S

ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN 629587

Proj. ECN

2. ECN Category (mark one)	3. Originator's Name, Organization, MSIN, and Telephone No.	4. USQ Required?	5. Date
Supplemental ☐ Direct Revision ☒ Change ECN ☐ Temporary ☐ Standby ☐ Supersedure ☐ Cancel/Void ☐	B. R. Johns, ISE, S7-24, 373-3429	☒ Yes ☐ No	07/18/00
	6. Project Title/No./Work Order No. Interim Stabilization,	7. Bldg./Sys./Fac. No. 241-G/200-GEN	8. Approval Designator QS
	9. Document Numbers Changed by this ECN (includes sheet no. and rev.) RPP-6201, REVISION 0	10. Related ECN No(s). N/A	11. Related PO No. N/A

12a. Modification Work	12b. Work Package No.	12c. Modification Work Completed	12d. Restored to Original Condition (Temp. or Standby ECNs only)
☐ Yes (fill out Blk. 12b) ☒ No (NA Blks. 12b, 12c, 12d)	N/A	N/A Design Authority/Cog. Engineer Signature & Date	N/A Design Authority/Cog. Engineer Signature & Date

13a. Description of Change — 13b. Design Baseline Document? ☒ Yes ☐ No

This ECN revises the ATP for skid "V". The following changes are made.
Page 11: Corrected drawing reference in step 4.6.8.
Page 12: Added "white" wire color if skid is "B" phase grounded.
Pages 13 and 17: Corrected circuit 2 location description.
Page 29: Changed steps 5.8.52 and 5.8.53 to allow for either an 8 or 14gpm pump.
Page 30: Corrected wire label identification in step 5.8.63.
Page 32 and 33: Corrected thermocouple identification in steps 5.8.85 and 5.8.89; added thermocouple identification to steps 5.8.91, 5.8.93, 5.8.94, and 5.8.96.
Page 36: Clarified wording in step 5.9.5.
Page 37: Added "RFPT" to clarify step 5.9.12.
Page 38: Added "JFPT" to clarify step 5.9.30.
Page 39: Added "PXPT" to clarify step 5.9.49. Added words to check amber light status in step 5.9.53.
Page 40: Added steps to check lights for LS-1 and LS-2 in steps 5.9.59, 5.9.62, 5.9.64, and 5.9.67.
Page 42: Added clarification for alarm reset in step 5.9.81.
Page 45: Added step 5.9.123.
Page 49: Added valves V-6054, V-6055 and V-6056. Added steps 5.11.8 through 5.11.11 should the skid be "B" phase grounded.

14a. Justification (mark one)	14b. Justification Details
Criteria Change ☒ Design Improvement ☐ Environmental ☐ Facility Deactivation ☐ As-Found ☐ Facilitate Const. ☐ Const. Error/Omission ☐ Design Error/Omission ☐	The ATP is revised to accommodate the latest changes in the skid design. Design verification by Informal review per HNF-IP-0842, volume IV, section 4.24. USQ tracking #TF-00-0478, revision 0. This ECN will not change collective dose since it has no impact on radiological sources, contamination control or shielding. A NEPA review screening was performed as evidenced by the Environmental signature on page 2.

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

B. R. Johns	S7-24
M. R. Koch	S7-24
W. F. Zuroff	S7-24
T. J. Volkman	S7-34
L. A. Flowers	S7-01

RELEASE STAMP

JUL 25 2000
DATE
STA: 4
HANFORD RELEASE
4
ID:

A-7900-013-2 (10/97)

A-7900-013-1

ENGINEERING CHANGE NOTICE

1. ECN (use no. from pg. 1): 629587

16. Design Verification Required	17. Cost Impact				18. Schedule Impact (days)	
	ENGINEERING		CONSTRUCTION			
☒ Yes	Additional ☐	$ N/A	Additional ☐	$ N/A	Improvement ☐	N/A
☐ No	Savings ☐	$ N/A	Savings ☐	$ N/A	Delay ☐	N/A

19. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 13. Enter the affected document number in Block 20.

SDD/DD	☐	Seismic/Stress Analysis	☐	Tank Calibration Manual	☐
Functional Design Criteria	☐	Stress/Design Report	☐	Health Physics Procedure	☐
Operating Specification	☐	Interface Control Drawing	☐	Spares Multiple Unit Listing	☐
Criticality Specification	☐	Calibration Procedure	☐	Test Procedures/Specification	☐
Conceptual Design Report	☐	Installation Procedure	☐	Component Index	☐
Equipment Spec.	☐	Maintenance Procedure	☐	ASME Coded Item	☐
Const. Spec.	☐	Engineering Procedure	☐	Human Factor Consideration	☐
Procurement Spec.	☐	Operating Instruction	☐	Computer Software	☐
Vendor Information	☐	Operating Procedure	☐	Electric Circuit Schedule	☐
OM Manual	☐	Operational Safety Requirement	☐	ICRS Procedure	☐
FSAR/SAR	☐	IEFD Drawing	☐	Process Control Manual/Plan	☐
Safety Equipment List	☐	Cell Arrangement Drawing	☐	Process Flow Chart	☐
Radiation Work Permit	☐	Essential Material Specification	☐	Purchase Requisition	☐
Environmental Impact Statement	☐	Fac. Proc. Samp. Schedule	☐	Tickler File	☐
Environmental Report	☐	Inspection Plan	☐	NONE	☒
Environmental Permit	☐	Inventory Adjustment Request	☐		☐

20. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number/Revision
N/A	N/A	N/A

21. Approvals

	Signature	Date		Signature	Date
Design Authority	WF ZUROFF	7/19/00	Design Agent		
Cog. Eng.	BR JOHNS	7/18/00	PE		
Cog. Mgr.	MR KOCH	7/19/00	QA		
QA	TJ Volkman	7/20/00	Safety		
Safety	LA Flowers	7/20/00	Design		
Environ.	LC Penn	7/19/00	Environ.		
Other			Other		
Informal Review:	D. Defend	7/19/00			

DEPARTMENT OF ENERGY

Signature or a Control Number that tracks the Approval Signature

ADDITIONAL

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

M. R. KOCH
CH2MHILL HANFORD GROUP, INC
Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-99RL14047

EDT/ECN: 629587 UC:
Cost Center: 74D00 Charge Code: 103361
B&R Code: EW3120071 Total Pages: 58

Key Words: PICS, SALT WELL, SKID, INTERIM STABILIZATION, ACCEPTANCE TEST

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

TRADEMARK DISCLAIMER. 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.

Printed in the United States of America. To obtain copies of this document, contact: Document Control Services, P.O. Box 950, Mailstop H6-08, Richland WA 99352, Phone (509) 372-2420; Fax (509) 376-4989.

7/24/00
Release Approval Date

JUL 25 2000
DATE
STA: 4
HANFORD RELEASE
4
ID:
Release Stamp

Approved For Public Release

RECORD OF REVISION

(1) Document Number: RPP-6201

(2) Title
ACCEPTANCE TEST PROCEDURE FOR NEW PUMPING INSTRUMENTATION AND CONTROL SKID "V"

Change Control Record

(3) Revision	(4) Description of Change - Replace, Add, and Delete Pages	Authorized for Release	
		(5) Cog. Engr.	(6) Cog. Mgr. Date
0	(7) EDT 624923, (ORIGINAL)	B.R. JOHNS	M.R.KOCH 5/11/00
RS 1	ECN 629587, Direct revision. Minor corrections made to ATP.		

TABLE OF CONTENTS

1.0 PURPOSE **2**
2.0 INFORMATION **2**
2.1 SCOPE 2
2.2 TERMS AND DEFINITIONS 3
2.3 RESPONSIBILITIES 3
2.4 SAFETY 4
2.5 QUALITY ASSURANCE 4
2.6 GENERAL INFORMATION 4
2.7 LIMITS AND PRECAUTIONS 5
3.0 RECORDS **5**
3.1 RECORD COPY 5
3.2 TEST RESULTS 5
4.0 PREREQUISITES **6**
4.1 DRAWING VERIFICATION 6
4.2 REDLINE INCORPORATION 6
4.3 PRESSURE VESSEL INSPECTION 7
4.4 NATIONAL ELECTRICAL CODE (NEC) INSPECTION 7
4.5 SUPPLIES 8
4.6 PRESTART CONDITIONS 10
5.0 PROCEDURE **12**
5.1 CONTINUITY CHECKS 12
5.2 MEGGERING OF POWER WIRES 14
5.3 ELECTRICAL POWER CHECKS 16
5.4 CALIBRATIONS 19
5.5 PLC/DTAM PROGRAMMING 19
5.6 SKID ELECTRICAL AND PROCESS AIR POWER-UP 20
5.7 SKID WATER DRIP SYSTEM 24
5.8 INPUT SIGNALS TO THE PLC AND DTAM 26
5.9 JET PUMP INTERLOCK CIRCUITS 36
5.10 HEATERS, AIR CONDITIONER AND LIGHTS 46
5.11 SKID PREPARATION FOR SHIPPING 48

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

1.0 PURPOSE

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

2.0 INFORMATION

2.1 SCOPE

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

2.1.1 Drawing verification (Prerequisites)
2.1.2 Red-line incorporation
2.1.3 Code Inspections (Prerequisites)
2.1.4 Instrument calibrations
2.1.5 Continuity, megger and voltage checks
2.1.6 Programmable Logic Controller (PLC) and Data Table Access Module (DTAM) programming
2.1.7 Air system
2.1.8 Water system
2.1.9 PLC inputs and outputs
2.1.10 Alarms and interlocks
2.1.11 Heaters, air conditioner and lights

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 PXPT - Pump Transfer Pressure Transducer
2.2.15 JFPT - Jumper Flush Pressure Transducer
2.2.16 RFPT - Recirculation Flush Pressure Transducer
2.2.17 PIC - Person In Charge

2.3 RESPONSIBILITIES

2.3.1 CHG Quality Assurance is responsible for:
- 2.3.1.1 Witnessing and signing steps as identified in the Acceptance Test Procedure.
- 2.3.1.2 Verifying that the ATP sections were performed correctly.
- 2.3.1.3 Approving Exception resolution and exception closure.

2.3.2 Test Engineer (or representative) and/or PIC are responsible for:
- 2.3.2.1 Identifying the equipment required for the ATP.
- 2.3.2.2 Recording equipment status and data per this ATP.
- 2.3.2.3 Conducting pre-job system walk-down.
- 2.3.2.4 Recording data and other notes during the ATP performance.
- 2.3.2.5 Providing technical support during the ATP.
- 2.3.2.6 Providing PLC/DTAM programming support during the ATP.
- 2.3.2.7 Acting as Test Director during the ATP.
- 2.3.2.8 Approving Exception resolution and exception closure.

2.4 SAFETY

Warning: 120vac energized circuits and leads may be encountered during testing when accessing PLC input/output terminals. Observe appropriate electrical precautions as directed by RPP-PRO-088, Electrical Work Safety.

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

2.5 QUALITY ASSURANCE

CHG Quality Assurance Inspector is to ensure that testing is performed per this ATP document. The Quality Assurance Inspector shall sign and date each ATP section verifying the data obtained and that the section was 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 shall be made by redlining the affected section by the engineer as long as the changes do not impact the personnel safety or the technical aspects of this ATP. 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 ATP shall be logged as "Exceptions and documented on the "Exception Record."

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

2.6.6 If the performance of the ATP is suspended for any reason, ensure the equipment is left in a safe condition per the direction of the test engineer and/or PIC and any Lock and Tag system requirements are met before leaving the test site.

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

2.6.8 A Job Hazard Analysis for shall be used in conjunction with the Pre-job safety meeting form when any unusual hazards are identified. The Pre-job meeting form (attached to this ATP) shall be used to document all attendees. NOTE: No unusual hazards are expected during the performance of this ATP.

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

2.6.10 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 the resumption of testing.

2.6.11 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.

2.6.12 Sections 4.2, 4.3, 4.4, 5.4 and 5.5 can be performed out of sequence in order to facilitate the completion of this ATP.

2.6.13 Sections 5.8 through 5.10 can be performed out of order as directed by the test engineer and/or PIC as necessary to facilitate ATP performance.

2.6.14 All personnel performing, initialing and/or signing this ATP shall enter their signature and initials on the Procedure Performer Signature Sheet on the last page of this document.

2.7 LIMITS AND PRECAUTIONS

NONE

3.0 RECORDS

3.1 RECORD COPY

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

3.2 TEST RESULTS

A test report, RPP-6202 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 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 labels on drawings H-14-104151, sheets 7 through 12 and H-14-104154, sheet 5.
4.1.2 Panel board arrangement on drawing H-14-104157.
4.1.3 Flow diagram on drawing H-14-104156.

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

_____

Engineer Signature Date

4.2 REDLINE INCORPORATION

4.2.1 _____Ensure the relines identified on the construction drawings in the fabrication work package are incorporated on the final drawings for skid "V" prior to the drawings being released. NOTE: Redlines must meet the intent of the markups and may not be exactly the same in order to meet drafting standards or for clarity.
4.2.2 Engineer to verify the redline incorporation is completed by signing below.

_____

Engineer Signature Date

4.3 PRESSURE VESSEL INSPECTION

A pressure vessel inspection by a third party inspector is required for the air compressor receiver tank and relief valves located in the air compressor cabinet and the water tank and relief valves located in the water cabinet. The inspection is to verify that the equipment meets National Codes for pressure vessels. An outside-certified inspector shall perform this inspection. (This inspection shall be completed prior to testing 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 sections 5.6 and 5.7.)

Report #'s: (Inspection #'s on tanks)

_____

_____

Engineer Signature Date

Information has been supplied to the PMS database to add relief valve inspection for the air compressor and water tanks. Completion of the database update will be tracked by the Acceptance for Beneficial Use documentation.

_____

Engineer Signature Date

4.4 NATIONAL ELECTRICAL CODE (NEC) INSPECTION

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

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

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

The NEC inspection sticker is placed on the panel board door. (This needs to be completed prior to the section 5.0 functional checks.) Report # (from sticker) _____

_____

Engineer Signature Date

4.5 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 is available prior to the start of each section.

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

Calibration No. _____ Exp. Date _____ QA _____

Calibration No. _____ Exp. Date _____ QA _____

Calibration No. _____ Exp. Date _____ QA _____

4.5.2 Transmation current (milliamp) simulator or equivalent

Calibration No. _____ Exp. Date _____ QA _____

Calibration No. _____ Exp. Date _____ QA _____

Calibration No. _____ Exp. Date _____ QA _____

Calibration No. _____ Exp. Date _____ QA _____

Calibration No. _____ Exp. Date _____ QA _____

4.5.3 Manometer capable of a minimum of 5 inches water gauge to a maximum of 125 inches water gauge for this ATP and a read-out of variable test pressure.

Calibration No. _____ Exp. Date _____ QA _____

Calibration No. _____ Exp. Date _____ QA _____

Calibration No. _____ Exp. Date _____ QA _____

4.5.4 Megaohm meter, at least 500vac range.

Calibration No. _____ Exp. Date _____ QA _____

4.5.5 Temperature simulator capable of 100 to 150 degrees F.

Calibration No. _____ Exp. Date _____ QA _____

Calibration No. _____ Exp. Date _____ QA _____

4.5.6 _____480vac, 3 phase, 30-ampere power supply for PIC skid.
4.5.7 _____Selector switches (3 each) with at least one contact.
4.5.8 _____Proximity switches (for simulating LS-1 and LS-2), 2 each.
4.5.9 _____Leak detector probes (2 each) not required to be green tagged.
4.5.10 _____Heat gun to warm thermocouple probes.
4.5.11 _____ Two thermocouple simulators for testing the thermocouples for the pump and jumper.
4.5.12 _____Buckets or pans for water for leak detector test and catching water from DIP tubes and relief valves.
4.5.13 _____Water supply and hose to fill water tank.
4.5.14 _____ Ice water or cold air spray to cool thermocouple probes.

4.6 PRESTART CONDITIONS

4.6.1 _____Fill the water tank at least one-third to half full of water. Operate the appropriate valves in the water cabinet to accomplish this task.

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

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

NOTE: All valves, electrical equipment and instruments are prefixed with "SALW".

_____V-6035V (EQUALIZING)
_____V-6036V (EQUALIZING)

4.6.4 _____Ensure the following PIC skid valves are CLOSED prior to starting this ATP.

Air Compressor Cabinet

_____V-6025V
_____V-6026V
_____V-6034V
_____V-6043V
_____V-6044V
_____V-6046V
_____V-6047V
_____V-6048V
_____V-6049V
_____V-6050V
_____V-6051V
_____V-6053V

Water Cabinet

_____V-6027V

_____V-6029V
_____V-6030V
_____V-6031V
_____V-6032V
_____V-6037V
_____V-6052V
_____V-6054V
_____V-6055V

WFIE Cabinet

_____V-6001V
_____V-6002V
_____V-6003V
_____V-6004V
_____V-6005V
_____V-6006V
_____V-6007V
_____V-6008V
_____V-6011V
_____V-6012V
_____V-6013V
_____V-6014V

_____V-6015V
_____V-6016V
_____V-6017V
_____V-6018V
_____V-6019V
_____V-6020V
_____V-6021V
_____V-6035V(LOW)
_____V-6035V(HIGH)
_____V-6036V(LOW)
_____V-6036V(HIGH)
_____V-6056V

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

_____DS-6002V _____DS-6003V
_____DS-6004V _____DS-6005V

(The following breakers are located in distribution panel DP-6001V.)

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

(The following fuses are located in the Instrument Enclosure.)

_____FA _____FB _____FC
_____FD _____LD _____HT

4.6.6 Check for loose electrical connections at the following locations:

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

4.6.7 _____Ensure desiccant and filters are installed in the air compressor dryer and filters prior to performing sections 5.6 and 5.7.

4.6.8 _____Ensure check valves in the air compressor and water cabinet are installed in the proper direction. Reference H-14-104156, sheets 1 and 2.

4.6.9 _____A pre-job safety meeting shall be held prior to performing section 5.0. Attendees shall sign the Pre-job Brief Signature and Performer Signature pages at the back of this document.

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 ohm readings 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 with this section.

NOTE: All valves, electrical equipment and instruments labels are prefixed with "SALW".

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

_____(RED) _____(YELLOW OR WHITE) _____(BLUE) _____(GND)

5.1.2 Load side of main disconnect switch (DS-6002V) to the line side of transformer disconnect switch (DS-6003V). Check the two phases used and ground.

_____(RED) _____(YELLOW OR WHITE OR BLUE) _____(GND)

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

_____(RED) _____(YELLOW OR WHITE) _____(BLUE) _____(GND)

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

_____(RED) _____(YELLOW OR WHITE) _____(BLUE) _____(GND)

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

_____ Continuity through the transformer primary.

5.1.6 Line side of the main breaker in panel board (DP-6001V) through the secondary of transformer (XFMR-6001V). 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 (DP-6001V) to terminal point identified.

_____Circuit 3 to TB10 in Instrument Enclosure (CKT3-H)
_____Circuit 5 to TB13 in Instrument Enclosure (CKT5H)
_____Circuit 2 to TB10 in Instrument Enclosure (CKT2H)
_____Circuit 12 to Air Conditioner/Heater receptacle in Instrument Enclosure
_____Circuit 6 to safe side terminal block in Intrinsic Safe panel
_____Circuit 1 to terminal block in FGM power junction box
_____Circuit 11 to terminal block in FGM power junction box
_____Circuit 13 to terminal block in FGM power junction box
_____Circuit 14 to terminal block in FGM power junction box
_____Circuit 10 to terminal block 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

5.1.8 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 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 prior to 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 DS-6002V 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 (DS-6002V) to ground and phase to phase. (Ensure switches DS-6003V, DS-6004V and DS-6005V 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 (DS-6003V) 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 neutral back to ground 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 _____Disconnect the circuit 5 wire at TB13 for the Instrument Enclosure light.

5.2.10 _____Ensure all the heaters, lights and air conditioner are disconnected or unplugged from the 120vac circuits. Ensure the fan thermostat switch in the air compressor cabinet is set high enough for the switch contacts to be open.

5.2.11 Megger each of the 14 circuits from the load side of the breaker or 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 on all the ground fault breakers prior to performing the megger check. This will prevent damage to the ground fault circuitry in the breaker. Reconnect the wire 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 _____

5.2.12 _____Ensure the load-side wire at each breaker where disconnected is reconnected.

5.2.13 _____Reconnect the circuit 6 wire to the safe side terminal block in the Intrinsic safe panel.

5.2.14 _____Reconnect the circuit 5 wire at TB13 for the Instrument Enclosure light.

5.2.15 _____Reconnect any wires disconnected in step 5.2.10 above. (Unplugged items do not have to be plugged back in.)

5.2.16 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; 24vdc; and 32vdc. 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 meggering checks are to be reconnected.

5.3.2 _____Ensure all switches and breakers are open and the six fuses in the Instrument Enclosure are open.

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

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

5.3.5 _____Turn ON the power source to the skid.

5.3.6 _____Ensure 480vac +/-20vac on the line side of the main disconnect switch (DS-6002V). Record the voltage readings.

_____vac, A-B _____A-C _____B-C

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

5.3.8 _____Ensure 480vac +/-20vac on the line side of the transformer disconnect switch (DS-6003V). Record the voltage readings.

_____vac

5.3.9 _____Ensure 480vac +/-20vac on the line side of the air compressor motor starter (DS-6004V). Record the voltage readings.

_____vac, A-B _____vac, A-C _____B-C

5.3.10 _____Ensure 480vac +/-20vac on the line side of the pump motor starter (DS-6005V). Record the voltage readings.

_____vac, A-B _____vac, A-C _____B-C

5.3.11 _____Ensure the dead front on the panel board (DP-6001V) is removed for access to the main breaker for a voltage measurement.

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

5.3.13 _____Check for 240vac +/-20vac on the line side of the main breaker. Record the voltage reading.

_____vac

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

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

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

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

5.3.18 _____Check the voltages for the circuits at the locations designated. Record the voltages in the space provided.

CKT #	Check voltage at	Bkr Open voltage (appr. 0vac)	Bkr Closed voltage (120 +/-10vac)	Open Bkr
1	FGM JUNCTION BOX			
2	TB10, INSTR ENCL			
3	TB10, INSTR ENCL			
4	RCPT, AIR COMPR			
5	TB13, INSTR ENCL			
6	TB, INTRINSIC PNL			
7	RCPT, WFIE CAB.			
8	RCPT, WATER CAB.			
9	OUTSIDE RCPT			
10	FGM HT BOX			
11	FGM JUNCTION BOX			
12	RCPT, INSTR ENCL			
13	FGM JUNCTION BOX			
14	FGM JUNCTION BOX			

5.3.19 _____Ensure fuses FA, FB, FC, FD, LD, and HT are installed in the fuseholders and the fuse switches are closed in the Instrument Enclosure.

5.3.20 _____Close breakers 2, 3 and 5 in the distribution panel (DP-6001V).

5.3.21 _____Ensure 120vac +/-10vac on the load side at the following fuseholders.

FA_____vac; FB_____vac; FC_____vac;

FD_____vac; (LD)_____vac; (HT)_____vac.

5.3.22 _____Ensure 24vdc +/-2vdc at the 24volt power supply.

_____vdc.

5.3.23 _____Close breaker 6 in the distribution panel (DP-6001V).

5.3.24 _____Ensure 32vdc +0/-4vdc at the output of the 3991 power supply in the Intrinsic safe panel (terminals 3 and 4). NOTE: Low voltage reading may indicate the 240/120vac input power switch on the side of the 3991 supply is in the wrong position.) _____VDC

5.3.25 _____Open breakers 2, 3, 5, and 6 in the panel board (DP-6001V).

5.3.26 _____Open the 100 ampere main breaker in the panel board (DP-6001V).

5.3.27 _____Open the transformer disconnect switch (DS-6003V).

5.3.28 _____Open the main disconnect switch (DS-6002V).

5.3.29 Voltage checks completed and readings within tolerance.

_____

Quality Assurance Inspector Signature Date

5.4 CALIBRATIONS

Instrumentation equipment on the skid requires calibration prior to the functional testing. Engineering will verify the calibration completion by checking for current calibration stickers on the equipment and checking off the completed calibrations in the table below.

INSTRUMENT	LOCATION	CAL. STICKER ON
SALW-PS-6004V	AIR COMPR. CABINET	
SALW-WFT-6002V	WFIE CABINET	
SALW-LT-6003V	WATER CABINET	
SALW-SGT-6001V	WFIE CABINET	
SALW-CONV-6001V	WFIE CABINET	
SALW-FQIT-6001V	INSTRUMENT ENCL.	
SALW-PI-6006V	AIR COMPR. CABINET	
SALW-PI-6007V	AIR COMPR. CABINET	
SALW-PI-6008V	WATER CABINET	
SALW-PI-6001V	WFIE CABINET	
SALW-PI-6002V	WFIE CABINET	
SALW-PI-6003V	WFIE CABINET	
SALW-PI-6004V	WFIE CABINET	
SALW-PI-6005V	WFIE CABINET	
SALW-PI-6011V	INSTRUMENT ENCL.	
SALW-PI-6012V	INSTRUMENT ENCL.	

Calibrations completed. Work package nos. _____

_____

Engineer Signature Date

5.5 PLC/DTAM PROGRAMMING

This section is where the programs for the PLC and DTAM will be entered into the equipment. Power will be required (circuit 5) at the Instrument enclosure to power up the PLC and DTAM and for the GFCI receptacle. Engineering will program the equipment from a laptop computer. Final software programs shall be documented as required by HNF-5034. This documentation is not part of this ATP, but will be documented after the OTP in a software report document.

PLC/DTAM programmed.

_____

Engineer Signature Date

5.6 SKID ELECTRICAL AND PROCESS AIR POWER-UP

NOTE: The pressure vessel inspection report must be received prior to proceeding with this section. Refer to section 4.3. Ensure desiccant is in the air dryer and the filters installed.

5.6.1 _____Ensure the skid is connected to the 480vac power source and grounded before proceeding with this functional test.

5.6.2 _____Energize or ensure energized the PIC skid by CLOSING the following disconnect switches in the order listed below.

_____DS-6002V
_____DS-6003V
_____DS-6004V
_____DS-6005V

5.6.3 _____Energize or ensure energized the breakers in the panel board (DP-6001V).

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

5.6.4 _____ACKNOWLEDGE any initial skid alarms.

5.6.5 _____OPEN valves ___V-6034V, ___V-6050V, and ___V-6053V in the Air compressor cabinet.

5.6.6 _____START the air compressor by positioning the positioning the switch on DS-6004V to the ON position.

5.6.7 _____Ensure the air compressor starts and builds up pressure and shuts off at 86 to 94 psig as indicated by pressure gauge PI-6006V. RECORD the shut off pressure: _____psig.

5.6.8 _____CHECK the tubing in the air compressor 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.

5.6.9 _____BLEED off air by slowly opening valve V-6043V until the compressor restarts and note the restart pressure as read on gauge PI-6006V. CLOSE valve V-6043V when the compressor restarts. RECORD the restart pressure reading: _____psig.

5.6.10 _____ENSURE the compressor restarts between 58 to 62 psig.

5.6.11 Valve in air to the PIC skid water tank by performing the following steps.

5.6.12 Check for air leaks as each of the remaining steps in this section are performed.

5.6.13 _____SLOWLY OPEN valve V-6025V located in the air compressor cabinet.

5.6.14 _____SLOWLY OPEN valve V-6027V located near the water tank.

5.6.15 _____SLOWLY OPEN valve V-6052V located near the water tank

5.6.16 _____ADJUST pressure regulator valve PCV-6006V to 30psi (+/-3psi) as indicated by pressure gauge PI-6008V on the outside of the water cabinet. _____psi

5.6.17 _____ACTUATE the lever on relief valve PRV-6004V on the top of the air compressor tank and hold open approximately 5 seconds. (Air system is to be at full pressure of approximately 90psi.)

5.6.18 _____ENSURE the relief valve PRV-6004V seats properly when the lever is released.

5.6.19 _____ACTUATE the lever on relief valve PRV-6005V on the top of the water tank and hold open approximately 5 seconds. (Water system air pressure is to be at full pressure of approximately 30psi.)

5.6.20 _____ENSURE the relief valve PRV-6005V seats properly when the lever is released.

5.6.21 VALVE IN air to the WFIE cabinet by performing the following steps.

5.6.22 _____SLOWLY OPEN valves ___V-6051V located inside the air compressor cabinet and ___V-6026V located on the outside of the air compressor cabinet.

5.6.23 _____SLOWLY OPEN valve V-6001V located in the WFIE cabinet. (NOTE: PRV-6002V may open if pressure through PCV-6001V is too high.)

5.6.24 _____ADJUST pressure control valve PCV-6001V in the WFIE cabinet to 20psi (+/-2.5psi) as indicated by the pressure gauge located on the face of the valve.

5.6.25 _____SLOWLY OPEN valve V-6004V located in the WFIE cabinet.

5.6.26 _____SLOWLY OPEN valve V-6003V located in the WFIE cabinet.

5.6.27 _____ SLOWLY OPEN valve V-6005V located in the WFIE cabinet.

5.6.28 _____ SLOWLY OPEN valve V-6006V located in the WFIE cabinet.

5.6.29 _____ SLOWLY OPEN valve V-6007V located in the WFIE cabinet.

5.6.30 _____ SLOWLY OPEN valve V-6020V located in the WFIE cabinet.

5.6.31 _____ SLOWLY OPEN valve V-6021V located in the WFIE cabinet.

5.6.32 _____ SLOWLY OPEN valve V-6019V located in the WFIE cabinet.

5.6.33 ADJUST the air flow through the diptubes by performing the following steps.

NOTE: Ensure the DIP tubes are not capped on the outside of the WFIE cabinet when performing steps 5.6.34 through 5.6.36.

5.6.34 _____ADJUST flow to dip tube to 1.5 CFH (+/-0.5 CFH) as indicated by FIV-6002V.

5.6.35 _____ADJUST flow to dip tube to 1.5 CFH (+/-0.5 CFH) as indicated by FIV-6003V.

5.6.36 _____ADJUST flow to dip tube to 1.5 CFH (+/-0.5 CFH) as indicated by FIV-6004V.

5.6.37 _____ENSURE air flow from pressure regulator PCV-6007V by slowly opening valve V-6044V in the air compressor cabinet and then reclose the valve.

5.6.38 _____ ENSURE air flow from pressure regulator PCV-6008V by slowly opening valve V-6048V in the air compressor cabinet and then reclose the valve.

5.6.39 _____ ENSURE air flow from the V-6042V port at the air compressor cabinet by slowly opening valve V-6046V in the air compressor cabinet and then reclose the valve.

5.6.40 _____ENSURE air flow from the drain line by slowly opening valves V-6047V and V-6046V in the air compressor cabinet and then reclose the two valves.

5.6.41 Engineer to ENSURE section 5.6 is completed and sign below.

_____

Engineer Signature Date

5.6.42 Quality Assurance Inspector to VERIFY that section 5.6 is complete and sign below.

_____

Quality Assurance Inspector Signature Date

5.7 SKID WATER DRIP SYSTEM

5.7.1 _____PROVIDE a container to capture water expelled from the dip tubes and the pressure relief valve PRV-6001V on the outside of the WFIE cabinet.

5.7.2 ACTUATE the Dip Tube Drip system by SLOWLY OPENING the following valves in the WFIE cabinet:

_____V-6016V
_____V-6013V
_____V-6008V

CAUTION: Relief valve PRV-6001V will actuate and relieve pressure at 25psig.

5.7.3 _____SLOWLY OPEN V-6018V WHILE CAREFULLY ADJUSTING Pressure Regulator PCV-6005V located in the WFIE cabinet to 20psig (+/- 2psig) as indicated on gauge PI-6001V in the WFIE cabinet. _____psig

5.7.4 _____ADJUST valve V-6014V to allow approximately 2 drops/second as indicated by sight glass FG-6001V.

5.7.5 _____ADJUST valve V-6015V to allow approximately 2 drops/second as indicated by sight glass FG-6002V.

5.7.6 _____OPEN valve V-6056V very slightly to verify water flow from the "Water Supply to Remote Drip Control" port located on the outside of the WFIE cabinet, then CLOSE valve V-6056V when water is observed.

5.7.7 VALVE OUT the dip tube drip system by SLOWLY CLOSING or ENSURING CLOSED the following valves located in the WFIE cabinet.

_____V-6015V
_____V-6014V
_____V-6008V
_____V-6013V
_____V-6019V
_____V-6021V
_____V-6020V
_____V-6007V
_____V-6006V
_____V-6005V

5.7.8 Engineer to ENSURE section 5.7 is completed and sign below.

_____

Engineer Signature Date

5.7.9 Quality Assurance Inspector to VERIFY that section 5.7 is complete and sign below.

_____

Quality Assurance Inspector Signature Date

5.8 INPUT SIGNALS TO THE PLC AND DTAM

5.8.1 _____ENSURE the two leak detector probes are connected to the skid at the Instrument Enclosure.

5.8.2 _____ENSURE a normally closed switch is connected to "CGM-AX" and "CKT5H-A" on terminal board TB4 in the Instrument Enclosure. (Can leave existing wires connected.)

5.8.3 _____ENSURE a normally closed switch is connected to "CGM-F" and "CKT5H-A" on terminal board TB4 in the Instrument Enclosure. (Can leave existing wires connected.)

5.8.4 _____ENSURE a normally closed switch is connected to "DIL-F" and "CKT5H-A" on terminal board TB4 in the Instrument Enclosure.

5.8.5 _____ENSURE two proximity switches are connected to the intrinsic safe terminal block in the Intrinsic Safe panel. Connect a normally closed proximity switch temporarily labeled as LS-1 to "LS-1(+) and LS-1(-)" and a normally open proximity switch temporarily labeled as LS-2 to "LS-2(+) and LS-2(-)". ACTUATE the proximity switches by placing metal in front the switch faces.

5.8.6 _____ENSURE the DIP switches for the Pepperl-Fuch module in the Intrinsic Safe panel are set to the correct positions: S1 and S2 in position II; and S3 in position I.

WATER TANK LEVEL TRANSMITTER

5.8.7 _____ENSURE valve V-6029V located in the water tank cabinet is CLOSED.

5.8.8 _____ENSURE valve V-6031V located in the water cabinet is CLOSED.

5.8.9 _____CONNECT a test manometer pressure source that can output at least 62" water gauge to the HIGH PRESSURE vent/test port of level transmitter LT-6003V.

5.8.10 _____ENSURE the LOW PRESSURE vent/test port of level transmitter LT-6003V is OPEN to atmosphere.

5.8.11 _____ADJUST the test manometer connected to LT-6003V to a pressure of 31" water gauge (+/-1"). Record reading _____

5.8.12 _____RECORD the water tank level reading on the DTAM. _____ 31" (+/-2")

5.8.13 The next step will cause a low water level alarm on the DTAM.

5.8.14 _____VERY SLOWLY DECREASE the test manometer pressure until the "PIC WATER LEVEL LOW" (alarm 9) occurs on the DTAM. (This alarm should occur at 12.25" +/-0.5" water gauge.)

5.8.15 _____ACKNOWLEDGE the alarm at the DTAM.

5.8.16 _____RECORD the manometer pressure and the DTAM water level readings.

Pressure on manometer _____ Water Level on DTAM _____

5.8.17 _____SLOWLY INCREASE the manometer pressure until the alarm clears on the DTAM. (This should occur at 15.5" +/-0.5" water gauge.)

5.8.18 _____RECORD the manometer pressure and the DTAM water level readings.

Pressure on manometer _____ Water Level on DTAM_____

5.8.19 _____ENSURE the "PIC Water" alarm indicates "norm".

5.8.20 _____REMOVE the test manometer from the LT-6003V high pressure vent/test port and reinstall the vent plugs on both the high and low sides.

5.8.21 _____OPEN valve V-6029V located in the Water Cabinet.

5.8.22 _____OPEN valve V-6031V located in the Water Cabinet.

5.8.23 _____ENSURE "Water Tank" reading on the DTAM shows a value in inches.

Record the reading _____

WEIGHT FACTOR TEST

5.8.24 _____CONNECT a test manometer pressure source that can output at least 125" water gauge to the HIGH PRESSURE dip tube on the side of the WFIE Cabinet.

5.8.25 _____ENSURE V-6001V is CLOSED.

5.8.26 _____ENSURE V-6005V is OPEN.

5.8.27 _____ENSURE V-6006V is OPEN.

5.8.28 _____ENSURE adjustment valves on FIV-6002V, FIV-6003V and FIV-6004V are CLOSED.

5.8.29 _____ ENSURE the LOW and HIGH side isolation valves located on the V-6036V 3-Valve manifold in the WFIE cabinet are OPEN.

5.8.30 _____ENSURE the EQUALIZING valve located on the V-6036V 3-Valve manifold in the WFIE cabinet is CLOSED.

5.8.31 _____SET the test manometer to 125" (+/-1") water gauge. Record the manometer reading. _____

5.8.32 _____RECORD the "WFT" reading on the DTAM. The reading is to be 125" (+/- 5"). _____

5.8.33 _____BLEED off the pressure on the test manometer. Leave connected for testing the specific gravity transmitter.

5.8.34 _____CLOSE V-6006V.

5.8.35 _____OPEN the EQUALIZING valve located on V-6036V 3-Valve manifold in the WFIE cabinet.

5.8.36 _____CLOSE the LOW and HIGH side isolation valves located on the V-6036V 3-Valve manifold in the WFIE cabinet.

SPECIFIC GRAVITY TRANSMITTER

5.8.37 _____ENSURE V-6007V is OPEN.

5.8.38 _____ENSURE V-6005V is OPEN.

5.8.39 _____ENSURE the LOW and HIGH side isolation valves located on V-6035V 3-Valve manifold in the WFIE cabinet are OPEN.

5.8.40 _____ENSURE the specific gravity transmitter equalizing valve located on the V-6035V 3-Valve manifold located in the WFIE cabinet is CLOSED.

5.8.41 _____SET the test manometer to 5"water gauge (+/- 0.3"). _____

5.8.42 _____RECORD the "SGT" reading on the DTAM. Reading to be 5" +/- 0.35". _____

5.8.43 _____BLEED off pressure on the manometer.

5.8.44 _____ENSURE "SGT LOW" alarm occurs (alarm 13).

5.8.45 _____ACKNOWLEDGE the alarm.

5.8.46 _____DISCONNECT the test manometer.

5.8.47 _____CLOSE V-6007V.

5.8.48 _____CLOSE V-6005V.

5.8.49 _____OPEN the EQUALIZING valve located on V-6035V 3-Valve manifold in the WFIE cabinet.

5.8.50 _____ CLOSE the LOW side and HIGH side isolation valves located on V-6035V 3-Valve manifold in the WFIE cabinet.

FLOW METER SIGNAL CHECK

5.8.51 _____Prepare the flow converter FQIT-6001V located in the Instrument Enclosure to simulate a flow either using the buttons on the front face or using a "brain terminal".

5.8.52 _____SIMULATE a flow signal of 50% span (4 or 7gpm) with the hand-held brain terminal or from the flow converter face switches.

5.8.53 _____RECORD the flow readings on the front of the flow converter and on the DTAM (PMP FLOW). Readings to be within +/- 0.1gpm of each other.

Flow converter _____ DTAM (PMP FLOW) _____

5.8.54 _____RESTORE the flow converter, FQIT-6001V to its original configuration.

SUCTION AND DISCHARGE PRESSURE SIGNAL

5.8.55 _____ENSURE a current source is connected to PSPT+ and PSPT- on the intrinsic side terminal board in the Intrinsic Safe panel. Set the source to "transmitter simulate."

5.8.56 _____SET the current source to approximately 4mA and record the suction pressure reading on PI-6012V. Reading to be approximately zero.

_____psi

5.8.57 _____SET the current source to approximately 20mA and record the suction pressure reading on PI-6012V. Reading to be approximately 100psi.

_____psi

5.8.58 _____DISCONNECT the current source.

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

5.8.60 _____SET the current source to approximately 4mA and record the discharge pressures on PI-6011V and on the DTAM. Readings should be approximately zero.

PI-6011V _____psi DTAM (PMP DISC) _____psi

5.8.61 _____SET the current source to approximately 20mA and record the discharge pressures on PI-6011V and on the DTAM. Readings should be approximately 300psi.

PI-6011V _____psi DTAM (PMP DISC) _____psi

5.8.62 _____DISCONNECT the current source.

COMBUSTIBLE GAS MONITOR ANALOG SIGNAL TO PLC

5.8.63 _____ENSURE a current source is connected to the CGM loop by lifting the CGM 0(+) wire going to the CGM transmitter at terminal board TB1 in the Instrument Enclosure, and connecting the current source between CGM 0(+) and 24vdc COM at TB1.

5.8.64 _____SET the current source to approximately 4mA.

5.8.65 _____RECORD the "CGM" percent reading from the DTAM. Reading is to be approximately zero. _____%

5.8.66 _____SET the current source to approximately 12mA.

5.8.67 _____RECORD the "CGM" percent reading from the DTAM. Reading is to be approximately 50%. _____%

5.8.68 _____SET the current source to approximately 20mA.

5.8.69 _____RECORD the "CGM" percent reading from the DTAM. Reading is to be approximately 100%. _____%

5.8.70 _____DISCONNECT the current source and reconnect the CGM 0 (+) wire to TB1.

DOME SPACE FLAMMABLE GAS MONITOR ANALOG SIGNAL TO PLC

5.8.71 _____ENSURE a current source is connected to terminal board TB1 in the Instrument Enclosure, points FGM 1(+) and FGM 1(-)

5.8.72 _____SET the current source to approximately 4mA.

5.8.73 _____RECORD the "FGM" percent reading from the DTAM. Reading is to be approximately zero. _____%

5.8.74 _____SET the current source to approximately 12mA.

5.8.75 _____RECORD the "FGM" percent reading from the DTAM. Reading is to be approximately 50%. _____%

5.8.76 _____SET the current source to approximately 20mA.

5.8.77 _____RECORD the "FGM" percent reading from the DTAM. Reading is to be approximately 100%. _____%

5.8.78 _____DISCONNECT the current source.

THERMOCOUPLE INPUTS TO THE PLC

5.8.79 _____WARM thermocouple TE-6004V located in the Instrument Enclosure.

5.8.80 _____ENSURE the "PLC CAB temp" on the DTAM displays a temperature change.

5.8.81 _____CONTINUE to warm the thermocouple until "PLC Enclosure HI" (alarm 10) occurs. This will be approximately 130 degrees F.

5.8.82 _____ACKNOWLEDGE the alarm.

5.8.83 _____ENSURE "PLC CAB temp" on the DTAM shows a temperature DECREASE after the heat source is removed from the TE-6004V thermocouple.

5.8.84 _____ENSURE the "PLC temp" alarm returns to "norm" when the temperature decreases below 125 degrees F.

5.8.85 _____WARM thermocouple TE-6001V located in the Air Compressor Cabinet.

5.8.86 _____ENSURE the "COMPRS temp" on the DTAM displays a temperature change.

5.8.87 _____CONTINUE to warm the thermocouple until "Air Compressor Temp HI" (alarm 11) occurs. This will be approximately 130 degrees F.

5.8.88 _____ACKNOWLEDGE the alarm.

5.8.89 _____ENSURE "COMPRS temp" on the DTAM shows a temperature DECREASE after the heat source is removed from the TE-6001V thermocouple.

5.8.90 _____ENSURE the "CMPRSR temp" alarm returns to "norm" when the temperature decreases below 125 degrees F.

5.8.91 _____COOL the thermocouple probe TE-6006V in the WFIE cabinet using ice water or cool air spray. Temperature needs to drop below 35 degrees F.

5.8.92 _____ENSURE alarm 50, "WFIE CAB Temp Low" occurs at the DTAM.

5.8.93 _____WARM or ALLOW to warm the thermocouple probe TE-6006V in the WFIE cabinet and ENSURE the "WFIE CAB Temp" alarm is "norm" when the temperature goes above 40 degrees F.

5.8.94 _____COOL the thermocouple probe TE-6005V in the Water cabinet using ice water or cool air spray. Temperature needs to drop below 35 degrees F.

5.8.95 _____ENSURE alarm 49, "WATER CAB Temp Low" occurs at the DTAM.

5.8.96 _____WARM or ALLOW to warm the thermocouple probe TE-6005V in the Water cabinet and ENSURE the "WATER CAB Temp" alarm is "norm" when the temperature goes above 40 degrees F.

5.8.97 _____CONNECT two temperature simulators to the intrinsic side of the two thermocouple modules (MTL 3081) in the Intrinsic Safe panel.

5.8.98 _____SET the motor temperature alarm setpoints at the DTAM to 125 degrees F for the high and 135 degrees F for the high high. NOTE: The security code is 11 for the restricted screen for entry.

5.8.99 _____SET both temperature simulators to approximately 120 degrees F.

5.8.100_____ENSURE the "PUMP temp" and the "JMPER TEMP" each read approximately 120 degree at the DTAM. _____ (Pump) _____ (Jumper)

5.8.101_____ENSURE the "Jmp Htr" is ON at the DTAM.

5.8.102_____DECREASE the temperature simulator on the top module to approximately 39 degrees or lower until alarm 8 "Pump/Jumper Temp Trouble" alarms on the DTAM.

5.8.103_____ACKNOWLEDGE the alarm.

5.8.104_____ENSURE the "PUMP TEMP" reads approximately 39 degree at the DTAM. _____

5.8.105_____INCREASE the temperature simulator on the top module to approximately 120 degrees. _____

5.8.106_____ENSURE the "JMPR HT" alarm on the DTAM reads "norm".

5.8.107_____ENSURE the "Jmp Htr" is ON at the DTAM.

5.8.108_____ENSURE the switches installed on TB4 between points "CGM-AX" and "CKT5H-A"; and "CGM-F" and "CKT5H-A" are in the CLOSED position.

5.8.109_____ENSURE approximately 120vac between HT-1 and CKT3-N at TB12. _____vac

5.8.110_____WHILE MONITORING the voltage at TB12, INCREASE the temperature on the second module to 206 degrees F or higher until the voltage at TB12 goes to approximately zero. DTAM temp. _____

5.8.111_____WHILE MONITORING the voltage at TB12, decrease the temperature on the second module to 194 degrees F or lower until the voltage at TB12 goes to approximately 120vac. DTAM temp. _____

5.8.112_____OPEN the switch on TB4 that is across "CGM-AX" and "CKT5H-A".

5.8.113_____ENSURE alarm "25" occurs and ACKNOWLEDGE.

5.8.114_____ENSURE the voltage at TB12 goes to approximately zero.

5.8.115_____CLOSE the switch on TB4 that is across "CGM-AX" and "CKT5H-A".

5.8.116_____ENSURE the voltage at TB12 returns to approximately 120vac.

5.8.117_____OPEN the switch on TB4 that is across "CGM-F" and "CKT5H-A".

5.8.118_____ENSURE alarm "31" occurs and ACKNOWLEDGE.

5.8.119_____ENSURE the voltage at TB12 goes to approximately zero.

5.8.120_____CLOSE the switch on TB4 that is across "CGM-F" and "CKT5H-A".

5.8.121_____ENSURE the voltage at TB12 returns to approximately 120vac.

5.8.122_____TURN OFF the heat trace from the DTAM.

5.8.123_____ENSURE the voltage at TB12 goes to approximately zero.

5.8.124_____TURN ON the heat trace from the DTAM.

5.8.125_____ENSURE the voltage at TB12 returns to approximately 120vac.

5.8.126_____INCREASE the temperature simulator on the second module to approximately 226 degrees or higher until alarm 8 "Pump/Jumper Temp Trouble" alarms on the DTAM.

5.8.127_____ACKNOWLEDGE the alarm.

5.8.128_____DECREASE the temperature simulator on the second module to less than 225 degrees.

5.8.129_____ENSURE the "JMPR HT" alarm 8 returns to "norm" on the DTAM.

5.8.130_____REMOVE the temperature simulator from the bottom module, but leave the top temperature simulator connected for the interlock checks in section 5.9.

5.8.131 Engineer to Ensure section 5.8 is completed and sign below.

_____

Engineer Signature Date

5.8.132 Quality Assurance Inspector to Verify that section 5.8 is complete and sign below.

_____

Quality Assurance Inspector Signature Date

5.9 JET PUMP INTERLOCK CIRCUITS

5.9.1 _____ENSURE the LS-1 and LS-2 proximity switches at the Intrinsic safe panel; the two leak detector probes; the two CGM, and the Dilution switches at TB4 in the Instrument Enclosure are in place as per steps 5.8.1 to 5.8.5.

5.9.2 _____IF POSSIBLE, CONNECT three current sources to the following points. One to JFPT+ and JFPT-in the Intrinsic Safe panel at the intrinsic terminal board; one to RFPT+ and RFPT- in the Instrument Enclosure at TB2; and one to PXPT+ and PXPT- at the intrinsic terminal board in the Intrinsic safe panel. Set the current sources to "transmitter simulate" and at 6mA. NOTE: If three current sources are not available, then software forces will be used during this section to bypass the inputs not being tested.

5.9.3 _____SET the temperature simulator at the Intrinsic Safe panel to 120 degrees F.

5.9.4 _____ENSURE the temperature setpoint for the motor-bearing temperature high-alarm is set to 125 degrees F and the high-high-alarm is set to 135 degrees F.

5.9.5 _____ENSURE the laptop computer is connected to the PLC to set forces and observe logic when required.

5.9.6 _____RECORD the reading of the Hourmeter on the front of the Instrument Enclosure. _____

RECIRCULATION FLUSH PRESSURE SIGNAL TO PLC

5.9.7 _____ENSURE a current source is connected to points RFPT+ and RFPT- in the Instrument Enclosure at TB2 and is set to approximately 6mA.

5.9.8 _____ENSURE the green light on the Instrument Enclosure and on the Jet Pump motor starter are ON.

5.9.9 _____APPLY software forces to allow the jet pump to start. (Engineering will apply the forces from the laptop computer connected to the PLC. Normally this will be the COMM Failure and any leak station interlocks. These can be forced out by setting the timers to a high set value such as 7200 seconds with the laptop on-line. If the timers need to be reset to start counting, this is done by turning the key switch on the PLC from "RUN" to "PROGRAM" and then back to "RUN".)

5.9.10 _____TURN the selector switch on the Jet Pump Motor Starter to ON.

5.9.11 _____START the jet pump from the DTAM and OBSERVE that the red lights at the Instrument Enclosure and motor starter come ON and the green lights at both locations turn OFF.

5.9.12 _____SLOWLY INCREASE the RFPT current source output to approximately 12.5mA or until the pump shuts down after a 3 second delay. OBSERVE the following: (Acknowledge the alarms as necessary to observe all the alarms.) NOTE: The horn sound can be adjusted by turning the set screw on the front of the horn for sound level as directed by the engineer or PIC.

_____Record current reading on current source. _____mA
_____The strobe light flashes and the horn sounds.
_____Alarm 12 occurs, "JET PUMP SHUTDOWN".
_____Alarm 39 occurs, "RECIRC FLUSH PRESS HI".
_____Red lights at the motor starter and Instrument Enclosure are OFF.
_____Green lights at the motor starter and Instrument Enclosure are ON.
_____The "RECR FL PR" is approximately 15psi. _____psi
_____Ensure addresses N20:32/2 and N20:32/6 are actuated as observed on the laptop computer in ladder 5.

5.9.13 _____DECREASE the current source to approximately 4mA.

5.9.14 _____ENSURE the "Recirc Press" alarm at the DTAM returns to "norm".

5.9.15 _____ENSURE address N20:32/6 clears as observed on the laptop.

5.9.16 _____START the jet pump from the DTAM and OBSERVE that the red lights at the Instrument Enclosure and motor starter come ON and the green lights at both locations turn OFF.

5.9.17 _____DECREASE the current source to zero.

5.9.18 _____ENSURE the jet pump shuts down.

5.9.19 _____ENSURE alarm 14, "RFPT SIGNAL LOSS ALARM" occurs.

5.9.20 _____ACKNOWLEDGE the alarm.

5.9.21 _____ENSURE address N20:32/7 is actuated as observed on the laptop.

5.9.22 _____INCREASE the current source to approximately 6mA.

5.9.23 _____ENSURE the "RFPT SIGNAL" alarm returns to "norm" on the DTAM.

5.9.24 _____ENSURE address N20:32/7 clears as observed on the laptop.

JUMPER FLUSH PRESSURE SIGNAL TO PLC

5.9.25 _____ENSURE a current source is connected to points JFPT+ and JFPT- in the Intrinsic Safe panel intrinsic terminal board and is set to approximately 6mA.

5.9.26 _____ENSURE the green light on the Instrument Enclosure and on the Jet Pump motor starter are ON.

5.9.27 _____APPLY software forces as necessary to allow the jet pump to start. (Engineering will apply the forces from the laptop computer connected to the PLC.)

5.9.28 _____START the jet pump from the DTAM and OBSERVE that the red lights at the Instrument Enclosure and motor starter come ON and the green lights at both locations turn OFF.

5.9.29 _____ENSURE address N20:32/2 is clear as observed on the laptop.

5.9.30 _____SLOWLY INCREASE the JFPT current source output to approximately 12.5mA or until the pump shuts down after a 3 second delay. OBSERVE the following: (Acknowledge the alarms as necessary to observe all the alarms.)

_____The jet pump shuts down.
_____Record current reading on current source. _____mA
_____Alarm 3 occurs, "Flush Pressure HI".
_____Alarm 12 occurs, "JET PUMP SHUTDOWN".
_____Blue light at the Instrument Enclosure is ON.
_____The "PS2 FL PR" is approximately 15psi. _____psi
_____Ensure address N20:32/5 is actuated as observed on the laptop.

5.9.31 _____DECREASE the current source to approximately 4mA.

5.9.32 _____ENSURE the "Flush Press" alarm at the DTAM returns to "norm".

5.9.33 _____ENSURE the blue light at the Instrument Enclosure turns OFF.

5.9.34 _____ENSURE address N20:32/5 clears as observed on the laptop.

5.9.35 _____START the jet pump from the DTAM.

5.9.36 _____DECREASE the current source to zero.

5.9.37 _____ENSURE the jet pump shuts down.

5.9.38 _____ENSURE alarm 16, "JFPT SIGNAL LOSS ALARM" occurs.

5.9.39 _____ACKNOWLEDGE the alarm.

5.9.40 _____ENSURE address N20:32/8 actuates as observed on the laptop.

5.9.41 _____INCREASE the current source to approximately 6mA.

5.9.42 _____ENSURE the "JFPT SIGNAL" alarm returns to "norm" on the DTAM.

5.9.43 _____ENSURE address N20:32/8 clears as observed on the laptop.

TRANSFER PRESSURE INTERLOCK INPUT

5.9.44 _____ENSURE a current source is connected to points PXPT+ and PXPT- in the Intrinsic Safe panel intrinsic terminal board and is set to approximately 6mA.

5.9.45 _____ENSURE the laptop computer is connected to the PLC and is "on-line".

5.9.46 _____ENSURE the green light on the Instrument Enclosure and on the Jet Pump motor starter are ON.

5.9.47 _____APPLY software forces to allow the jet pump to start. (Engineering will apply the forces from the laptop computer connected to the PLC.)

5.9.48 _____START the jet pump from the DTAM.

5.9.49 _____DECREASE the PXPT current source to approximately 4.8mA or until Timer 4.1 on the ladder logic of the PLC (rung 0 of ladder 5) starts timing.

5.9.50 _____ENSURE the amber light on the Instrument Enclosure turns ON immediately after the timer starts.

5.9.51 _____ENSURE after 30 seconds, the following occurs: (Acknowledge alarms as necessary to view all the alarms.)

_____The jet pump shuts down.
_____ "XFR Pressure LOW" (alarm 1) occurs at the DTAM.
_____ "JET PUMP SHUTDOWN" (alarm12) occurs at the DTAM.

5.9.52 _____INCREASE the current source to approximately 6mA.

5.9.53 _____ENSURE the "XFR Pressure" alarm is "norm" on the DTAM and the amber light is OFF on the Instrument Enclosure.

5.9.54 _____START the pump from the DTAM.

5.9.55 _____INCREASE the current source to approximately 11.5mA or until Timer 4.2 on rung 2 of ladder 5 starts timing as observed on the laptop computer.

5.9.56 _____ENSURE after a 3 second delay, the following occurs: (Acknowledge alarms as necessary to view all the alarms.)

_____The jet pump shuts down.
_____ "XFR Pressure HIGH" (alarm 2) occurs at the DTAM.
_____ "JET PUMP SHUTDOWN" (alarm12) occurs at the DTAM.

5.9.57 _____DECREASE the current source to approximately 6mA.

5.9.58 _____ENSURE the "XFR Pressure" alarm indicates "norm" on the DTAM.

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

5.9.59 _____ENSURE the amber lights for LS-1 and LS-2 are ON at the Pepperl-Fuchs modules in the IS panel.

5.9.60 _____START the pump from the DTAM.

5.9.61 _____REMOVE the metal from the front face of LS-1.

5.9.62 _____ENSURE the following occurs immediately: (Acknowledge alarms as necessary to view all the alarms.)

_____The jet pump shuts down.
_____ "JR-1 Position NON-PROCESS" (alarm 5) occurs at the DTAM.
_____ "JET PUMP SHUTDOWN" (alarm12) occurs at the DTAM.
_____Address N20:32/0 on ladder 5 is actuated as observed on the laptop.
_____ENSURE the amber light is OFF and the red light is ON for light set 1.

5.9.63 _____REMOVE the metal form the front face of LS-2.

5.9.64 _____ENSURE the "JR-1" still indicates "NON-PROCESS" at the DTAM.
_____ENSURE the amber light is OFF and the red light is ON for light set 2.

5.9.65 _____ENSURE address N20:32/1 is actuated on ladder 5 as observed on the laptop.

5.9.66 _____REPLACE the metal in front of LS-1 and LS-2.

5.9.67 _____ENSURE the "JR-1" indicates "norm" on the DTAM and addresses N20:32/0 and N20:32/1 are clear on ladder 5 as observed on the laptop.
_____ENSURE the amber lights are ON and the red lights are OFF.

COMBUSTIBLE GAS MONITOR INTERLOCK INPUTS

5.9.68 _____START the pump from the DTAM.

5.9.69 _____OPEN the CGM-AX switch at TB4.

5.9.70 _____ENSURE the following occurs immediately: (Acknowledge alarms as necessary to view the alarms.)

_____The jet pump shuts down.
_____ "JET PUMP SHUTDOWN" (alarm12) occurs at the DTAM.
_____ "HIGH LFL ON CGM" (alarm 25) occurs at the DTAM.

5.9.71 _____CLOSE the CGM-AX switch at TB4.

5.9.72 _____ENSURE the "HI LFL CGM" alarm indicates "norm" at the DTAM.

5.9.72 _____START the pump from the DTAM.

5.9.73 _____OPEN the CGM-F switch at TB4.

5.9.74 _____ENSURE the following occurs after a 3-second delay: (Acknowledge alarms as necessary to view the alarms.)

_____The jet pump shuts down.
_____ "JET PUMP SHUTDOWN" (alarm12) occurs at the DTAM.
_____ "CGM TROUBLE" (alarm 31) occurs at the DTAM.

5.9.75 _____CLOSE the CGM-F switch at TB4.

5.9.76 _____ENSURE the "CGM TROUBLE" alarm indicates "norm" at the DTAM.

5.9.77 _____START the pump from the DTAM.

5.9.78 _____OPEN the dilution switch at TB4 in the Instrument Enclosure.

5.9.79 _____ENSURE the following occurs after a 5-minute delay: (Acknowledge alarms as necessary to view the alarms.)

_____The jet pump shuts down.
_____ "JET PUMP SHUTDOWN" (alarm12) occurs at the DTAM.
_____ "DILUTION TANK NO FLOW" (alarm 35) occurs at the DTAM.

5.9.80 _____CLOSE the dilution switch.

5.9.81 _____ENSURE the "Dilution tk" alarm indicates "norm" on the DTAM (The "norm" returns once the alarm is acknowledge since the MR-1 contact is in series with alarm and opens when the pump shut downs thus clearing the alarm.)

MOTOR HIGH TEMPERATURE

5.9.82 _____ START the pump from the DTAM.

5.9.83 _____INCREASE the temperature on the temperature simulator to approximately 126 degrees F or greater until alarm 58, "MOTOR TEMP HIGH" actuates.

5.9.84 _____INCREASE the temperature on the temperature simulator to approximately 136 degrees F or greater until the following occurs:

_____The jet pump shuts down.
_____ "JET PUMP SHUTDOWN" (alarm12) occurs at the DTAM.
_____ "Motor Temp Hi Shutdown" (alarm 59) occurs at the DTAM.

5.9.85 _____DECREASE the temperature simulator to approximately 125 degrees F or lower until alarm "PMP HIHI TEMP" indicates "norm" at the DTAM.

5.9.86 _____ENSURE the "PMP HI TEMP" alarm indicates "norm" at the DTAM.

LEAK DETECTION INTERLOCK

5.9.87 _____ENSURE there is a water supply and bucket available to actuate the leak detector probes.

5.9.88 _____START the pump from the DTAM.

5.9.89 _____PLACE the primary leak detector probe in a bucket of water.

5.9.90 _____ENSURE the following occurs after a 3-second delay: (Acknowledge alarms as necessary to view the alarms.)

_____The jet pump shuts down.
_____ "PUMP PIT LEAK" (alarm 6) occurs at the DTAM.
_____ "JET PUMP SHUTDOWN" (alarm12) occurs at the DTAM.
_____The red light for the "Primary" leak detector is ON at the Instrument Enclosure.
_____Ensure address N20:32/3 in ladder 5 actuates as observed on the laptop.

5.9.91 _____REMOVE the leak detector probe from the bucket and allow the water to drain off.

5.9.92 _____ENSURE the "Pump Pit" leak alarm returns to "norm".

5.9.93 _____ENSURE the red light for the "Primary" leak detector is OFF.

5.9.94 _____ENSURE address N20:32/3 clears as observed on the laptop.

5.9.95 _____START the pump from the DTAM.

5.9.96 _____DISCONNECT one of the "SD" wires going to the primary leak detector probe.

5.9.97 _____ENSURE the following occurs after a 3-second delay: (Acknowledge alarms as necessary to view the alarms.)

_____The jet pump shuts down.
_____ "PUMP PIT LEAK TROUBLE" (alarm 7) occurs at the DTAM.
_____ "JET PUMP SHUTDOWN" (alarm12) occurs at the DTAM.
_____The red light for the "Primary" leak detector at the Instrument Enclosure is ON.
_____Ensure address N20:32/3 actuates as observed on the laptop.

5.9.98 _____RECONNECT the "SD" wire.

5.9.99 _____ENSURE the "Pump Pit" trouble alarm indicates "norm" on the DTAM.

5.9.100_____ENSURE the red light for the "Primary" leak detector is OFF.

5.9.101_____ENSURE address N20:32/3 clears as observed on the laptop.

5.9.102_____START the pump from the DTAM.

5.9.103_____PLACE the leak detector 1 probe in a bucket of water.

5.9.104_____ENSURE the following occurs after a 3-second delay: (Acknowledge alarms as necessary to view the alarms.)

_____The jet pump shuts down.
_____ "JET PUMP SHUTDOWN" (alarm12) occurs at the DTAM.
_____ "LEAK DETECTOR NO 1 LEAK DETECTED" (alarm 18) occurs at the DTAM.
_____The red light for "Leak Detector 1" at the Instrument Enclosure is ON.
_____Ensure address N20:32/4 actuates in ladder 5 as observed on the laptop.

5.9.105_____REMOVE the leak detector probe from the bucket and allow the water to drain off.

5.9.106_____ENSURE the "Leak 1" alarm returns to "norm".

5.9.107_____ENSURE the red light for "Leak Detector 1" is OFF.

5.9.108____ENSURE address N20:32/4 clears as observed on the laptop.

5.9.109_____START the pump from the DTAM.

5.9.110_____DISCONNECT one of the "SD" wires going to the leak detector 1 probe.

5.9.111_____ENSURE the following occurs after a 3-second delay: (Acknowledge alarms as necessary to view the alarms.)

_____The jet pump shuts down.
_____ "JET PUMP SHUTDOWN" (alarm12) occurs at the DTAM.
_____ "LEAK DETECTOR NO 1 TROUBLE" (alarm 19) occurs at the DTAM.
_____The red light for "Leak Detector 1" at the Instrument Enclosure is ON.
_____Ensure address N20:32/4 actuates as observed by the laptop.

5.9.112_____RECONNECT the "SD" wire.

5.9.113_____ENSURE the "Leak 1 ck" alarm indicates "norm" on the DTAM.

5.9.114_____ENSURE the red light for "Leak Detector 1" is OFF.

5.9.115_____ENSURE address N20:32/4 clears as observed on the laptop.

5.9.116_____RECORD the hourmeter reading. _____

5.9.117_____VERIFY by comparing the readings in steps 5.9.6 and 5.9.108 that the hourmeter is recording time.

5.9.118_____REMOVE the software forces and disconnect the laptop computer from the PLC.

5.9.119_____TURN OFF breakers 2, 3, 5, and 6 in the distribution panel.

5.9.120_____DISCONNECT the current sources from the PXPT, RFPT and JFPT termination points.

5.9.121_____DISCONNECT the test switches from the CGM and Dilution termination points.

5.9.122_____DISCONNECT the proximity switches from the Intrinsic Safe panel.

5.9.123_____DISCONNECT the temperature simulator from the Intrinsic Safe panel.

5.9.124_____DISCONNECT the leak detector probes from the Instrument Enclosure.

5.9.125_____TURN ON breakers 2, 3, 5, and 6 at the distribution panel.

5.9.126Engineer to ENSURE section 5.9 is completed and sign below.

_____

Engineer Signature Date

5.9.127Quality Assurance Inspector to VERIFY that section 5.9 is completed and sign below.

_____

Quality Assurance Inspector Signature Date

5.10 HEATERS, AIR CONDITIONER AND LIGHTS

5.10.1 _____TURN the heater ON in the air compressor cabinet. Set the thermostat high enough to allow the unit to operate.

5.10.2 _____RESET the thermostat to approximately 40 degrees F to allow the heat to turn OFF. Then unplug the heater.

5.10.3 _____TURN the fan thermostat switch to allow the fan in the air compressor cabinet to run.

5.10.4 _____RESET the fan switch to approximately 90 degrees F to allow the fan to turn OFF.

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

5.10.6 _____RESET the thermostat to approximately 40 degrees F to allow the heat to turn OFF. Then unplug the heater.

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

5.10.8 _____RESET the thermostat to near the "LO" setting to allow the heat to turn OFF. Then unplug the heater.

5.10.9 _____ TURN the heater ON in the Instrument Enclosure. Set the thermostat high enough to allow the unit to operate.

5.10.10_____RESET the thermostat to approximately 40 degrees F to allow the heat to turn OFF. Then unplug the heater.

5.10.11_____TURN ON the air conditioner in the Instrument Enclosure. If necessary, remove the front grill on the unit and adjust the temperature setting to get the unit to operate.

5.10.12_____RESET the temperature setting on the air conditioner to between 90 to 95 degrees F. Remove the grill and filter on the front of the air conditioner for access to the adjustment. Then unplug the air conditioner.

5.10.13_____ENSURE the light in the WFIE cabinet operates.

5.10.14_____ENSURE the light in the Instrument Enclosure operates.

5.10.15 Engineer to ENSURE that section 5.10 is completed and sign below.

_____

Engineer Signature Date

5.10.16 Quality Assurance Inspector to VERIFY that section 5.10 is completed and sign below.

_____

Quality Assurance Inspector Signature Date

5.11 SKID PREPARATION FOR SHIPPING

5.11.1. _____Ensure the following PIC skid circuit disconnects, breakers and fuses are OPEN or OFF.

_____DS-6002V
_____DS-6003V
_____DS-6004V
_____DS-6005V

The breakers below are located in the distribution panel DP-6001V:

_____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

5.11.2. _____Disconnect the power plug from the 480vac power source and ground wire.

5.11.3. _____ENSURE the power plug on the power cable is a Crouse-Hinds model APJ3475.

5.11.4. _____DRAIN the water tank in the Water Cabinet.

5.11.5. _____Bleed the air pressure off the air system by OPENING the following valves:

_____V-6043V
_____V-6046V
_____V-6047V
_____V-6037V

NOTE: After the air system has bled down, proceed with the following valve positioning.

5.11.6. _____Ensure the following PIC skid valves in the WFIE cabinet are OPEN.

_____V-6035V (EQUALIZING)
_____V-6036V (EQUALIZING)

5.11.7. _____Ensure the following valves are CLOSED.

Air Compressor	Water Cabinet
_____V-6025V	_____V-6027V
_____V-6026V	
_____V-6034V	_____V-6029V
_____V-6043V	_____V-6030V
_____V-6044V	_____V-6031V
_____V-6046V	_____V-6032V
_____V-6047V	_____V-6037V
_____V-6048V	_____V-6052V
_____V-6049V	_____V-6054V
_____V-6050V	_____V-6055V
_____V-6051V	
_____V-6053V	

WFIE Cabinet

_____V-6001V	_____V-6015V
_____V-6002V	_____V-6016V
_____V-6003V	_____V-6017V
_____V-6004V	_____V-6018V
_____V-6005V	_____V-6019V
_____V-6006V	_____V-6020V
_____V-6007V	_____V-6021V
_____V-6008V	_____V-6035V LOW
_____V-6011V	_____V-6035V HIGH
_____V-6012V	_____V-6036V LOW
_____V-6013V	_____V-6036V HIGH
_____V-6014V	_____V-6056V

5.11.8. Engineer to determine if the skid will be used on a "B-phase grounded" system. (Yes/No)_____ If yes, perform the following: (Otherwise N/A steps 5.11.9 through 5.11.11.)

5.11.9. _____Replace the "B-phase" fuse in disconnects DS-6002V, DS-6004V and DS-6005V with a dummy fuse NTS-R-30.

5.11.10. _____Install the "B-phase grounded" label on DS-6002V, DS-6004V and DS-6005V.

5.11.11. _____Ensure the "B-phase" wires are white or taped white at disconnects DS-6002V, DS-6004V and DS-6005V.

5.11.12Engineer to ENSURE that section 5.11 is completed and sign below.

_____

Engineer Signature Date

5.11.13. Quality Assurance Inspector to VERIFY that section 5.11 is completed and sign 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

This page may be reproduced as necessary.

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

Section 5.0 of the Acceptance Test Procedure has been completed including completion of all exceptions. 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