairs as necessary. Deenergize compressor motor and bleed off air pressure if necessary to make the repairs.

5.8.13 _____**SLOWLY OPEN** valve SALW-V-6025M located in the air compressor cabinet.

5.8.14 _____**SLOWLY OPEN** valve SALW-V-6027M (located near the water tank).

5.8.15 _____**SLOWLY OPEN** valve SALW-V-6028M (located near the water tank).

5.8.16 _____**ADJUST** Pressure Regulator Valve SALW-PCV-6006M to 30 psi (± 3 psig) as indicated by pressure gauge SALW-PI-6008M (WTR TK PRESS).

5.8.17 _____**VALVE IN** air to WFIE Cabinet by **PERFORMING** the following (Refer to H-14-103543 Sheet 1):

5.8.18 _____**SLOWLY OPEN** valve SALW-V-6026M located in the Air Compressor Cabinet.

5.8.19 _____**SLOWLY OPEN** valve SALW-V-6001M, located in the bottom of WFIE Cabinet. (NOTE: SALW-PRV-6002M may open if pressure through SALW-PCV-6001M is too high.)

5.8.20 _____**ADJUST** pressure control valve SALW-PCV-6001M in WFIE Cabinet to 20 psi (± 2.5 psi) as indicated by the pressure gauge located on the face of the valve.

5.8.21 _____**SLOWLY OPEN** valve SALW-V-6004M, located in the middle of WFIE Cabinet.

5.8.22 _____**SLOWLY OPEN** valve SALW-V-6003M, located in the middle of WFIE Cabinet.

CAUTION: The next three steps cause air to flow from ports on outside of WFIE cabinet.

5.8.23 _____**SLOWLY OPEN** valve SALW-V-6005M, located in the bottom left of WFIE Cabinet.

5.8.24 _____**SLOWLY OPEN** valve SALW-V-6006M, located in the bottom left of WFIE Cabinet.

5.8.25 _____**SLOWLY OPEN** valve SALW-V-6007M, located in the bottom left of WFIE Cabinet.

5.8.26 _____**SLOWLY OPEN** valve SALW-V-6020M, located in the middle left of WFIE Cabinet.

5.8.27 _____**SLOWLY OPEN** valve SALW-V-6021M, located in the middle left of WFIE Cabinet.

5.8.28 _____**SLOWLY OPEN** valve SALW-V-6019M, located in the middle left of WFIE Cabinet.

5.8.29 _____**ADJUST** the air flow through the diptubes by **PERFORMING** the following:

5.8.30 _____**ADJUST** flow to dip tubes to 1.5 CFH (± 0.5 CFH) as indicated by SALW-FIV-6002M.

_____ _____
Flow Engineer Signature Date

5.8.31 _____**ADJUST** flow to dip tubes to 1.5 CFH (± 0.5 CFH) as indicated by SALW-FIV-6003M.

_____ _____
Flow Engineer Signature Date

5.8.32 _____**ADJUST** flow to dip tubes to 1.5 CFH (± 0.5 CFH) as indicated by SALW-FIV-6004M.

_____ _____
Flow Engineer Signature Date

5.8.33 _____**VALVE IN** SALW-WFT-6002M **AND** SALW-SGT-6001M by **PERFORMING** the following:

5.8.34 _____**ENSURE** the LOW side **AND** HIGH side isolation valves, located on SALW-V-6036M in cabinet WFIE Cabinet are OPEN.

5.8.35 _____**ENSURE** SALW-WFT-6002M EQUALIZING valve on valve manifold SALW-V-6036M in cabinet WFIE Cabinet is CLOSED.

5.8.36 _____**ENSURE** the LOW side **AND** the HIGH side isolation valves, located on SALW-V-6035M in cabinet WFIE Cabinet are OPEN.

5.8.37 _____**ENSURE** SALW-SGT-6001M equalizing valve on valve manifold SALW-V-6035M in cabinet WFIE Cabinet is CLOSED.

5.8.38 _____**CONFIRM** that a signal is present between WFIE Cabinet instruments and the Programmable Logic Controller by **PERFORMING** the following:

5.8.39 _____**ENSURE** Weight Factor is approximately 0.0" (±0.5") Water Gauge as indicated by Data Table Access Module. If DTAM displays "<<<<" indicating less than zero, ENSURE continuity between the transmitter and the Programmable Logic Controller and proceed with the test.

_____
Engineer Signature Date

5.8.41 _____**ENSURE** Specific Gravity is approximately 0.0" (±0.5") Water Gauge as indicated by Data Table Access Module. If DTAM displays "<<<<" indicating less than zero, ENSURE continuity between the transmitter and the Programmable Logic Controller and proceed with the test.

_____
Engineer Signature Date

5.8.42 _____**OPEN** valve SALW-V-6035M Equalizing.

5.8.43 _____**CLOSE** valves SALW-V-6035M HI and LO.

5.8.44 _____**OPEN** valve SALW-V-6036M Equalizing.

5.8.45 _____**CLOSE** valves SALW-V-6036M HI and LO.

5.8.46 _____**CLOSE** valves SALW-V-6019M, SALW-V-6021M and SALW-V-6020M.

5.8.47 _____**ENSURE** all air leaks repaired.

_____
Engineer Signature Date

5.8.48 Engineer to **VERIFY** that section 5.8 is complete by **SIGNING** below.

_____

Engineer Signature Date

5.8.49 Quality Assurance Inspector to **VERIFY** that section 5.8 is complete by signing below.

_____

Quality Assurance Inspector Signature Date

5.9 SKID WATER DRIP SYSTEM

5.9.1 _____**Provide** a container to capture water expelled from the dip tubes and pressure relief valve SALW-PRV-6001M on the outside of the WFIE cabinet.

5.9.2_____**ACTUATE** the Dip Tube Drip system by **SLOWLY OPENING** the following valves:

VALVES	OPEN (✔)
SALW-V-6016M located in the middle of WFIE Cabinet	
SALW-V-6013M located in the middle of WFIE Cabinet	
SALW-V-6008M located in the middle of WFIE Cabinet	

CAUTION

Relief valve (SALW-PRV-6001M) will actuate and relieve pressure at 25 psig.

5.9.3_____**SLOWLY OPEN** SALW-V-6018M **WHILE CAREFULLY ADJUSTING** Pressure Regulator SALW-PCV-6005M, located in the bottom of WFIE Cabinet to 20 psig (± 2 psig) as indicated by SALW-PI-6001M in the middle of WFIE Cabinet.

5.9.4_____**ADJUST** valve SALW-V-6014M to allow APPROXIMATELY 2 drops/second as indicated by sight glass SALW-FG-6001M (±1 drop/second).

5.9.5_____**ADJUST** valve SALW-V-6015M to allow APPROXIMATELY 2 drops/second as indicated by sight glass SALW-FG-6002M (±1 drop/second).

5.9.6____**VALVE OUT** the dip tube drip water by **SLOWLY CLOSING** the following:

VALVE	CLOSED (✔)
SALW-V-6015M located in the middle of WFIE Cabinet	
SALW-V-6014M located in the middle of WFIE Cabinet	
SALW-V-6008M located in the middle of WFIE Cabinet	
SALW-V-6013M located in the middle of WFIE Cabinet	

5.9.7____**Ensure** equalizing valve SALW-V-6035M is OPEN.

5.9.8____**Ensure** HI and LO isolation valves on SALW-V-6035M are CLOSED.

5.9.9____**Ensure** equalizing valve SALW-V-6036M is OPEN.

5.9.10 ____**Ensure** HI and LO isolation valves on SALW-V-6036M are CLOSED.

5.9.11 ____**Ensure** the following valves in the order listed: SALW-V-6019M, SALW-V-6021M, SALW-V-6020M, SALW-V-6007M, SALW-V-6006M, and SALW-V-6005M are CLOSED.

5.9.12 ____**SLOWLY** open valve SALW-V-6044M in the Air Compressor Cabinet.

5.9.13 ____**ENSURE** air flows from pressure regulator SALW-PCV-6007M outside Air Compressor Cabinet.

5.9.14 ____**CLOSE** valve SALW-V-6044M in the Air Compressor Cabinet.

5.9.15 ____**SLOWLY** open valve SALW-V-6048M in Air Compressor Cabinet.

5.9.16 ____**ENSURE** air flows from pressure regulator SALW-PCV-6008M outside Air Compressor Cabinet.

5.9.17 _____**CLOSE** valve SALW-V-6048M in the Air Compressor Cabinet.

5.9.18 _____**SLOWLY** crack open valve SALW-V-6046M in the Air Compressor Cabinet to **ENSURE** air flow at the fitting for the DOV (SALW-V-6042M), then **RECLOSE** SALW-V-6046M.

5.9.19 _____**SLOWLY** crack open valves SALW-V-6047M and SALW-V-6046M in the Air Compressor Cabinet to **ENSURE** air flow at the drain line.

5.9.20 _____**CLOSE** valves SALW-V-6047M and SALW-V-6046M in the Air Compressor Cabinet.

5.9.21 Engineer to **VERIFY** that section 5.9 is complete by **SIGNING** below.

_____

Engineer Signature Date

5.9.22 Quality Assurance Inspector to **VERIFY** that section 5.9 is complete by signing below.

_____

Quality Assurance Inspector Signature Date

5.10 ANALOG INPUT SIGNALS TO THE PLC AND DTAM

Water Tank Level Transmitter

5.10.1 _____**PREPARE** the Water Tank Level Transmitter SALW-LT-6003M for test signals by **PERFORMING** the following:

5.10.2 _____**ENSURE** valve SALW-V-6029M, located in the bottom of WATER TANK ENCL, is CLOSED.

5.10.3 _____**ENSURE** valve SALW-V-6031M, located in the bottom of WATER TANK ENCL, is CLOSED.

5.10.4 _____**CONNECT** test Manometer pressure source that can output at least to 62" water gauge to the HIGH PRESSURE vent/test port of the level transmitter SALW-LT-6003M.

5.10.5 _____**ENSURE** the LOW PRESSURE vent/test port of the level transmitter SALW-LT-6003M is OPEN to atmosphere.

5.10.6 _____**ADJUST** the test Manometer on the SALW-LT-6003M to a pressure of 31" Water Gauge (± 1").

5.10.7 _____**RECORD** the following:

DATA TABLE ACCESS MODULE WATER TANK LEVEL (RANGE: 28.5 TO 33.5 Inches)

NOTE - In the next step, the alarm should annunciate between 11.75" and 12.75" Water Gauge.

5.10.8 _____**VERY SLOWLY DECREASE** the Level Transmitter test Manometer pressure **UNTIL** the Data Table Access Module "PIC WATER LEVEL LOW" alarm (alarm 9) annunciates.

5.10.9 _____**ACKNOWLEDGE** the Water Tank Low Level alarm at the Data Table Access Module.

5.10.10___**OBSERVE** the Data Table Access Module **AND RECORD** the water tank level readings below:

DATA TABLE ACCESS MODULE WATER TANK LEVEL (RANGE 11.75 to 12.75 inches Water Gauge)

5.10.11___**SLOWLY INCREASE** the Level Transmitter test Manometer pressure to 15.5" Water Gauge.

5.10.12___**OBSERVE** the Data Table Access Module **AND RECORD** the water tank level readings below:

DATA TABLE ACCESS MODULE WATER TANK LEVEL (RANGE 14.5 to 16.5 inches)

5.10.13___**ENSURE** "PIC WATER" is back to "norm" on DTAM.

5.10.14___**REMOVE** the test manometer from the SALW-LT-6003M high pressure vent/test port, AND **RE-INSTALL** vent plugs.

5.10.15___**RESTORE** the Water Tank Level Transmitter SALW-LT-6003M by **PERFORMING** the following:

5.10.16___**OPEN** valve SALW-V-6029M, located in the bottom of WATER TANK ENCL.

5.10.17___**OPEN** valve SALW-V-6031M, located in the bottom of WATER TANK ENCL.

5.10.18___**ENSURE** "WATER TANK" on DTAM shows a value in inches.

WEIGHT FACTOR TEST

5.10.19___**ENSURE** that NO Programmable Logic Controller input signals are FORCED and that the forcing function is DISABLED.

5.10.20___**CONNECT** the test Manometer pressure source that can output at least a 125" water gauge to the HIGH PRESSURE dip tube on the side of the "WFIE Cabinet."

5.10.21___**ENSURE** SALW-V-6001M is CLOSED.

5.10.22___**ENSURE** SALW-V-6005M is OPEN.

5.10.23___**ENSURE** SALW-V-6006M is OPEN.

5.10.24___**ENSURE** adjustment valves on SALW-FIV-6002M, SALW-FIV-6003M, SALW-FIV-6004M are CLOSED.

5.10.25___**ENSURE** SALW-WFT-6002M EQUALIZING valve located on SALW-V-6036M 3-Valve Manifold in cabinet WFIE Cabinet is CLOSED.

5.10.26___**ENSURE** the LOW side and HIGH side isolation valves, located on SALW-V-6036M 3-Valve Manifold in cabinet WFIE Cabinet are OPEN.

5.10.27___**SET** the test Manometer to 125" (+/- 1") Water Gauge.

5.10.28___**OBSERVE** Data Table Access Module **AND RECORD** the Weight Factor on the table below.

DATA TABLE ACCESS MODULE WEIGHT FACTOR READING (RANGE 120 to 130 inches)

5.10.29___**BLEED** off pressure from the manometer.

5.10.30___**CLOSE** SALW-V-6006M.

5.10.31___**OPEN** SALW-WFT-6002M equalizing valve, located on SALW-V-6036M 3-Valve Manifold in cabinet WFIE Cabinet.

5.10.32___**CLOSE** the LOW side and HIGH side isolation valves, located on SALW-V-6036M 3-Valve Manifold in cabinet WFIE Cabinet.

SPECIFIC GRAVITY TEST

5.10.33___**ENSURE** SALW-V-6007M is OPEN.

5.10.34___**ENSURE** SALW-V-6005M is OPEN.

5.10.35___**ENSURE** the LOW side and the HIGH side isolation valves, located on SALW-V-6035M in cabinet WFIE Cabinet are OPEN.

5.10.36___**CLOSE** the Specific Gravity Transmitter equalizing valve located on SALW-V-6035M in cabinet WFIE Cabinet.

5.10.37___**SET** the test Manometer to 5" Water Gauge (± .3").

5.10.38___**OBSERVE** Data Table Access Module **AND RECORD** the Specific Gravity reading on the table below.

DATA TABLE ACCESS MODULE SPECIFIC GRAVITY READING (RANGE 4.65 to 5.35 inches)

5.10.39___**BLEED** off pressure from the manometer.

5.10.40___**DISCONNECT** the test manometer pressure source.

5.10.41___**CLOSE** SALW-V-6007M.

5.10.42___**CLOSE** SALW-V-6005M.

5.10.43___**OPEN** SALW-SGT-6001M equalizing valve, located on SALW-V-6035M 3-Valve Manifold in cabinet WFIE Cabinet.

5.10.44___**CLOSE** the LOW side and HIGH side isolation valves, located on SALW-V-6035M 3-Valve Manifold in cabinet WFIE Cabinet.

FLOW METER TEST

5.10.45___**IF** necessary **CONNECT** the brain terminal to the SALW-FQIT-6001M (SUPERNATANT FLOW XMIT), located in cabinet Instrument Cabinet.

5.10.46___**ENSURE** SALW-FQIT-6001M is powered and configured for simulated flow signals.

5.10.47___**SIMULATE** a flow signal of 2.0 gpm (50% span) with the hand held calibrator, or from flowmeter face plate.

5.10.48___**ENSURE** the SALW-FQIT-6001M transmitter is operating properly by **RECORDING** the following:

DATA TABLE ACCESS MODULE SUPERNATANT FLOW (RANGE: 1.8 TO 2.2 GPM)	**SUPERNATANT FLOW XMIT SUPERNATANT FLOW (RANGE: 1.8 TO 2.2 GPM)**

5.10.49___**RESTORE** the SALW-FQIT-6001M (SUPERNATANT FLOW TRANSMITTER) to its original configuration.

SUCTION AND DISCHARGE PRESSURE SIGNAL

5.10.50___**ENSURE** a current source is connected to PSPT+ and PSPT- at the intrinsic side terminal board in the Intrinsic Safe panel. Set to transmitter simulate.

5.10.51___**SET** the current to 4mA and record the suction pressure on SALW-PI-6012M in the table below. Reading is to be approximately zero.

5.10.52___**SET** the current source to 20mA and record the suction pressure in the table below. Reading is to be approximately 100psi.

5.10.53___**DISCONNECT** the current source.

5.10.54___**ENSURE** a current source is connected to PDPT+ and PDPT- at the intrinsic side terminal board in the Intrinsic Safe panel. Set to transmitter simulate.

5.10.55___**SET** the current to 4mA and record the discharge pressures on SALW-PI-6011M and on the DTAM in the table below. Readings are to be approximately zero.

5.10.56___**SET** the current source to 20mA and record the discharge pressures in the table below. Readings are to be approximately 300psi.

5.10.57___**DISCONNECT** the current source.

SALW-PI-6012M JET PUMP SUCTION PRESSURE		**DTAM DISCHARGE PRESSURE**	**SALW-PI-6011M JET PUMP DISCHARGE PRESSURE**	
	At 4mA			At 4mA
	At 20mA			At 20mA

PIT FLAMMABLE GAS MONITOR ANALOG SIGNAL TO PLC

5.10.58___**ENSURE** a current source is connected to terminal board TB1 in the PICS Instrument Enclosure, points FGM 0(+) and FGM 0(-).

5.10.59___**SET** current source to 4 mA (±.25 mA).

5.10.60___**RECORD** the Data Table Access Module Flammable Gas DISPLAY on the "Pit FGM Input/Output Table" below. (Expected value to be approximately 0%.)

5.10.61___**SET** current source to 10 mA (±.25 mA).

5.10.62___**RECORD** the Data Table Access Module Flammable Gas display on the "Pit FGM Input/Output Table" below. (Expected value to be approximately 11%.)

5.10.63___**SET** current source to 20 mA (±.25 mA).

5.10.64___**RECORD** the Data Table Access Module Flammable Gas display on the "Pit FGM Input/Output Table" below. (Expected value to be approximately 30%.)

Pit FGM Input/Output Table	
Input (mA)	**Output (as displayed on Data Table Access Module)**
4	
10	
20	

5.10.65___**DISCONNECT** the current source.

DOME SPACE FLAMMABLE GAS MONITOR ANALOG SIGNAL TO PLC

5.10.66___**ENSURE** a current source is connected to terminal board TB1 in the PICS Instrument Enclosure, points FGM 1(+) and FGM 1(-).

5.10.67___**SET** current source to 4mA (+/- .25mA).

5.10.68___**RECORD** the Data Table Access Module Flammable Gas DISPLAY on the "Dome Space FGM Input/Output Table" below. (Expected value to be approximately 0%.)

5.10.69___**SET** current source to 10 mA (±.25 mA).

5.10.70___**RECORD** the Data Table Access Module Flammable Gas display on the "Dome Space FGM Input/Output Table" below. (Expected value to be approximately 11%.)

5.10.71___**SET** current source to 20 mA (±.25 mA).

5.10.72___**RECORD** the Data Table Access Module Flammable Gas display on the "Dome Space FGM Input/Output Table" below. (Expected value to be approximately 30%.)

Dome Space FGM Input/Output Table	
Input (mA)	**Output (as displayed on Data Table Access Module)**
4	
10	
20	

5.10.73___**DISCONNECT** the current source.

THERMOCOUPLE INPUTS TO PLC

5.10.74___**WARM** thermocouple SALW-TE-6004M, located in the Instrument Enclosure.

5.10.75___**ENSURE** Data Table Access Module displays a changed temperature.

_____
Engineer Signature Date

5.10.76___**ENSURE** SALW-TE-6004M temperature decreases after heat source removed.

5.10.77___**WARM** thermocouple SALW-TE-6003M, located in INSTRUMENT AIR ENCLOSURE.

5.10.78___**ENSURE** Data Table Access Module displays a changed temperature.

_____
Engineer Signature Date

5.10.79___**ENSURE** SALW-TE-6003M temperature decreases after heat source removed.

5.10.80___**ENSURE** a thermocouple probe is connected to the intrinsic side of top thermocouple module (MTL 3081) in the Intrinsic Safe Panel. (This will simulate pump temperature.)

5.10.81___**WARM** the connected thermocouple probe.

5.10.82___**ENSURE** Data Table Access Module displays a changed temperature.

_____
Engineer Signature Date

5.10.83___**ENSURE** the connected probe temperature decreases after heat source removed.

5.10.84___**DISCONNECT** the temperature probe.

5.10.85___**ENSURE** a thermocouple probe is connected to the second thermocouple module in the Intrinsic Safe panel. (This will simulate jumper temperature.)

5.10.86___**WARM** the thermocouple probe.

5.10.87___**ENSURE** Data Table Access Module displays a changed temperature

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Engineer Signature Date

5.10.88___**ENSURE** SALW-TE-6002M temperature decreases after heat source removed.

5.10.89___**DISCONNECT** the temperature probe.

RECIRCULATION FLUSH PRESSURE SIGNAL TO PLC

5.10.90___**ENSURE** a current source is connected to points RFPT+ and RFPT- at terminal board TB2 in the Instrument panel. (Set the current source to "TRANSMITTER SIMULATE."

5.10.91___**SET** the current source to 4mA.

5.10.92___**SLOWLY** increase the current output until an alarm on the DTAM for High Recirc. Flush Pressure(alarm 39) occurs. (Approx. 12.5mA.)

5.10.93___**ACKNOWLEDGE** alarm.

5.10.94___**ENSURE** the pressure on the DTAM for RFPT is approximately 15psi.

5.10.95___**DECREASE** the current source to approximately 4mA.

5.10.96___**ENSURE** the High Recirc. Flush Pressure alarm clears on the DTAM.

5.10.97___**DISCONNECT** the current source.

5.10.98___**ENSURE** a "RFPT SIGNAL LOSS" alarm (14) occurs.

5.10.99___**ACKNOWLEDGE** the alarm.

JUMPER FLUSH PRESSURE SIGNAL TO PLC

5.10.100 ___**ENSURE** a current source is connected to points JFPT+ and JFPT- at the intrinsic side terminal board in the Intrinsic Safe panel. (Set the current source to "TRANSMITTER SIMULATE."

5.10.101 ___**SET** the current source to 4mA.

5.10.102 ___ **SLOWLY** increase the current output until an alarm on the DTAM for High Flush Pressure(alarm 3) occurs and the BLUE light on the instrument panel is ON. (Approx. 12.5mA.)

5.10.103 ___**ACKNOWLEDGE** alarm.

5.10.104 ___**ENSURE** the pressure on the DTAM for JFPT is approximately 15psi.

5.10.105 ___**DECREASE** the current source to 4mA.

5.10.106 ___**ENSURE** the High Flush Pressure alarm clears on the DTAM and the BLUE light turns OFF.

5.10.107 ___**DISCONNECT** the current source.

5.10.108 ___**ENSURE** a "JFPT SIGNAL LOSS" alarm (16) occurs.

5.10.109 ___**ACKNOWLEDGE** the alarm.

LOW PRESSURE INTERLOCK (TRANSDUCER) INPUT

5.10.110 ___**ENSURE** a current source is connected to points PXPT+ and PXPT- at the intrinsic side terminal board in the Intrinsic Safe panel. (Set the current source to "TRANSMITTER SIMULATE."

5.10.111 ___**ENSURE** a normally closed transducer is connected across the LS-1+ and LS-1- and a normally open transducer across the LS-2+ AND LS-2- points on the intrinsic safe terminal board in the Intrinsic Safe panel.

5.10.112 ___**ACTUATE** both transducers by placing a piece of steel in front of the each transducer face.

5.10.113 __**ENSURE** the laptop computer is connected to the PLC and on-line.

5.10.114 ___**SET** the current source to approximately 6mA on transmitter simulate.

5.10.115 ___**ENSURE** the GREEN light on the instrument panel is ON.

5.10.116 ___**APPLY** software forces or bypasses to allow the pump to start including the recirc low flow. Record the forces and bypasses installed.

_____

_____

_____

5.10.117 ___**TURN** selector switch on Jet pump motor starter to ON.

5.10.118 ___**PRESS** the pump start from DTAM.

5.10.119 ___**ENSURE** the RED light on the instrument panel is ON and the GREEN light is OFF.

5.10.120 ___**LOWER** the current input to approximately 4.8mA or until Timer 4.1 starts timing on rung 0 of ladder 5 as observed on the lap top.

5.10.121 ___**ENSURE** that the amber light on the instrument panel turns ON immediately after the timer starts.

5.10.122 ___**ENSURE** after a 30 second delay (Timer 4.1 times out) the following occurs:

___"XFR Pressure LOW" alarm (alarm 1) occurs at the DTAM;
___a pump shutdown occurs indicated by the horn sounding, strobe flashing;
___a pump shutdown alarm on the DTAM;
___the red light turns OFF;
___and the green light turns ON.
ACKNOWLEDGE alarms at Data Table Access Module to view the various alarms.

5.10.123 ___**INCREASE** the current to approximately 6mA to clear the "XFR PRESSURE LOW" alarm and turn OFF amber light.

5.10.124 ___**LEAVE** the current source in place for the high pressure section.

5.10.125 ___**RESET** as necessary the forces for the high pressure test. Record changes made.

HIGH PRESSURE INTERLOCK (PS-1-1) INPUT

5.10.126 ___**PRESS** the pump start from DTAM.

5.10.127 ___**ENSURE** the RED light on the instrument panel is ON and the GREEN light is OFF.

5.10.128 ___**INCREASE** the current to approximately 11.5mA or until Timer 4.2 on rung 2 of ladder 5 starts timing as observed on the laptop computer.

5.10.129 ___**ENSURE** after a 3 second delay the following occurs:

___"XFR Pressure HIGH" alarm (alarm 2) at the DTAM;
___pump shutdown occurs indicated by the horn sounding, strobe flashing;
___shutdown alarm on the DTAM;
___the red light turns OFF;
___the green light turning ON.
ACKNOWLEDGE the alarms at the DTAM to view the various alarms.

5.10.130 ___**RETURN** the current to approximately 6mA and leave in place for the next section. **ENSURE** the high pressure alarm clears.

___**LEAVE** the software forces and bypasses in place for the next sections.

5.10.132 Engineer **VERIFY** that section 5.10 is complete by **SIGNING** below.

Engineer Signature Date

5.10.133 Quality Assurance Inspector **VERIFY** that section 5.10 is complete by signing below.

Quality Assurance Inspector Signature Date

5.11 DISCRETE SIGNAL INPUTS TO PLC AND DTAM

NOTE: The DIP switches on the Intrinsic Safe Panel may require changing in order to get the proper responses for LS-1 and LS-2.

JR-1 VALVE POSITION (LS-1/LS-2) INPUT

5.11.1 _____**ENSURE** a normally closed transducer is connected across the LS-1+ and LS-1- and a normally open transducer across the LS-2+ AND LS-2- points on the intrinsic safe terminal board in the Intrinsic Safe panel.

5.11.2 _____**ENSURE** both transducers are actuated by a piece of steel in front of the each transducer face.

5.11.3 _____**ENSURE** the JR-1 valve indicates "norm" at the Data Table Access Module.

5.11.4 _____**REMOVE** the metal from in front of the LS-1 switch installed in the above step.

5.11.5 _____**ENSURE** the JR-1 valve indicates "NON-PROCESS" at the Data Table Access Module and address N20:32/0 is actuated on ladder 5 (rung 89).

5.11.6 _____**REMOVE** the metal from in front of the LS-2 switch.

5.11.7 _____**ENSURE** the JR-1 valve still indicates "NON-PROCESS" at the Data Table Access Module and address N20:32/1 is actuated on ladder 5 (rung 91).

5.11.8 _____**REPLACE** the metal in front of the LS-2 and the LS-1 transducers.

5.11.9 _____**ENSURE** the JR-1 valve indicates " norm" at the Data Table Access Module and addresses N20:32/0 and N20:32/1 are clear on ladder 5 (around rungs 89 and 91).

5.11.10___**LEAVE** the transducers in place and actuated for the following sections.

DILUTION TANK NO FLOW INPUT

5.11.11___**ENSURE** a normally closed switch is connected across terminal points DIL-F and CKT5H-A on terminal board TB4 in the Instrument Cabinet.

5.11.12___**ENSURE** software forces and bypasses are in place to start the pump. Record changes made.

_____

_____

5.11.13___**ENSURE** no dilution tank no flow alarm on the DTAM (alarm 35).

5.11.14___**START** the pump from the DTAM.

5.11.15___**OPEN** the switch at TB4.

5.11.16___**ENSURE** after a **5-minute delay** a dilution tank no flow alarm on the DTAM and a pump shutdown occurs.

5.11.17___**ACKNOWLEDGE** the alarm.

5.11.18___**CLOSE** the switch.

5.11.19___**ENSURE** alarm clears.

5.11.20___**DISCONNECT** the switch.

FLAMMABLE GAS MONITOR INPUT

5.11.21___**ENSURE** a normally closed switch is connected to points FGM and CKT5H-A on terminal board TB 4 in the instrument cabinet.

5.11.22___**ENSURE** software forces and bypasses are in place to start the pump. Record changes made.

_____

_____

5.11.23___**ENSURE** no FGM interlock alarm on the DTAM (alarm 22).

5.11.24___**START** the pump from the DTAM.

5.11.25___**OPEN** the switch.

5.11.26___**ENSURE** an FGM alarm on the DTAM and the pump shuts down immediately.

5.11.27___**ACKNOWLEDGE** the alarm.

5.11.28___**CLOSE** the switch.

5.11.29___**ENSURE** the FGM alarm clears.

5.11.30 ___**LEAVE** the switch connected for the Heat Trace check.

HEAT TRACE CONTROL FOR PUMP AND JUMPER

5.11.31___**ENSURE** the Heat Trace control on the DTAM is OFF.

5.11.32___**ENSURE** that heat trace relays HT-1 and HT-2 are deenergized by checking for zero voltage across points 2 and 7 at each relay.

5.11.33___**ENSURE** zero voltage at TB12 between HT-1 and CKT3-N.

5.11.34___**TURN** ON heat trace from DTAM to actuate relays HT-1 and HT-2.

5.11.35___**CHECK** for 120vac at TB-12, points HT-1 and CKT3-N.

5.11.36___**OPEN** the FGM switch.

5.11.37___**ENSURE** 0vac at TB-12, points HT-1 and CKT3-N.

5.11.38___**TURN** OFF heat trace from the DTAM.

5.11.39___**REMOVE** the switch.

5.11.40___**REMOVE** all software forces and bypasses.

5.11.41___ **REMOVE** the LS-1 and LS-2 transducers.

5.11.42 Engineer **VERIFY** that section 5.11 is complete by **SIGNING** below.

_____

Engineer Signature Date

5.11.43 Quality Assurance Inspector **VERIFY** that section 5.11 is complete by signing below.

_____

Quality Assurance Inspector Signature Date

5.12 HEATERS AND AIR CONDITIONER

5.12.1 _____**TURN** the heater ON in the air compressor cabinet. Set the thermostat high enough to allow the unit to operate.

5.12.2 _____**RESET** the thermostat to approximately 40 degrees F to allow the heat to turn OFF.

5.12.3 _____**TURN** the fan thermostat switch low to allow the fan in the air compressor cabinet to run.

5.12.4 _____**RESET** the fan switch to approximately 90 degrees.

5.12.5 _____**TURN** the heater ON in the WFIE cabinet. Set the thermostat high enough to allow the unit to operate.

5.12.6 _____**RESET** the thermostat to approximately 40 degrees F to allow the heat to turn OFF.

5.12.7 _____**TURN** the heater ON in the Water cabinet. Set the thermostat high enough to allow the unit to operate.

5.12.8 _____**RESET** the thermostat to approximately 40 degrees F to allow the heat to turn OFF.

5.12.9 _____**TURN** the heater ON in the Instrument cabinet. Set the thermostat high enough to allow the unit to operate.

5.12.10___**RESET** the thermostat to approximately 40 degrees F to allow the heat to turn OFF.

5.12.11___**TURN** ON the air conditioner in the Instrument cabinet. If necessary, remove the front grill on the unit and adjust the temperature setting lower to get the unit to operate.

5.12.12___**RESET** the temperature setting to approximately 90 to 95 degrees. (Remove the grill and filter on the front of the unit for access to the adjustment.)

5.12.13 Engineer **VERIFY** that section 5.12 is complete by **SIGNING** below.

_____ _____

Engineer Signature Date

5.12.14 Quality Assurance Inspector **VERIFY** that section 5.12 is complete by signing below.

_____ _____

Quality Assurance Inspector Signature Date

5.13 LEAK DETECTION INTERLOCK CHECK

5.13.1 _____Set up one or two buckets for leak detector testing if leak detector probes are used for testing.

NOTE - A supply of water needs to be available to pour into the buckets during testing.

- Pump operation will be simulated during the remainder of the ATP.

WARNING

Energized circuits and leads are contained inside the cabinet. Observe appropriate electrical. Comply with HNF-PRO-088, ELECTRICAL WORK SAFETY to avoid personnel electrical shock hazards.

5.13.2 _____**ENSURE** performed the CGI dedication for the leak detector relays per HNF-4275 and WTF-1-18 and WTF-30-16.

5.13.3 _____**ENSURE** a leak detector probe is connected to the primary leak detector terminals at TB11 in the Instrument Cabinet, points SD-1A, SD-1B, SA-1A, and SA-1B and **CONNECT** a leak detector probe to leak detector #1 terminals at TB11 in the Instrument Cabinet, points SD-2A, SD-2B, SA-2A, and SA-2B. **IF NECESSARY** remove the jumpers from the terminal block for leak detector #1.

OR

_____**ENSURE** a normally open switch is connected to the primary leak detector terminals at TB11 in the Instrument Cabinet, points SD-1A, SD-1B, SA-1A, and SA-1B and **CONNECT** a normally open switch to leak detector #1 terminals at TB11 in the Instrument Cabinet, points SD-2A, SD-2B, SA-2A, and SA-2B. (NOTE: Connect SD-MA and SA-MA wires to one pole of the switch and SD-MB and SA-MB wires to the other pole of the switch.) **IF NECESSARY** remove the jumpers from the terminal block for leak detector #1.

5.13.4 _____**ENSURE** no primary leak detector alarms at the DTAM (alarms 6 and 7).

5.13.5 _____**PLACE** the primary leak detector assembly in a bucket of water **or** close the test switch on the primary leak detector.

5.13.6 _____**ENSURE** a leak detector leak alarm for the primary leak detector is received at the DTAM (alarm 6) after a 3 second delay.

5.13.7 _____**ACKNOWLEDGE** the Leak Detector Alarm at the Data Table Access Module.

5.13.8 _____**REMOVE** the leak detector assembly from the bucket and allow the water to drain off the assembly into the bucket **or** open the test switch.

5.13.9 _____**ENSURE** the leak detector alarms clear at the DTAM.

5.13.10___**DISCONNECT** one of the "SD" wires going to the probe or switch.

5.13.11___**ENSURE** trouble alarm 7 occurs.

5.13.12___**ACKNOWLEDGE** the alarm.

5.13.13___**ENSURE** no leak detector #1 alarms at the DTAM (alarms 18 and 19).

5.13.14___**PLACE** the leak detector #1 assembly in a bucket of water **or** close the switch for leak detector #1.

5.13.15___**ENSURE** a leak detector leak for leak detector #1 is received at the DTAM (alarm 18) after a 3 second delay.

5.13.16___**ACKNOWLEDGE** the Leak Detector Alarm at the Data Table Access Module.

5.13.17___**REMOVE** the leak detector assembly from the bucket and allow the water to drain off the assembly into the bucket **or** open the test switch.

5.13.18___**ENSURE** the leak detector alarms clear at the DTAM.

5.13.19___**DISCONNECT** one of the "SD" wires going to the probe or switch.

5.13.20___**ENSURE** trouble alarm 19 occurs.

5.13.21___**ACKNOWLEDGE** the alarm.

5.13.22___**DISCONNECT** the probes or switches from TB11.

5.13.23___**ENSURE** the jumpers for leak detector #1 are installed at TB11.

5.13.24 Engineer **VERIFY** that section 5.13 is complete by **SIGNING** below.

Engineer Signature Date

5.13.25 Quality Assurance Inspector **VERIFY** that section 5.13 is complete by signing below.

Quality Assurance Inspector Signature Date

5.14 SKID SHUTDOWN AFTER ATP

5.14.1 Bleed the air pressure off the air system by turning the selector switch on the air compressor starter to OFF and then OPENING the air drain valves SALW-V-6043M, SALW-V-6046M, SALW-V-6047M, AND SALW-V-6037M.

5.14.2 Ensure the following PIC skid circuit disconnects, breakers and fuses are OPEN or OFF.

_____SALW-DS-6002M _____SALW-DS-6003M _____SALW-DS-6004M _____SALW-DS-6005M

The following breakers are in distribution panel SALW-DP-6001M:

_____Breaker "MAIN"
_____Breaker 1
_____Breaker 3
_____Breaker 5
_____Breaker 7
_____Breaker 9
_____Breaker 11
_____Breaker 13
_____Breaker 2
_____Breaker 4
_____Breaker 6
_____Breaker 8
_____Breaker 10
_____Breaker 12
_____Breaker 14

5.14.3 _____DISCONNECT the power plug from the 480vac power source.

5.14.4 Ensure the following PIC skid valves in the WFIE cabinet are OPEN.

_____SALW-V-6035M (EQUALIZING)
_____SALW-V-6036M (EQUALIZING)

5.14.5 Ensure the following PIC skid valves are CLOSED.

Air Compressor cabinet:

_____SALW-V-6025M
_____SALW-V-6026M
_____SALW-V-6034M
_____SALW-V-6043M
_____SALW-V-6044M
_____SALW-V-6046M
_____SALW-V-6047M
_____SALW-V-6048M
_____SALW-V-6049M

Water cabinet:

_____SALW-V-6027M
_____SALW-V-6028M
_____SALW-V-6029M
_____SALW-V-6030M
_____SALW-V-6031M
_____SALW-V-6032M
_____SALW-V-6037M

WFIE Cabinet:

_____SALW-V-6001M	_____SALW-V-6015M
_____SALW-V-6002M	_____SALW-V-6016M
_____SALW-V-6003M	_____SALW-V-6017M
_____SALW-V-6004M	_____SALW-V-6018M
_____SALW-V-6005M	_____SALW-V-6019M
_____SALW-V-6006M	_____SALW-V-6020M
_____SALW-V-6007M	_____SALW-V-6021M
_____SALW-V-6008M	_____SALW-V-6035M LOW
_____SALW-V-6011M	_____SALW-V-6035M HIGH
_____SALW-V-6012M	_____SALW-V-6036M LOW
_____SALW-V-6013M	_____SALW-V-6036M HIGH
_____SALW-V-6014M	

5.14.6 _____ENSURE the power plug on the power cable is the correct model per H-14-103546, item 41.

5.14.7 Engineer **VERIFY** that section 5.14 is complete by **SIGNING** below.

_____

Engineer Signature Date

5.14.8 Quality Assurance Inspector **VERIFY** that section 5.14 is complete by signing below.

_____

Quality Assurance Inspector Signature Date

5.15 REDLINE INCORPORATION

5.15.1 _____ENSURE the redlines identified in the redline log in the Fabrication work package are incorporated into the revised drawings for skid "M".

NOTE: Redlines incorporation must meet the intent of the redline log. The redlines may not be exactly the same as marked on the working drawings. Example: If a part was added to a drawing and then it is discovered that the part already existed on the drawing, then the final incorporation may be to increase the quantity of the existing part. Drawing views may change from the redline version in order to meet drafting standards.

5.15.2 Engineer to VERIFY section 5.15 is completed by signing below.

Engineer Signature Date

5.15.3 Quality Assurance Inspector to VERIFY section 5.15 is completed by signing below.

Quality Assurance Inspector Signature Date

ACCEPTANCE TEST PROCEDURE

This page may be reproduced as necessary PAGE _____ of___

ACCEPTANCE TEST PROCEDURE LOG		
Name	**Date**	**Comment**

ACCEPTANCE TEST PROCEDURE EXCEPTION LOG

This page may be reproduced as necessary PAGE _____ of___

ACCEPTANCE TEST PROCEDURE EXCEPTION LOG		
Number	**Date**	**Description**

ACCEPTANCE TEST PROCEDURE EXCEPTION RECORD

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ATP step number:	**ATP Exception Log Number**
Description of Exception:	
Resolution of Exception:	
Date of Resolution:	
Cognizant Engineer signature:	
Quality Assurance signature:	
Design Authority:	
RESOLUTION COMPLETED: (date)	
Quality Assurance:	
Cognizant Engineer:	

ACCEPTANCE TEST PROCEDURE ACCEPTANCE RECORD

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

Cognizant Engineer (Signature)	**(Print Name)**	**Date**

Quality Assurance (Signature)	**(Print Name)**	**Date**

PROCEDURE PERFORMER SIGNATURE SHEET

All personnel who will be performing, initialing and signing the procedure shall enter their printed name, signature and initials below.

PRINT NAME	SIGNATURE	INITIALS

PRE-JOB BRIEF SIGNATURE PAGE

PRINT NAME	SIGNATURE